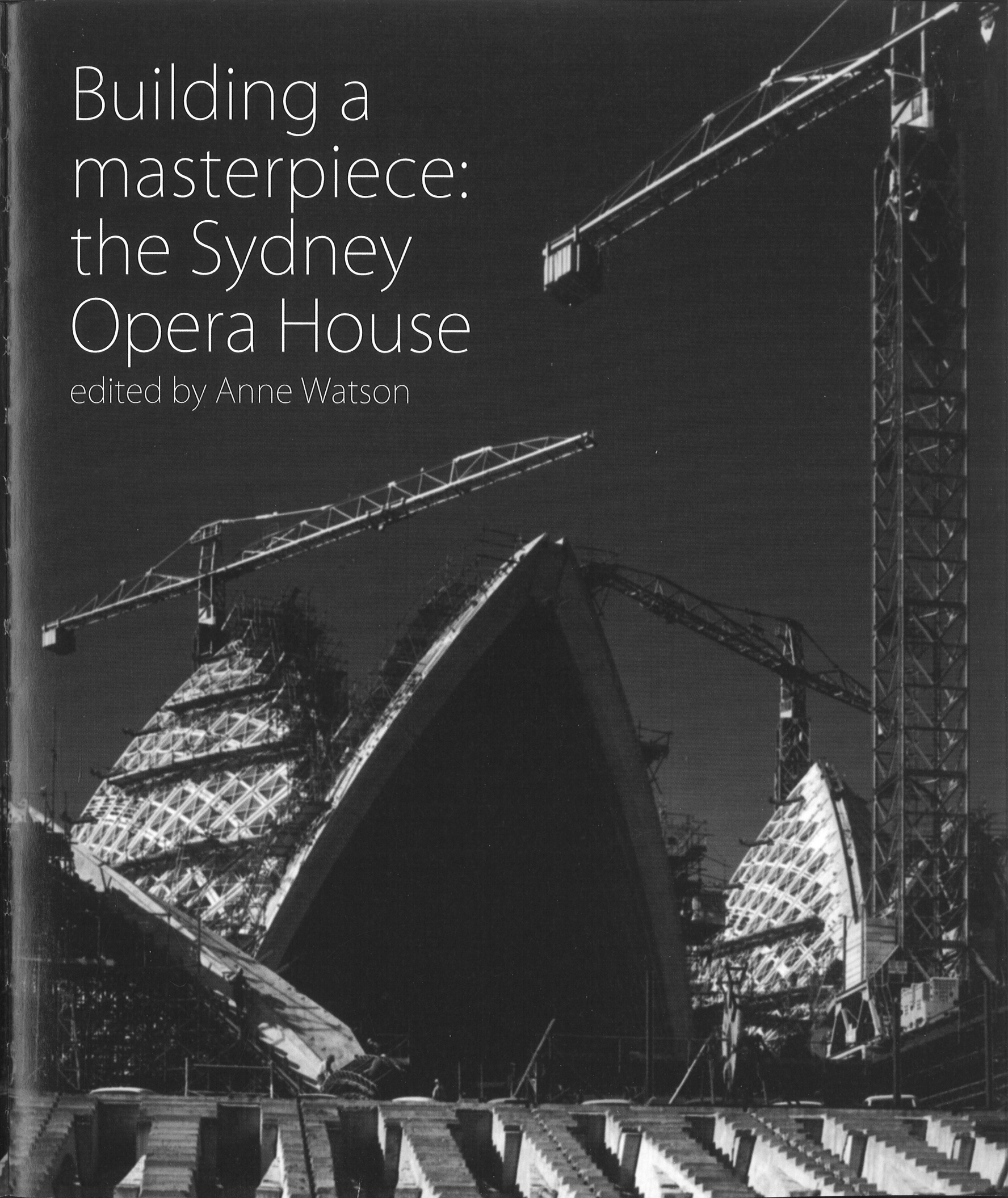


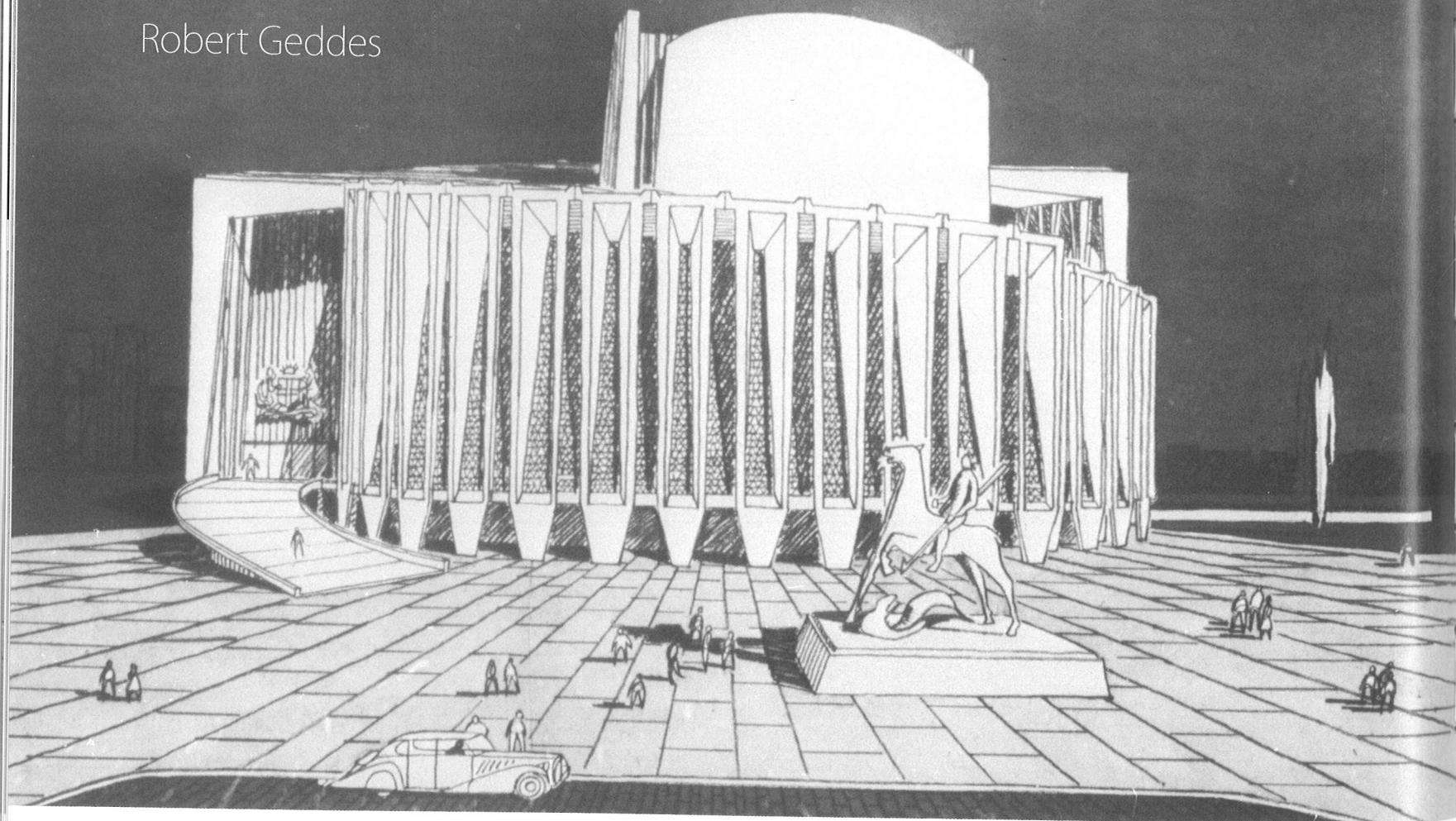
Building a masterpiece: the Sydney Opera House

