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The Institutionalisation of Campus Planning in Australia: Wally Abraham and the Development of Macquarie University 1964-1982

This paper explores the institutionalisation of university planning as an area of specialist knowledge produced through specialist journals, prestigiously funded studies and international symposia during the boom in tertiary education in the 1960s and 1970s. The development of a specialist discourse on campus planning in this period reflected the perception that the modern university constituted a new and complex spatio-temporal planning problem that required strategies for dealing with growth and change, and the design of a planning process as much as a campus plan. This paper takes Macquarie University (1964), one Australia's first post-war universities, as an example to illustrate this point, and highlights the transnational exchange of planning ideas that influenced it. The campus plan for Macquarie was developed by architect-planner Wally Abraham who was actively involved in the international campus planning discourse, writing for The Australian University, and its American counterpart Planning for Higher Education. This paper discusses Abraham's theorisation of campus planning in these forums in relation to the linear grid plan he produced for Macquarie, which addressed the problem of uncertainty that arose from short funding cycles and the reform of the university institution, at the scale of both campus and building, and was influenced by John Weeks's (Llewellyn-Davies Weeks) concept of indeterminate building.

Between 1958 and 1975 ten new universities were developed in Australia's capital cities and regional centres – Monash (1958), Macquarie (1964), Latrobe (1965), Newcastle (1965), Flinders (1966), James Cook (1970), Griffith (1971), Murdoch (1973), Deakin (1974) and Wollongong (1975).¹ This represented a significant growth in the tertiary education sector in Australia, and more than a doubling in the number of its universities – taking the total from nine to 19. The growth in Australia was part of the wide-ranging and diverse growth of tertiary education internationally that occurred after the Second World War as a result of policy initiative associated with post-war reconstruction and increased population growth. It presented opportunities to redefine the university institution as more open, accessible and integrated into a democratic and prosperous society. This vision for an expanded role for tertiary education in society had its intellectual origins in the interwar university reform agenda articulated by scholars such as José Ortega y Gasset that emphasised “general education” and interdisciplinary exchange; and the late nineteenth-century philosophical inquiry that he was influenced by, which warned against the over specialisation and the disconnected organisation of knowledge.² In Australia the policy agenda to expand the tertiary education sector was also related to the increased professionalisation of occupations and the conscious expansion of university education into the role of professional education.³

The development of campus planning as a specialist area of knowledge in this period was an integral part of the larger university planning discourse that burgeoned with the growth of the sector, in which universities became a particular subject of analysis and theorisation. The planning of new university campuses, in Australia and internationally, presented a tangible opportunity to translate social and educational aspirations in the physical arrangement and architectural expression of the campus and its buildings. Despite often being sited in ex-urban locations on greenfield or bushland sites, the new university campuses were conceptualised as fragments of a more dense and adaptable urban condition that was anticipated to become pervasive after World War II.⁴ They became an opportunity to enact and test contemporary town planning theory, and the catalyst for the development of new theories specific to campuses and other modern typologies subject to rapid growth and ongoing change. More generally the planning of the new universities and their campuses exemplified the multivalent conceptualisation of planning as a perpetual activity of the post-war welfare state that underpinned its agenda for social reform, civic expression and efficient modern life.

This paper focuses on the planning and development of Macquarie University in Sydney, in order to discuss some of the ideas influencing campus planning in Australia in this period. Macquarie was established in 1964, becoming Sydney's third university, after Sydney University (est. 1851) and the University of New South Wales (est. out of the NSW University of Technology, 1949).⁵ The planning and development of Macquarie's campus in North Ryde, to the north-west of the Sydney CBD, was overseen by Wally Abraham (1923-2006), who was appointed campus architect-planner in 1964 and held this position until his retirement

in 1982. Abraham was one of the first three staff members appointed by the University. He came from Sydney University where he had lectured in town planning and was involved in planning the post-war expansion of that campus.⁶

