

Expo 67, or the Architecture of Late Modernity

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Abstract

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The 1967 Universal and International Exhibition, the Montreal world's fair commonly known as Expo 67, produced both continuations of and crises in the emancipatory project of modern architecture. Like many world's fairs before it, Expo 67 was designed to mediate relations between peoples and things through its architecture. The origins of this work lay in the efforts of Daniel van Ginkel and Blanche Lemco van Ginkel, architects and town planners who, in remarkable reports, drawings, and architectural ideals advanced between 1962 and 1963, outlined the basis of a fundamentally new, though never fully realised, world's fair in the late twentieth century. Party to the Congrès Internationaux d'Architecture Moderne and its influential prewar edicts on functionalist town planning as well as to groups like Team 10 and their opposition to diagrammatic generalisations by an emphasis on the personal, the particular, and the precise, the van Ginkels also drew on contemporary theories and practices of North American urban renewal when first conceiving Expo 67 as an instrument for redeveloping downtown Montreal. The resulting work, *Man and the City*, which officially secured the world's fair bid but remained unbuilt, carefully drew on the legacies of most great exhibitions, especially those of the nineteenth century, in order to conceive of sufficiently heroic structures making immanent novel forms of human interaction, social control, and the technical organisation of space. In 1967, this was to suggest a new world historical project – in a space existing for only six months but crowded

with 50 million visitors – promoting senses of fraternal self-awareness through the unrelenting promise of *progress*. The resulting well-known Expo 67 theme, Man and His World, was a paean to contemporary humanism first used by the van Ginkels and their architect allies to reject the most enduring symbols of world exhibitions: the nation-state and its emblematic architecture. They imagined new kinds of architecture that could somehow engender new senses of political consciousness (inspired by, for example, UNESCO or the celebrated *Family of Man* photography exhibition of 1955) outside nationalist chauvinism. This was a vision of *late modernity*: a transitional form of political subjectivity still clinging to the shared passions of the citizen (thus for the *polis*) before being subsumed by mass culture – in other words, a moment during which nationalisms could still be channelled into alternative forms of political belonging free of narrow self-interest. The belief marked every aspect of the van Ginkels early plans and had half-lives in two consequential works: the theme pavilions Man the Producer and Habitat 67, which, with outward emphasis on the aesthetics and technics of innovative structures (and mass production), were seen as fulfilling the ambitions of the megastructural movement in the 1960s. As such, these architectures of late modernity reflected a markedly modernist conviction of long duration: on the one hand, an abiding faith in technological salvation and, on the other hand, the sense of some liberative social mass giving rise to a new citizen of the world. At the very same moment, this universalism was fraught with ambiguity: on the one hand, any abiding faith in techno-scientific salvation was shaken in the aftermath of global war and the terror of nuclear holocaust; on the other hand, assumed geopolitical ideals were being upended, however

temporarily, by, say, decolonisation and resulting alternative global alignments (with effects on the very layout of a postwar world's fair). Expo 67, perhaps the most consequential twentieth-century world's fair in terms of the utopian hopes of modern architecture, was prey to these and related desires to reinvigorate the modern project of uniting instrumental reason, mass edification, and popular spectacle in a genuinely new public realm. It would irrevocably shape the ways in which Canada, as a host nation purposely celebrating its centennial in the ambit of a world's fair, confronted its collective sense of cultural representation and global belonging.

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Acknowledgements

A: ... the inner life of comic strip is a very fragile ecosystem. It has its own rules, its own time frames, its own internal logic. That logic may be completely askew, but if you tinker with it, the chances are pretty good that the whole thing will collapse.

Q: Could you elaborate?

A: Yes, but I'd rather not. I only put in that last bit for people who might be working on dissertations.

Garry Trudeau, creator of Doonesbury (1981)

Gonna get my PhD,

I'm a teenage lobotomy

The Ramones, "Teenage Lobotomy" (1977)

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Introduction

But Marlow was not typical (if his propensity to spin yarns be excepted), and to him the meaning of an episode was not inside like a kernel but outside, enveloping the tale which brought it out only as a glow brings out a haze, in the likeness of one of these misty halos that sometimes are made visible by the spectral illumination of moonshine.

Joseph Conrad, Heart of Darkness (1902)

If anything, then the 1967 Universal and International Exhibition, the Montreal world's fair commonly known as Expo 67, was a tale of many cities. A pair of artificial islands, dredged from the St Lawrence River, held fairgrounds as a mirror of modernisation to an existing city simultaneously facing urban renewal. In turn, the world's fair served as litmus of emerging theories on experiencing postwar space that were caught between praising and dismissing this temporary architecture as either a genuine public realm or a spectacular *divertissement*. In each instance Expo 67 was a project of reconciling ideal cities, real or imagined. Some had been long known in the consciousness of modernism. Others were only appearing in debates on what, exactly, constituted modern life after world war. A few were newly conceived as situating the unique aesthetic, cultural, and technological motivations of North American life. Here, the optimism of large-scale thinking in the 1960s imagined sufficiently heroic structures making immanent new forms of human interaction, social control, and the technical organisation of space (fig. 0.1). If this indicated an avant-garde undertaking, then it reminded just how art, including the building sciences, had, since the late eighteenth century, served the ongoing construction of a European-American subject – as citizen, as tastemaker – and corresponding notions on transforming the rest of the world. In this long march, the architecture of Expo 67 would, it was first hoped, do something utterly

antithetical to all world's fairs, thus to visions of modernity: oppose the consecration of the nation-state.

The utopian suggestion was hardly accidental. Expo 67 was, after all, a place existing for only six months but crowded with 50 million visitors – conditions allowing, perhaps, for a more honest test of theory (fig. 0.2). The very fact that the exhibition was set on islands – and removed from any context – only emphasised the ideal framing of objects – pavilions – marking a new world historical project. World's fairs had established critical passages through global modernity since the nineteenth-century. Notwithstanding very real crises, including war, these long-planned but short-lived events promoted senses of fraternal self-awareness through the unrelenting promise of *progress*. The ecumenical practice and understanding of art, philosophy, science, and technology crystallised in the didactic function of architecture, which, in its most vanguard forms, introduced advanced technics seen as not only capturing a spirit of the age but quite literally housing a new mass public. This held significance for the liberal humanist worldview presumably guiding postwar architecture culture (which Expo 67 served to exemplify). Broadly speaking, world's fairs extended the Enlightenment project of instrumental reason and public edification – “the world in a shilling” the 1851 Great Exhibition had promised – as *popular* events. In the past, these ambitions were captured in any number of *galeries des machines*, vehicles of measuring human self-realisation by an awestruck awareness of a world mediated by technology. Yet in the aftermath of global war and the terror of nuclear holocaust, the destructive capacity of techno-science gave pause. The splitting of the atom signified both a terrifying power and a

thrilling source of energy. One promised total annihilation; the other salvation. On one side stood a complete social and psychological alienation, as a product of fear, from the life world; on the other side grew a total embrace of emerging technologies – communications, mass media, transportation – shaping pacific visions of internationalism and collective self-awareness. Between these poles was a compensatory mechanism of mid-century existentialism, phenomenology, or philosophical humanism seeking to build doctrines of authentic experience. Such currents coloured challenges to the modern movement in architecture, with, for example, the Congrès Internationaux d'Architecture Moderne (CIAM) and its influential prewar edicts on functionalist town planning yielding to groups like Team 10 that countered any diagrammatic generalisations by an emphasis on the personal, the particular, and the precise: as opposed to the rational ordering of space, it was to be the psychological need for it. In terms of some historical self-consciousness, this was not yet a fully postmodern moment marked by consumer culture or obsessive aesthetic formalism (or the consequent rejection of utopianism). Indeed, there remained a somewhat apocalyptic view on reforming, say, the city – the *plan* could, it was hoped, still organise spatial-formal ideas with some corresponding political purpose. The modernist paradigm was, however, passing through a transitional form of political subjectivity still clinging to the shared passions of the citizen (thus for the *polis*) before being subsumed by mass culture – in other words, a moment during which nationalisms (including those of recently decolonising countries) could still be channelled into alternative forms of political belonging free of

chauvinism or narrow self-interest.¹ This *late modern* form of association still held out hope for linking impressions of nationhood to public life. The corresponding architecture was to be technologically sophisticated (and possibly mass produced) while engendering novel forms of social interaction.

Expo 67 was, at its very start, conceived in these terms. It was the work of Daniel van Ginkel and Blanche Lemco van Ginkel, husband and wife, architects and town planners, contributors to CIAM but instigators of the emergence of Team 10 from it, and, crucially, the first voices on what, exactly, a world's fair constituted in the late twentieth century. Based in Montreal, the van Ginkels were central to introducing the city's planning and bureaucratic elites to contemporary theories on urban renewal in the early 1960s. Politicians and planners aspired to make Montreal a city of 5,000,000 million people by the year 2000 (a millenarian hope never fulfilled). The first appearance of glass and steel skyscrapers – notably I.M. Pei's Place Ville Marie completed in 1961 and celebrated by Peter Blake, the influential editor of *Architectural Forum*, as giving rise to “the first 20th century city in North America” with its links to what became known as Montreal's “underground city” – promised a belated experience of international style modernism (fig. 0.3).² The ambition was accompanied by the typical instruments of urban renewal – not only the infrastructures of a Metro system and an enormous network of *autoroutes*, both designed to coincide with the

¹ Blake Stimson, *The Pivot of the World: Photography and Its Nation* (Cambridge MA: The MIT Press, 2006), 3, 7.

² Peter Blake, “Downtown in 3-D”, *Architectural Forum* (September 1966): 34. Place Ville Marie was undertaken by the prominent New York real estate developer William Zeckendorf, a pioneer of integrating of shops and services in high rise projects built at the scale of city blocks.

world's fair, but the creation of cultural acropolises, a key aspect of postwar CIAM doctrine on rediscovering the city "core".³ Indeed, unlike the more dogmatic members of Team 10, the van Ginkels balanced a new CIAM search for "The Heart of the City", which aimed at creating the symbols of community within a still rationalistic framework, and the Team 10 desire for discovering a primal language uniting form and meaning.⁴ These ideas and programmes, which raised questions on the relevance of monumental architecture to spaces of public appearance, were critical to the world's fair plans. As opposed to a short-lived spectacle, Expo 67 was, in its earliest guise, to usher long-lasting, epochal urban change.

To encounter the legacy of CIAM – in Montreal, in the early 1960s – was to consider its continued relevance as a truly international agent of modern architecture and urbanism. Indeed, its prewar civilising mission – against insalubrity, for mass housing – had reappeared in attempts to lend the authority of specialists – architects – to postwar reconstruction efforts. Yet the *cultural* revivification of CIAM was found elsewhere, in other forms of global communion and purchase. Dissatisfied with nation-state hegemony, the van Ginkels and associated architects discovered other kinds of internationalism, epitomised by the United Nations but especially UNESCO, as the basis of aesthetic, social, and political values. The ideal of one world-ness was to be approximated – that is, made architectural – in the world's fair: a master plan could, the architects believed, make visible geopolitical

³ J. Tyrwhitt, J.L. Sert, and E.N. Rogers, eds., *The Heart of the City: Towards the Humanisation of Urban Life* (London: Lund Humphries, 1952). The book collected ideas on the urban "core" raised during the eighth CIAM congress in Hoddesdon, England, in July 1951.

⁴ Alan Colquhoun, *Modern Architecture* (Oxford: Oxford University Press, 2000), 218-219.

alignments outside cold war demarcations or distinctions between rich and poor countries. To reject the authority of the nation – and its architectural equivalent, the pavilion – was to intervene in the ways artefacts and ideologies were typically parsed, catalogued, and displayed at world exhibitions as global showcases.