edited by Anne Watson



Second thoughts: reflections on winning second prize

Robert Geddes



Design for the Sydney Opera House competition, 1956, by the Philadelphia collaborative group: (alphabetically) Melvin Brecher, Warren Cunningham, Robert Geddes, Leon Loschetter, Joseph Marzella, George Qualls and Walter Weissman. The perspective was drawn by George Qualls. The entry was placed second and was praised by the jury for its 'robust' spiral structure which was 'well suited to its position on Bennelong Point'.

We almost won.
But we didn't.
Why?

Who were we in 1956? We were the equivalent of a pick-up band in a dance hall.¹ There were seven of us, friends and colleagues, with diverse and complicated connections. Four of us (Loschetter, Qualls, Weissman and I) were teaching architecture at the University of Pennsylvania. Loschetter was a visiting critic from Grasse, France. Four of us were working in downtown architectural offices (Brecher and Cunningham in one, Marzella and Qualls in another), while two of us (Brecher and I) were starting our practice. Qualls and I were sharing a design studio at Penn, and regularly entering design competitions together.

In the 1950s, young architects flocked to Philadelphia. Penn was the catalyst. Its new dean, Holmes Perkins, was creating an avant-garde modernist school, following decades of a splendid Beaux Arts tradition. Perkins came to Penn from Harvard, where he had been on the now-famous trip to Europe in 1936 to choose between J J P Oud, Ludwig Mies van der Rohe and Walter Gropius to be the new professor of architecture. Gropius moved to America to teach at Harvard from 1937 to 1952.²

At Harvard and at Penn, the 'collaborative process' — among individuals, among the arts, and among design professions — was pervasive. It came in three models. One came directly from Gropius, who created The Architects' Collaborative, a firm which enabled members of the same profession to work as a team. In America, the triumph of this collaborative way of working had been the design group for New York's Rockefeller Centre (1931–40). The second model of the collaborative process came from the 'city beautiful movement', which brought together artists — painters and sculptors, architects and landscape architects — to create 'civic art' and

to participate in 'civic design'. Its triumph had been a neo-classical 'White City' of monumental buildings, sculptures and landscapes for Chicago's Columbian Exhibition (1893). The third model of the collaborative process brought together three types of design professionals — architects, landscape architects, city and regional planners. As a process it was evident in the regional plans for New York, in the historic city plans for Philadelphia, in district plans for Boston's neighbourhoods and Baltimore's Inner Harbour, and in campus plans of colleges and universities.³

The collaborative was an ideal way of working. In 1950, four of us at Harvard (Conklin, McHarg, Sevely and Geddes) had submitted a joint thesis project for the redevelopment of downtown Providence, Rhode Island.⁴ Two aspects of this thesis were forecasts of the Philadelphia collaborative group's entry in the Sydney Opera House competition six years later. First, it was the cumulative work of a group, rather than one person. Second, some of the dominant new buildings — cylindrical office towers (designed by Sevely) and a spiral department store (designed by Geddes) — were centroidal in form. Monumentality was an issue debated but not well resolved in this thesis. While the project's rectangular shopping courts and linear garages were vernacular background buildings, its cylindrical buildings were monumental in form — but not in function. The tension between form and meaning, inherent in architecture, was later resolved in the competition program for the Sydney Opera House, where the site and function were intentionally monumental from the outset.

In 1953 in Philadelphia, a group of the new Penn faculty began to collaborate in the Group for Architectural Investigation (GAI),⁵ creating a chapter of the International Congress on Modern Architecture (CIAM), sending analytical studies and



Model for the redevelopment of downtown Providence, Rhode Island, 1950. A collaborative thesis project by Geddes and three other graduate students at Harvard, it anticipated two important aspects of the opera house competition to which Geddes contributed six years later: its collaborative approach and the centroidal design of three of its major buildings.

design works to the conferences in Aix-en-Provence in 1953 and Dubrovnik in 1956. In 1954, for the City of Philadelphia, a Penn faculty group collaborated for a Redevelopment Authority design study of new housing types for post-war neighbourhoods.⁶

The City of Philadelphia played a key role in this story. Following the end of World War II, its politics and culture changed direction. Progressive 'young Turks' banded together, mounted exhibitions, formed citizens' planning councils, and ran for election as mayor and senator. Architect Louis Kahn and planner Edmund Bacon were leaders in this civic renaissance. The city itself became a laboratory for new architecture and urbanism.

