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## The Mechanical Organic: On the Discourse of Ecology in the Architecture of John Andrews

Beyond the Brutalist and Structuralist labels commonly used to describe the work of John Andrews is the architect's strong interest in environmental values. From the project for Scarborough College, Toronto (1963-69) through to the Intelsat Headquarters, Washington (1980-89), ideas for creating climate-tempered environments were demonstrated in design terms through the organisation of the building's plan and section as well as through the modulation of the exterior skin - revealing a systematic and scientific logic. However, the terms of Andrews' interest in the relationship of environment and architecture developed in his period in Canada up to 1970 took place in a wider context of gathering social awareness of ecological issues, which was crystallised by the influential work of landscape architect, Ian McHarg. Author of *Design with Nature* (1969), a seminal primer of ecological planning, McHarg provided inspiration to others working in Andrews' Colborne St office in Toronto namely landscape architect, Richard Strong, and artist, Gerald Gladstone, who were involved with Andrews on projects such as Gund Hall, Harvard (1968-72) and the Cameron Offices, Canberra (1970-77). This paper examines the effect of the discourse of ecology on the work of John Andrews, seeking to understand how that broader set of values - spanning from science to art - shaped his architecture. There are clear links between the design methods of McHarg and Andrews, which both centre on ecological planning, and there are also concepts expressed in Gladstone's art - his mechanical/organic analogy - that bear upon Andrew's architecture. By seeing the discourse of ecology in architecture as more than a simple reflection of environmental science brought to the discipline - we see, as never before, the larger implications of Andrews' design approach of the 1960s and -70s and the operations of an 'ecological network' in which he was embedded and to which he circumstantially belonged.

In his monograph, *Architecture: a performing art*, the Australian architect John Andrews decries the “misunderstanding” of his work by his architectural critics. Rejecting its interpretation through categories of “contemporary style” (Brutalism and Structuralism) and through the vocabularies of form attributed to major modernists Le Corbusier, Louis Kahn and Alvar Aalto, Andrews seeks to privilege the work itself – to claim its adequacy to “explain its own forms [and] the attitudes that went into its design”.<sup>1</sup> At face value such a claim evidences the architect’s direct and pragmatic approach to architecture – a stance deemed anti-theoretical by his critics – which marked Andrews out from his contemporaries. Yet this invocation of ‘cause and effect’ between the problems set for architecture and the forms that resulted illustrates a particularity of Andrews’ thinking – a belief in architecture’s relationship to environmental conditions and values that developed in the period of his education at Harvard’s Graduate School of Design in 1957-58, through the establishment of his architectural practice in Canada in the 1960s and up to his return to Australia in 1970. During this time in North America there was gathering awareness of ecology as a social ethic and Andrews found himself amidst a network of ambitious colleagues – landscape architects, artists and other professionals – who pursued ecological ideas and values both personally and professionally. This awareness broadly crystallized in the influential work of landscape architect, Ian McHarg, whose practice, teaching and writing of the 1960s recast the fields of landscape architecture and regional planning around the idea of the interrelation of natural and human systems.

This paper examines the impact of the discourse of ecology on Andrews’ architecture of the period, pointing to networks that developed between professional contemporaries of Andrews who advocated ecological thinking and the affects this had for the architect’s practice. In doing so the paper sketches out profiles of key individuals in fields other than that of architecture – namely landscape architecture and art – to illustrate the interdisciplinary operations of ecological discourse in 1960s North America and Andrews’ place within this milieu.

One of the pre-eminent figures of the discourse of ecology was the landscape architect Ian McHarg, who Andrews acknowledges as an important contemporary – but not someone whose work he followed closely.<sup>2</sup> Nonetheless there is an important link between Andrews and McHarg in the North American context that was afforded by another landscape architect, Michael Hough, a devotee of McHarg in his early career who was taught by him at the University of Pennsylvania, only to become an instrumental collaborator in the design of Andrews’ Scarborough College project begun in

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1 John Andrews and Jennifer Taylor, *Architecture: a performing art* (Guilford: Gutterworth Press, 1982), 47.