The resulting Expo 67 theme, *Man and His World*, was a paean to contemporary humanism. Borrowed from the French aviator-philosopher Antoine de Saint Exupéry's book *Terre des Hommes* of 1939, the idea – first advanced by the van Ginkels' friend Claude Robillard, head of the Montreal Service d'Urbanisme, but officially ratified by the Montebello Conference of Canadian intellectuals charged with defining the world's fair in May 1963 – evoked, the architects insisted, “man's possession of the world or active manipulation by man of natural forces and social structures.”⁵ New humanist values could extend through a public spectacle seen as marrying science to poetry and culture to democracy.⁶ Thus, events and images like the famous 1955 *Family of Man* photography exhibition, admired by the architects for its fraternal spirit and repeatedly invoked as precedent, were to portend a postwar project of *recuperation* – that is, somehow to find in the Enlightenment project not its end but the possibilities of new beginnings. Even as it was couched in the operations of an expanding Canadian welfare state and government debt expenditure purposely aimed at creating a viable “culture industry”, the van Ginkels' plan was little aligned to the dire warnings of a total rationalisation of life predicted by, among

⁵ “Heigh Ho Come to the Fair/Exhibition”, *The Canadian Architect* (March 1963): 104.

⁶ Konstantin Kolenda, “Humanism”, in Robert Audi, ed., *The Cambridge Dictionary of Philosophy* (Cambridge UK: Cambridge University Press, 1999, second edition), 396-397.

others, Theodor Adorno and Max Horkheimer, who, in *The Dialectic of Enlightenment* of 1944, nervously anticipated a world of instrumental reason limiting subjective autonomy. Instead, the architects' mission was more akin to what Jürgen Habermas, heir to Frankfurt School critical theory, described (at the very moment of early prognostication on Expo 67) as a *public sphere* shaped by *culture*, thus serving as “training ground for critical public reflection” and opening up new ways of relating to the world.⁷ Though not translated into English until 1989, Habermas's book is symptomatic of late-modern efforts to shape a social imaginary freed from the limits of private interest and bureaucratized public authority.⁸ For the van Ginkels, this owed to a self-conscious synthesis of a range of precedents, first in early postwar regroupings of CIAM, then in challenges to it by Team 10, and finally in new methods of urban design based on synaesthetic readings of the built environment (for example, the planner Kevin Lynch's book *The Image of the City* of 1960). None of these approaches were seen in opposition. Rather, as countless critical early reports – the work was carried far more in words than in drawings – made clear, the willful use of these theories, through liberal though unattributed borrowings, made abstract formal principles – “patterns” in Lynch's parlance – the basis of organising sequential experiences of “interconnectedness” across multiple levels and in many directions; in turn, different local-global connections were to be construed by visitors themselves and not via a determining

⁷ Jürgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society* (1962; Cambridge MA: The MIT Press, 1989), 29, 34. The notion of world's fair as testing ground follows from Habermas's description of the eighteenth-century *salon* as exercising the “monopoly of first publication” – that is, the space in which new works, including artistic ones, were raised and legitimated.

⁸ Stimson, *The Pivot of the World: Photography and Its Nation*, 19.

plan.⁹ As such, or so the theory went, people could explore new forms of political consciousness inside one sufficiently enormous structure. *Man and His World* was to convey the integration of creative expression and understanding in art, science, and technology as well as promote awareness of belonging to the “community of man” (eventually a subtheme of Expo 67) – a condition the Canadian media theorist Marshall McLuhan was calling the “global village”.¹⁰ The tension in McLuhan’s term, between *Gemeinschaft* and *Gesellschaft*, between modernity and tradition, between mechanised life and the rootedness of cultures, offered the space in which *Man and His World* was hopefully to appear.

The utopian gesture was not about arriving at a historical plateau, at a settled state of human affairs. Rather, it premised a constant revolutionising, by architecture, of the relations between peoples and things. Throughout 1963, the van Ginkels imagined the theme of “man” as parsed among any number of artistic, cultural, or geographic conditions existing outside geopolitics – for example, the Arctic, which they repeatedly upheld as a genuine multinational scape of scientific discovery. Indeed, their first architectural statement, *Man and the Polar Regions* – designed by a group of young architects freshly minted from the urban design programme at Harvard, a source of both late-CIAM thought and new theories like Lynch’s “imageability” of cities – provided a blueprint of how they saw

⁹ Kevin Lynch, *The Image of the City* (Cambridge MA: The MIT Press, 1960).

¹⁰ Krista L. Bennett, “Montreal 1967”, in John E. Findling and Kimberly D. Pelle, eds., *Encyclopedia of World’s Fairs and Expositions* (Jefferson NC: McFarland & Co, 2008), 337. McLuhan first described the “global village” in his books *The Gutenberg Galaxy: The Making of Typographic Man* (1962) and *Understanding Media* (1964). The van Ginkels did not necessarily advance their ideas in similarly breathless embraces of modern technology.

the world's fair functioning: a singularly massive architectural work in which countries could simply add their contributions – as buildings – to various themes, whether of artistic or scientific inquiry, thus allowing visitors to navigate global production by a comparative unfolding of human endeavour. This was to ensure one overriding demand: that the national pavilion would be eclipsed at Expo 67, relegated to an outmoded sense of history. The belief held that any number of things – whether cultural artefacts or machines – could be disentangled from national origins and brought together in a spirit of “transhumanism” (an idea the architects borrowed from the evolutionary biologist and first UNESCO Director Julian Huxley). Modernity, witnessed in the aesthetic and technological achievement of, among other things, architecture, could be rehabilitated as long it was placed beyond the limits of upholding the nation-state.

The sentiment was both tricky and timely. Expo 67 was, as a world's fair, the nationalist vehicle *par excellence*. In fact, it was specifically meant to celebrate the centennial of Canadian Confederation in 1867. In this, it followed currents of postwar cultural modernisation. Much in the way that an event like the 1951 Festival of Britain and its architecture was, on the one hand, a Labour Party effort celebrating a (Scandinavian style) welfare state and, on the other hand, the presentiment of a sort of Tory futurism with policies of military-industrial growth and a consumer economy shaping a popular power diffused through a body of national (or even, at this time, Commonwealth) culture, Canadian ambitions for the centennial were, in terms of the Conservative government of the early 1960s, both reverently nationalist and therapeutic – that is, an *official* construction of

identity by the vehicles of public institutions and modern technology.¹¹ The aspiration was tied to establishing levels of state patronage. The Royal Commission on National Development in the Arts, Letters and Sciences, commonly known as the Massey Commission, had, from 1949 to 1951, undertaken hearings in major cities on what, exactly, should be the role of government in shaping Canadian cultural life. The resulting recommendations irrevocably changed the country, with the creation arts institutions, funding programmes, and universities.

The argument was, in a sense, levelled at mass culture. In places, this had translated as the fear, shrill and often unsubstantiated, of American hegemony over Canadian taste-making (whether in literature or television programming). It was also extended during a period in which global alliances were being readjusted: the eclipse of the British empire by the rise of *Pax Americana* shaped Canadian thought and life, not least in contributions to Cold War defence, notably the Distant Early Warning (DEW) Line, a system of radar stations stretching roughly along the 69th parallel in the far northern Arctic. The debate rested on whether Canada was a participant, even a leader, in global affairs. It crystallised in the “Sixty days of decision”, a proclamation by the former diplomat and newly elected Prime Minister Lester B. Pearson in May 1963, when committing to full employment, reforming health care, introducing a public pension plan, aiming at the equal partnership of French and

¹¹ David Mellor, “A ‘Glorious Technicature’ in Nineteen-Fifties Britain: The Many Cultural Contexts of the Independent Group”, in David Robbins, ed., *The Independent Group: Postwar Britain and the Aesthetics of Plenty* (Cambridge MA: The MIT Press, 1990), 229; L.B. Kuffert, *A Great Duty: Canadian Responses to Modern Life and Mass Culture, 1939-1967* (Montreal and Kingston: McGill-Queen’s University Press, 2003), 217.

English in national life, and, notably, promising a national flag officially replacing the British Union Jack.¹² The recipient of a Nobel Peace Prize, awarded for resolving the Suez Crisis through the United Nations (which, along with NATO, he had done much to help found), Pearson had also campaigned on repudiating his opposition to atomic weapons and accepting that American missiles stationed on Canadian soil could be armed with nuclear warheads. In all this, he sought to define Canada as a “middle power” – a status to be exercised through institutions like the United Nations (namely peacekeeping but also the international coalition fighting the Korean War) that, with the fallout from Suez, gave opportunity to circumvent or at least to modify relations, sometimes perceived as neocolonial, to British authority (believed in relative decline) and American power (seen as inflexibly centred on “domino theory”) without invoking anti-Americanism. Read through these national-international debates, the Centennial celebrations were meant to endorse a unifying vision of Canada – not only to Canadians but to observers abroad, especially in terms of promoting the host nation as a model non-imperial power (an ambiguous status throughout at least the 1950s, with Ottawa rarely criticising London on its foreign affairs). Indeed, to the architects first imagining Expo 67, decolonisation and its effects were to be promoted specifically because of an assumed resonance with postwar Canadian ideals.

There was, here, a statement on architecture, culture, and nationhood. The reluctance for aspects of American power replaced earlier fears of ceding Canadian intellectual life to British influence. This held almost millenarian significance. Any perusal

¹² The Canadian flag was first unfurled in 1965. It replaced both the British Union Jack and the Red Ensign.

of prewar issues of the *Journal of the Royal Architecture Institute of Canada* revealed a prevailing Neoclassicism that, by the 1930s, evolved into the *moderne* styling of Art Deco; at times, some Arts and Crafts or neo-Gothic tendencies emerged, whether in private, often palatial, homes (otherwise done up in a Scottish baronial style) or middle class housing developments. The aesthetic culture was resolutely British (with some concessions made to French taste). No mention was made of European modernism – or of things much closer to home: in Canada, there was no equivalent PSFS building, no community planning along the lines of the Radburn plan, no aesthetic project arising from monumental schemes like the Works Progress Administration, no effect of Frank Lloyd Wright.¹³ Symptomatic was the Canadian contribution to the 1937 Paris Exposition Universelle: unimaginatively rendered as a group of cylinders evoking grain silos, the pavilion could only lamely recall the original, robust works that had, indeed, been championed by European modernist as *gestalt* entities for what Le Corbusier called the “engineer’s aesthetic”.¹⁴ As Humphrey Carver, the émigré

¹³ Among the four Canadian schools of architecture, McGill was the first to evince a modern sensibility, though only in the late 1930s (owing perhaps to students returning fueled by Bauhaus-thinking at Harvard). At the time, some Canadian architects were, indeed, modernists but without visible impact on their country: Hazen Sise, raised in privilege in Montreal, worked for Le Corbusier after having attended the 1933 CIAM meeting that produced *The Athens Charter* but was, by the mid-1930s, volunteering in Norman Bethune’s ambulance brigade sympathetic to the Republican cause during the Spanish Civil War; and the British Columbian Wells Coates, who was firmly ensconced in London and a founding member of the Modern Architectural Research Group, the British wing of CIAM.