Abraham was preoccupied with the problem of planning for growth and change in the modern university, a theme that dominated the post-war campus planning discourse internationally. For Abraham, the modern campus was an “uncertain environment” and the challenge of the campus architect-planner was to design a planning process to deal with this ongoing uncertainty. His long-term association with Macquarie gave him scope to have such an influence. Abraham was engaged with contemporary international planning theory and employed some of its key ideas to address the problem of uncertainty in the planning of Macquarie. His plan for Macquarie employed a grid plan, a linear spine for pedestrian circulation, and a centrally located, architecturally distinctive courtyard as the focal point of the campus. It illustrates the interface between planning and architecture in resolving the problem of planning for uncertainty, and one type of resolution of the competing demands of the post-war welfare state paradigm for civic expression and efficiency. It also reflects the shifts in international architectural and planning theory during the 1960s as it underwent generational and paradigmatic change with the re-evaluation of the doctrines of modernism. Abraham wrote and lectured about the development of Macquarie and the theoretical influences on its plan in a range of forums. This paper draws on these texts to analyse the influence of international ideas about campus planning in Australia at this time.

A “globalised architecture and planning movement”

As acknowledged by Stefan Muthesius, in his international survey of the post-war university, *The Postwar University: Utopianist Campus and College* (2000), the growth in the tertiary education sector after World War II was unique in generating a “globalised architecture and planning movement”.⁷ Campus planning as a specialist area of knowledge saw the convergence of “planning” as a general activity of post-war development under the welfare state paradigm, and as a specific activity of the disciplines of both architecture and town planning.

The rhetoric of uncertainty that prevailed in the university planning discourse was tied to the rapid growth of student numbers, the short funding cycles for capital works, and the influence of new ideas about the organisation of knowledge in universities. It saw the uptake of concepts such as flexibility and indeterminism in campus planning that were also being applied to other modern typologies such as hospitals and airports, as a means to address the physical and formal repercussions of rapid growth and short cycles of programmatic change anticipated in the modern university. The treatment of the city as a large, integrated system that underpinned these concepts exemplified post-war modernism’s preoccupation with the urban scale. In campus planning, the disciplinary exchange between architecture and town planning that had become commonplace in post-war modernism, was motivated by a search for new models of campus plan to supersede the cloistered courtyard and college arrangement which no longer matched the vision of openness and interdisciplinary

exchange, and the anticipated large scale of the modern university. It involved testing the capacity of each discipline to deal with the complex spatio-temporal planning problem constituted in the modern university.

Australia's new campuses were developed under the framework of the policy reform outlined in the Murray Report (1958)⁸ and the Martin Report (1964)⁹. The Murray Report, prepared by Sir Keith Murray, chair of the British University Grants Committee (UGC) under Menzies' prime ministership, was a concise visionary document setting out a future plan for tertiary education in Australia. However, as noted by Hannah Forsyth, the document was "almost certainly written by Ian Clunies Ross", then head of CSIRO and a significant advocate of tertiary education reform in post-war Australia.¹⁰ The Martin Report, prepared by Sir Leslie Martin, a Foundation Fellow of the Australian Academy of Science and Commissioner with the Australian Atomic Energy Commission, set out the policy framework and funding regime through which the expansion of tertiary education in Australia would happen. The Australian Universities Commission (AUC), a federally funded but independent body modelled on the British Universities Commission, was established in 1959 to oversee and fund the expansion of the sector. The abolition of the AUC and its successor the Tertiary Education Commission in 1987 as part of the Dawkins reforms of tertiary education can be understood as a bookend to this period of post-war expansion of the sector in Australia.¹¹

Planning of the new campuses in Australia, as in other locations internationally, was shaped by three significant factors: the real and perceived situation of uncertainty that resulted from the triennium funding regime of the AUC and the anticipated fast-paced growth of the sector; the changing demographic of the university and the desire for new organisational models; and the siting and landscape characteristics of the new campuses. The example of Macquarie University is useful in illustrating how ideas about physical planning and the planning process intersected in the development of campus planning discourse, and how the influence of the requirement to plan for growth and change that pervaded the international discourse took shape in Australia.

Macquarie University and campus architect-planner Wally Abraham

Planning for Macquarie, one of the first of the new campuses to be funded through the newly formed Australian Universities Commission, began in mid-1964.¹² A decision was made early in the piece that Macquarie would undertake its own planning rather than through the appointment of an external consultant.¹³ The Architects Planning Office (APO) was established within the University to fulfil this role, with the architect-planner Abraham at its helm. The APO made over-arching planning decisions allowing the long-range planning of the campus, and wrote briefs for specific building projects for which consultant architects were appointed. The University Council also appointed a consultant panel with representatives from six architectural firms to advise on decisions.¹⁴ In his plan for Macquarie (Figure 1), Abraham selectively adopted a range of ideas from the international campus planning discourse to deal with different challenges associated with planning the modern university.