2 John Andrews, in discussion with Paul Walker, April 2013.

1962.<sup>3</sup> While McHarg and Andrews' began developing their thinking on design and the environment independently during the late 1950s, Hough's critical role in Andrews' design for Scarborough College illustrates where their ideas were to crossover - indicating shared theoretical premises that begin to reveal something of the impact of ecological thinking on Andrews' architecture of the 1960s and -70s.

Ian McHarg (1920-2001) was a Scottish born landscape architect who came to prominence in the early 1960s for his approach to regional planning based on the use of natural systems, an approach that became known as ecological planning. Taking a degree in landscape architecture and city planning at Harvard between 1946 and 1949, McHarg absorbed its multi-disciplinary education, learning in parallel and jointly taught courses -an approach he brought to his concerns on the environment.<sup>4</sup> McHarg subsequently joined the Faculty of the University of Pennsylvania in 1952 before establishing its newly created Department of Landscape Architecture in 1956.<sup>5</sup>

McHarg utilized his role at University to advance his thinking about environmentalism and landscape architecture while also setting out to test his ideas in practice. In teaching his course 'Man and Environment', McHarg enlisted a diverse range of scientific specialists including biologists, meteorologists and anthropologists to promote a total understanding of environment in his students. In parallel with his University role McHarg established the office of Wallace McHarg Roberts and Todd in 1962, with the aim of instrumentalizing his teaching methods in practice and experimented with new ways of approaching landscape architecture. This was an inclusive method of rational planning that drew upon broad scientific research as a means to address the problem of landscape holistically and systematically, a method which began by identifying and evidencing the causal links between natural phenomena which formed landscapes. McHarg promoted the idea of "nature as process",<sup>6</sup> and of places as the outcome of processes, which could be understood and designed for through concepts of adaptation and best fit. In his lectures and writing he evoked the evolutionary theory of Charles Darwin, proposing that the place of humans in any environmental system was dynamic in that finding proper fit included the need to adapt the environment and to interact with the system itself.<sup>7</sup>

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3 Andrews and Taylor, *Architecture: a performing art*, 31.

4 Anne Sprin, "Ian McHarg, Landscape Architecture, and Environmentalism: Ideas and Methods in Context," in *Environmentalism in Landscape Architecture*, ed. Michael Conan (Washington, D.C.: Dunbarton Oaks Research Library and Collection, 2000), 97-114.

5 Sprin, "Ian McHarg, Landscape Architecture," 98.

6 Sprin, "Ian McHarg, Landscape Architecture," 103.

7 Ian McHarg, "The Theory of Creative Fitting," in *Ian McHarg: Conversations with Students - dwelling in nature*, ed. Lyn Margulis, James Corner and Brian Hawthorne (New York: Princeton Architectural Press, 2007), 23.

In 1962 the practice took on its first major project as a test of McHarg's theoretical teaching-based method. The 'Plan for the Valleys' was a design problem set within a landscape of forests and agricultural land north of Baltimore, Maryland, that required planning to receive a new expressway. The office set about mapping the region extensively in order to discover the best way to preserve and adapt the place. Identifying the broader environmental conditions meant designing through the elimination of possibilities, allowing the 'inevitable' solution to emerge, a process McHarg referred to as "physiographic determinism".<sup>8</sup>

Through the 'Plan for the Valleys' and subsequent projects McHarg refined his design method, which began to centre on the production of sets of ecological overlays describing distinct but interrelated geographical data - a technique considered a pioneering example of GIS (Geographic information systems) use as a basis of planning and environmental management today.<sup>9</sup> McHarg's technique had broader applicability, particularly to architecture, where issues of site planning were also important, and it was through the landscape architect, Michael Hough, who was teaching alongside John Andrews at the University of Toronto in the early 1960s, that Andrews would be directly introduced to McHarg's ecological thinking - a thinking which was, up to then, central to Hough's own education and practice. Yet even before this introduction Andrews was developing his own interest in the environment as a design determinant through his Canadian projects of the late 1950s. From the Toronto City Hall competition project (1958), undertaken with Harvard colleagues, with its parasol roofed 'summer court', and the scheme for the Malton Hotel at Toronto Airport (1959) whose canted forms in section responded to sound studies for noise protection, Andrews' attention was drawn to the ways in which architectural form could emerge as a logical solution to clearly identified environmental problems.