¹⁴ Along with Le Corbusier (in *Vers un architecture* of 1923), other European architects – including, for example, Erich Mendelsohn (in *Amerika: Bilderbuch eines Architekten* of 1926) and Bruno Taut (in *Modern Architecture* of 1929) – had celebrated North American grain silos as *a priori* modern forms. The 1958 Brussels Exhibition witnessed the first truly modernist Canadian world’s fair pavilion; designed by Charles Greenberg, it brilliantly adapted the Miesian frame to the demands of temporary erection and installation. Greenberg noted: “The problem, then, of presenting a building at Brussels truly representative of Canada was a complicated one. It could have been skirted entirely by the very tempting ‘exotic’ solution, fully licentious architecturally, which produces a result beyond all national identification. A controlled solution more consonant with the Canadian temperament, integrating a diversification of skills, art forms and symbols, and employing a representative

British architect and leading community planner, recalled when anticipating urban trends in 1960:

In both the U.S. and in Britain the foundation of present planning ideas and methods was laid down during the period between the two wars. In Canada this did not happen. For us the economic Depression of the Thirties was a vacuum and a complete break with the past. We had no Fredric Osbornes, Abercrombies and Clarence Steins. We had no public housing programs and none of the adventurous social experiments of the New Deal. In the Toynebee sense, we did not react to the challenge of the Depression – perhaps our roots were not yet deep enough. We withered on the stem. So in 1946 we almost literally started from scratch with no plan or planners and we immediately hit a period of tremendous city growth.¹⁵

Indeed, the prewar hesitation underwent a swift and epochal transformation. Around 1943, the *RAIC Journal*, like similar concerns in Britain and America, began pondering postwar reconstruction. In Canada, this was not, of course, tied to rebuilding shattered cities but meant for the needs of an urbanising nation. Canadian architectural circles suddenly began evoking the edicts of CIAM functionalist town planning, which were applied equally to existing cities and hinterland communities.¹⁶ This became a fundamental part of a growing

technology for a building of this size, was selected as being more likely to yield a nationally identifiable result". In other words, Canadian-ness was identified with modernism by the 1950s. See: "Canada Pavilion at Expo 58", *Journal of the Royal Architecture Institute of Canada* (August 1958): 290-295.

¹⁵ Humphrey Carver, "Planning in Canada", *Habitat* (Ottawa, September-October 1960): 2. Canada was not, of course, unmodern: the nineteenth century witnessed heroic works of engineering, including a transcontinental railway, which shaped a collective sense on being a young nation. By the early twentieth century, major cities had experiences massive planning and infrastructure, with large-scale architecture – railways stations, hotels, and department stores – that relied on imported senses of American know-how.

¹⁶ For modernist town planning principles adopted in Canada during the Second World War, see: Architectural Research Group, "Planning", *Journal of the Royal Architecture Institute of Canada* (January 1944): 10-17. The Architectural Research Group (ARGO), based in Ottawa, remarked that the postwar architect would "no longer be expected to work within the small confined of individual achievement in respect to individual buildings. Rather, 'collective' or 'group' efforts should deal with the great social works which will be required to keep faith with those who have fought so hard on our behalf of our country and its future." ARGO described "our *approach*, rather than a specific solution" in unmistakably CIAM terms: "transportation", "dwelling", "recreation and education", and "work".

welfare state, with government viewed as necessary to organising public and private provisions of infrastructure for the common good. The future was seen in terms of technological solutions to social needs. In architectural terms, the growing presence of megastructures – massive architectures containing large programmes for shaping a new mass society – in Canada was first captured in John Andrews’s Scarborough College of 1965, an enormous building-cum-campus set in a then-distant Toronto suburb and equipped with closed circuit television as an innovative educational tool providing “flexible” (a keyword of 1960s architecture culture) means of instruction and edification (fig. 0.4). An earlier though still resonant source of Canadian anxiety had arisen over the complementary relationship between technology and mass distraction inevitably weakening national culture.¹⁷ Now, key forms of technicism – a faith in mass media that, here, included architecture conceived in terms of its “life cycle”, or *obsolescence*, and writ large in the uses and aesthetics of prefabrication – were given state sanction in light of growing cities and suburbs, increasing university enrollment, and rising immigration.

The modernisation of Canadian culture as a *mass culture* was, then, to see it perforce contributing to global artistic and scientific discovery. The van Ginkels’ ceaseless rendering of the world’s fair in terms of pacific endeavours like Arctic exploration – thus hemispheres, not nations – culminated in the official division of Man and His World into a series of subthemes: Man the Producer, Man the Explorer, Man the Provider, Man the Creator, and

¹⁷ Kuffert, *A Great Duty: Canadian Responses to Modern Life and Mass Culture 1939-1967*, 212.

Man in the Community. The parsing was the rejection of nationhood (and nationalism) in favour of artistic, cultural, and scientific inquiry. Rather than comparisons with the past, Expo 67 would try to situate the near future. This meant envisioning the social world of 1967 in terms of architectures responding to the subdivisions of “Man” – specifically, as the van Ginkels’ and their architect allies would argue, with such *themes* becoming the “components” of a “single structure”.¹⁸ Two implications were clear: first, an architectural work registered at the scale of the urban; second, a unique aesthetic-organisational form enabling the qualitative equalisation of “things”. The argument was remarkable, upending inherited ideas, even prejudices, on how world’s fairs, and architecture, were assumed to privilege the status of nations. Little of it came to pass. The van Ginkels’ ambitions were to succumb to demands for staging a world’s fair in its most typical senses. Along the way, they were made to surrender an earlier and preferred project of transforming space relations in the *existing* city by leveraging the world’s fair as a massive programme of urban renewal. This proposal, Man in the City, linked heritage sites, areas for housing prototypes, an international pavilions zone, and transportation networks along a single line of action. The plan, which could have been among the first realisations of Team 10 urbanism, was inevitably prey to political expediency.

Neither project – to oppose the nation-state or to rebuild the city *in toto* – finally arose. Expo 67 was atomised by national or corporate pavilions, each competing by its

¹⁸ R. Affleck, Michel Chevalier, R. Lemoyne, Hazen Sise, H.P.D. and B.L van Ginkel, “1967 Montreal World Fair” (October 29, 1962): 3, Fonds Gilles Gagnon, 39-1991-02-005, Canadian Centre for Architecture, Montreal.

progressive or kitsch architecture (fig. 0.5). Yet out of this failure, two works of architecture – two official theme pavilions – emerged. Both embodied the van Ginkels’ hopes well after they had resigned from Expo 67. The first, Man the Producer, a huge space structure of steel truncated tetrahedra produced by the Montreal office Arcop, drew on early ambitions to situate the entire fair in a uniquely massive form (fig. 0.6). The second, Habitat 67, a permanent housing complex designed by Moshe Safdie, continued the ambition to reshape permanently space relations in the city. Capturing tendencies of “cluster” or “cellular” geometries rife in the 1960s, it became among the most celebrated works at Expo 67 (fig. 0.7). Seen as important early contributions to megastructural ideas, the pavilions satisfied desires, held by architects and critics alike, for innovative technics as engendering new forms of social life. Yet both Expo 67 and megastructures faced a fundamental tension between ideas on spontaneous versus engineered social worlds. The challenge remained whether large-scale experimental architecture, here constructed well outside the limits of everyday life, could actually fulfill the greater demands of cultural representation in the late twentieth century.

In this grand arc of experiment lies an architectural history of Expo 67. The trajectory – from the van Ginkels’ early plans, through readings of their intellectual borrowings, across the many contemporaneous urban theories bearing on the master plan, and ultimately to the partial results of Man the Producer and Habitat 67 – was swift:

December 1959	Canada submits its candidacy to the Bureau International des Expositions (BIE) in Paris for hosting the 1967 world exhibition
May 1960	The BIE awards the exhibition to the Soviet Union to commemorate the fiftieth anniversary of the October Revolution
April 1962	Moscow informs the BIE that it is withdrawing from the project. Canada renews its bid and Montreal Mayor Jean Drapeau campaigns on behalf of his city
June 1962	The van Ginkels and allied architects begin exchanging ideas on what a world's fair should represent in the late twentieth century. At the invitation of leading businessmen, the van Ginkels prepare Man in the City, a plan for situating the world's fair throughout downtown Montreal
November 13, 1962	The BIE awards the world's fair to Montreal. Drapeau is in Paris to receive the news
December 20, 1962	The Canadian Parliament passes an act approving the incorporation of the Canadian Corporation for the World Exhibition (CCWE)
January 1963	Paul Bienvenu and C.F. Carsley, Montreal businessmen, are appointed Commissioner General and Deputy Commissioner General respectively. Later, Claude Robillard, head of Montreal's urban planning department, is made Director General. Daniel van Ginkel becomes chief planner and assembles a staff of talented young architects to develop the master plan
January 26-27, 1963	The Order of Quebec Architects holds a weekend retreat to define the programmatic aims of the world's fair. The deliberations are organised following discussions among the van Ginkels and Montreal architects. Key ideas on the Expo 67 theme emerge
March 1963	The Expo 67 site is announced: it will be set on Ile Notre-Dame and Ile Ste-Hélène in the middle of the St Lawrence River. The choice is strongly supported by Montreal mayor Jean Drapeau, who sees the world's fair as contributing to Montreal's greatness. The van Ginkels, Robillard, and others openly disagree with the choice
May 1963	The BIE approves the islands site
May 21-25 1963	The Montebello Conference brings together leading Canadian intellectuals (including architects) and defines the Expo 67 theme: Man and His World or <i>Terre des Hommes</i>

July 1963	The City of Montreal begins filling and dredging operations for the islands site
September 1963	With the departure of Bienvenu and Carsley, who reluctantly supported the islands and warned of rising costs, Pierre Dupuy, a retired diplomat, and Robert F. Shaw, a businessman, become Commissioner General and Deputy Commissioner General respectively. Robillard resigns soon thereafter
December 1963	Despite his longstanding objection to the islands site, van Ginkel's design team delivers the Expo 67 master plan. Originally designed as massive structures to which all nations would contribute, the fairgrounds layout is finally marked by plots for individual pavilions. Key theme pavilions are to be located throughout to lend coherence. The plan is submitted to the governments of Canada and Quebec for approval. Van Ginkel resigns
1964	Throughout the year, Dupuy travels and presses for national and international participation at the fair. Promotional campaigns, which continue until the fair's opening, are mounted in Canada, the United States, and abroad. Eventually, over 65 nations build pavilions
July 1, 1964	The City of Montreal hands over the site to the CCWE. It is divided into four areas: the entrance Cité du Havre, a part of the port of Montréal; an exhibition area on Ile Ste-Hélène (connected by the new Concordia Bridge across the St Lawrence River); a second fairgrounds area on Ile Notre-Dame; and an amusement park on the east side of Ile Ste-Hélène.
1965	Technical missions go to London, Paris, Washington, and Moscow to hold conferences on explaining the Expo 67 theme. Construction of the fairgrounds and pavilions begins
April 28, 1967	Expo 67 opens
October 28, 1967	Expo 67 closes its gates. 50 million people attend the fair over six months

Expo 67 was said to begin by an official Act of Parliament bringing into existence the Canadian Corporation for the World Exhibition (CCWE). More than a managerial authority, a paymaster, a commissioning agent, and a host to foreign nations, the CCWE was an *archive*. This was both its civilising purpose – to present an image of world history –

and actual organisation. From 1963 until the close of the world's fair and eventual the issue of the final five-volume *General Report on the 1967 World Exhibition* in 1969, every letter, memorandum, meeting minute, photograph, report, speech, and, indeed, architectural drawing was deposited – in English and French, the two national languages – at the Public Archives of Canada. As breathtakingly huge bureaucratic undertakings, all world exhibitions had been similarly constituted since the nineteenth century. The labelling, indexing, and filing were to inform the voluminous reports issued after the close of every exposition, thereby serving the construction of official culture.