Out of this brew, a new architectural firm emerged — Geddes Brecher Qualls Cunningham. The Sydney Opera House competition was the first time that the four of us had worked together. A quarter-century later, in 1979, this collaborative was awarded the highest professional honour of the American Institute of Architects, cited for its 'design quality, respect for the environment, and social concern'.

The 1950s were the Eisenhower years. Following World War II, Americans sought peace and stability. The winning political slogan was 'I like Ike', while a Broadway song proclaimed 'And Ike likes me!' It was a period of 'moderate Republicanism'. But it was also an era of fundamental change: the start of racial integration in public schools in Birmingham, Alabama, and the construction of a nation-wide highway system and sprawling new suburbs. Living 'the American dream' was the source of popular imagery. In 1955, a double-page advertisement which proclaimed 'Looking out of your window wall of Parallel-O-Plate Insulating Glass, you see the scene as it is', expressed the essence of American thought — a blend of empiricism, realism and pragmatism.



These details from a 1955 American advertisement for 'Parallel-O-Plate' glass express the essence of the 'American dream' in the 1950s: comfortable middle-class life in a modern home with lots of recreation time and the latest in automobiles.



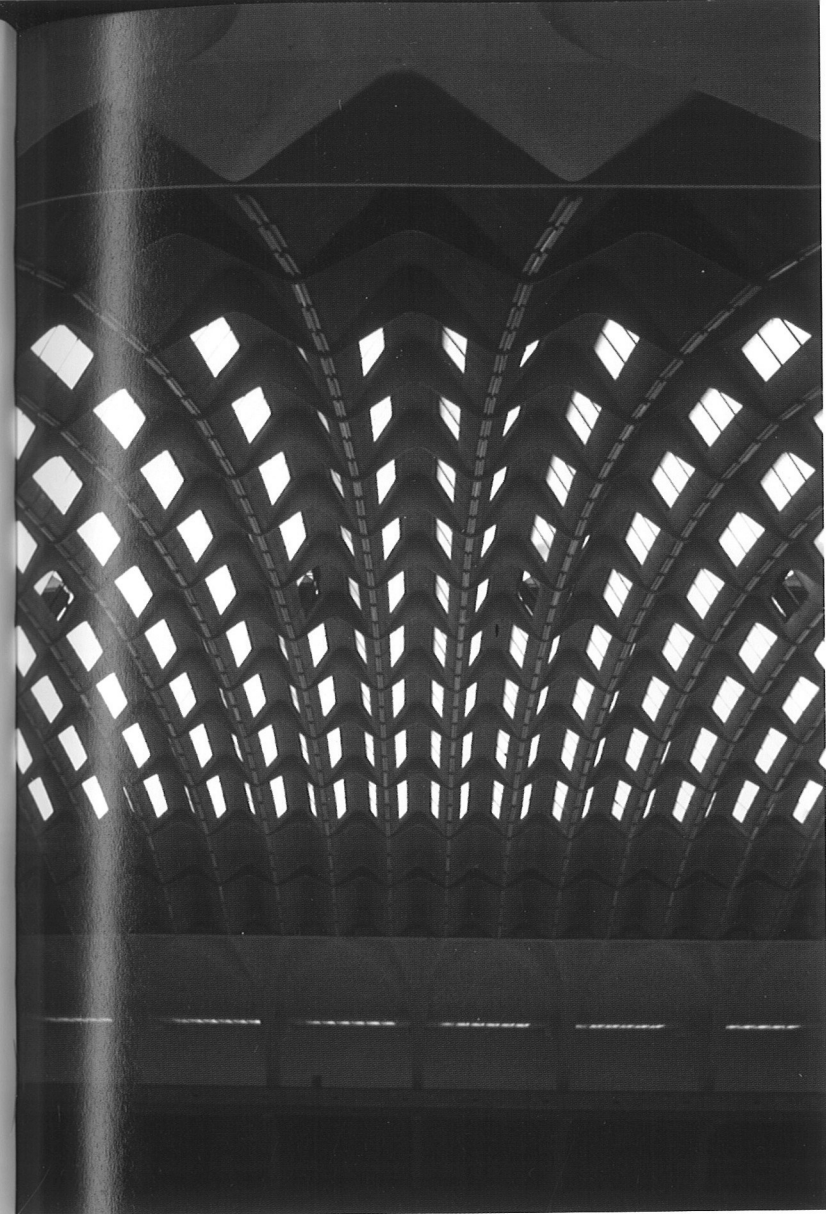
Renowned American architectural photographer Ezra Stoller took this shot of Skidmore, Owings & Merrill's Lever House, New York, soon after completion in 1952. One of the earliest of New York's buildings to express the triumph of European metal-and-glass modernism, it was quickly followed by Mies van der Rohe's Seagram Building (1954) on a site diagonally opposite.

The decade's iconic figures, as portrayed in the novel *The man in the gray flannel suit* and the series of essays *The organisation man*, became the clients for modern architecture.⁷ Removed from the social and political program of its roots, the International Style was readily adopted by corporate culture. The European architecture of Mies van der Rohe became the American architecture of Skidmore, Owings & Merrill (SOM). The triumph of corporate modernism was first evident on New York's Park Avenue, which had been a triumph of Beaux Arts civic design. In the 1950s, one of its stone palaces, the Racquets Club, designed by McKim, Mead & White (1918), was joined by two glass-box neighbours — SOM's Lever House (1952) and Mies' Seagram Building (1954). Each broke away from the traditional street wall. Mies' symmetrical composition — tower, entrance, plaza and street — was rigorously classical, while SOM's asymmetrical composition was casually picturesque. Otherwise they had much in common — grids and frames, rectilinear structures and transparent claddings, modular 5-foot units and regular rhythms. Soon Park Avenue was taken over, along with most American streets. It seemed that modern architecture had settled in. Or settled down?

