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Megastructure Revisited: The Australian Entries to the Plateau Beaubourg Competition, 1970-1971

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Abstract

Held between December 1970 and June 1971, the international competition for the design of a Contemporary Art Complex on the Plateau Beaubourg in Paris that would eventuate in the Centre Pompidou, was significant for being the first international architecture competition held in France. The competition presented the problem of a new architectural type, and the question of the relationship between architecture and urbanism, both issues that had resonated throughout the 1960s in the megastructure movement. The critical notoriety and popular success of the Centre Pompidou has tended to overshadow the competition as an architectural event or as a framework through which to understand the building. The competition attracted 681 entries from 46 countries. Among these were six entries from Australia. An Australian entry by Ken Maher, Colin Stewart and Craig Burton was awarded among the top 30 schemes. It is significant for its lightweight structural expressionism, transparency and engagement with flexibility through a megastructural system, all themes that were evident in the winning entry by architects Richard Rogers, Renzo Piano, Gianfranco Franchini and John Young; and not typical of the manifestation of the megastructure movement in Australia at the time. This paper aims firstly to interrogate the significance of the competition for architectural history. It does this primarily through an analysis of the numerous megastructure entries. It considers the involvement of visual artists in the various groups active in making urban proposals in this period, thus proposing an aesthetic framework through which to understand the formal, spatial and temporal strategies evident in the megastructure entries in the competition and the completed Centre Pompidou. Secondly, this paper examines the Australian entries to the competition. It focuses on the premiated megastructure entry by Maher, Stewart and Burton and discusses the influences and Australian context surrounding their design.

Introduction

Held between December 1970 and June 1971, the international competition for the design of a Contemporary Art Complex on the Plateau Beaubourg in Paris that would eventuate in the Centre Pompidou, was significant for being the first international architecture competition held in France, in a city well known for the role of sovereign and state power in urban development.¹ The competition is often accounted for historically in terms of the relationship between architecture and the representation of political power in the urban history of Paris, especially as it is invoked as a precedent for the *Grand Projets* undertaken by President François Mitterrand during the 1980s and 1990s.² For architecture, the competition presented the problem of a new architectural type, and the question of the relationship between architecture and urbanism, both issues that had resonated throughout the 1960s in the megastructure movement. As an architectural type, the megastructure offered formal unity with programmatic flexibility, key requirements of the competition brief, and a successful paradigm for the winning entry by architects Renzo Piano, Richard Rogers, Gianfranco Franchini and John Young, and engineers Ted Happold and Peter Rice. The completion of the building in January 1977 came just after the publication in 1976 of critic-historian Reyner Banham's book *Megastructure: Urban Futures of the Recent Past* in which he explores the perceived failings of the megastructure movement and relegates it to history.³ To some extent this framework determined the critical reception of the building. Both the critical notoriety and popular success of the Centre Pompidou have tended to overshadow the competition as an architectural event or as a framework through which to understand the building. Despite the familiarity of the building and its firm place in the history of architecture, the competition entries as a set have not been critically examined.

The competition attracted a large number of entries, 681 from 46 countries.⁴ Among these were six entries from Australia.⁵ Neither the competition nor the results were widely publicised in Australia. An Australian entry by Ken Maher, Colin Stewart and Craig Burton was awarded among the top 30 schemes. Their entry is significant for its lightweight structural expressionism, transparency and engagement with flexibility through a megastructural system, all themes that were evident in the winning entry and not typical of the manifestation of the megastructure movement in Australia at the time.

This paper aims firstly to interrogate the significance of the competition for architectural history. It will do this primarily through an analysis of the numerous megastructure entries. Despite waning enthusiasm for the megastructure by the late 1960s, the predominance of megastructure entries in the competition reflect a continued engagement with the type. Beyond the urban, technological and social preoccupations of the megastructure movement, this paper will also consider the influence of the visual arts and the involvement of kinetic and cybernetic artists in the various groups active in making prospective urban proposals in this period. It will thus position the megastructure movement in relation to the discourse surrounding the synthesis of the arts that existed in post-war France that was integral to the conception of the Plateau Beaubourg competition; and present an aesthetic framework through which to understand the formal, spatial and temporal strategies evident in the megastructure entries in the Plateau Beaubourg competition and the completed Centre Pompidou building. These aims fit into my larger and ongoing research project, which is concerned with the question of temporal experience in architecture, the relationship between architecture and the visual arts, and between architecture and urbanism in the period of the 1960s and 1970s.

Secondly, this paper aims to provide an analysis of the Australian entries to the competition, which have not otherwise been examined in the context of Australian architectural history. It will focus on the premiated megastructure entry by Maher, Stewart and Burton and discuss the influences and Australian context surrounding their design. The research for this paper is based on a survey of the competition entries undertaken at the archives of the Centre Pompidou in October 2008 and interviews conducted with Maher in February 2009 and Burton in March 2009.

The Architectural and Urban Context of the Competition

The competition brief called for a new architectural type that integrated diverse cultural functions and flexible spaces on a central urban site. This aspect of the brief was both innovative and experimental. Both the idea and the site for the project emerged under the previous administration of Charles de Gaulle and have a longer history in relation to both the development of the Marais district of Paris and the discourse for a synthesis of the arts that existed in France in the post war period.

The role of the arts in French cultural life and its relationship to the urban environment was of specific interest to André Malraux, the Minister for Cultural Affairs under De

Gaulle between 1958 and 1969. This was a new position in the French government instigated by De Gaulle. As minister, Malraux undertook many initiatives that engaged with the discourse surrounding the role of the arts in society at this time including the cleaning of the façades of Parisian buildings, inspired by an earlier proposition of Fernand Léger; the construction of regional *Maisons de la culture*, and the inauguration of the Paris Biennale.⁶ Malraux also oversaw the legislation for the inclusion of a 1% art budget for all state-financed building projects.⁷

In 1964-65, Malraux commissioned Le Corbusier to design a new cultural facility for Paris, on a site in the new La Defense district being planned at the time.⁸ The Museum for the Twentieth Century was one of several projects that Le Corbusier was involved in since the 1930s for buildings that endeavoured to represent and facilitate a synthesis of the arts.⁹ For Le Corbusier, architecture was ideally placed to lead this integration, however the movement involved many multidisciplinary groups including *Groupe Espace* formed in 1949/1951 around Andre Bloc the founding editor of *l'Architecture d'Aujourd'hui*; *Groupe International d'Architecture Prospective* (GIAP) founded in 1965 by architectural and art critic Michel Ragon and *Groupe de Recherche d'Arts Visuel* (GRAV) founded in 1966, that had various aesthetic interests including neo-plasticity, kinetics, cybernetics, performance or event based work, and the involvement of the spectator.¹⁰ An ongoing aspect of the discourse of the synthesis of the arts and of Malraux's approach to the question of cultural infrastructure was its connection with the urban environment.