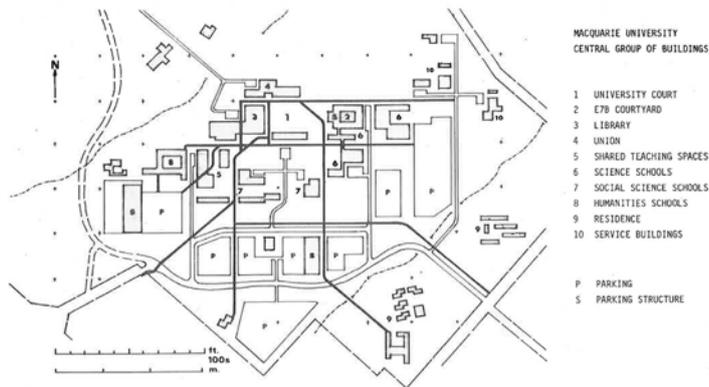


Fig. 1 Macquarie University Campus Plan. W. V. Abraham, "Inheritance and Style: Planning Design at Macquarie University," *Planning for Higher Education* 11, no. 2 (1983): 5.

A Provisional Development Plan for Macquarie was established by 1965. It identified three overarching zones: the University Centre, the Academic Zone and the Fringe Zone.¹⁵ Overlaying these functional zones was a linear grid that defined building areas, service networks, pedestrian circulation, and open space. The grid would become a powerful organising feature in the ongoing development of the campus plan and will be discussed in more detail later in this paper, however in its first years of development of the campus Abraham's attention was focused on the University Centre.

The influence of Radburn planning is evident in Abraham's articulation of the key principles that guided the Provisional Development Plan for Macquarie, which included:

- "the need for a compact, interlocking group of buildings;"
- recognising that the new campus would be a "motor car university;" and
- achieving "pedestrian and vehicle separation with car parks on the periphery."¹⁶

The principles of Radburn planning were a pervasive influence in the planning of Australia's campuses in this period and can be attributed to the influence of Gordon Stephenson, one of the key figures in campus planning in Australia in this period.¹⁷ Stephenson came to Australia from the UK and brought firsthand knowledge of international planning theory from his experience working with Patrick Abercrombie on the Greater London Plan, on the design of Stevenage (1946) – the first of Britain's post-war new towns, and as editor of *The Town Planning Review* (1948-54).¹⁸

In an article written for *The Australian Planning Institute Journal* in 1965, Stephenson observed: "nearly all the interesting and workable campus plans of recent years are based on the Radburn system of layout, and show a variety of inner spaces flanked by buildings of varying size and function."¹⁹ In this article Stephenson identified William Pereira's plan for the University of California at Irvine as an exemplar, describing its "arrangement of outward growing clusters of courts around central campus buildings ... [with] pedestrian ways lead through the clusters from ample peripheral car parks. ... [a] system of layout demonstrated for the first time in the modern world by Wright and Stein at Radburn, New Jersey."²⁰ The clearest expression of these principles in the Macquarie campus plan was in the central pedestrian circulation spine, which has since come to be known as Wally's Way.

However Abraham also sought insight from other voices in the international campus planning discourse, particularly to solve the problem of planning for rapid growth and ongoing change. One factor that distinguished Abraham's engagement with the international discourse was his attitude towards the courtyard as a suitable organising principle in the modern university campus. Debates about the relative utility of the courtyard and the grid in the modern campus reflected the problem of reconciling and managing short- and long-term development, and the parallel but sometimes competing ambitions of the post-war welfare state for civic expression and efficiency.