We resisted. From our perspective, there were many possibilities.

We were enthralled by the new architecture of Alvar Aalto and Pier Luigi Nervi, and we were envious of the new urbanism in England and the Netherlands. Immediately after World War II, while Gropius was at Harvard, Aalto was teaching nearby at MIT. In Cambridge, Aalto built a wood-panelled reading room inside a new Harvard library, and a curvilinear residence hall for MIT along the Charles River. We loved them both. Back in Helsinki, in 1955, Aalto designed a new House of Culture with an auditorium that was 'a lilting interpretation of the shape of music'. The fan-shaped floor plan, and the clam-shell cross-section, were derived from human performance requirements. Can you hear well? Can you see well?

We were sponges. We absorbed images and ideas from biologist D'Arcy Thompson, artist Paul Klee and social critic Lewis Mumford. We read Geoffrey Scott's *The architecture of humanism* and we also read Le Corbusier's *Towards a new architecture*.⁸ We wanted to achieve both possibilities. In that struggle, Matthew Nowicki's 1951 essay, 'Origins and trends in modern architecture', was a great help.⁹ Nowicki sought to



reconcile humanism and modernism by tracing the beginnings of modern architecture to 'the domestic structure of the late Renaissance. It was then that the problem of human comfort was rediscovered'. Nowicki had been Qualls' and Weissman's teacher at North Carolina State College. He was the Polish delegate on the United Nations Headquarters collaborative, working alongside Le Corbusier and Eero Saarinen. Sadly, he died in an airplane crash in 1950. His major built work was the Livestock Judging Pavilion at the North Carolina State Fair (1953–54). It was, in Mumford's words, 'an architecture of democracy: a new architecture such as Whitman had foretold'.

Around the corner from us in Philadelphia, during the early 1950s, Louis Kahn had been designing two of the most important new works in modern architecture: the Yale University art gallery in New Haven, Connecticut (1951–53), and the bathhouse for the Jewish Community Centre in Trenton, New Jersey (1955). Because Kahn was still teaching at Yale, until the spring of 1955 our day-to-day encounters — at Penn, at parties, on street corners — came later. Meanwhile, his engagement with the Centre City Plan involved many of us in the urban design committee of the Philadelphia chapter of the American Institute of Architects, in the Citizens Council on City Planning, and in his office as night-shift helpers.

What other new works in the mid-1950s did we find compelling? In urbanism, the Lijnbaan shopping street and neighbourhood in the core of Rotterdam, designed by CIAM's Bakema and van den Broek, was just completed, and in the ring around London, the new towns of Stevenage and Harlow were underway. In architecture, we studied the structural expressionism of Nervi's Exhibition Hall in Turin, Italy (1949), the functional expressionism of Aalto's House of Culture in Helsinki, Finland



Top: Like a shell, the ribbed concrete roof structure of Pier Luigi Nervi's Exhibition Building, Turin (1948–49), derived its form from the forces acting upon it and from the way it was made. As with genuine Gothic construction, Nervi's building was simultaneously structure and space.

Bottom: Alvar Aalto's House of Culture, Helsinki (1955–58), with its curving, fan-shaped auditorium, was based on a new exploration of architectural humanism. Its plasticity of forms and texture and lightness of natural materials provided an exciting expansion of international modernism's aesthetic.



Matthew Nowicki's Lumber Pavilion, North Carolina State Fair, Raleigh, 1950. Nowicki's last major work before his death in a plane crash in 1950, the pavilion was influential in its expression of a new attempt to reconcile humanism and modernism, a new 'architecture of democracy'.

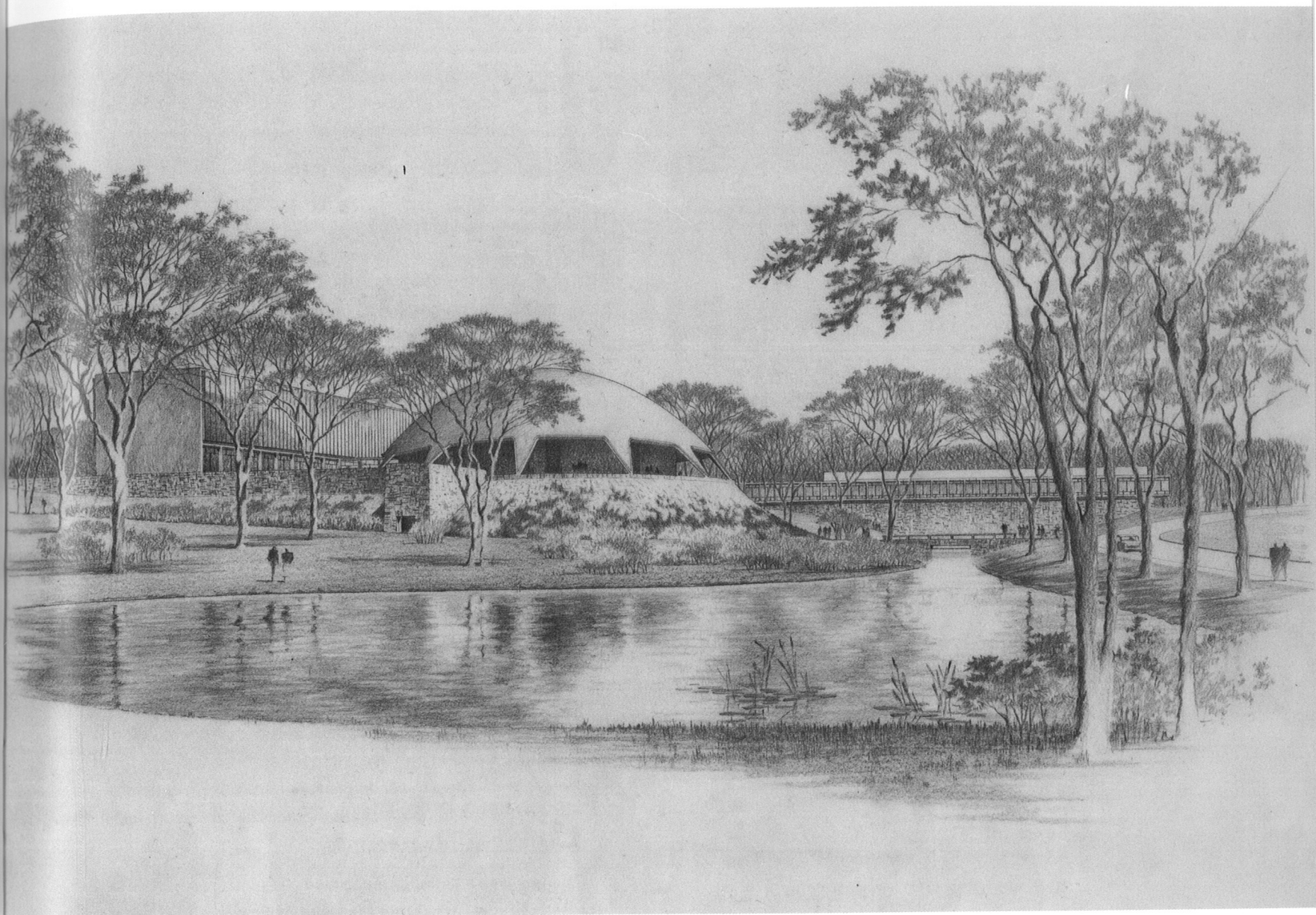
(1955), and the interplay of Palladian humanism and Miesian modernism in the Hunstanton School, Norfolk, England, by Peter and Alison Smithson (1954).