The possibility and idea to develop a cultural facility in the centre of Paris also had its origins in the De Gaulle administration and the question of what to do with large inner-city sites that had become available through various programmes of modernisation. The Marais district was particularly affected by demolition associated with modernisation. Health surveys initiated in 1892 and documented by Louis Sellier between 1906 and 1937 mapped a series of *îlots insalubres* throughout the city, unsanitary areas that required complete renovation through demolition. While many of these areas remained intact until the 1960s, the Plateau Beaubourg area was cleared between 1923-34.¹¹

Major decisions about arts patronage and the urban development of Paris required the ultimate approval of the French President, to whom the elected Paris city council ultimately reported.¹² This allowed De Gaulle to be directly involved in decisions about

the development of the city, and in 1967 he initiated an invited architectural competition which generated five schemes for the urban renewal of the Plateau Beaubourg and the nearby Les Halles market site, for a mixed brief that included a new library.¹³ However there was a lack of public support for the project and growing popular opinion that the nineteenth-century cast iron market pavilions designed by Victor Baltard on the Les Halles site should be retained. After the student demonstrations of 1968, De Gaulle decided that a library would be built on the Plateau Beaubourg site, as a way of avoiding the debates about the fate of the market pavilions, though he would not have a chance to develop the decision before his resignation in 1969.

The Baltard market pavilions became a symbolic rallying point for the community with a new awareness of heritage issues and wanting to be involved in decisions about the urban development of the city.¹⁴ The vacated market pavilions were used spontaneously as venues for visual and performance art events during the period between 1969 and 1971, when they were finally demolished.¹⁵ This period overlapped with the Plateau Beaubourg competition and resonated with architects involved in it. Some competition entries, like those of French architects Joseph Belmont and Michel Cler, suggested recycling the pavilions on the Plateau Beaubourg site. Richard Rogers was also aware of the controversy and suggested that his and Piano's design referred to the material and spatial qualities of the pavilions.¹⁶ The demolition of the pavilions was announced with a full-page notice in *l'Architecture d'Aujourd'hui*, in the same issue that announced the winner of the Plateau Beaubourg competition.¹⁷

On 11 December 1969 President Georges Pompidou, who succeeded De Gaulle as president, announced a project for a new cultural centre on the Plateau Beaubourg that would be designed through an international architectural competition.¹⁸ Pompidou had a personal interest in contemporary art and, with his wife Claude, was a collector of post-war French art. His vision for the project included both a new library and new premises for the *Musée National d'Art Moderne*, space for technological arts like cinema and industrial design which traditionally had not been dealt with in state institutions, and studio space for the creation of art. His project picked up on the discourse of the synthesis of the arts in a symbolic way by offering a central space in which the arts could come together. Critics of Pompidou objected to the scale and centralist approach of the project and the institutionalisation of contemporary art, though the finished building would provide a successful model for multi-arts culture

centres as a building type. The decision by Pompidou to commission the building through an open international competition organised under the rules set out by the UIA was unprecedented in France. The judging panel under the leadership of French designer Jean Prouvé included architects Philip Johnson (USA), Emile Aillard (France) and Oscar Niemeyer (Brazil); Michel LaClotte from the Louvre; Sir Frank Francis from the British Museum; William Sandberg from the Stedelijk Museum in Amsterdam; Herman Liebaers from the Bibliotheque Royale de Belgique and Gaetan Picon (France).¹⁹ Pompidou himself remained detached from the competition process though he endorsed the jury's decision.²⁰

The urban context of the competition was also embedded in the vision set out for the city in the Regional Development Plan for Paris prepared by Paul Delouvrier between 1962-65. A significant aspect of Delouvrier's plan was to deal with the problem of increased vehicular and population density through the provision of new road, train and metro infrastructure including a new RER and Metro station into which the Plateau Beaubourg site would connect.²¹ Despite the Plateau Beaubourg site being reasonably small in the context of other urban development projects being undertaken in the city, Delouvrier's focus on circulation and movement and infrastructure solutions influenced the character of many entries in the competition, which utilised infrastructure-scale responses including building completely under or above ground. Michel Ragon, who was an acquaintance of Delouvrier and had written several pieces about the future of the city at the time Delouvrier was preparing his plan, involved his architect and artist friends in the question of an urban vision for the future of Paris. Several architects in his GIAP collective prepared prospective projects in reaction to Delouvrier's plan in the late 1960s.²²

Analysis of the Competition Entries

In their assessment of the competition entries, the jury highlighted several common functional problems among the competition entries including schemes with many levels of a small floor area that would be inappropriate for gallery and library functions; a lack of provision for natural light, especially in those that put gallery and library spaces underground; and the lack of a successful resolution of the expression of individual functions while achieving an overall unity for the building. The jury was also critical of overly formal, figurative or monolithic responses, which included spheres, domes, donuts, eggs, ziggurats, inverted pyramids and a giant hand.²³ A common response among the competition entries that did not pursue a figurative or monolithic

response was for a megastructure. As an architectural type the megastructure offered formal unity with programmatic flexibility and a way to address the polyvalent nature of the competition brief. It also had a particularly urban quality in the way it subsumed contemporary ideas about the city as a complex system into its formal character. Despite the changed political situation since the 1968 student riots, which would eventually call into question the power structures embedded in the idea of managed flexibility inherent in the megastructure, it also remained a viable option for the jury. Amongst the winner and the additional 30 awarded schemes at least half could be classified as megastructures.