Despite its association with the Oxbridge colleges model, the courtyard was seen to have many benefits as an organising element in the planning of Australia's modern campuses. Stephenson described the courtyard as "difficult to surpass as a spatial element"²¹ and it was a key organising principle of Flinders University, developed by Stephenson and Geoffrey Harrison from 1964. Its use at Flinders suited the "schools" model that the University adopted following Sussex (1961), one of the first post-war "plate glass" universities that became an exemplar in the campus planning discourse in the UK.²² The organisation of universities into small disciplinary groups or schools, was pursued as an alternative to the college system, and as a means to give clear expression to the ambition for the life of the modern university to come from exchange between disciplines.

Adapting the courtyard as the basis of a planning model that could accommodate growth and give an underlying pattern to campuses in various states of completion was another important aspect of its continued relevance for the modern university internationally. However Abraham did not see the courtyard as an effective way to plan for the anticipated scale of Macquarie and the demand for it to be responsive to change, and sought other strategies from the international discourse to deal with this issue. While Macquarie, like Flinders, also adopted an academic structure based on schools, with ten schools in the areas of the Humanities, Social Sciences, Economic and Financial Studies, and the Sciences, Abraham did not use the schools as a generating unit in the campus plan.²³

At its inception, the projected student population for Macquarie was 20,000 students.²⁴ This was not dissimilar to the projections for many of Australia's new universities. While the issue of a large campus size underlay much of the preoccupation with planning for growth in campus planning in Australia, Abraham's engagement with the issue of uncertainty at Macquarie was also related to the potential for ongoing changes to the academic programme and the unpredictability associated with the availability of capital funds.²⁵ In an extensive article for the journal *The Australian University* in 1966 Abraham outlined the role of new developments in international campus planning theory and their relevance to the specific situation of funding in Australia, noting how the triennium funding regime introduced by the AUC would directly effect the physical layout and formal characteristics of new campuses.²⁶

Managing the interface between short- and long-term planning in the post-war university was a pervasive theme in the discourse that took place in *The Australian University*, a journal established in 1963 by the Vice Chancellor's Commission, which became an important

forum for the dissemination of ideas about university planning in Australia. As noted in the editorial of first edition by S. L. Prescott, the vice-chancellor of University of Western Australia: "There has been such rapid growth in the size and complexity of the Australian university community that there is room for an additional publication ... for information and discussion on the many-sided and rapid development of the Australian universities, and which would provide an additional link between the universities of this country and those overseas."²⁷ The journal covered a broad range of topics and developed a research base for university planning as an area of specialised knowledge. It discussed the impact of the AUC funding cycles on physical and administrative aspects of planning, the emergence of new theories of teaching and learning, and impact of technological change in the management and practices of the university; the character of campus life in the modern university; and the design evolution of particular campus building types including laboratories, libraries and student housing.

At the beginning of Abraham's article in *The Australian University* he noted the influence of Stephenson on the field of campus planning in the Australian context, but also noted the lack of development and understanding of planning as a process and the importance of this distinction in addressing the growth-change paradigm of the modern university campus. He also made reference to Richard Dober's recently published study of UK campus planning (1965) and his identification of "omniflexible floor space" and buildings with "'open' ends" as new concepts that had relevance in the Australian context.²⁸

A year later, in an article for *Architecture in Australia* (based on a lecture Abraham had given to the Civic Design Society of the University of NSW on July 5, 1967), Abraham described the issue of planning for growth and change through the catchword "uncertainty". In this article Abraham also made a more explicit connection between the ideas described in *The Australian University* about open-ended building, with the theory of British architect John Weeks. Weeks was partner in Llewellyn-Davies Weeks, the British architectural firm specialising in complex large-scale urban planning and building projects, and was becoming well-known for his ideas about indeterminate building, a concept Llewellyn-Davies Weeks were applying in the design of hospitals to address the issue of rapid obsolescence, that Abraham thought was equally relevant to campus planning.²⁹

A significant characteristic of the Development Plan for Macquarie was that Abraham attempted to deal with the issue of uncertainty at the scale of the campus plan, and to individual campus buildings. This was achieved primarily through the use of an open grid as the over-arching organising principle for the campus, and the application of indeterminate building principles to buildings in the Central and Academic Zones (Figure 2). Macquarie's open grid corresponded to the set-out of services and was dimensionally configured to allow for infill and expansion of buildings, as well as the extension of the grid if required. As described by Abraham, it located "growth points" from which the physical growth of the campus would be controlled as "a balance of both internal infill and peripheral expansion".³⁰