In America, Mies was completing Crown Hall at the Illinois Institute of Technology in Chicago (1950–56) at the same time that Saarinen was completing the Kresge Auditorium at MIT in Cambridge (1955). One was rectilinear, the other curvilinear. One was a steel frame, the other a concrete shell. Both were structural expressions. Both were sculptural expressions. They differed in their architectural intentions, one rationalist, the other expressionist.

Throughout the 20th century, colleges and universities were the laboratory grounds for new architecture. A 'battle of the styles' had been fought on almost every college campus, first between the neo-Georgian and the neo-Gothic, and later between the traditional and the modern. Mid century, Kahn designed the first modern building at Yale, a new wing of an art gallery. Yale's splendid old art gallery was in an eclectic neo-Gothic building, with parts copied from Florentine palaces. Kahn's art gallery was an affirmation of modern architecture and simultaneously a new beginning. Its essential components were light, space and structure. Each was authentic in its own right. Each showed how it was made.

Walking through Kahn's building — especially the cylindrical stairwell — evoked cries of rediscovery and possibility. The wall, rather than the column, prevailed. The light was captured in the space by the structure. The structure — in this case, a triangle inscribed in a circle — was an idealised geometry. It was, in Rothstein's words, like mathematics and music 'an emblem of the mind'.¹⁰

At the same time, for a new campus of the traditionally neo-Gothic University of Michigan, Saarinen proposed a school of music that would be recognisably modern. His drawing for the proposal, published in 1955, was a summary of modern architecture in America. The building was both rationalist and expressionist. It was rationalist in its linear rectangular wings — reminiscent of Saarinen's metal-and-glass General Motors Technical Centre — and it was expressionist in its concrete shell structure — reminiscent of his Kresge Auditorium then



Eero Saarinen, project, School of Music, University of Michigan, Ann Arbor, 1955. Saarinen's unbuilt proposal was a summary of modern architecture in America, combining rationalist rectangular wings with an expressionist concrete shell structure.



Louis Kahn, stairwell, Yale University Art Gallery, New Haven, Connecticut, 1951–53. Kahn's new wing of an existing neo-Gothic building was an affirmation of modern architecture. Throughout the building — in the lofts and especially the stairwell — light, space and structure were united. It had a sense of order, like mathematics and music.

under construction at MIT. In both architecture and landscape, it was a romanticised modernism. Saarinen's proposal for a music school and performance halls for a large public university — a building type historically associated with cities — was set in an Arcadian greenpark.

Superficially — that is, outside of matters like race relations, social inequity and the looming Cold War — it seemed a time of sweetness and light. The American Institute of Architects awarded its Gold Medal to the beloved Dutch modernist, William Dudok; the speaker at its annual banquet was Clarence Stein, the pioneering architect of housing, neighbourhoods and new towns; and an honorary membership was conferred on Carl Sandberg, the poet who celebrated landscapes and cities.