Throughout the 1960s Banham was a leading advocate for the megastructure movement, particularly as it manifest in the work of Archigram.²⁴ Yet by the early 1970s his position had changed, which allowed him to treat the type historically. Just before the Pompidou Centre was completed in 1977, Banham produced the first cohesive account of the movement in his book, *Megastructures: Urban Futures of the Recent Past*. The last pages of his book included photographs of architectural models and drawings of the as yet unfinished building, and thus even before it was completed the terms of its critical reception had been established.²⁵ In this section of the paper I will focus on an analysis of the entries that proposed a megastructure solution because of their prevalence, and their relevance to the reception of the resulting Pompidou Centre building. I will preface this analysis with a brief outline of the megastructure movement that touches on its disciplinary, political and cultural origins.

The megastructure had its prehistory, according to Banham, in nineteenth century urbanism when the geometric perfection of the ideal forms in the ideal Renaissance city and utopian proposals for ideal social systems that did not otherwise have a formal expression were conflated, establishing the ground for modern architecture to engage formally with the question of the future city.²⁶ Formal origins of the type can certainly be found in utopian or prospective planning schemes of the nineteenth century, such as Henry-Jules Borie's *aérodomes*, integrated multi-level urban buildings that including transportation infrastructure (1865), and Arturo Soria y Mata's project for a continuous linear industrial city intended to span between Cadiz and St. Petersburg (1882).²⁷ One of the first uses of the term and attempts at a definitions is attributed to Japanese architect Fumihiko Maki, who used the term 'mega-structure' in 1961 to describe his idea of collective form, 'a large frame in which all the functions of a city or part of a city are housed'. This idea came out of an engagement with the rapid urbanisation of

Tokyo that would be integral to the development of the Metabolist movement.²⁸ By 1968 a more comprehensive definition was developed by Ralph Wilcoxon from Berkeley. He described four characteristics of the megastructures:

(1) constructed of modular units; (2) capable of great or even 'unlimited' extension; (3) a structural framework into which smaller structural units ... can be built ... 'plugged-in' or clipped on'...; (and 4) a structural framework expected to have a useful life much longer than that of the smaller units which it might support.²⁹

Integral to this prehistory and early definitions is the idea that architecture takes the city as its formal subject, but as a meta-type it marks the elision of architectural history as the source of an urban typology.

As architectural historian Sarah Deyong has observed, the megastructure movement also emerged out of architecture's engagement with the perceived problems of post-war population growth and rapid urbanisation, and was sanctioned by various government policies and institutional attention.³⁰ Deyong traces the development of key ideas underlying the megastructure movement to the International Congress of Modern Architecture (CIAM) and its younger generation of successors, Team X's attempt to engage with planning authorities and the United Nations post-war reconstruction effort. Team X members, Georges Candilis and Sadrach Wood's Moroccan Housing scheme of 1953 introduced the idea of 'megaform' and 'clusters' as a way of achieving a cohesive urban identity in large-scale, complex developments.³¹

By the mid 1960s various groups dedicated to exploring megastructural urban solutions had formed. *Groupe Étude d'Architecture Mobile* (GEAM) was formed by Yona Friedman in 1957.³² In 1960 the Metabolists issued their manifesto at the World Design Conference in Tokyo.³³ In 1961 the first Archigram was circulated.³⁴ In 1963 the collaboration between Claude Parent and Paul Virilio was formalised in the group Architecture Principe and as previously mentioned, Groupe International d'Architecture Prospective (GIAP) was formed in 1965.³⁵ Archigram brought a pop-culture and ludic flavour to the megastructure movement.³⁶ The Metabolists pursued concrete as their material of choice, while the French megastructuralists, or spatial urbanists as they were known, were particularly interested in lightweight tensile structures.³⁷ Many of the members of these various groups would enter the Plateau Beaubourg competition

including Friedman, Paul Maymont, Nicholas Schöffer, and Justus Dahinden from GEAM and GIAP; Metabolists Kisho Kurokawa and Kiyonori Kikutake; Dennis Crompton from Archigram and Parent from Architecture Principe.³⁸ Many of these groups also included or engaged with visual artists who shared ideas about indeterminate and open form, movement, and user determined flexibility. Architect Werner Ruhnau from GEAM worked closely with kinetic artists Jean Tinguely and Yves Klein in the late 1950s and early 1960s.³⁹ Kinetic artist Victor Vasarely and cybernetic artist Nicholas Schöffer were members of GIAP.⁴⁰ Parent had also worked closely with Tinguely, Klein and Schöffer on architectural and urban projects throughout the 1960s.

There were many variations on the megastructure among the Plateau Beaubourg competition entries, more or less determined by a geometric logic, utilising large spans or modular systems to achieve flexibility, and extending to a greater or lesser degree into the urban context. Many of these entries employed similar strategies and shared various qualities with the winning scheme by Piano and Rogers. The following analysis of the competition entries outlines the various ways that proposals for megastructures engaged with the competition themes of flexibility and urban integration. For this purpose, I have identified three distinct characteristics evident in the megastructure competition entries including: megastructures that were configured around a monumental frame; megastructures that proposed a monumental expression of circulation patterns; and megastructures that used a geometric matrix as an ordering device and determinant of form.

The megastructure entries that exemplify the use of a monumental frame used large-scale structural elements to order otherwise complex spatial arrangements. They are distinguished by the tendency for the structural elements to be few in number and centrally located. Flexibility in these schemes is suggested in the loose or provisional way spaces are arranged around the otherwise fixed and enduring structural elements. Often the contrast between the simplicity of the frame and the complexity of the infill spaces is highlighted. Within this category are schemes such as Henry Pottier's from France and Yutaka Murata's from Japan, which appear as conglomerate structures and borrow their aesthetic from oilrigs or space stations. Others like the schemes by Michael Pearson from Great Britain and Hugh Stubbins from the USA achieve formal order through the unifying gesture of a space frame roof supported at minimal points and spanning the whole site. Precedents for this approach can be found in the New

National Gallery in Berlin by Ludwig Mies van der Rohe (1968), and the Osaka Expo Theme Pavilion by Kenzo Tange (1970).⁴¹

Another typical strategy of formal ordering among the megastructure entries was through the monumental expression of circulation patterns or routes. The competition brief suggested a series of desired connection points from the Plateau Beaubourg into the surrounding areas and in many cases these are expressed as raised walkways or underground concourses. The separation of pedestrians and cars through the use of raised podiums or sunken plazas is also typical of this group. The plaza in Piano and Rogers' competition scheme shows their original intention for the plaza to be one level below the surrounding streets. The schemes by Candilis and Japanese architect Kisho Kurokawa are examples where circulation routes form an integral part of the architectural expression, a strategy shared also by Piano and Rogers' scheme.