It was in the design for Scarborough College (commissioned in 1962) that Andrews' interest in informing architecture through environmental considerations became more significant to his process, not surprising through his collaboration with the landscape architect Hough, who had intimate knowledge of McHarg's thinking and methods. It was Hough, acting as landscape architect for the University of Toronto in 1962 who suggested Andrews and the planner, Michael Hugo-Brunst, collaborate on the master planning of Scarborough College, which would become a watershed project of the young Australian architect's North American career.<sup>10</sup>

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<sup>8</sup> Ian McHarg, "The Theory of Creative Fitting," 28-30.

<sup>9</sup> David Orr, "Preface," in *Ian McHarg: Conversations with Students - dwelling in nature*, ed. Lyn Margulis, James Corner and Brian Hawthorne (New York: Princeton Architectural Press, 2007), 10.

<sup>10</sup> Andrews and Taylor, *Architecture: a performing art*, 31.

As recalled by Andrews, the design team for Scarborough College began with the identification of the key problem: to determine siting - a problem that would inform all subsequent decision-making.<sup>11</sup> In this respect what constituted the site would become both a critical idea and a methodological starting point for design. Here the site was understood as the broadly constituted environmental setting that, in the case of Scarborough, was a wooded ravine and hillside forming part of a greater ravine landscape that traversed metropolitan Toronto. The ravine floor was largely protected for public use by civic authorities and while the University had the power to override this ruling, Andrews was personally inclined to respect it, despite the contrary views of his client. While this 'intuition' was a beginning it was the introduction of a climatologist to the project team by Hough, which proved decisive, at least according to Andrews - a move to introduce other environmental expertise that was strongly 'McHargian'.<sup>12</sup> With reference to a series of scientific studies that recorded the micro-climatic zones of the ravine environment and its meteorological conditions in both plan and section, Andrews and his team was able to convince the University authorities that the most appropriate climatic location for the university complex had been identified, a territory tracing the high northern edge of the ravine.

For Andrews the intention to use scientific knowledge to justify decision-making in the design of Scarborough College constituted a decisive moment in the development of his design practice for two important reasons. Firstly, it revealed that the architect alone, with his or her disciplinary knowledge base, had insufficient means to deal with the cast of the 'problem' given (a conclusion that McHarg had earlier come to for his own discipline of landscape architecture). This led to an understanding that working with other specialists and acknowledging their input and disciplinary bases was crucial to outcomes, a view which identifies the legacy of Andrews' study at the Harvard Graduate School of Design where the program encouraged and valued interdisciplinary understanding educationally and professionally. Secondly, it revealed a new paradigm in design method where environmental factors, previously little regarded, now emerged as critical. In Andrews' own words, through the process of designing Scarborough it became evident that "seemingly minor matters kept turning into major planning determinants."<sup>13</sup> The micro-climatic conditions of wind, snow and rain; the maintenance of marshlands at the base of the ravine and the location of established trees closer to the hilltops were all matters cited as key parameters of the design.<sup>14</sup> Point for point those parameters were argued to determine architectural concerns - the

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11 Andrews and Taylor, *Architecture: a performing art*, 32.

12 Andrews and Taylor, *Architecture: a performing art*, 32.

13 Andrews and Taylor, *Architecture: a performing art*, 33.

14 Andrews and Taylor, *Architecture: a performing art*, 33.

position of the building in the context, the cranked linear arrangement, the concentration of form on the site, the continuously accessible interior, the protected open space created by the two main wings and so on.