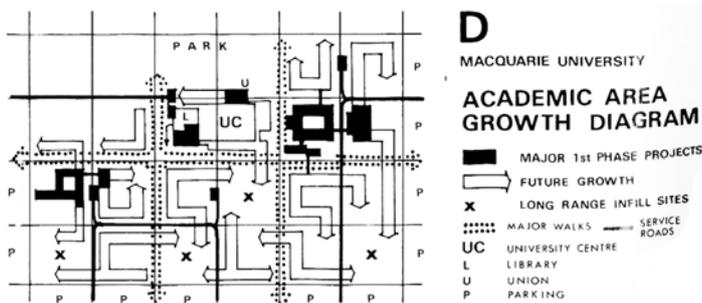


Fig. 2 Growth Diagram of Macquarie University. Wally Abraham, “The Uncertain Environment,” *Architecture in Australia* 56, no. 6 (1967): 1000.

The grid of the Macquarie campus was also used to relate the location of teaching spaces to walking times, where 300 feet equalled a one minute walk and “the top floors in three storey walk up facilities at opposite perimeters of this academic zone, represented a ten minute walk.”³¹ Abraham envisaged that the movement of students would make the campus dynamic and full of life. This contrasted with Stephenson’s conception of the campus where student movement was regulated and calmed by cloistered courtyards.

In the Development Plan for Macquarie the concept of indeterminate building was also employed. For each building envelope described in the University and Academic Centre zones, Abraham indicated a direction in which the building could be extended in the future (see Figure 2). Architectural briefs for individual buildings set out specifications for the organisation of structure and the use of materials to facilitate such future expansion. In 1983 Abraham noted: “13 such open ends received extension during the 1970s”.³²

In a 1983 article for the American journal *Planning for Higher Education*, Abraham provided a systematic account of the theoretical influences on the Macquarie plan and reflected on the influence of the growth-change paradigm on campus planning (Figure 3). He attributed the first recognition of the significance of this issue for campus planning to a report made for the proposed development of Birmingham University by Hugh Casson and Neville Condor,

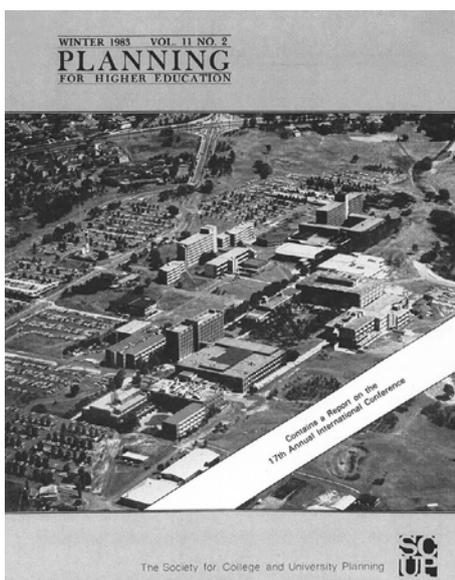


Fig. 3 Aerial photograph of Macquarie University featured on the cover of *Planning for Higher Education* showing buildings of the University Centre, the University Courtyard and the pedestrian spine. W. V. Abraham, “Inheritance and Style: Planning Design at Macquarie University,” *Planning for Higher Education* 11, no. 2 (1983): cover.

which “foreshadowed much of the theory which was to emerge in the 20 years ahead”.³³ Abraham also outlined the influence of the urban structuring theory of Donald Foley from Berkeley, which sought to develop concepts for urban planning that took account of both “spatial and aspatial [sic] approaches to community organization and form and process aspects of metropolitan structure.”³⁴ Abraham found Foley’s distinction between unitary (product focused design) and adaptive (process driven design) approaches to planning apt in the context of the modern university, stating: “the need to achieve a balance between the unitary and adaptive approaches ... in the context of an imprecise, evolutionary academic brief ... [as] a guiding idea for the design decisions at Macquarie.”