A further technique of structural ordering can be observed in the group of megastructures that utilise a highly determined geometric framework with an internal, non-site-specific logic. Some of the schemes in this category suggest the possibility for the reconfiguration of functions and spaces within the structural framework where void spaces are left, like in the Piano and Rogers' scheme, but also through the possibility of the expansion of the framework beyond the site. Entries in this group include Jean Boudriot, Maymont, and Friedman. For Friedman, the raised megastructure provided flexibility, public open space at ground level and a way to retain and frame the historic fabric of the city.

The Australian Entries to the Competition

There were six entries to the Plateau Beaubourg competition from Australia. This included the team of Ken Maher, Colin Stewart, and Craig Burton from New South Wales; Anthony Taussig also from New South Wales; Geof Nairn from South Australia; Gerd Block and Sam Broudo from Melbourne; Stuart McIntosh from Brisbane; and David Ham. Maher, Stewart, and Burton had recently graduated from the University of New South Wales in 1969 and were able to use the registered architect status of their former tutor Richard Apperly to enter the competition, though he did not participate in the development of the design.⁴² Taussig and Nairn were also relatively new graduates, Taussig from the University of New South Wales in 1968 and Nairn from the University of Adelaide in 1964.⁴³ Gerd Block was a post-war German migrant. At the time of the competition he had an established practice with his wife Renate in

Melbourne, developing a specialization in office design, and also taught at Melbourne University where he had undertaken his Masters and PhD.⁴⁴ Sam Broudo had been a student at the University of Melbourne and was working for Block at the time of the competition. Stuart McIntosh graduated from the University of Melbourne. Between 1952 and 1963 he completed numerous buildings as architect for the English Scottish and Australian Bank. He relocated to Brisbane in 1963 to start his own practice on the basis of a commission for a Great Hall at the University of Queensland, which he had won in a national competition.⁴⁵

The Plateau Beaubourg competition was announced in French newspapers and architectural journals including *l'Architecture d'Aujourd'hui*, which was held in some Australian university libraries at the time.⁴⁶ It was not a consistent practice to announce competitions in Australian architectural publications at this time and there was no announcement of the competition in *Architecture in Australia* or the publications of the Queensland, New South Wales or Victorian chapters of the RAI.⁴⁷ Among the Australian entries, Maher subscribed to a competitions newsletter and found out about the competition this way.⁴⁸ As new graduates Maher, Stewart and Burton were actively engaged in entering competitions.⁴⁹

The Australian entries to the Plateau Beaubourg competition demonstrate an engagement with a range of contemporary international trends evident in the competition as a whole. The entry by Maher, Stewart, and Burton and the entry by Nairn have a megastructural character, while the entries by Block and McIntosh follow an International Style modernism tempered by contextual gestures. Ham's entry was somewhat eclectic, using historical references characteristic of postmodernism as well as a regularized concrete frame typical of the brutalist trend of late modernism. The following paragraphs describe each of the Australian entries in further detail.⁵⁰

The entry by Maher, Stewart and Burton was based around a three dimensional, orthogonal grid of super-sized box trusses, forming a skeletal megastructure inside which rooms, voids and circulation element could be flexibly arranged. The trusses are spaced apart in section. In plan they are arranged in a square grid of 5 bays by 5 bays, with each bay being approximately 15m wide. The megastructure takes up the full width of the site leaving a small open space along the northern edge, predominantly for service entrances, and a more significant public entry plaza on the southern edge of the site. Transparent rooms are inserted between the trusses in various parts of the

grid while other parts are left open as void spaces, resulting in a high degree of spatial variety and the potential for different spatial compositions and sequences. There is also a heightened contrast between the matt black truss frame and the luminous quality of the inserted boxes, though it was intended that rooms could be either transparent or opaque as required. There is an ambiguity between what is internal and external, reinforcing the open and ephemeral character of the structure.

Nairn also proposed a megastructure, though one with a more contained and monumental form. The geometry of the superstructure grid in Nairn's scheme is diagonal to the site boundaries, a common strategy among entries that used geometric grids to determine a structural logic. The structure is made of shiny metallic circular columns and beams that meet at ball bearing joints, giving it a high-tech, molecular or space-age quality reminiscent of the Atomium building made for the Brussels World Fair in 1958. The structure is hollow, allowing it to be used for services and in some cases vertical circulation. In plan the grid suggested by the column layout is designated for horizontal circulation, resulting in a network of similarly proportioned gallery and library spaces surrounded by circulation paths that are punctuated by structural columns. The building covers the whole site and is raised above the ground. The perimeter line of enclosure, which follows a zig-zag pattern resulting from the meeting of the diagonal grid and the site boundaries, is very transparent though the overall effect of the building form is heavy. Entry is via the columned undercroft into an atrium that extends the full height of the building. Exterior balcony spaces are nestled into the zig-zag perimeter of the building and an upper level point of access is provided via a single column that sits outside the grid in the neighbouring Plateau de la Reynie.

Block and Broudo's entry takes the simple form of a glass curtain-wall box-like building raised on a series of pilotis that taper as they meet the ground. It has similarities with Skidmore Owings and Merrill's Beinecke Rare Book Room (1963) in its overall form, and Mies's New National Gallery (1968) in its use of curtain wall construction and the contrast that is created between refined dark structural elements and the illusory quality of the glass surfaces. Of the Australian entries, Block's leaves the most open space in the site plan in the form of an entry plaza on the southern side of the site. The interior of the square plan building is divided into two wings separated by an atrium, which contains circulation and space for large art works. The exterior glazing was intended to have a metal coating that would allow it to be transparent in the direction of the dominant light source. When viewed from the outside the building would thus have

a reflective quality during the day so as to mirror the surrounding historic buildings context, and a transparent quality at night.⁵¹ The plan is carefully organized to allow for rational and efficient service and circulation zones and finds opportunities in this functional strategy for spatial variety. Some gallery spaces are provided at ground level and have the potential to open directly onto the entry plaza. Block was interested in *bürolandschaft* office planning principles.⁵² These ideas manifest in his Plateau Beaubourg entry in the provision of large open plan spaces and the use of flexible interior partition systems to articulate functional zones.