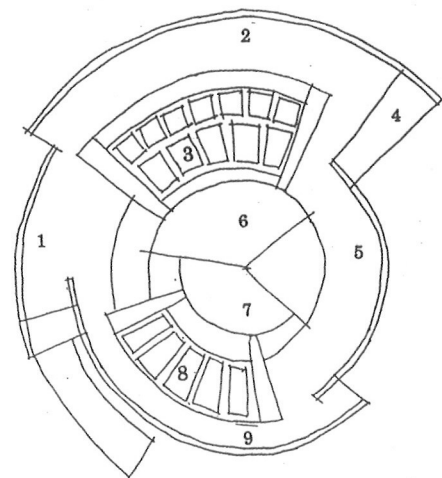
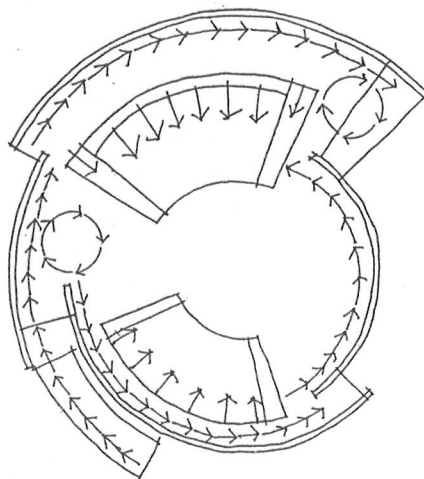
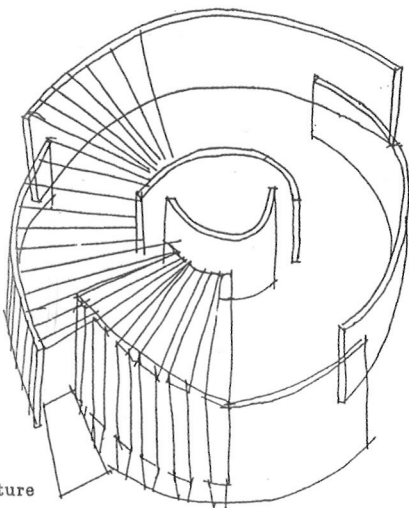
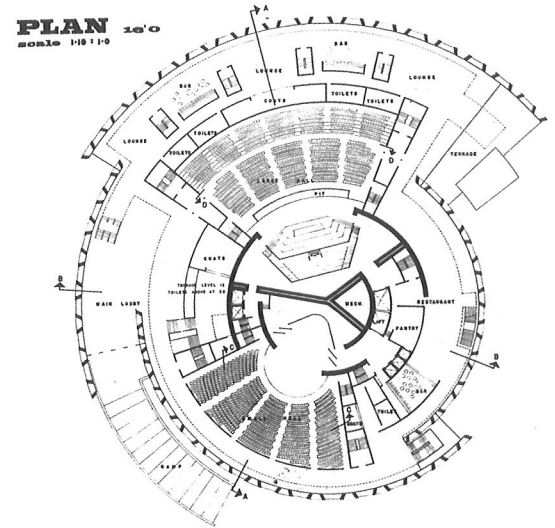
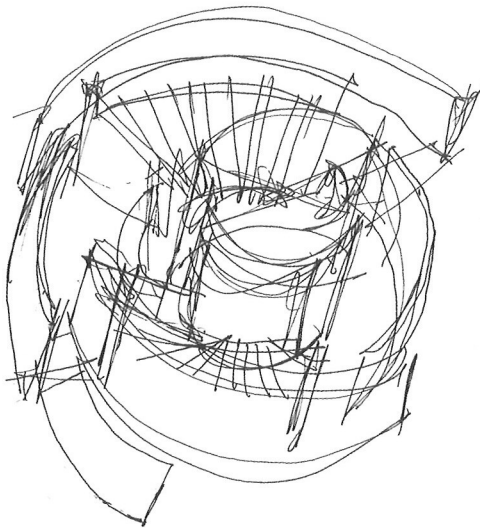
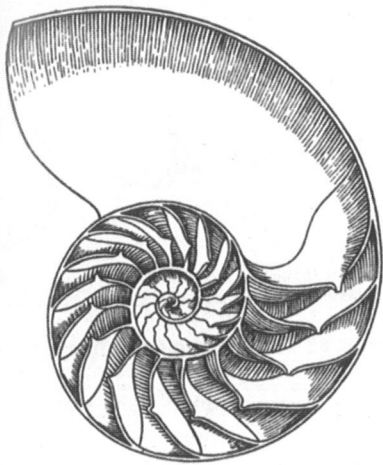
The mid 1950s was a particularly appealing time for an international design competition. 'National style' was not a primary factor, as it had been earlier in the design of public buildings in England and America.¹¹

Australia made no such demands. The National Opera House competition program dealt with the fundamentals of architecture — the setting, the purposes, the aspirations. As a competition, it was irresistible.

What did we propose?

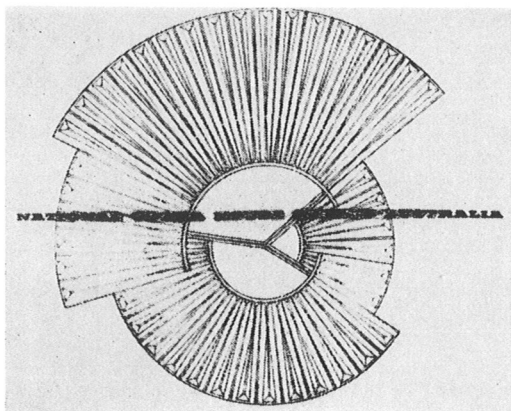
A slight digression here: I recall a lecture at Princeton when a student asked the architect James Stirling, 'What building types are you working on?' He immediately responded, 'Linear and centroidal.' The answer was intentionally provocative — ask not what is the function of a building; ask what is its form. In a word, our design was centroidal.

Our design was a spiral composition. Around a central core (the stage house), we rotated fan-shaped spaces (two music halls, cafés, restaurant and lobbies). We wrapped them all with a circular, glazed promenade gallery. Both music halls were fan-shaped, because their radial, sloped seating provided perfect sightlines, and an opportunity for excellent acoustics. In the 1950s, fan-shaped halls were thought to be the best shape for a room for music, functionally, and most expressive of the nature of musical instruments. Aalto's fan-shaped compositions were especially appealing.