The focus on planning as a process became a significant part of the campus planning discourse in Australia. The 1966 survey of campus planning in Australia completed by US scholar Robert Stephenson, which took its cues from Dober’s 1964 study of innovations in campus planning in the UK, focused on outlining the different approaches and impact of funding cycles on the management of planning decisions. Stephenson described campus planning as “an activity of optimisation” and introduced the concept of “feedback” as a means to allow the evaluation of buildings and changing organisational structures of the university to influence planning processes in a timely manner, as integral to effective campus planning.³⁵ Abraham described the university design process as “continuous, pragmatic [and] programmatic” and highlighted his role as one of “planning design”, which he implemented at Macquarie utilising a range of techniques including making “design decisions at the lowest possibly density, ... restricting the content of each building to as few of the floor space classifications as possible, ... [applying] a two-stage briefing [process], ... [and providing] as many incomplete, open ends to buildings as possible”.³⁶

By the early 1970s questions of process were embedded in the campus planning discourse. The ANU symposium on campus planning held in 1973, which adopted Abraham’s catchphrase in its title *Planning for Uncertainty*, attracted both architects and administrators and brought together a range of international speakers to take stock of advances in campus planning theory since the 1960s. The symposium was organised by A. A. Robertson, Assistant Registrar, Property and Plans at ANU. Speakers included Dean McHenry from the University of California, Santa Cruz, long-time friend of Clark Kerr, the influential educational theorists whose book *The Uses of the University* (1964) set out a vision for the modern university; Peter Dickens from the University of Cambridge, Centre for Land Use and Built Form Studies, which was at the forefront of applying advances in computer technology to the planning problems of the modern university; and a range of Australian campus planners including Roger Johnson who spoke about Griffith University, and R. G. Marginson, A. G. Cole and H. B. Morlock who spoke about the University of Melbourne.

However, by the mid-to-late-70s, when the last universities scoped out in the Martin Report were taking their first students, the growth trajectories in student numbers had plateaued.³⁷ The Fraser and Hawke governments both initiated national inquiries into the tertiary education sector and university funding, culminating in the Dawkins Green Paper on Higher Education of 1987. As a consequence of the policy shifts of the 1980s, including the abolition

of the Tertiary Education Commission, priorities of the sector shifted towards consolidation and economic efficiency and no significant development of campuses would take place again until the 1990s.

After his retirement from Macquarie, Abraham was concerned to highlight and explain the enduring physical characteristics of the campus. Where previously the issue of the design of a planning process had preoccupied Abraham, in his 1983 account of the design of the campus he emphasised the courtyard model of ancient universities as a significant reference point, and the role of such traditional models in the establishment of long-term meaning. He described how the proportions and scale of the University Courtyard at Macquarie had been based on the Quad at the University of Sydney.³⁸ While the courtyard had been rejected as an organisational unit for the campus plan, it was embraced by Abraham as a powerful model of civic space and applied in a singular way in the University Centre (Figure 4).³⁹ The fluctuating status of the courtyard in the post-war campus planning discourse – where it was employed as both a model for growth and a signifier of identity – and the tension between order and image in architectural expression that underpinned it – exemplified two competing aspects of the campus planning discourse that were synonymous with post-war modernism more generally.⁴⁰



Fig. 4 The open courtyard at the centre of the Macquarie campus is surrounded by the library, student services and large capacity lecture theatres. Photograph by Susan Holden, 2015.



Fig. 5 Avenue planting along the pedestrian spine and the informal park landscape of the edge of the campus proper to the right. Photograph by Susan Holden, 2015.

Abraham also later emphasised the significance of landscaping at Macquarie, where it served two functions. Firstly, to contrast with the formal aspects of the campus plan and establish a memorable setting for the campus at its edges. As described by Abraham: “the formal, urban qualities of the academic area, which, as in the case of La Trobe, lies in the centre of the site, are to be contrasted with informal, open, landscape-dominated zones surrounding it.”⁴¹ And secondly, to reinforce the experience and expression of two of the important features of the campus plan: the pedestrian spine, which was treated like an avenue (Figure 5), and the University Centre, where formal planting arrangements were employed to complement the brutalist expression of the buildings surrounding the University Courtyard (Figure 6). As described by Abraham: “120 Eucalyptus Citriodora [were] planted within the courtyard on a common grid ... determined for the buildings and expressed in the tree layout.”⁴²



Fig. 6 Western end of the University Court showing grid of eucalyptus planting (l). The courtyard today showing the eucalypt planting complementing the architecture of the Library (r). Government Architect of NSW (Peter Hall), 1967-71. W. V. Abraham, “Inheritance and Style: Planning Design at Macquarie University,” *Planning for Higher Education* 11, no. 2 (1983): 6. Photograph by Susan Holden, 2015.