McIntosh's scheme uses a similar building and site arrangement strategy and modernist language to Block, though his building takes up the whole site at ground level. The main exterior open space is a raised courtyard that sits between two wings of building running across the site. A low tower extends above this central courtyard. McIntosh's proposal is the most introverted and least transparent of the Australian entries. The gallery planning is conventional and contrasts with the large open plan arrangement of the north library wing. There is no overt strategy for flexibility except in the ambiguity of arrangement of load-bearing structure. The otherwise monolithic massing of the two wings is articulated with alcoves, balconies and courtyards that provide a contrast between shadowed recesses and light surfaces, add variety to the scale and type of spaces, and the experience of the building from the street. The building bears some resemblance in its massing, solidity and integration of planting to the Queensland Cultural Centre complex designed by Robin Gibson in 1973.

David Ham's entry also creates a central raised courtyard, which acts as the main entry off the eastern boundary of the site. It is surrounded by a conventional 'C' shaped building comprised of a regular concrete bay structure with chamfered cornices. A tower with a turret and a dome-roofed rotunda mark the significant public spaces. The domed rotunda straddles the over-scaled stair that rises up to the courtyard from the street where the tower sits in the corner. Ham's entry is the most direct in its reference of historical building types, both classical and vernacular.⁵³

As well as the winning scheme by Piano and Rogers, the jury selected 30 other entries, which were each awarded a 10,000F prize. Maher, Stewart and Burton's entry was among the 30 awarded. The jury praised their entry for its simplicity and potential for flexibility.⁵⁴ They travelled to Paris to receive their prize at an exhibition of all the competition entries held at the Grand Palais, where they were surprised to find their

entry displayed next to that of Piano and Rogers. They had not been aware of any other Australian entries until they attended this exhibition.⁵⁵ An exhibition of the winning entry and the 30 awarded schemes travelled to MOMA in New York and the RIBA in London.⁵⁶ They were also published in special editions of *Techniques et Architecture* and *Architecture, Movement, Continuité* dedicated to the competition.⁵⁷ There was no announcement of their award in *Architecture Australia*, though it was mentioned in the University of New South Wales Newspaper and they received letters of congratulations from the RAIA and the University of New South Wales.⁵⁸ The completed Centre Pompidou building was not reviewed in *Architecture Australia* until November 1979, almost 3 years after its completion, in an article by engineer Peter Towson. The article did not mention any Australian entries to the competition.⁵⁹

Maher, Stewart and Burton's Megastructure

The entry by Maher, Stewart and Burton is perhaps the most interesting of the Australian entries not least because it gained a prize. Of the Australian entries reviewed, it had most in common with the winning entry of Piano and Rogers in its structural expressionism, approach to flexibility, and high degree of transparency. The open and lightweight quality of their entry distinguished it from other more brutalist and complex megastructure entries in the competition and from the general manifestation of the megastructure trend in Australia at the time. This section of the paper explores the influences on, and Australian context of, their entry in more detail and is based on interviews conducted with Ken Maher and Craig Burton.⁶⁰

In contrast to the light material expression of Maher, Stewart and Burton's entry, the dominant manifestation of the megastructure in Australia in the late 1960s was in rugged concrete frame buildings which followed late modernism's brutalist trend; the use of geometric organisational strategies that involved the monumentalization of circulation patterns in individual buildings; and the use of matrix or field planning strategies to masterplan large sites or organise sets of buildings.⁶¹ Examples include Menzies College, La Trobe University (1965-70) by Robin Boyd, which shows the influence of Japanese Metabolist principles on Boyd's work, and the work of John Andrews including the Cameron Offices, Canberra (1968) and the Student Residences of Australian National University (1970).⁶²

There were several commissions for new art gallery buildings in Australia in the late 1960s and early 1970s, included the National Gallery of Victoria, part of the Victorian

Arts Centre (Roy Grounds, completed 1969), The National Gallery of Australia, Canberra (Edwards, Madigan, Torzillo and Briggs, competition 1968, constructed 1973-82), the Queensland Art Gallery (Robin Gibson, competition 1973, constructed 1977-82) and the Adelaide Festival Hall (Hassell and Partners, constructed 1970-73). In general, these buildings have a modernist or brutalist quality and utilise heavy concrete structures. Lightweight approaches were more common in singular symbolic buildings like the tensile canopy structure of the Myer Music Bowl, Melbourne (Yunken Freeman Architects, 1959) and the Victorian Art Centre Spire (Grounds).⁶³

Both Maher and Burton recalled an interest in adaptable and systems building as an important design generator for their Plateau Beaubourg competition entry. Maher was attracted to the programmatic flexibility inherent in the idea of a universal building type, while Burton was inspired by the elemental and playful quality of open structures. He was particularly interested in school and playground design at the time. Maher was aware of the work of the Japanese Metabolists and interested in their use of geometric determinants as the basis of adaptable and extendable structures. The work of the Metabolists was known in Australia through Robin Boyd's publications on Kenzo Tange published in 1962 and *New Directions in Japanese Architecture* published in 1968.⁶⁴

However, Maher and Burton were more attracted to a lightweight structural expression of the idea of flexibility. They were influenced by the Russian Constructivists; Archigram; the early British high-tech architecture of Team 4; and Buckminster Fuller. Maher and Burton had both met Fuller at the student convention in Perth in 1966, and like many students that came under Fuller's spell: they constructed a giant geodesic dome out of balsa wood in the sunroom of Burton's parents house in Castlecrag, which is where they would ultimately prepare the Plateau Beaubourg entry.⁶⁵ Maher also recalled the particular influence of Bill Lucas, who was a design tutor of his at the University of New South Wales.⁶⁶ Lucas's glass house at Palm Beach, which for Maher evoked the steel framed houses of Charles and Ray Eames, was a particular formative influence on him. Both Maher and Burton shared the view that technology offered expressive potential for architecture, but were not so interested in the expression of services that was a key part of the Piano and Rogers' scheme.