Andrews' design approach at Scarborough and its acknowledgement of environmental determinants might be understood as evidencing the self-styled pragmatism that marked the architect's work of the 1960s;<sup>15</sup> however it also reveals certain theoretical premises underpinning his work, which mirrored those of others at the time. The value that Andrews gave to interdisciplinary practices of design attuned to environmental concerns suggests a theoretical position of the architect that was strongly intentioned. It also evidenced his position within a network of similarly committed thinkers like McHarg and Hough who also conceived of their practice as responding to ecological concerns.

The presence and impact of ecological discourse within Andrews' professional network in Canada can also be traced to the establishment of Andrews' office at Colborne St, Toronto, in 1962 and the earlier formation of the group known as INTEG, constituting the various professionals - occasionally collaborating - who gathered and worked there.<sup>16</sup> Members of the group came from a range of backgrounds including, the lawyer George Miller, the landscape architect Richard Strong, structural engineer Norbert Seethaler, Vancouver architect Ron Thom and, joining later, the artist/sculptor Gerald Gladstone. Of the group it was considered that Andrews was the driving force, however, from within, collaborations were most often improvised.<sup>17</sup> The name INTEG was an important identifier of the group and had two senses, standing for 'integrated professionals' - describing the productive sharing of professional knowledge - and also 'integrity' - describing a common ethical stance.<sup>18</sup> It was the later that connoted a commitment to a kind of holistic thinking that carried ecological concepts as critical background and one of the strongest advocates for ecological thinking within INTEG's membership was the artist Gladstone.

During his residence at Colborne St, Gladstone, along with Miller and Strong, self-financed a documentary film on the habitat of Gros Morne, Newfoundland, a wilderness area threatened by commercial logging, hiring cameras and scuba gear for the purpose of recording the site. Their action was largely impromptu but politically motivated, intended to influence the Canadian government to declare the area a national reserve, which it eventually did in 1973. According to Gladstone this event mirrored attitudes within INTEG, and the way in which its members liked to

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15 Andrews and Taylor, *Architecture: a performing art*, 14.

16 Andrews and Taylor, *Architecture: a performing art*, 25.

17 Gerald Gladstone, in discussion with Evan Walker, June 2004.

18 Gerald Gladstone, in discussion with Evan Walker, June 2004.

collaborate towards a greater impact than they might have achieved separately.<sup>19</sup> For the artist, a concern for the fate of cities and of nature was important because of their mutual interdependence - matters that were, to his mind, indivisible.<sup>20</sup>

The activism of Gladstone, Miller and Strong was emblematic of attitudes and approaches within INTEG - a commitment to issues that lay beyond professional practice, which could nonetheless inform, and become significant to their tasks as professionals. Andrews' commitment to INTEG and its approaches including commissioning artworks by Gladstone for his buildings, an action which can also be seen as a desire to promote ideals that lay beyond the practice of architecture, but which were implicated to it. In this respect it is important to note that Andrews was not a subscriber to the idea of a 'synthesis of the arts', that is, he was not searching for a unity between art and the spaces of architecture, an intention that characterized the international scene in the immediate post-war period. Rather, providing art installation work to his friend and colleague Gladstone reflected specific shared ideals within INTEG, not a strict belief in the value of art for architecture per se.<sup>21</sup> These were timely works of art, indicative of attitudes broadly shared and of particular meaning to the close-knit professional network from which they emerged. That said, in order to understand the impact of the groups' shared ideals on Andrews' architectural work of the period, ideals which included a commitment to the discourse of ecology, it is useful to understand more about Gladstone's art and the manner in which it sought to address an ecological agenda.

Gerald Gladstone (1929-2005) is largely a forgotten figure today and his work has not received due critical attention. Yet he is arguably a significant figure in the broader story of Andrews' architecture of the 1960s and early -70s. One of the most prominent Canadian artist/sculptors of his generation, Gladstone worked nationally and internationally, receiving commissions for major public works, often at a monumental scale. Such works included *Pylon* (1960) adjacent the East York Public Library, Toronto, *Galaxy* (1964), commissioned by the Constellation Hotel, Toronto, and *Uki* and *Space Column* both executed for the Montreal Expo '67.<sup>22</sup> For Andrews' architectural projects Gladstone produced a steel and acrylic work for the Graduate School of Design at Harvard (1969-73), *Universal Man* (1972), a work that originally stood at the base of the John Andrews' designed CN Tower, Toronto, and *Optical Galaxy* (1974-75) a fountain sculpture installed within the Cameron Offices Complex, Canberra.