- 1 lobby
- 2 gallery
- 3 large hall
- 4 terrace
- 5 restaurant
- 6 stage
- 7 stage
- 8 small hall
- 9 gallery

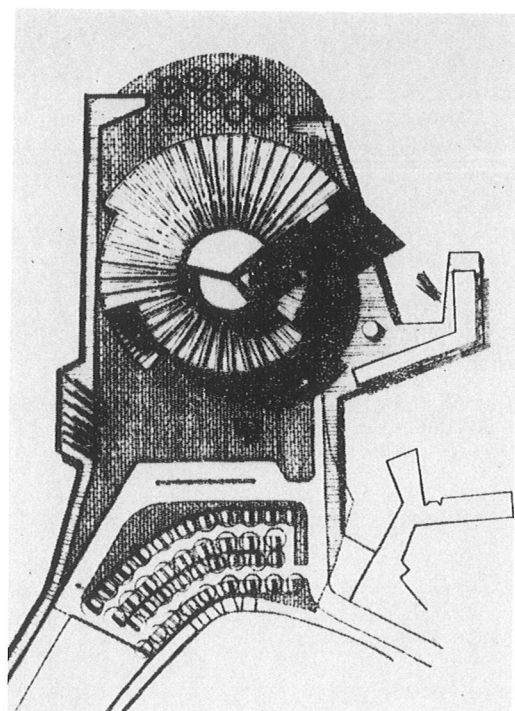
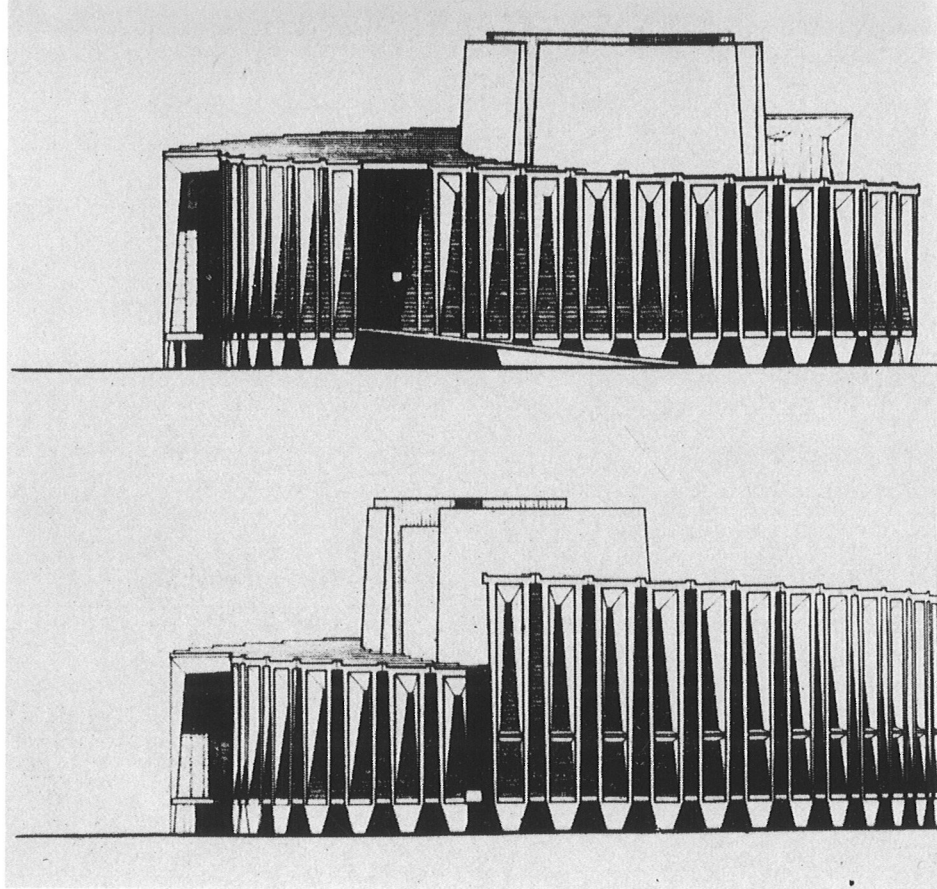
D'Arcy Thompson's analysis of the structural logic in nature in his book *On growth and form* (1917) was an important source of inspiration for Geddes and his colleagues, as it was for Jørn Utzon. Thompson's drawing of the nautilus shell (top left) inspired the spiral plan for both Geddes' Harvard thesis and the Philadelphia collaborative's competition entry, seen here in Geddes' conceptual sketches. The plan of the competition entry placed the two wedged-shaped halls around a central core that contained the stage house. Foyers, restaurants, bars and lounges were set between the halls and along a circular promenade gallery overlooking the harbour and city.



SYDNEY COMPETITION

DESIGN PLACED
SECOND

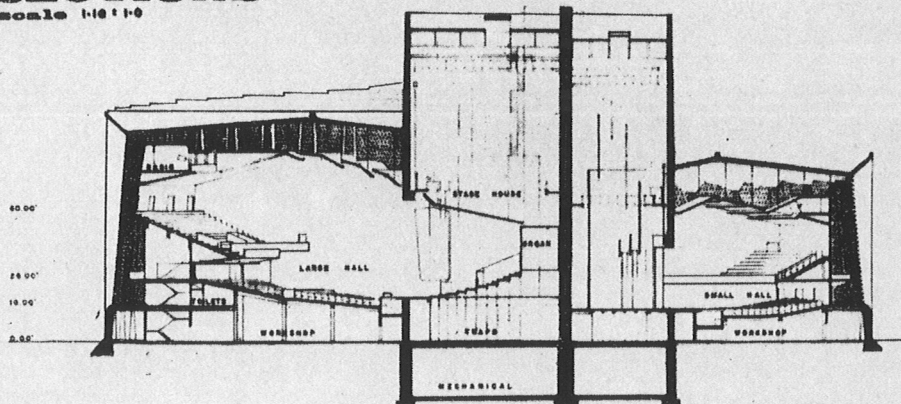
Architects: MARZELLA,
LOSCHETTER, CUNNINGHAM,
BRECHER, GEDDES & QUALLS