In this lay a misrepresentation of history. The CCWE archive was incapable of accommodating things existing before its creation – its mission was not expansive but restrictive. As such, it produced a myth of origins, one based on promoting the renowned Montebello Conference as bestowing the theme Man and His World and defining its architectural programme. The narrative was immediately canonised in journalistic accounts and repeated *ad infinitum* over decades. The story was false. In fact, the origins of Expo 67 lay elsewhere, in the deliberations of Montreal architects, including the van Ginkels, when defining *Terre des Hommes* – as a work of architecture – long before history was made to begin by parliamentary fiat. To understand their work as the *raison d'être* of Expo 67 is to pose multiple intellectual affinities against the official record. To do is to recuperate a lost project, one that pinpoints modern architecture as protagonist of Expo 67. With their immersion in CIAM, Team 10, and North American urban renewal, the van Ginkels worked on remaking the “world” in built form. The synthesis of tendencies and sources, the

interweaving of personal consciousness and professional worldview, was tied to a purposeful appropriation of critical architectural ideas as *statements* on future possibilities.¹⁹ In other words, these discourses and their uses, as spatial systems and knowledge categories, were *objects* as much as any work of architecture. These artistic-social avant-gardes (who may well have seen themselves also as technocratic elites) wished to close the gap between *discursive* acts (the speculations on a future *Terre des Hommes*) and pragmatic ones (the creation of *Man in the City* by techniques of architectural design).²⁰ However naively, the architects felt confident that they could collapse divisions between thought and action, thereby advancing nothing less than a world historical project in which architecture could usher the stabilisation of societies.

The history of the early architectural ideals behind Expo 67 is a statement on *late modernity*. In 1967, architects and others still retained a historical self-consciousness of markedly modernist conviction and long duration – on the one hand, an abiding faith in technological salvation and, on the other hand, the sense of some genuine mass culture and political subjectivity giving rise to a new citizen of the world. At the very same moment, this universalism was fraught with ambiguity: on the one hand, the model was being challenged by, say, decolonisation and the impression of new global alignments; on the other hand, this emancipation was accompanied by the ongoing extension of techno-science in the

¹⁹ Michel Foucault, *The Archaeology of Knowledge* (1969; New York: Pantheon Books, 1972), 206-207; Stimson, *The Pivot of the World: Photography and Its Nation*, 71-72.

²⁰ Victor Margolin, *The Struggle for Utopia: Rodchenko, Lissitzky, Moholy-Nagy 1917-1946* (Chicago and London: The University of Chicago Press, 1997), 3.

capitalisation of recently revealed global labour forces and spaces of industrial production. The van Ginkels' project was marked by this former sympathy and latter utility. Put another way, their philosophical ideal, characteristic of so many postwar North American architects, had not yet come to derive its critical distance by rejecting Enlightenment reason, encyclopaedic understanding, and universal self-realisation. (The parallel rise of the Canadian welfare state – and the impression of unremitting economic prosperity – supported this view.) The aim for Expo 67 was, again, somehow to channel the passions of nationalism into alternative forms of social belonging and public life outside nation-state chauvinism or consumerist distraction. The architects believed deeply in the idea of *nation* as a force for “good” while wishing to protect their project from the nationalist nightmares of the not-so-distant past. The *late modern* suggests, therefore, a *historical phase* – that is, a transitional moment between the mechanical and the informational. This shift was characterised by both a fetishisation of visible reservoirs of energy (machines whose stored labour is apparent and can be explosively reactivated) and a ceaseless transmission of signals whose relation to human energy was problematic but offered an immense new field in which people could immerse themselves.²¹ The world's fair was to be precisely this kind of scape, offering a pre-emptive space for preparing individuals for future forms of socialisation.

The “other” history of Expo 67 – perhaps the most consequential twentieth-century world's fair in terms of projecting the utopian hopes of modern architecture – was necessarily short-lived and unfulfilled. Man the Producer and Habitat 67 could be understood as the half-

²¹ Fredric Jameson, *Brecht and Method* (London and New York: Verso, 1998), 178.

lives of this lost project. It ended with truly remarkable architectures emblematising the heroic aspirations of the 1960s – but symbolising, as nation-state pavilions, precisely what was to have been avoided in the “pre”-history of Expo 67. Still, like so many modernist plans, including those doomed to failure, this one started with vanguard architects finding themselves in the right place at the right time.

Chapter 1: City

WORLD'S FAIR (EXPOSITION): Subject of frenzy for the nineteenth century
Gustave Flaubert, Dictionary of Received Ideas (1870s)

*I hear there's entry only to those with green hair,
...In the next world's fair,
Because of the gamma ray.*
Joe Strummer & the Mescaleros, "Gamma Ray" (2001)

This time it would be different. In early September 1962, right after Labour Day, Montreal city councillors formally requested the Government of Canada to submit an official bid to the Bureau International des Expositions (BIE) in Paris for hosting the 1967 world's fair. Two years earlier, Canada had sought to bring the 1967 International Exhibition, officially sanctioned by the BIE and maintaining the long tradition of world's fair since the nineteenth century, to Montreal. The BIE had, by a narrow margin, rejected the Canadian tender in favour of the Soviet Union and the expected celebration of the fiftieth anniversary of its revolution. On April 13, 1962, Moscow unexpectedly withdrew. On May 11, Canada again presented its candidacy, asking that it be given until November to resubmit a full application. The first Canadian bid had been a dull, unimaginative exercise in promoting a glorified trade show in light of the newly opened St Lawrence Seaway. The new effort promised something more: a vision of a confidently *modern* nation anticipating its upcoming Centennial.

The 1962 initiative would be ambitious. Contemporary architecture was to be advanced as the principle means of creating cultural capital for a world's fair. At its heart, this process would find the exhibition elaborated in terms of reforming the enduring influence of prewar doctrines on town planning espoused by the Congrès Internationaux

d'Architecture Moderne (CIAM). The proposed works were to be nothing short of heroic. Drawing on contemporary theories of urban renewal (as slum clearance) along with the emerging discourses of Team 10, a postwar group of largely European architects (with increasing influence in North America) challenging CIAM orthodoxy, the world's fair quickly became a discourse on how to redevelop Montreal.

The cultural, economic, and political reasons for hosting a world's fair owed to two ambitions. On the one hand, impetus came from the federal government's desire to project the upcoming Canadian Centennial on an international stage, thereby upholding Canada as a beacon of global fraternity. On the other hand, it was local, often private, initiative that first fashioned reasons for an architectural response – one grounded in the most up-to-date design theory – to the host city. Starting in the summer of 1962, the Montreal Citizens Committee (MCC), group of businesspeople directly involved in civic affairs and buttonholing City Hall on urban improvement, set out to solicit a plan for the world's fair. The group's charismatic Secretary Michel Chevalier was especially close to H.P. Daniel van Ginkel and Blanche Lemco van Ginkel, a husband-and-wife team of architects and town planners who had established an office in Montreal in 1957. The van Ginkels had, beginning in the 1960s, undertaken a series of studies for the MCC that became instrumental to the city's planning. Deeply sensitive to local conditions and histories, the van Ginkels nevertheless brought to bear an immersion in the theories and practices of the modernist movement in architecture (including certain avant-garde tendencies). This

intellectual framework would shape their critical contribution to conceptualising and planning the Montreal world's fair.

The van Ginkels' participation owed to an invitation extended by Chevalier. At the behest of the MCC, the van Ginkels had undertaken previous studies for ameliorating parts of Montreal. These efforts imagined massive infrastructural changes to the downtown core while safeguarding patrimonial built fabric. The van Ginkels' earliest thinking on the future exposition was similar in intent: to provide a long-term rationale for improving the city as a whole.¹ It was, as the van Ginkels came repeatedly to note, to be a counterargument to the upcoming 1964 New York world's fair organised by Robert Moses, the longstanding and powerful planning czar who had, early in career, likened his work to Baron Haussmann's transformation of Paris in the Second Empire.² They especially opposed the typical fairgrounds layout (at Flushing Meadows in the New York borough of Queens, and originally prepared by Moses to host the 1939 world's fair). The Montreal City Planning Department had earlier scrutinised several sites far outside the downtown core. Adamantly against an *extra-muros* setting, Daniel van Ginkel wrote to Chevalier in mid-June 1962, when presenting his office's very first proposal:

As we have previously discussed, the odds are against the success of a fair in Montreal in 1967 if it based on the customary pattern – because of the proximity in time and distance to the New York Fair of 1964. However, if it has a strong theme which has

¹ Margaret Emily Hodges, *Blanche Lemco van Ginkel and H.P. Daniel van Ginkel: Urban Planning*, PhD dissertation, McGill University (Ann Arbor: ProQuest/UMI Dissertations Publishing, 2004), 322.

² Robert Moses, "What Happened to Haussmann", *Architectural Forum* (July 1942): 57-66. The 1964 world's fair witnessed the beginning of the end of Moses's career, with increasing opposition to his large-scale urban plans. The fair was not sanctioned by the BIE and many countries, including Canada, refused to participate.

universal appeal and if the total concept is new and purposeful, we firmly believe that Montreal 1967 can be a resounding success.

We therefore propose a scheme which focuses upon the city – both as a theme and in its physical relationship to Montreal. One might remember, in this connection, that the exhibitions which had the greatest international impact were those at the end of the last century, which had a very strong theme of universal appeal. The unprecedented volume of city building in the second half of the 20th century, makes the city a matter of profound interest and concern in every country, whether highly developed or in a period of transition.³

To intervene directly in Montreal was an argument not only for local renewal but to see urbanism as a pressing issue of global concern. As such, van Ginkel insisted on opposing *commerce* with *culture*. The insistence on some organising *theme* – as opposed to spectacle – could, it was hoped, inculcate a sense of *universal* humanistic sentiment appropriate to a world exhibition.

The earliest, most polemical, partially realised, but ultimately influential designs of the Expo 67 rested entirely on theorising the rebuilding of the modern city. The heroic nineteenth-century expositions had been catalysts of urban development and their most famous architectures, typically long-span and ferro-vitreous, would serve as litmus for the architects soon advancing the Montreal world's fair. Yet in 1967, as van Ginkel suggested to Chevalier, a world's fair could no longer be produced as an enclave; rather, it demanded to be set permanently within the city exigencies. The projected civic ideal drew on a unique lineage of modernist debate in which CIAM edicts were challenged in a postwar climate marked by new forms of internationalism and urban life. It owed, too, to the context of a

³ H.P. Daniel van Ginkel, Letter to Michel Chevalier (July 16, 1962): 2, Series 27-A21-11, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

Canadian city grappling with its urbanity that anticipated a quick adoption of the norms and forms of modern architecture as means of emblematising the future North American (and not necessarily European) city. Above all, the Expo 67 schemes were resolutely to advance a spirit of visionary architecture in *how* the plan was defined – not only by processes of design but in the uses of architectural discourse.

CITY

The van Ginkels' sense of the Montreal exposition rested squarely on theorising the rebuilding of the modern city. Rather than a short-term spectacle of contrasting peoples and things, the world's fair was posited as directing both embedded and emergent cultural and financial capital toward rearranging space relations in the existing – and remodelled – city. Montreal was, as host, to be a “live” demonstration of urban renewal techniques, debt-financed by public monies as a civic “good”, which would apply and express the aesthetic and technological values of modernist architecture. This kept, of course, with a fundamental purpose of world's fairs: not only to serve as spaces of popular education, but, with the display of new technologies, systems of communications, ethnographic showcases, and works of art, to make largely capitalistic, democratic society conscious of its own modernity. In the schema of world's fairs, the ambition of technocratic elites to fashion a public consensus on – and support for – technical, sociological, economic, even artistic concerns was, here, to be directed toward the “city”.

World's fairs typically stood apart from the city. Even as they ushered urban change, the exhibitions were temporary. As in a *fata morgana*, visitors could imagine themselves to be in distant worlds or times, only cruelly to be awoken amid ruins where the spectacle – writ large in architecture – once stood.⁴ The illusory proposition was markedly utopian: its very impermanence assumed the production of social relations – in a temporary city – outside the limits of everyday life. At the same time, a long-standing praxis of utopianism demanded fixing the future in the terms of the present: an ideal city based on, even showcasing, real and lasting improvements. In Montreal, there was to be no rude awakening from any dream world, any perfect vision of ordered society, since the very facts of its constitution – buildings and infrastructure – would be achieved in real time and for a very real need. The city was not to be simply a site for development but a space of acculturation.