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19 Gerald Gladstone, in discussion with Evan Walker, June 2004.

20 Nancy Philips, "My work is GREAT, says Gerald."

21 None of the works remain as originally intended. The installation at Gund Hall was removed in the 1970s and its whereabouts is unknown. The sculptural fountain at Cameron Offices remains in its setting but was decommissioned when part of the complex was demolished in 2006. Gladstone's figurative sculpture *Universal Man* positioned at the base of the Andrews' designed CN Tower was moved to a park at the nearby Yorkdale shopping centre when the site around the tower was redeveloped.

22 John Warkentin, *Creating Memory: A guide to Outdoor Public Sculpture in Toronto* (Toronto: Becker Publishing, 2010).

Gladstone began his career as an artist in the 1950s and took up a 1959 Canada Council travel grant to study sculpture at the Royal College of Art, London.<sup>23</sup> Gladstone's works of the period were predominately bold metal sculptures, roughly welded amalgams of discs, funnels and spokes, conjuring images of spacecraft and interstellar travel.<sup>24</sup> The work was formally dynamic and considered menacing in its machine-like appearance.<sup>25</sup> In the artist's own words, the work revealed his imaginative "preoccupation with machines and science,"<sup>26</sup> presenting prophetic dream-like images of a future society that would overcome mechanistic alienation and reconcile itself with nature. Out of his experience in London, Gladstone had ambitions to establish a career in New York and, with a second Canada Council grant he temporarily set up a studio there and was exhibited. Not meeting with the success he imagined to find in the United States he returned to Canada and won a string of high profile public commissions through the 1960s including major sculptural works for Expo '67.<sup>27</sup>

On his return to Toronto from New York Gladstone accepted an offer from his friend George Miller to use the Colborne St basement as a studio and workshop, bringing the artist into the circle of INTEG. There he befriended John Andrews who collected some of his artworks including paintings and sculptures, acquired through purchase and gift.<sup>28</sup> Gladstone was known for his feisty temperament,<sup>29</sup> matching Andrews' Australian 'directness of character', which had found the architect's favour with clients in Canada.<sup>30</sup> The artist soon became involved in art commissions on Andrews' architectural projects.<sup>31</sup>

Gladstone's art installation for Andrews' Gund Hall at Harvard was inaugurated in 1973 as part of the building's dedication ceremony, attended by the artist himself as well as Andrews. The work consisted of welded metal assemblages cast in acrylic blocks cut into geometric shapes - cubes and extruded hexagons. With the cooling of the plastic, fissures formed around the embedded metal objects resulting in silvery looking surfaces deep within.<sup>32</sup> Similar metal assemblages in acrylic were

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23 Sandra Martin, "Gerald Gladstone, Artist 1929-2005," *The Globe and Mail*, Toronto, 9 March 2005.

24 See review in *Studio*, 166 (November, 1963): 208.

25 Gerald Gladstone, "Funnel," *Apollo*, 76 (June, 1962): 148.

26 Nancy Philips, "My work is GREAT, says Gerald," *The Telegram*, Toronto, 19 October 1963.

27 Sandra Martin, "Gerald Gladstone, Artist 1929-2005."

28 John Andrews, in discussion with Paul Walker, April 2013.

29 Sandra Martin, "Gerald Gladstone, Artist 1929-2005."

30 Andrews and Taylor, *Architecture: a performing art*, 4-5.

31 Gladstone was the only artist who Andrews invited into his projects for the creation of art installations. John Andrews, in discussion with Paul Walker, April 2013.