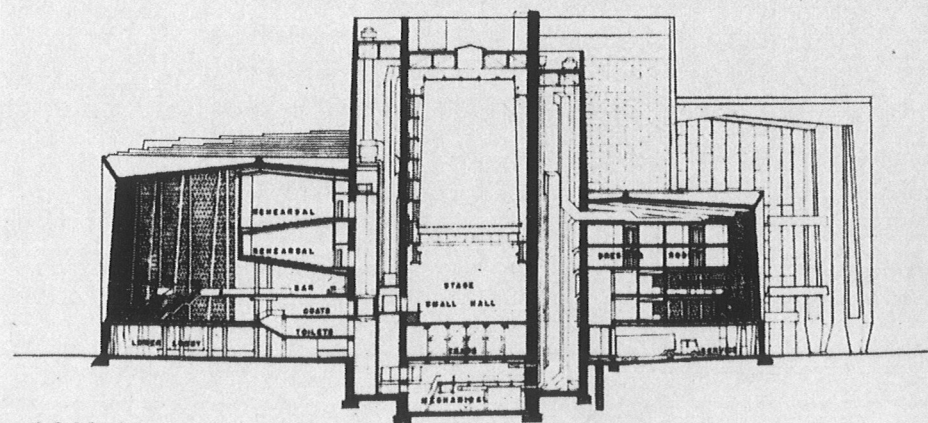
▲
ROOF PLAN

SECTIONS

scale 1/16" = 1'-0"



SECTION A-A



SECTION B-B

The public rooms — restaurant, bars and cafés, lounges and lobbies — were set between the halls, along the promenade gallery. The experience of coming and going was a continuous procession around the edge, looking out toward the harbour, the bridge and the city.

The composition of the construction was like the composition of the spaces — it was centroidal. The structure consisted of precast concrete panels of folded ribs, both vertically and horizontally. The wedge-shaped roof panels were ribbed concrete, covered in copper. The vertical wall panels were also ribbed concrete, with full height windows, intentionally creating a monumental scale.

The inspiration for the structure came from works by Nervi, like the Turin Exhibition Building seen on page 61. The inspiration for the composition came from the spiral organic form of the nautilus shell.¹² By day, it would have looked like a ribbed, spiral, concrete shell. By night, it would have looked like a glazed lantern.

We almost won.

But we didn't.

Why?

Because Jørn Utzon's design was a masterpiece.

Opposite: Page from *The Architect and Building News* (February 1957) showing plans, sections and elevations of the design by the Philadelphia collaborative group.

Notes

1 The Philadelphia collaborative team for the Sydney Opera House Competition consisted of seven architects: Melvin Brecher, Warren Cunningham, Robert Geddes, Leon Loschetter, Joseph Marzella, George Qualls and Walter Weissman.

2 Walter Gropius as a teacher at Harvard (1937–52) thought in a different way to Gropius at the Bauhaus. He focused on architecture related to social and cultural problems — housing, neighbourhoods, new communities. His humane essays from this period were published with the unfortunately authoritarian title of *Scope of total architecture* in the series 'World Perspectives', Harper & Brother Publishers, New York, 1955.

3 By 2005, the collaborative design process was more important than ever. Here is an example, taken from the MIT website, describing their design process: 'The evolving MIT campus: the collaborative process powers each new building and renovation on campus. Using a fully integrated team process, architects, builders, engineers, artists, landscapers, and occupants work together to develop the best in contemporary facilities.'

4 In 1950, a collaborative thesis at the Harvard Graduate School of Design was submitted by William Conklin, Ian McHarg, Marvin Sevely and myself, as 'Redevelopment of downtown Providence, Rhode Island'. It was published in the CIAM 8 book, *The heart of the city: towards the humanisation of urban life*, J Tyrwhitt, J L Sert and E N Rogers (eds), Pellegrini & Cudahy, New York, and Lund Humphries & Co Ltd, London, 1952, p 142. It was featured more recently in Anthony Alofsin, *The struggle for modernism: architecture, landscape architecture and city planning at Harvard*, W W Norton & Co, New York and London, 2002, p 11, pp 206–9.

5 In Philadelphia, the Group for Architectural Research (GAR) began in 1953 to collaborate as a new chapter of the International Congress on Modern Architecture (CIAM). Its members were Romaldo Giurgola, Blanche Lemco, George Qualls and myself. We set about studying Levittown, an automobile suburb under construction outside Philadelphia. Using the analytical format of the CIAM Habitat grid, we sent our work to two international conferences, CIAM 9 and CIAM 10.

6 In 1954, the collaborative group for the Philadelphia Redevelopment Authority's 'New House Type Study' included Ian McHarg, George Qualls and myself. We explored new possibilities for the design of dwelling units, streets, blocks and neighbourhoods for the growth of the city.

7 Sloan Wilson, *The man in the gray flannel suit*, Simon & Schuster, New York, 1955, was about post-war disappointments — domestic life in the leafy suburb, and competitive corporate life in the city. In 1956, it was made into a movie starring Gregory Peck. William H Whyte Jr, *The organization man*, Doubleday, New York, 1956, was a series of essays pointing out the contrasts in everyday living arising from two work ethics, the old individualist Protestant ethic, and the new social ethic in organisations — especially the corporation.

8 Geoffrey Scott, *The architecture of humanism*, Constable & Co, London, 1924, first published 1914; Le Corbusier, *Towards a new architecture*, tr Frederick Etchells, Architectural Press, London, 1927, originally published in 1923 by Editions Cres, Paris, as *Vers une architecture*.

9 Matthew Nowicki, 'Origins and trends in modern architecture', in *The Magazine of Art*, November 1951, republished in *Architecture culture 1943–1968*, Joan Ockman and Edward Eigen (eds), Columbia Books of Architecture/Rizzoli, New York, 1993.

10 'We begin with objects that look dissimilar. We compare, find patterns, analogies with what we already know. We step back and create abstractions, laws, systems, using transformations, mappings, and metaphors. This is how mathematics grows increasingly abstract and powerful; it is how music obtains much of its power, with grand structures growing out of small details.' Edward Rothstein, *Emblems of mind: the inner life of music and mathematics*, Times Books, New York, 1995.

11 Sir John Summerson, 'A Victorian competition', in *Victorian architecture in England*, W W Norton, New York and London, 1970.

12 D'Arcy Wentworth Thompson, *On growth and form*. This book by the famous biologist and mathematician was originally published in 1917 by Cambridge University Press, republished 1942, abridged edition by John Tyler Bonner 1961.