Montreal would be used to show how the metropolis could, by the interrelations of large-scale architectural works, be adapted to a new, advanced stage of urban life. While this process was to follow local social and political concerns, it was really to consider how far more universal – read: modernist – design tenets could be tested, thus idealised for emulation elsewhere. If Montreal was to become itself a world's fair *in toto*, then it meant serving as the very context in which modern architecture could be intelligibly displayed. Thus the van Ginkels' insistence, in their very first letter to Chevalier on "Montreal's World Fair 1967", that the "city" be thought as a "theme".⁵ Believing that "the exhibitions which had the

⁴ Pieter van Wesemael, *Architecture of Instruction and Delight: A Socio-historical Analysis of World Exhibitions as a Didactic Phenomenon (1798-1851-1970)* (Rotterdam: 010 Publishers, 2001), 17.

⁵ Van Ginkel, Letter to Michel Chevalier, 1.

greatest international impact were those at the end of the last century (French, incidentally), which had a very strong theme of universal appeal”, the van Ginkels – obviously recalling the 1867 and 1889 Paris *Expositions universelles*, and echoing the determining Saint-Simonian belief in a new progressive society ushered by scientific advance and works of engineering – evoked events fundamental to the construction of mass culture on a global scale. Indeed, the engineer Frédéric le Play, a committed Saint-Simonian, had conceived the 1867 Exposition around a notion of the Enlightenment *encyclopédie* as a way to present a total vision of knowledge.⁶ He organised the Colisée de Fer, a vast ferro-vitreous “coliseum”, in seven concentric rings around which visitors circumambulated to compare the similar production (machinery, the arts) of different nations, or cut through single wedges directly toward the centre to survey the varied output of a single country. The idea of “city” as “theme”, circa 1967, was to re-enact a similarly multifaceted but assuredly universalising project. Van Ginkel’s emphasis on the “unprecedented volume of city building in the second half of the 20th century” – then not even two decades old – was to insist on an interest in modern urbanism – thus modernisation – shared around the world.⁷ The urban imaginary of First and Third Worlds, to say little of Cold War Second World states, was believed conjoined in a shared recurring dream: to see city design as enabling better futures. The wilful collapsing

⁶ Paul Greenhalgh, *Ephemeral Vistas: the Expositions Universelles, Great Exhibitions and World’s Fairs, 1851-1939* (Manchester: Manchester University Press, 1988), 20.

⁷ Van Ginkel, Letter to Michel Chevalier, 1.

together of global cultures kept, quite simply, with a far greater and longstanding “theme” of world’s fairs – namely *progress*.

The van Ginkels’ insistence on the “city” as an emerging but universally-held preoccupation was, at least discursively, grounded in a latent ethos of world’s fairs – the conscious projection of human self-development. The binding aspect of a “theme” (again, the “city”) was to announce a new phase in human affairs or, really, of history. This demanded both capture of and break from the past. It held, for the van Ginkels, millenarian significance. In their first detailed report to Michel Chevalier, submitted in late July 1962, they opened with prophecy followed by historical sweep:

NEW YORK ’64 WILL BE THE LAST OF THE OLD WORLD’S FAIRS.

MONTREAL ’67 CAN BE THE FIRST OF A NEW ERA IN INTERNATIONAL EXHIBITIONS.

The great exhibitions were the product of the industrial revolution. They appeared at a time when the shift from handwork to machine production made itself obvious.... The industrial exhibition foretold the transformation that was to be affected in man, as well as in industry, in human feelings as well as in human surroundings.

The second period of exhibitions in the latter half of the 19th century was international. This was the period of great exhibitions that left an indelible mark on our environment – not only in their stimulus to industry, but in their innovations in engineering, construction and architecture....

By the end of the 19th century, industry was no longer a source of wonder. The series of international exhibitions of the 20th century gradually lost creative momentum.... If the international exhibition is to survive as a medium for the exchange of ideas – if it is to be a potent force in international affairs it must find a new *raison d’etre*.

THE NEW YORK WORLD'S FAIR OF 1964 WILL BE THE END OF AN ERA.⁸

The “end” – and the “new era” – appeared in the deliberate eclipse of “world’s fair” by “international exhibition”. It was not only the dismissal of an assumed commercialism (anticipated in the upcoming 1964 New York World’s Fair) but the recasting of a contemporary mass spectacle in the spirit of past events thought capable of synchronic “transformation” of people (“man”), technology (“industry”), culture (“human feelings”), and the environment (“human surroundings” or buildings and cities). The harkening back to colossal precedents of the nineteenth century – the lessons of 1851, 1867, or 1889 to which the van Ginkels would very soon assign prognostic architectural value – demanded the recuperation, in 1967, of some form of *zeitgeist*. “Space-age and science will be old hat in 1967 and any theme will require a more cultural, socio-cultural or socio-economic approach”; hence a “new raison d’être” – for an exposition, for civilisation – evinced in the “universal preoccupation with the city”:

The sheer volume of city building has never occurred before. This is so in highly industrialized countries such as the United States, as much as in those which are in transition from an agrarian economy.... New cities are being built on every continent. There is massive rebuilding of older cities, and the ideas behind city building have free currency throughout the world. Here is a theme of international interest... a spirit founded on the exchange of ideas and capable of having a profound effect on the way man lives.

THE THEME OF THE WANING 20th CENTURY IS THE SURGING CITY.⁹

⁸ Van Ginkel Associates, “Montreal World’s Fair 1967” (July 27, 1962): 2-3, Series 27-A21-04, Fonds van Ginkel, Canadian Centre for Architecture, Montreal. The United States was not member of the Bureau International des Expositions (BIE); the New York world’s fair was, therefore, not officially sanctioned. Canada, Australia, many European Nations, and the Soviet Union did not participate.

⁹ Van Ginkel Associates, “Montreal World’s Fair 1967”, 3-4.

1967 was to be a historic juncture, the marker of an inevitable and infinitely expanding late modern form of life organised by the demands to design for the “surging city”. Here, all nations would, at least discursively, be collected under one “spirit”; the twinned tasks of “rebuilding of older cities” and erecting new ones was to collapse any cultural, even spatial, differences between First and Third Worlds, otherwise registered by the uneven development of global urbanisms. The suggestion of an “idea” with “free currency” was, therefore, to indicate that worldwide urban practices owed to a common wellspring of modernist theory. To recuperate somehow the prophetic ambition of “universal exhibitions” (as opposed to “world’s fairs”) was to reset the ratio of history: if the nineteenth-century exhibitions “foretold the transformation that” – with industrialisation – “was to be affected in man”, then a late-twentieth-century exposition would have “a profound effect on the way man lives” by resituating space relations in a post-industrial “city” (as “theme”).

Montreal *in toto* was to be testbed of this epochal change. The “theme of THE CITY should be borne out in the site of the Fair”, the van Ginkels again asserted. “Fortunately, favourable conditions exist in Montreal. By taking advantage of some slum areas which are due for *renewal*” – duly noted as ripe for Federal Government grants – “and by extending the shore with fill (which has been proceeding for some time) cheap land is available close to *the heart of the city*.”¹⁰ While the *locus* was apparently justified by the immediate socio-economic rubric of slum clearance and the geotechnical demand of land

¹⁰ Ibid., 4, emphasis added.

reclamation, the design criteria were to be manifested in key discourses on postwar urbanism. “The Heart of the City” had been the theme of the eighth CIAM meeting held in Hoddesdon, England, in July 1951. Meant to shift CIAM discourse away from a preoccupation with functionalist housing, “Heart of the City” was among the earliest discussions on the public realm in the changed circumstances of contemporary architecture, especially in terms of architect-designed urban gathering spaces.¹¹ Emphasis was now to be placed on the “Core”: a counter-project – described by Sigfried Giedion, the long-standing CIAM secretary-general and polemicist of the modern movement – to “the over-employed term ‘civic centre’” that could be actualised by designing for “spontaneity” – an “emotional experience” achieved by “reconquering the right of the pedestrian” – with the “man-made construction” of “undisturbed spaces”.¹² The stress on relationships rather than fixed forms was to project a new postwar social collectivity that included rehabilitated downtowns and spectacles like world’s fairs.¹³ (The celebrated example was Le Corbusier’s unrealised plan for the war destroyed French industrial city of Saint-Dié. The plan had, in fact, penetrated North American architecture culture with its last-minute inclusion an exhibition, organised by the Walker Art Center in Minneapolis, that opened on September 20, 1945, in Rockefeller Center and by May 1947 had been shown at fifteen locations throughout the

¹¹ Eric Mumford, *The CIAM Discourse on Urbanism, 1928-1960* (Cambridge MA: The MIT Press, 2000), 215.

¹² S. Giedion, “The Heart of the City: a Summing-up”, in J. Tyrwhitt, J.L. Sert, and E.N. Rogers, eds., *The Heart of the City: Towards the Humanisation of Urban Life* (London: Lund Humphries, 1952), 159-163.

¹³ Mumford, *The CIAM Discourse on Urbanism, 1928-1960*, 214, 215.

United States as well as in Montreal, where Lemco van Ginkel would likely have seen it.¹⁴) Thus the van Ginkels' mention of "renewal", which brought contemporaneous efforts at *urban renewal* within the purview of the future world's fair. In the Canadian context, this followed amendments to the 1956 National Housing Act. For the first time, "urban redevelopment" became official planning policy, thus allowing land purchased by federal funds to be used for commercial redevelopment.¹⁵ By the early 1960s, urban renewal – as political rhetoric, civic policy, and architectural theory affecting Western cities – varying called for demolishing blighted neighbourhoods, densifying downtowns, or building new cultural acropolises, all owing to the administrative capacities of government. As an instrument of large-scale design, it indicated just how Montreal could be made commensurate to an "international exhibition", and *vice versa*.

Almost immediately, a plan appeared. It demanded "the theme of THE CITY" be "part of the urban environment."¹⁶ Rendered solely by a large model, the scheme offered a series of massive podia supporting clustered structures, each base linked to the next across reclaimed city districts and the downtown core (fig. 1.1). International Sections along the waterfront, an International Housing Section downtown, a rehabilitated Old City, and,

¹⁴ Mary McLeod, "Saint-Dié: 'A Modern Space Conception' for Postwar Reconstruction", in Jean-Louis Cohen, ed., *Le Corbusier: An Atlas of Modern Landscapes* (New York: The Museum of Modern Art, 2013), 199, n22.

¹⁵ John C. Bacher, *Keeping to the Marketplace: The Evolution of Canadian Housing Policy* (Montreal and Kingston ON: McGill-Queen's University Press, 1993), 213. "Urban redevelopment" brought social housing (as well as corporate enclaves and arts centres) into the core of Canadian cities while contributing to the razing of historic neighbourhoods. "Urban renewal" was officially adopted as a term in the 1964 National Housing Act.

¹⁶ Van Ginkel Associates, "Montreal World's Fair 1967", 4.

further to the east, a site for Canadian pavilions, were to become permanent infrastructure for improving Montreal. A transportation network tied each sector to the next. The plan appeared both as a rationalist framework and a system open to change.

The tension between these poles – an urban gesture grounded in expressions of the “functional city” but somewhat distanced from the Cartesian logic of *The Athens Charter* – formalised ongoing postwar challenges to CIAM orthodoxy. The van Ginkels’ exhibition plan, soon titled *Man in the City*, betrayed effects of these paroxysmal debates to which they had in fact been party. Its basis as the evolving form of Expo 67 would, from the very start, follow the van Ginkels’ commitment to efforts in defining new norms of postwar urban doctrine.