The urban development of Paris and the history of modern architecture in France were known to Maher, Stewart and Burton through their study of architectural history at

university, though their entry was as much a response to urban issues facing Australian cities, particularly Sydney. Their Plateau Beaubourg design evolved from a collaborative final year student project for the redevelopment of the inner-city Regent Theatre site in Sydney, undertaken with another student, Mike Berry. Maher and Burton had met and become friends in their first year at university, when they were both student representatives. They came to work on their final year project together with Stewart, as a consequence of them all converting to part-time study to avoid George Molnar as studio master. Their project was for a mixed-use building that included a hotel, residential and commercial uses. While many of their fellow students were developing proposals for high-rise buildings, their design was for a medium-rise continuous building fabric made of box trusses, in which different uses could be arranged.⁶⁷

The question of historic preservation, the variable merits of low and high-rise building, and the problem of incorporating large scale urban infrastructure into established cities, were typical urban problems shared by Paris and Sydney. While Maher did not necessarily see technology as offering a complete urban solution in the way that Archigram and others did, both he and Burton wanted to propose a contemporary building that did not try and mimic the historical context. They felt that the expression of a steel frame was an interesting way to achieve a contrast with the surrounding urban context and express a contemporary attitude, while at the same time creating a building that did not overly dominate its context. Maher was attracted by the inclusion of Jean Prouvé as part of the competition jury. They were familiar with Prouvé's work and felt that he would be interested in an innovative contemporary solution. Their scheme is interesting for exploring contextual solutions for cities based on medium-rise horizontal solutions and in this sense their design has an affinity with the French spatial urbanists, especially Friedman's design proposals for Paris.

Conclusion

Not only was the completion of the Centre Pompidou seen to mark the end of the *Trente Glorieux* of post-war prosperity in France, it was also seen to mark the end of the megastructure movement in architecture, with Banham referring to it as the terminal monument to an exhausted movement.⁶⁸ Banham argued that the movement was conceptually exhausted, unable to resolve the internal contradiction embedded in the idea that the city could be composed as a single design at the same time that it could be adaptable to the needs and desires of its inhabitants.⁶⁹ The issue of the

relationship between indeterminate form and flexibility would be a significant point of criticism in the ongoing evaluation of the Centre Pompidou.⁷⁰

Beyond the utopian or prospective concerns of the megastructure movement, the Plateau Beaubourg competition presented a real opportunity for architects to engage with a complex brief and an urban site that had international relevance for cities facing the dilemma of renovation or redevelopment. The competition entries reviewed in this paper show the predominance for megastructural solutions, revealing a continued engagement with the type into the 1970s. This can partly be explained by the framing of the competition brief, where questions of urbanism, typology and flexibility were at the fore. The megastructure entries show a struggle to articulate architecture's relationship to the city that acknowledged its temporal dimension. They also reveal the tension that existed between the urban ideas underpinning the megastructure movement and the possibility of applying them in an individual building, which is especially evident given the relatively small scale of Plateau Beaubourg site.

The number of megastructure entries in the competition offers an opportunity to draw out productive distinctions between the application of different ideas inherent in the type, like the idea of cluster or field planning, universal space and modular construction, and their deployment towards different aims, including flexibility; formal unity; user determined adaptability; playfulness or contextualism. They also provide a new context through which to understand the winning proposal by Piano and Rogers, revealing several points of overlap, and a more contextual understanding of its spatial and temporal qualities. Unlike the figurative and monolithic entries in the competition, the lightweight megastructure entries, like that of Piano and Rogers, elide direct architectural referents and engage instead with the aesthetic affects of material ephemerality and open forms that result in a disembodiment of the building. These aesthetic interests were shared by kinetic and cybernetic artists active at the time.

Lastly, Australia's engagement with the competition, though small in its number of entries, was typical in its response to the architectural brief of the range of international entries. The premiated entry by Maher, Stewart, and Burton, which proposed a lightweight, structural expressionist, megastructure system, is particularly noteworthy. Its similarity with the French spatial urbanists can be explained partly by their common interest in Constructivism, the cross-fertilisation of ideas about flexibility through the

Metabolists, whose work was well known in Australia, but also in a common aesthetic concern for lightness, dematerialisation and ephemerality.

Endnotes

Acknowledgements:

I would like to thank the staff at the *Service des Archives du Centre Pompidou*, the *Bibliothèque du Institut National d'Histoire de l'Art* and the *Centre d'Archives d'Architecture du XXe Siècle* at the *Institut Français d'Architecture* in Paris for their assistance in accessing information about the architectural competition and various competition entries. I would also like to thank Ken Maher and Craig Burton for discussing their entry with me and providing original competition documents for me to consult. This paper is part of the ongoing research for my PhD and I would like to thank my advisors John Macarthur, Andrew Leach and Nicole Sully for their comments and advice.

¹ Annette Michelson, 'Beaubourg: The Museum in the Era of Late Capitalism', *Artforum*, 13, 8 (1975), 65; and Hilde de Haan (ed.), *Architects in Competition: International Architectural Competitions of the Last 200 Years* (London: Thames and Hudson, 1988), 173.

² Annette Fierro, *The Glass State: the Technology of the Spectacle, Paris, 1981-1998* (Cambridge, Mass.: MIT Press, 2006).

³ Reyner Banham, *Megastructures: Urban Futures of the Recent Past* (London and New York: Thames and Hudson and Harper & Row, 1976).

⁴ The Sydney Opera House competition of 1956-57 attracted 233 entries from 31 countries including 61 from Australia (de Haan, 138); the Kyoto Congress Building competition of 1963 attracted 195 entries (de Haan, 149); the Amsterdam Town Hall competition of 1967-68 attracted 804 entries (de Haan, 161); the Vienna International Centre (for the UN) of 1968 attracted 288 entries (http://www.unvienna.org/unov/en/vic_history.html accessed 09.02.09); and the New Parliament House of Australia competition of 1979 attracted 329 entries from 28 countries (<http://www.peo.gov.au/students/cl/aph.html#parl>, accessed 09.02.09).

⁵ There were no entries from New Zealand.