32 John Andrews, in discussion with Paul Walker, April 2013.

featured in *Optical Galaxy*, Gladstone's work for the Cameron Offices in Canberra, and both the works were animated by movement. At Gund Hall sensors were proposed to track the movement of spectators, which controlled lighting effects upon the stacked array of blocks.<sup>33</sup> At Cameron Offices the cast acrylic elements were housed on top of tall curving concrete fins arranged in a radial pattern within a shallow pool, and animated by falling water.

In describing his art at the Gund Hall dedication ceremony Gladstone referred to analogies in the work traversing the mechanical and the organic as its underpinning conception.<sup>34</sup> In this respect the metal and acrylic works present the development of Gladstone's art practice beyond the images of interstellar travel and space that dominated his work in the early 1960s to the organic forms (spirals, petals, shells and spines) which begin to appear more regularly while he was resident at Colborne St. Yet these forms retain an underlying ambiguity - presenting as like crustaceans and machines - producing a simultaneity that characterises Gladstone's mechanical organic analogy.

The impetus behind Gladstone's late 1960s art and his turn to organic forms can be seen in the artist's commitment to the broader environmental movement, the discourse of ecology, which brought him into contact with professional contemporaries who shared such ideals. Gladstone's invitation to speak at the Ottawa Architecture Association Convention entitled 'Environmental Concerns', in 1969, lecturing alongside landscape architects Ian McHarg and Michael Hough (who had worked closely with Andrews) evidences the interdisciplinary operations of ecological discourse and the networks that it formed.<sup>35</sup> The holistic viewpoint on the environment promoted by the term 'ecology' included the design professions and the sciences as well those in the spheres of art and culture. Art's role was to propagandise an ecological understanding, giving public impetus to new agendas, as was the case with Gladstone who related his art to public activism on the future of cities and the fate of nature. In the context of INTEG and Gladstone's working friendship with Andrews, it could be argued that ecological themes explored in the practice of art affected architectural outcomes. In Andrews' work this manifested as a perceptible movement between the 'non-capricious' forms emerging from science-based processes of design and the architect's imaginative capacity to express this larger environmental agenda through his buildings and the disciplinary collaborations he sought in producing them. In this respect Andrews' place in the professional scene of North America in the late 1960s - his embedding within a close-knit network of practitioners espousing ecological values - was not irrelevant to his work.

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33 Gund Hall Dedication Addresses - Dedication of Sculpture, Harvard University, Graduate School of Design, 1973.

34 Gund Hall Dedication Addresses - Dedication of Sculpture, Harvard University, Graduate School of Design, 1973.

35 Anita Aarons, "Alice through the looking glass, or an artist looks at an architect's convention," *Architecture Canada*, 46 (April, 1969):17-18.

Beyond the Brutalist and Structuralist labels attributed to Andrews' architecture, a full account of buildings he produced in North America and on his return to Australia - the later including the King George Tower, Sydney (1970-76), the Callum Offices, Canberra (1973-76) and the Cameron Offices (1970-76), Canberra - might take into consideration the affects of the ecological discourse that Andrews' encountered over the previous decade - a time in which he effectively built his practice and established his architectural methods. Such an account might better explain the works' particular aspects - the architect's collaborative interdisciplinary approach to design and the search for 'practical solutions' in the task of building - which both mirrored Ian McHarg's search in the field of landscape architecture to find 'best fit' through the logic of 'physiographic determinism'. The professional networks to which Andrews found himself attached, and their belief in discourses of ecology, might also explain how an architect who squarely dismissed the concept of 'architecture as art' sought to include artworks by his INTEG colleague Gladstone within key projects of the period including Gund Hall and the Cameron Offices. In light of these possibilities, the architect's rejection of the conventional discipline-based labels applied to his architecture could be justified by admitting to contextual aspects present in the North American scene of the 1960s that produced new questions for the interrelation of the design professions, the sciences and art and perceived an urgent need for new ways of structuring their mutual engagement - all in an atmosphere of imminent environmental crisis to which 'ecology' provided solution.<sup>36</sup>

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<sup>36</sup> See Philip Drew, *Third Generation: The Changing Meaning of Architecture* (New York: Praeger, 1972).