ORIGINS

The preoccupation with “city” as “theme” owed to a previous decade-long reformulation of the programmatic aims of modern architecture. Central to this was the theory and practice of Team 10, a group of CIAM “youngers” – including, importantly, the van Ginkels – who wished to supersede the watertight categories of *dwelling*, *work*, *leisure*, and *circulation*, as enshrined in *The Athens Charter*, by deploying concepts like “human associations”, “cluster”, “change and growth”, and “mobility” as means to create environments, often large-scale ones, reflecting anthropologically observed patterns of life.¹⁷ The van Ginkels would draw

¹⁷ Mumford, *The CIAM Discourse on Urbanism, 1928-1960*, 7.

on these and related discourses, bringing a constellation of influence to bear on the world's fair.

The van Ginkels' shared critique of prewar modernism stemmed from a deep immersion in its theory and practice. For van Ginkel, it was part of his grounding in discourses on the "functional city", the paradigmatic expression of CIAM urbanism. For Lemco van Ginkel, it owed to balancing European and North American approaches to urban design shaped by intellectual migrations between pre- and postwar Old and New Worlds, an exchange in which she would be a vital conduit.

Born in Amsterdam in 1920, Daniel van Ginkel studied architecture followed by sociology. Completing his architecture studies during the German occupation of the Netherlands, van Ginkel refused the diploma because he would not sign the Nazi documents. He became member of the Dutch CIAM group De 8 Opbouw, whose influential member Cornelius van Eesteren was, in the 1930s, central to defining the "functional city". For van Eesteren this meant establishing the mutual relations of "units of the metropolis", which would be organised by both the "rational" use of statistical information as well as a kind of spatiality inherited from the influence of de Stijl.¹⁸ Following the Second World War, van Ginkel practised in Sweden, where he encountered the new architecture of a social democratic state untouched by conflict. It was what J.M. Richards, editor of *The Architectural Review*, famously termed "The New Empiricism", a description of functionalism being "humanized" on the "aesthetic side" without becoming

¹⁸ Ibid., 61.

irrational: “an attempt to be more objective than the functionalists”, Richards believed, “and to bring back another science, that of psychology, into the picture”.¹⁹ Van Ginkel was especially affected by efforts at what he termed the “reconditioning” and “rehabilitating” of inner-city housing stock in Stockholm, twin processes that he would, immediately upon immigrating to Canada in 1957, contrast to the trends in “development” of Canadian cities involving total clearance and rebuilding.²⁰ The experience of Swedish approaches, which involved the preservation of historic quarters, offered an alternate model for resituating everyday life in the postwar metropolis. This was especially pressing given debates on how properly to reconstruct and to expand European cities, a situation van Ginkel faced upon returning to Holland in 1951, when he began working on the redevelopment of the Amsterdam historic core under the direction of van Eesteren. While Amsterdam suffered little wartime damage, severe postwar housing shortages led to implementing aspects of van Eesteren’s prewar Expansion Plan, which had served as model for the crucial 1933 CIAM meeting on the “functional city”. It was a debate to which van Ginkel would soon contribute, challenging the relevance of *The Athens Charter* to the arrangements of a postwar world.

Blanche Lemco, too, bore modernist imprimatur. Having studied architecture at McGill University in Montreal, she moved to London in search of work and soon

¹⁹ J.M. Richards, “The New Empiricism: Sweden’s Latest Style”, *The Architectural Review* (June 1947): 199-204; Mumford, *The CIAM Discourse on Urbanism*, 167.

²⁰ H.P. Daniel van Ginkel, “Small Scale Action – Large Scale Activity: Reconditioning in City Renewal”, *Community Planning Review* (June 1957): 97-100.

participated in the sixth CIAM congress held in Bridgewater, England, in 1947. The following year, she arrived at Le Corbusier's office and designed the roof garden on the Unité d'Habitation, then under construction in Marseilles. In 1949, Lemco returned to North America, enrolling in the Department of City and Regional Planning at the Harvard Graduate School of Design. There she studied under Martin Wagner, who had been the powerful prewar chief city architect of Berlin in the 1920s; committed to urban planning as a tool of social change, Wagner oversaw the development of new housing estates by Bruno Taut, Walter Gropius, and others. Upon emigrating, Wagner became preoccupied by questions on decentralisation along the lines of American Greenbelt towns. At the same time, he retained his urban interests and joined early postwar calls for creating civic centres as means to renew the city. The idea reflected CIAM's "Heart of the City" and shaped the emergence of urban design as a discipline in North America during the 1950s and 1960s.²¹ Lemco became a key participant in this discourse. In 1951, she joined the faculty at the University of Pennsylvania under the deanship of Holmes Perkins (previously her professor at Harvard) and led design studios until 1956. Crucially, at the suggestion of Jacqueline Tyrwhitt, a landscape architect and city planner closely tied to Giedion in CIAM and then teaching at the University of Pennsylvania, Lemco helped to initiate the Group for

²¹ Eric Mumford, *Defining Urban Design: CIAM Architects and the Formation of a Discipline, 1937-69* (New Haven: Yale University Press, 2009), 196. Wagner was not a member of CIAM. While teaching city planning at Harvard, Wagner would, in the early 1940s, propose the design of prefabricated mass housing. For images of Wagner's projects, see: Anthony Alofsin, *The Struggle for Modernism: Architecture, Landscape Architecture, and City Planning at Harvard* (New York and London: W. W. Norton & Company, 2002), 139-140, 183.

Architectural Investigation (GAI), a Philadelphia chapter of CIAM.²² With GAI, Lemco soon participated in CIAM congresses at Aix-en-Provence (1953) and Dubrovnik (1956) that witnessed an emerging opposition to prewar functionalism.

Attending the CIAM meetings of the 1950s, first separately and later as married, Lemco and van Ginkel bore witness to debates, often fierce, on *The Athens Charter*. Resulting from generational dissatisfactions with functionalism, a series of postwar CIAM meetings, originally conceived as resurrecting the group's prewar aims, came to produce an entirely new lexicography for conditions by which modernism, and modern urban life, was to be considered. CIAM 8, the 1951 meeting that produced "The Heart of the City", had, despite ending inconclusively, expressed the desire to find some new basis for the architecture of social collectivity.²³ Anticipating its next congress, CIAM thus charged a group of younger members to draft a "Charter of Habitat", now Le Corbusier's stated ambition, as a corollary to *The Athens Charter*.

The issue was taken up at CIAM 9, which convened at Aix-en-Provence in July 1953. Here, at what was the largest congress to date, Lemco met van Ginkel, her future husband. Despite the presence of over 3,000 delegates, members, and observers, the aim to define "habitat" remained elusive; for a like-minded younger generation, including Lemco and van Ginkel along with Aldo van Eyck, Jaap Bakema, Alison and Peter Smithson,

²² Mumford, *The CIAM Discourse on Urbanism, 1928-1960*, 249. Along with Lemco, GAI included Robert Geddes, Romaldo Giurgola, and George Qualls. Tyrwhitt had also set up the planning programme at the University of Toronto in 1951.

²³ *Ibid.*, 215.

Georges Candilis, and Shadrach Woods, who would forge an alliance, the term came to represent a set of values associated with a “more humane approach” to modern architecture. The ambition was to achieve environments engendering relations between inhabitants and between a building and its surroundings, thus to accommodate the cultural needs of people. The idea was captured by the Moroccan group ATBAT-Afrique, which included Candilis and Woods, for apartment buildings replacing *bidonvilles*, or squatter settlements, in Casablanca.²⁴ Causing a sensation, the ATBAT work, designed with sensitivity to local sociological and cultural norms, revealed a general – and generational – dissatisfaction with CIAM. ATBAT accordingly framed its presentation around, first, detailed photographic and ethnological analysis of everyday life in a *bidonville* and, second, new housing typologies that seemingly adapted aspects of Le Corbusier’s Unité d’Habitation to Islamic notions of privacy and a local climate. The qualitative approach was a remove from CIAM norms of codification: emphasis was placed on the role of embedded social habits, including street life and folk art, as crucial to imagining the modern urban environment.²⁵ Quotidian spatial practices were to be scrutinised in the hope of defining an expansive view on “habitat”.

Van Ginkel became instrumental to this shift in discourse. In late January 1954, he convened a “study weekend” in Doorn, Holland, at the country home of his first wife. Here, van Ginkel, Jaap Bakema, Peter Smithson, John Voelker, and Hans Hovens-Greve, an

²⁴ Annie Pedret, “CIAM IX: Discussing the Charter of Habitat”, in Dirk van den Heuvel and Max Risselada, eds., *Team 10 1953-81: In Search of a Utopia of the Present* (Rotterdam: NAI Publishers, 2005), 20-21. The analysis of the *bidonville* was undertaken by GAMMA (Groupe d’architectes modernes Marocains) and the housing blocks were built by ATBAT-Afrique; Candilis and Woods belonged to both groups.

²⁵ Tom Avermaete, “Habitat du plus grand nombre Grid, 1953”, in Max Risselada and Dirk van den Heuvel, eds., *Team 10, 1953-81: In Search of a Utopia of the Present* (Rotterdam: NAI Publishers, 2005), 26.

economist working in the Rotterdam municipal planning office, independently considered the subject of the next CIAM meeting. They concluded by issuing a “Statement on Habitat” that, while commending *The Athens Charter* as adequate to countering the “chaos” of the nineteenth-century city, sought “a method which will liberate still further this potential” of “the 20th century”; instead of simply “towns” (as produced under *The Athens Charter*), new ways of comprehending “human associations” could allow “urbanism as communities of varying degrees of complexity”.²⁶ The polemic was illustrated by a “Scales of Association” diagram that, borrowing from the Scottish town planner Patrick Geddes’s “Valley Section” of 1909, aimed at the comparative study of settlements in varying regions and countries (fig. 1.2). The Smithsons soon canonised the proceedings as the “Doorn Manifesto” and fought to define the “Scales of Association” as specific types of habitat (in their parlance, “house-street-district-city”).²⁷ The Dutch architects, joined by van Eyck, took strong exception to the English approach, and argued for interpreting Geddes’s diagram as a comprehensive tool for newly designed settlements. Van Ginkel and others thus sought to design complete city districts, even new towns, where the issue of “number” would be advanced by ostensibly projecting some form of social cohesion via the programmed arrangement of buildings.²⁸

²⁶ Bakema, van Eyck, van Ginkel, Hovens-Greve, Smithson, Voelker, “Doorn Manifesto” (1954), in Joan Ockman, ed., *Architecture Culture 1943-1968: A Documentary Anthology* (New York: Columbia Books of Architecture/Rizzoli, 1993), 183.

²⁷ For the Smithsons’ appropriation of the “Scales of Association”, see their *Urban Structuring: Studies of Alison & Peter Smithson* (London: Studio Vista, 1967): 14-20.

²⁸ Francis Strauven, “The Shaping of Number in Architecture and Town Planning”, in Max Risselada and Dirk van der Heuvel, eds., *Team 10, 1953-81: in Search of a Utopia of the Present* (Rotterdam: NAI Publishers, 2005), 298-299.

The CIAM “four functions” were to face more fundamental questions on the specific scale and type of human collectivity.²⁹ Van Ginkel’s clique was soon entrusted with preparing a tenth CIAM gathering. The group thus labelled itself Team 10.