Conclusion

Although in later more reflective writing about the campus plan Abraham emphasised the tradition of the courtyard model and its role in creating an “aura of permanence,”⁴³ there is no doubt the open grid and indeterminate building strategies being advanced in the international campus planning discourse played an important role in the development of the campus plan. Macquarie is significant for representing how the concept of uncertainty in campus planning in the 1960s was addressed at the scale of the campus plan as well in the design of university buildings. At Macquarie the adoption of indeterminate building strategies took precedent over the formal expression of the schools, while the University Core became a location for the emphasis of architectural expression based around the courtyard as a suitable model of civic space.

Macquarie also exemplifies the influence of another line of campus planning theory in Australia to that of Gordon Stephenson with his background in Radburn and British new

town planning. This line of influence, which came through figures such as John Weeks, was important in redefining the activity of planning as a process that became paradigmatic in the post-war revision of modernism. In its treatment of planning as a process, the post-war campus planning discourse brought together the two pillars of the welfare state – efficiency and the social value of democratic civic society – in a way that generated new interdisciplinary concepts for how the modern campus could deal with uncertainty, growth and change.

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- 1 The dates indicate date of establishment of the university by an act of parliament. See www.australianuniversities.com.au/directory/history-of-australian-universities (accessed February 15, 2015).
 - 2 José Ortega y Cassat, *Mission of the University* (London: Routledge and Kegan Paul, 1946, Third Imprint 1963).
 - 3 Hannah Forsyth, *A History of the Modern Australian University* (Sydney: NewSouth Publishing, 2014), 41.
 - 4 Joseph Rykwert, "Universities as Institutional Archetypes of our Age," *Zodiac* 18 (1968): 61-63.
 - 5 One result of the Martin Report (1964) was a "binary" approach to the growth of the tertiary education sector in which "trade-focused technical colleges [were turned into] ... universities and institutes" but required less funding in the area of research. Forsyth, *A History of the Modern Australian University*, 40.
 - 6 Don Gazzard, "Wally Abraham – a distinguished planner for Sydney and Macquarie Universities," November 15, 2006, Faculty of Architecture, Design and Planning, University of Sydney website, <http://sydney.edu.au/news/architecture/274.html?newsstoryid=1452> (accessed September 16, 2013).
 - 7 Stefan Muthesius, *The Postwar University: Utopianist Campus and College* (New Haven: Yale University Press, 2000), 1.
 - 8 Committee on Australian Universities (Sir Keith Murray et al.), *Report of the Committee on Australian Universities*, September 1957 (Canberra: Government Printer, 1958) (Murray Report).
 - 9 Committee on the Future of Tertiary Education in Australia (Sir Leslie Martin et al.), *Tertiary Education in Australia: Report of the Committee on the Future of Tertiary Education in Australia to the Australian Universities Commission* (Canberra: Government Printer, 1964-65) (The Martin Report).
 - 10 Forsyth, *A History of the Modern Australian University*, 55.
 - 11 For recent commentary on the interface between tertiary education policy and administration, and government, see Simon Marginson, "Back to the Future: Do we need a Universities Commission?" *The Conversation*, November 27, 2012, <http://theconversation.com/back-to-the-future-do-we-need-a-universities-commission-10983> (accessed May 11, 2015).
 - 12 Wally Abraham, "The Uncertain Environment," *Architecture in Australia* 56, no. 6 (1967): 999.
 - 13 W. V. Abraham, "Environment and the New Campus: Physical Planning at Macquarie University," *The Australian University* 4, no. 2 (1966): 132. Abraham notes that Monash, La Trobe and Newcastle outsourced campus planning to consultant firms, while Flinders and Townsville "undertook their own planning in association with a planning consultant." See Gordon Stephenson, "The Physical Planning of Universities," *Australian Planning Institute Journal* 3, no. 5 (1965): 133.
 - 14 Rex Torzillo, "Macquarie University Centre Buildings circa 1964" (BArch. thesis, University of New South Wales, 1995), 31.
 - 15 Torzillo, "Macquarie University Centre Buildings circa 1964," 35-37.
 - 16 Torzillo, "Macquarie University Centre Buildings circa 1964," 31.
 - 17 Christine Garnaut, "Gordon Stephenson and University Planning: A Pleasurable Professional Pursuit," *The Town Planning Review* 83, no. 3 (2012): 377-395. Stephenson worked on an expansion plan for the University of Western Australia (1954) and would subsequently be involved in the planning of three of Australia's new campuses: Flinders, James Cook and Murdoch. The influence of the principles of traffic separation and a pedestrianised core are evident in all of these campuses.
 - 18 See Christina Demarco, "Stephenson, Gordon," in *The Encyclopedia of Australian Architecture*, ed. Philip Goad and Julie Willis (Port Melbourne, Vic.: Cambridge University Press, 2012), 652.
 - 19 Stephenson, "The Physical Planning of Universities," 150.
 - 20 Stephenson, "The Physical Planning of Universities," 150.
 - 21 Stephenson, "The Physical Planning of Universities," 150.