⁶ Joan Ockman, 'A Plastic Epic: The Synthesis of the Arts Discourse in France in the Mid-Twentieth Century', in Eeva-Liisa Pelkonen and Esa Laaksonen (eds.), *Architecture + Art: New Visions, New Strategies* (Helsinki: Alvar Aalto Academy, 2007), 35; and Michelson, 'Beaubourg', 63-64.

⁷ Ockman, 'A Plastic Epic', 50.

⁸ de Haan, *Architects in Competition*, 173.

⁹ Ockman, 'A Plastic Epic', 30-50.

¹⁰ Ockman, 'A Plastic Epic', 43.

¹¹ Phillipe Simon, *Paris Visite Guidee: Architecture, Urbanism, History and Actuality* (Paris: Éditions du Pavillon de l'Arsenal and Éditions A and J. Picard, 2007), 105 and 108-110.

¹² This situation changed in 1977 when the position of Mayor of Paris was introduced. Simon, *Paris, Visite, Guidee*, 133.

¹³ It also included a commercial centre, a new ministry for finance, a conference centre, hotels, housing, and new public transport infrastructure. de Haan, *Architects in Competition*, 171.

¹⁴ François Loyer's comprehensive survey of architectural heritage in the city undertaken between 1974-80 was an outcome of this rising awareness of the importance of heritage in the city. Simon, *Paris, Visite, Guidee*, 136.

¹⁵ Evenson, *Paris*, 303.

¹⁶ Simon Sadler, *The Situationist City* (Cambridge, Mass., and London, England: MIT Press, 1998) 65.

¹⁷ *l'Architecture d'Aujourd'hui*, 43:157 (August-September 1971), v and vi-x.

¹⁸ Nathan Silver, *The Making of Beaubourg: A Building Biography of the Centre Pompidou, Paris* (Cambridge, Mass., and London, England: MIT Press, 1994), 3.

¹⁹ 'Concours International D'idée a Un Degré: Centre Du Plateau Beaubourg Paris', (Paris: Le Ministère des Affaires Culturelles de la République Française, 1970-71), 31-32. Jorn Utzon was

listed as a jury member in the original competition documents but had to withdraw due to ill health at the last minute. (Silver, 28) He was replaced by Liebaers.

²⁰ Silver, *The Making of Beaubourg*, 54.

²¹ Simon, *Paris Visite Guide*, 124.

²² Larry Busbea, *Topologies: The Urban Utopia in France, 1960-1970* (Cambridge, Mass.: MIT Press, 2007), 119-130.

²³ 'Concours International Pour La Réalisation Du Centre Beaubourg: Rapport Du Jury', 23-26.

²⁴ Sarah Deyong, 'Memories of the Urban Future: the Rise and Fall of the Megastructure', in Terence Riley (ed.), *The Changing of the Avant-Garde: Visionary Architectural Drawings from the Howard Gilman Collection* (New York: The Museum of Modern Art, 2002) 30.

²⁵ Banham, *Megastructures*, 211-216. In his review of the finished building he also refers to it as potentially the only good building of the 1970s: 'The Pompidolium', *Architecture Review*, 161, 693 (1977), 270-94.

²⁶ Banham, *Megastructures*, 80.

²⁷ François Choay, *The Modern City: Planning in the 19th Century* (London: Studio Vista, 1969), 20 and 100.

²⁸ Fumihiko Maki, *Investigations in Collective Form* (St. Louis: Washington University, 1964), 8. The original 1961 essay by Maki and Otaka 'Some Thoughts on Collective Form with an Introduction to Group Form' was unpublished. *Investigations in Collective Form* was republished as an appendix in Banham, *Megastructure*, 217-218. This information is from Sarah Deyong, 'Planetary Habitat: The Origins of a Phantom Movement', *Journal of Architecture*, 6 (Summer 2001), 113 and 125.

²⁹ As planning librarian at the College of Environmental Design, Berkeley, Ralph Wilcoxon developed a Megastructure Bibliography. His definition is quoted in Banham, *Megastructures*, 8.

³⁰ For example the Buchanan Report on Traffic produced by the British Ministry of Transport in 1963, advocated megastructure solutions to transport problems. Sarah Deyong, 'Planetary Habitat', 113-28.

³¹ Deyong, 'Planetary Habitat', 119.

³² Michel Ragon, *La Cité de l'An 2000* (Paris: Casterman, 1968), 133.

³³ Deyong, 'Planetary Habitat', 122-23.

³⁴ Simon Sadler, *Archigram: Architecture without Architecture* (Cambridge, Mass., and London, England: MIT Press, 2005) 3.

³⁵ Ragon, *La Cité de l'An 2000*, 133.

³⁶ The work of Archigram and their predecessors Basil Spence and Cedric Price is often cited as precedents for Piano and Rogers' design for the Centre Pompidou. It would certainly have been influential for Richard Rogers.

³⁷ Banham, *Megastructures*, 57-58; and Busbea, *Topologies*, 122.

³⁸ Crompton's entry is attributed to Will Alsop who was working for Crompton at the time and entered the competition with Nora Kohen and Julius Tabacek. It shares some characteristic with the work of Archigram.

³⁹ Tinguely and Klein made works for Ruhnau's theatre at Gelsenkirchen. *Yves Klein: Air Architecture* (Ostfildern-Ruit: Hatje Cantz and Verlag, 2004), 106.

⁴⁰ Vasarely made proposals for a polychrome city while Schöffner made proposals for a spatiodynamic and cybernetic city.

⁴¹ The Osaka expo of 1970 was underway at the same time as the competition and many of the competition entries share formal similarities with expo pavilions.

⁴² Ken Maher is now executive chairman of Hassell and is the 2009 AIA Gold Medal recipient. Colin Stewart runs his own practice as an architect and urban designer in Canberra. Craig Burton runs his own practice, CAB Consulting, predominantly as a landscape architect in Sydney. He also researches the history of the Pittwater. Richard Apperly, an architectural historian was on the first editorial board of *Fabrications* (1989-91). He co-wrote with Robert Irving and Peter Reynolds, *A Pictorial Guide to Identifying Australian Architecture: Styles and Terms from 1788 to the Present* (Sydney: Angus and Robertson, 1994).

⁴³ Anthony Taussig is an architect in Sydney. Geof Nairn is a director of DesignInc. Ltd., a firm based in Adelaide that grew out of Nairn Architects which he started in 1976.