The “Doorn Manifesto” declared a new beginning to CIAM urban doctrine. Its polemic coloured the last CIAM meetings held in Dubrovnik and Otterlo (September 1959), which established theoretical foundations for architecture culture in the 1960s. Lemco and van Ginkel, now married, appeared at Dubrovnik with their respective CIAM chapters: the former joining GAI to show a study on “The problem of the relation of the automobile and home ownership in a suburban habitat”; the latter by virtue of van Eyck’s presentation of the Dutch De 8 group’s new village of Nagele (for which he and van Ginkel designed three elementary schools). The van Ginkels’ sympathies were clear. In the company of van Eyck, Bakema, Volker, and the Smithsons, they mounted a placard declaring the “death” of CIAM at its final meeting in Otterlo (fig. 1.3).³⁰ With it were to rest the edicts of functionalist town planning. Van Eyck confidently project an entirely new paradigm on modern architecture and, by extension, city design. Recently made editor of the Dutch architecture journal *Forum*, van Eyck arrived at Otterlo armed with a special issue titled “The Story of another Idea” (also known as “The Story of an Other Idea”). The cover

²⁹ Joan Ockman, *Architecture Culture 1943-1968: A Documentary Anthology* (New York: Columbia Books on Architecture/Rizzoli, 1993), 181. Daniel van Ginkel recalled the rise of Team 10: “Mainly it originated with a group of young people for whom man was total man and environment was total environment and for whom any division of function was a Cartesian dogma that had no place in a new image.” See: H.P. Daniel van Ginkel, “Credo”, *Canadian Architect* (July 1964): 46.

³⁰ Otterlo was the last CIAM meeting, with a small group of members – thus hardly unanimous – deciding to abandon the name “CIAM”.

was a pinwheel of nascent Team 10 ideas: “cluster”, “change and growth”, “identity”, “core”, “hierarchy of human association”, “mobility”, “*l’habitat pour le plus grand nombre*”, “visual group” (fig. 1.4).³¹ Team 10 had first been convened as the “CIAM research group for visual and social relationships”; the new keywords gave contour to its search for a primal language in which form and meaning would be one.³² Lemco van Ginkel was crucial to this shift, having earlier joined Giedion and van Eyck in preparing a session on “Architectural Expression” at CIAM 6. Theirs was an argument for questions of aesthetics meant to reorient rationalistic or mechanistic notions on progress – “the tyranny of common sense”, in van Eyck’s dismissal – and, by extension, city design.³³ Lemco van Ginkel continued the critique when contributing the keywords – really ideograms – “identity” and “visual group” to Team 10 discourse.³⁴ Both concepts, central to the thrust of van Eyck’s *Forum*, supposed elementary signifying forms as the structural principles of urban growth. At its most anarchistic, the conscious suggestion of informal organisation was to imply a purposeful breakdown of architectural order into more culturally accessible arrangements.

³¹ The list was trilingual: English, French, and Dutch; translations appear in Arnulf Lüchinger, *Structuralism in Architecture and Urban Planning* (Stuttgart: Karl Krämer, 1981), 10-11.

³² Alan Colquhoun, *Modern Architecture* (Oxford and New York: Oxford University Press, 2000), 218.

³³ Mumford, *The CIAM Discourse on Urbanism, 1928-1960*, 179; Ockman, *Architecture Culture 1943-1968: A Documentary Anthology*, 100; Aldo van Eyck quoted in Oscar Newman, *CIAM '59 in Otterlo* (Stuttgart: Karl Krämer, 1961), 12. A heated debate at CIAM 6 followed Giedion and van Eyck’s session, ending with Le Corbusier enthusiastically exclaiming “finally imagination comes to CIAM!” (while having added “we should place art at the summit of our preoccupations”). For a synopsis of the “Architectural Expression” debate at CIAM 6, see: Sigfried Giedion, *A Decade of New Architecture* (Zurich: Editions Girsberger, 1951), 30-37.

³⁴ Francis Strauven notes that Blanche Lemco van Ginkel was responsible for introducing the terms “identity”, and “visual group” to Team 10 thinking. See: Strauven, *Aldo van Eyck: The Shape of Relativity* (Amsterdam: Architectura & Natura, 1998), 249-250.

Otterlo marked the van Ginkels' final appearance with Team 10. They had served on the Committee of Coordination and issued invitations to the congress, where they presented the master plan of a public park in St John's, Newfoundland (fig. 1.5).³⁵ Yet having already immigrated to Montreal in 1957, their Atlantic crossing gave opportunity to test ideas in a context far removed from the paroxysmal debates (not least the abiding British and Dutch intellectual split as Team 10 became a "family" affair) consuming their European friends.³⁶ In this, Montreal was almost *tabula rasa*.³⁷ The total lack of functionalist discourse in prewar Canadian culture gave way to a postwar context – a rapidly urbanising population, concurrent urban renewal of city centres, and the ready adoption of modern architecture as emblematising a new Welfare State – providing fertile ground for both CIAM precedent and its discontents.

The van Ginkels would, upon arriving in Montreal, freely intertwine CIAM notions on the "core" and Team 10 thinking on the "cluster" when imagining the future Canadian city. Describing the intellectual framework of the Expo master plan, Van Ginkel projected a

³⁵ The van Ginkels' presentation is found in Oscar Newman, *CIAM '59 in Otterlo* (Stuttgart: Karl Krämer, 1961), 102-106.

³⁶ Alison Smithson, who would do much to compile – and to revise – Team 10 history, described the group as "a small family group of architects". See: Smithson, ed., *Team 10 Primer* (Cambridge MA: The MIT Press, 1968). Team 10 had, almost from the start, witnessed a division, with van Eyck's "structuralist" line opposed to the Smithsons' latent functionalism.

³⁷ For discussion on the van Ginkels' impact on Montreal architecture in the early 1960s, including the transformation of the municipal Service de l'Urbanisme (by their sending its architects either to Harvard or the University of Pennsylvania for training in urban design), see: "Rencontre avec Blanche Lemco van Ginkel", in *Urbanité* (Montreal, November 2003): 47-47, and Guy R. Legault, *La ville qu'on a bâtie: Trente ans au service de l'urbanisme et de l'habitation à Montréal 1956-1986* (Montreal: Editions Liber, 2002).

“total environment” understood as a “*casbah organisée*”.³⁸ It was direct reference to van Eyck’s exhortation, at the close of “The Story of another Idea”, to design “*Vers une casbah organisée*” – a deeply personal view on discovering in vernacular architectures a way to work outward from a basic element while achieving an overall form that would not appear to be predetermined (fig. 1.6). Trained also in sociology, van Ginkel shared van Eyck’s ethnological interests, having accompanied his friend on a formative trip to North African oasis settlements in 1952; later, van Eyck would find his ultimate paradigm of human habitation in the Dogon cliff dwellings in Mali. Yet faced by the sheer scale of the North American city *and* the urgency of designing a world’s fair *in toto*, Van Ginkel betrayed little of van Eyck’s phenomenological limit; instead, he purposefully located the *casbah organisée* elsewhere, in the heroic plans for the British new towns Hook and Cumbernauld being planned at this very moment as long, extendible multi-storey spines. The buildings were suggestions of *megastructure*, contemporaneously defined by Fumihiko Maki, member of the Japanese avant-garde Metabolist group, as a large frame in which all the functions of a city are housed.³⁹ Van Ginkel saw it as a fundamentally *new* building type: a “single function building”, opposed to CIAM division of space, “incorporating the daily activities of all citizens, the honky-tonk as well as culture, squalor as well as grace”.⁴⁰ Appearing along the arc of the van Ginkels’ thinking from CIAM to Team 10, the megastructure was soon

³⁸ Van Ginkel, “Credo”, 46.

³⁹ Fumihiko Maki, *Investigations in Collective Form* (St Louis MO: Washington University School of Architecture, 1964), 8-13.

⁴⁰ Van Ginkel, “Credo”, 46.

contextualised in the colossal nineteenth-century precedents made litmus of Expo 67 and serving as the emblematic vessel of a new mass society.

CITY, REDUX

Central to the emergence of Team 10 out of CIAM, the van Ginkels would project Expo 67 in a similarly vanguardist spirit. Man in the City, their nascent world's fair theme that prepared Montreal for total transformation, had functionalist resonance. Yet it would also see the urban realm in terms of socio-psychological needs – “human associations” in Team 10 parlance – and resulting aesthetics. Indeed, the very title supposed replacing the modern *mass* by *man*. While this was not to reject senses of collective experience, it was to present individual perception as an agent of design. Nevertheless, CIAM doctrine continued as a determining base: the *city* was to be an object of study, intervention, display, and spectacle. From the start, the van Ginkels would insist that the unparalleled postwar explosion in worldwide city building made it a pressing subject of international interest.⁴¹ Montreal was to be made to express this utterly unique moment in human history.

The van Ginkels had, in fact, assiduously prepared studies on transforming large swathes of Montreal. Upon arriving in Montreal, they established Van Ginkels Associates Architects, Town Planners. By the early 1960s, they were heavily involved in the city's urban design. At the behest of the Montreal Citizens' Committee (MCC), the organisation of “concerned” businessmen later responsible for initiating the first world's fair plans, the van

⁴¹ Van Ginkel, Letter to Michel Chevalier, 1.

Ginkels consecutively undertook several comprehensive planning studies: the protection of Mount Royal Park (the city's urban "lung" first designed by Frederick Law Olmsted), the preservation of Old Montreal (given the slow eclipse of the port), and, importantly, the successful relocation of a proposed elevated expressway away from the waterfront (deemed historic by the van Ginkels) to the continuous east-west escarpment that ran directly through the downtown core. The studies quickly informed policy at the City Planning Division (with van Ginkel consulting on its complete reorganisation) as it suddenly faced Montreal's unprecedented transformation.⁴² The very areas of the van Ginkels' proposals – "old" diminished districts of trade and manufacture contrasted to "new" emerging spaces of corporate seats and services – anticipated the urbanism of a post-industrial economy.

Montreal was, in fact, in the throes of transformation. The downtown had undergone a swift change with the completion of I.M. Pei's Place Ville Marie skyscraper in 1961. An early instance of postwar corporate architecture in Montreal, it sat atop a growing subterranean network of shopping concourses and tunnels (and, later, the new Metro system). Popularly known as the "underground city", it was soon celebrated by architects and critics, including Peter Blake, the editor of *Architectural Forum*, as ushering "the first 20th century city in North America".⁴³ A longstanding modernist fixation, the separation of

⁴² The van Ginkels exhibited their projects at the invitation of the City Planning Department, employing its staff members in their office and establishing links between it and leading urban design schools (notably at the University of Pennsylvania but also Harvard, where Lemco van Ginkel had, respectively, taught and studied).

⁴³ Peter Blake, "Downtown in 3-D", in *Architectural Forum* (September 1966).

walking from traffic was, really, to privilege the mechanisation of movement (fig. 1.7). The idea quickly informed the van Ginkels' plans.

The van Ginkels recognised the possibility of a new urban morphology. So did civic and business elites. On the commission of MCC secretary Michel Chevalier – a figure tied to the Canadian Chamber of Commerce, the Port of Montreal Authority, and soon the future world's fair – the van Ginkels prepared their Central Area Circulation (CAC) study of 1961.⁴⁴ CAC gave dimension to Montreal as an infrastructural whole. Identifying underutilised space in the downtown core, thereby to reclaim uneconomical land uses, the van Ginkels sought “new routes... connected in a workable pattern” for “a free flow of movement” – thus capital – “over the entire metropolis” (fig. 1.8).⁴⁵ Lemco van Ginkel nevertheless dismissed “the term CBD” (Central Business District) for its “unfortunate” connotations, insisting instead on “the heart of the city” where “all the activities of man in community should exist in their highest form – not separately but in close interaction.”⁴⁶ (The preferred example was Rockefeller Centre.) While offering a regional plan of highways, major roads, and local arteries, the van Ginkels pinpointed the downtown, already under transformation, for further modernisation. They proposed widened pedestrian ways and

⁴⁴ In his capacity as Secretary of both the MCC and the Port of Montreal, Chevalier regularly solicited the van Ginkels on urban design issues. With Lemco van Ginkel's encouragement, Chevalier eventually pursued a PhD in planning at the University of Pennsylvania. In 1967, he returned to join the new Institute d'Urbanisme at the Université de Montréal.