- 22 Susan Holden and Jared Bird, "An Open Plan: The Development of the Griffith University Nathan Campus Plan, 1966-1973," in *Proceedings of the Society of Architectural Historians, Australia and New Zealand: 30, Open*, ed. Alexandra Brown and Andrew Leach (Gold Coast, Qld: SAHANZ, 2013), vol. 2, 723-736.
- 23 W. V. Abraham, "Inheritance and Style: Planning Design at Macquarie University," *Planning for Higher Education* 11, no. 2 (1983): 1.
- 24 Torzillo, "Macquarie University Centre Buildings circa 1964," 31.
- 25 Torzillo, "Macquarie University Centre Buildings circa 1964," 27.
- 26 Abraham, "Environment and the New Campus".
- 27 S. L. Prescott, "The Australian University: An Introduction," *The Australian University* 1, no. 1 (1963): 2. The journal was published three times a year until 1976. It covered a broad range of topics including campus planning. Its publication reflected Australia's relatively early engagement with the international discourse of university planning. Its American counterpart *Planning for Higher Education* was established in 1974, running until 1987.
- 28 Abraham, "Environment and the New Campus," 126-27. Richard P. Dober, *Campus Planning* (New York: Reinhold Pub. Corp., 1964).
- 29 John Weeks, "Indeterminate Architecture," *Transactions of the Bartlett Society* 2 (1963-64): 85-106. Richard Llewellyn-Davies visited Australia in 1967. He gave an address to the NSW chapter outlining Week's theory of indeterminacy, see Abraham, "The Uncertain Environment," 998.
- 30 Abraham, "Environment and the New Campus," 135.
- 31 Abraham in Torzillo, "Macquarie University Centre Buildings circa 1964," 37.
- 32 Abraham, "Inheritance and Style," 7.
- 33 Abraham, "Inheritance and Style," 3.
- 34 Abraham, "Inheritance and Style," 3.
- 35 Robert B. Stephenson, *Campus Planning in Australia* (Australia, 1966), 8, 10. Stephenson's study was sponsored by the Australian-American Educational Foundation and completed at the University of Sydney under the guidance of Denis Winston.
- 36 Abraham, "Inheritance and Style," 7.
- 37 Forsyth, *A History of the Modern Australian University*, 96. "The late 1970s marks the beginning of a decade-long decline in growth, not in student numbers ... in 1975 the annual student growth rate was 8.6 per cent, but by 1981 it was only 1.3 per cent."
- 38 Abraham, "Inheritance and Style".
- 39 Torzillo, "Macquarie University Centre Buildings circa 1964," 31.
- 40 The first campus buildings at Macquarie were by notable Australian architects: the Library in 1967-71 by the Government Architect of NSW (Peter Hall), the Union Building of 1969 by Ancher Mortlock and Woolley (Ken Woolley and Bryce Mortlock), and the Council Building in 1972 by Edwards, Madigan and Torzillo (Jack Torzillo).
- 41 Abraham, "Inheritance and Style," 5.
- 42 Abraham, "Inheritance and Style," 5.
- 43 Abraham quoted in Torzillo, "Macquarie University Centre Buildings circa 1964," 94.