⁴⁴ Block completed his degree in Karlsruhe and served on the Russian Front during World War II. He subsequently moved to New Zealand in 1974-75 to become the founding Professor of Architecture at Victoria University of Wellington. He is deceased.

⁴⁵ The Queensland University Great Hall commission (resulting in Mayne Hall) was taken up Robin Gibson after McIntosh's involvement in the project was ceased. McIntosh maintained his practice in Brisbane until 1993 and passed away in 2008. Igea Troiani, 'Deserved Exposure: Stuart McIntosh's Architecture, 1953-1963', *Fabrications*, 16, 2 (2006), 28-43.

⁴⁶ *l'Architecture d'Aujourd'hui*, 152 (October-November 1970), vii. *l'Architecture d'Aujourd'hui* was held in the University of Melbourne from at least 1948 (issues dating from 1946), the University of Adelaide from 1958 and the University of Queensland from at least 1965 (with issues dating from 1950). The journal is also in the libraries of the University of New South Wales (issues from 1947) but the library cannot confirm when the journal was first acquired.

⁴⁷ The RAlA Queensland Chapter publication *Centreline* did announce some competitions including the Commonwealth competition for the design of a new parliamentary office building in Westminster in December 1970 and the Queensland Art Gallery competition in 1971.

⁴⁸ The RIBA published a journal called Competition News through which the Rogers and Piano team found out about the competition (Silvers, *The Making of Beaubourg*, 13). The UIA also announced international competitions.

⁴⁹ Around the time of the Plateau Beaubourg competition, they also entered the Commonwealth competition for a new parliamentary office building in Westminster, London, held in 1970-71 and organized by the RIBA in which Robin Boyd was a judge; the international competition for a Resort Centre in the Bay of Tangiers held in 1973-74 and organized by the UIA; and the competition for a new university campus in Calabria, Italy in 1973. Interview with Ken Maher, 10 February 2009. Interview with Craig Burton, 12 March 2009.

⁵⁰ The entry by Taussig was missing from the digital archive at the Centre Pompidou.

⁵¹ This effect was described to me by John Gray, April 2009. Gray worked in Block's office at the time of the competition. He is currently a senior lecturer at Victoria University of Wellington.

⁵² *Bürolandschaft* or 'office landscape' principles developed in Germany in the 1950s out of organisational theory. Block was interested in how the new discipline of environmental psychology could contribute to architecture. He incorporated these ideas into his design of the Nunawading Civic Centre (1968) which involved the design of furniture systems and other interior elements. According to Gray, Featherstone Interiors who were a supplier for the interior fit-out subsequently marketed the furniture and screens used in this project.

⁵³ I have not found any biographical information on David Ham.

⁵⁴ 'Concours International Pour La Réalisation Du Centre Beaubourg: Rapport Du Jury', 78-79.

⁵⁵ Interview with Maher, 10 February 2009.

⁵⁶ Professor Ashworth, Dean of the Faculty of Architecture of UNSW, wrote to the Beaubourg committee on 10 April 1972 to inquire if the exhibition could be sent to Australia. Box 2, 36-42, Centre Pompidou Archives.

⁵⁷ 'Special Issue. Centre Du Plateau Beaubourg, Paris: Report on International Competition', *Techniques & Architecture*, 34, 3 (1972), 79. 'Special Issue. Centre Du Plateau Beaubourg, Paris: Report on International Competition', *Architecture Mouvement Continuite*, 23 (1971). It was also illustrated along with a few other entries in Giuseppe Marinelli, *Il Centro Beaubourg a Parigi, 'Macchina' E Segno Architettonico* (Bari: Dedalo libri, 1978) Figure 73 (n.p.).

⁵⁸ 'Architecture Graduates Successful in International Competition', *University News from the University of New South Wales*, 10, 4 (September 1971), 4.

⁵⁹ Peter Towson, 'Centre Georges Pompidou – One Year On', *Architecture Australia*, 68, 5 (November 1979), 46-53. There was a review in the Australian cultural journal *Meanjin* in 1977: Catherine Burke, 'Paris's Culture Complex,' *Meanjin*, 36, 2 (1977), 148-55.

⁶⁰ Interview with Maher, 10 February 2009. Interview with Burton, 12 March 2009.

⁶¹ Jennifer Taylor, *Australian Architecture since 1960* (Canberra: The Royal Australian Institute of Architects, National Education Division, 1990), 78-79.

⁶² Peter Raisbeck, 'Celebrating Robert Gordon Menzies 1894-1978: Robin Boyd's Menzies College and Japanese Metabolism', in Andrew Leach and Gill Matthewson (eds.), *Celebration: Proceedings of the XXII Annual Conference of the Society of Architectural Historians Australia and New Zealand* (Napier: SAHANZ, 2005), 303-07. Jennifer Taylor, *John Andrews: Architecture a Performing Art* (Melbourne: Oxford University Press, 1982).

⁶³ Apperly, Irving and Reynolds, *A Pictorial Guide to Identifying Australian Architecture*, 256-59.

⁶⁴ Robin Boyd, *Kenzo Tange* (London: Prentice-Hall International, 1962). Robin Boyd, *New Directions in Japanese Architecture* (London: Studio Vista, 1968).

⁶⁵ The 1966 Perth student convention also included Team X members Aldo Van Eyck and Jacob Bakema. *The Architect, Special Issue: Student Convention*, 3, 66 (September, 1966), 37.

⁶⁶ Lucas had given Maher and Burton drafting work while they were completing their final year of studies part-time. They often spent time in his office in Paddington, which was not far from their own flat / studio.

⁶⁷ They received positive feedback and praise for their scheme, particularly from external critic Harry Seidler, and the ideas explored in it formed the basis of their Plateau Beaubourg entry.

⁶⁸ Banham, *Megastructure*, 211-12.

⁶⁹ Banham, *Megastructure*, 216.

⁷⁰ Alan Colquhoun, 'Plateau Beaubourg', in Alan Colquhoun, Peter Eisenman and Kenneth Frampton (eds.), *Essays in Architectural Criticism: Modern Architecture and Historical Change* (Cambridge, Mass.: MIT Press, 1981).