⁴⁵ Van Ginkel Associates, “Central Area Circulation: A Preliminary Study”, quoted in Hodges, *Blanche Lemco van Ginkel and H.P. Daniel van Ginkel: Urban Planning*, 252.

⁴⁶ Blanche Lemco van Ginkel, “The Form of the Core”, in *Journal of the American Institute of Planners*, 27:1 (1961): 57.

jitney service to parking garages, holding up to 8,000 cars per hour, on the core's periphery. At the centre of this new infrastructure arose civic institutions set on a podium hovering above but connected to a network of staggered walkways and roads; ancillary extensions led to terraced housing linked by interwoven circulation paths. The "multi-level pedestrian system", Lemco van Ginkel argued, "flowed from one level to another, connecting multiple functions of the city. Below ground, upon the ground and above the ground were regarded as equally significant".⁴⁷ The conceit of a city freed from traffic echoed CIAM's isolation of "circulation", a gesture fundamental to the construction of modernity as the amelioration of insalubrious nineteenth-century life. It equally reflected CIAM's postwar embrace of "The Heart of the City", which, as a correction to its "four functions", emphasised compact pedestrian civic centres as places of public life.⁴⁸ Party to this debate on reorganising the modern city and its symbolism, Lemco van Ginkel further defined CAC: "The visual impression of space is created by the superimposition of many images"; thus, "to see the

⁴⁷ Blanche Lemco van Ginkel, "The Centre City Pedestrian", *Architecture Canada* (August 1966): 38. The CAC site was adjacent to I.M. Pei's recently completed Place Ville Marie, a cruciform skyscraper resting atop a multilevel network of shopping and transportation concourses that became the first node in Montreal's famous "underground city". William Zeckendorf, the prominent American real estate developer, had invited Pei to design Place Ville Marie and other mixed-use and pedestrianised central city projects, which partially represented the postwar CIAM values on "core" and urban design as expressed in *The Heart of the City*. For Pei's links to postwar CIAM thought, especially Giedion and Sert's reformulation of urban design at Harvard, see: Eric Mumford, "The Emergence of Urban Design in the Breakup of CIAM", in Alex Krieger and William S. Saunders, eds., *Urban Design* (Minneapolis: University of Minnesota Press, 2009): 23-24.

⁴⁸ Sigfried Giedion's call in *Space, Time and Architecture* (1941) for pedestrian civic centres provided the basis of his "New Monumentality" (1943) that, in turn, contributed to the CIAM discussions on the "core" during its 1951 congress in Hoddesdon, England. This led to the edited book *The Heart of the City: Towards the Humanisation of Urban Life* (New York: Pellegrini and Cudahy, 1952). For discussion on CIAM's theory on "core", see: Mumford, *Defining Urban Design: CIAM Architects and the Formation of a Discipline, 1937-69*, 131-152.

whole of it and to receive a complete image it is necessary to move through the space”.⁴⁹

Evoking her notion on “visual group”, which she had introduced to Team 10, Lemco van Ginkel argued for a dynamic perception of space that could make appreciable underlying abstract principles of urban design. The civic realm was not limited to an ideal figure-ground view of the traditional street but was extended spatially, through movement by mechanical or bodily means, across overlapping sections of a terraced core.

CAC bore affinity to contemporaneous precedent. It made common cause with efforts to redefine the modern urban core in the wake of reforming CIAM thinking. CAC recalled, in spirit (not in form), Louis Kahn’s unrealised Philadelphia Centre City studies developed throughout the 1950s. Kahn saw the city as flux of movement patterns. He shifted traffic to edges of the downtown core (with cars left in massive cylindrical garages) thereby reserving streets for unhurried circulation (both pedestrian and vehicular); reclaimed space was given over to an honorific central esplanade hosting new civic institutions, with large sunken courtyards providing ample light, air, and access to public concourses below (fig. 1.9).⁵⁰ Kahn had, in fact, presented his project at the CIAM meeting in Otterlo. While his ideas came to shape Team 10 concerns on the city, Lemco van Ginkel was already aware of his work given her connections to Philadelphia. The van Ginkels acknowledged the influence when interviewing Kahn, who described architecture that “can grow out of

⁴⁹ Blanche Lemco van Ginkel, “Aesthetic Considerations in Community Planning”, *Community Planning Review*, vol. XI, no. 4 (1961), quoted in Hodges, *Blanche Lemco van Ginkel and H.P. Daniel van Ginkel: Urban Planning*, 262.

⁵⁰ Peter S. Reed “Philadelphia Urban Design”, in David B. Brownlee and David G. De Long, eds., *Louis Kahn: In the Realm of Architecture* (New York: Rizzoli, 1991), 307-311.

movement which can be of terrific service to the centre of the city.”⁵¹ An apt description of CAC, Kahn’s words appeared in a 1962 issue of *Canadian Art* edited by Lemco van Ginkel and devoted to “The Automobile”. Divided into four sections on “Design of”, “Design by”, “Design with”, and “Design for” the car, the issue carried, in its third part, a significant article by van Ginkel titled, simply, “The City”. Echoing Kahn’s often essentialist propositions, van Ginkel described a city in which the car “wants to experience the city as a totality” but once having arrived in the core “it loses its purpose and meaning”; in turn, “the driver wants to be a pedestrian” when experiencing downtown life.⁵² The “basis of the solution is clear. The reestablishment of the visual scale of the pedestrian as well as the scale of movement.”⁵³ While privileging the very act of walking in the city, the hope was for something altogether more dynamic. As such, only three “visionary” examples appealed to van Ginkel: Le Corbusier’s *viaduct autostrade* projects of the early 1930s; Kahn’s “viaduct architecture”, a culminating gesture of his ongoing Philadelphia urban design studies, which served “the architecture of movement” by providing interconnections between the institutions of a new city centre; and Kenzo Tange’s audacious 1960 proposal for a new city of 10 million people over Tokyo Bay as solution to acute congestion (fig 1.10). Perhaps distancing himself from the more shrill denunciations of functionalism by van Eyck and

⁵¹ Louis I. Kahn, “The Animal World”, *Canadian Art* 77 (January-February 1962): 51. Unlike the Smithsons, Lemco van Ginkel had firsthand knowledge of the Philadelphia scene, having taught at the University of Pennsylvania and instigating GAI, the local CIAM chapter.

⁵² Daniel van Ginkel, “The City”, *Canadian Art* (January-February 1962): 46.

⁵³ *Ibid.*

others, Van Ginkel viewed Tange's scheme – “a structural reorganization” of the city in which “the consequences of locomotion have been fully accepted” – as perfectly synthesising “almost every aspect of the theories of men like Le Corbusier and Kahn – the great line about the centre about which Kahn speaks” and “the relation of the *Unité d'habitation* to the core in the manner that Le Corbusier has been working ever since *Le Plan voisin* for Paris.”⁵⁴

Tange's floating city centred on a double transport spine (for automobile and monorail) that bound a “civic axis” of public institutions and to which were attached secondary lines of floating housing. Rendered as both utopian and buildable (with suggestion of large-scale prefabricated elements), the project expressed the aims of the Japanese Metabolist group, which emerged, circa 1960, by declaring: “we believe design and technology should be denotation of human vitality.”⁵⁵ Instrumental to theories on “megastructure”, the Metabolists' organic analogies followed a sophisticated approach to building technologies.⁵⁶ They shared Team 10 notions on “change and growth” and embraced Kahn's Philadelphia plan given its granting of architectural form to what were typically infrastructural spaces.

⁵⁴ Ibid., 48.

⁵⁵ Kiyonori Kikutake, Noboru Kawazoe, Masato Ohtaka, Fumihiko Maki, and Noiaki Kurokawa, *Metabolism: The Proposals for New Urbanism* (1960), quoted in Joan Ockman, ed., *Architecture Culture 1943-1968: A Documentary Anthology* (New York: Columbia Books on Architecture/Rizzoli, 1993), 319. The Metabolists appeared at the World Design Conference held in May 1960 in Tokyo. Older by at least a generation, Tange, who had worked in Le Corbusier's *atelier*, was the group's *éminence grise*.

⁵⁶ “Megastructure” was defined by Fumihiko Maki in *Investigations in Collective Form* (St Louis MI: Washington University School of Architecture, 1964): 5, 8-13. As opposed to “megastructure” (a “structural approach”), Maki preferred “group form” (a “sequential approach”), which he believed more clearly expressed patterns of “growth” through the aggregation of basic units – an approach not unlike that of Aldo van Eyck.

While lacking the more radical solutions of Kahn or the Metabolists, the van Ginkels' CAC nevertheless situated both CIAM and Team 10 doctrine as means to design Montreal.

CAC served as blueprint for the world's fair plans. Man in the City, the van Ginkels' first articulation of a universal theme of global concern, sought also to reshape space relations in Montreal itself. Montreal was to test and to display a worldwide desire for modernised cities: "There exists a new technology" – *urban renewal* – "which has not been applied to the city."⁵⁷ The resulting presentation model, quickly completed in July 1962, collaged in part the van Ginkels' recent projects. The strategy was one of enormous interventions with Man in the City coordinating issues of heritage, housing, and transportation into a single line of action.⁵⁸ The entire city would be rezoned by a world's fair. Across "six connected sections", short-term needs provided reasons for the long-term planning of the city.⁵⁹ Two International Sections built on landfill along the waterfront – a vision of land reclamation owing perhaps to van Ginkel's Dutch background – and "designed as groups of pavilions in which each nation can express its individuality" could be "re-used as recreational or cultural buildings with interior modifications". A permanent International Housing Section – "similar to Interbau", the development showcasing works by leading international architects

⁵⁷ Van Ginkel Associates, "Montreal World's Fair 1967", 3.

⁵⁸ Benjamin Portis, "Civic Visions, World's Fairs", in *Civic Visions, World's Fairs* (Montreal: Canadian Centre for Architecture, 1993), 27. The approach to land reclamation for the world's fair site would be endorsed by the van Ginkels' architect allies in the City Planning Department; see: Guy R. Legault, "L'Exposition Universelle 1967, Choix d'un site" (16 August 1962), Fonds du Secrétariat Général, VM3-S0-D3, City of Montreal Archives.

⁵⁹ Van Ginkel Associates, "Montreal World's Fair 1967", 5-6.

built in West Berlin in 1957 – was to spur the rebuilding of the downtown.⁶⁰ Old Montreal was, in the standing ambition of the van Ginkels, to be “rehabilitated and renovated” and “one of the oldest cities of North America restored to its rightful state” as “a centre of culture” and commerce. Immediately adjacent to the city core was an amusement park – not permanent but aimed at removing “substandard housing” and “redeveloped” after the fair. To the east, the Canadian pavilions would be “designed as shells so that, with interior change, they could be re-used for the C.B.C. workshops” (thereby fulfilling an official proposal to build the headquarters of Radio Canada, the French language service of the Canadian Broadcasting Corporation). A continuous transportation spine linked the six sites, each made of elements suggesting both tower and “cluster” architectures forming either superblocks or rising on massive podia. The large ensembles gave status to the exhibitionary purpose while securing areas from which future urban amelioration could be launched.

Man in the City was heroic, projected at the critical mass of the city. Each large-scale grouping was, in turn, to create a city in miniature. The podia – for, say, the International Section or the Housing Exhibit – served this purpose: to locate new cultural ensembles for the regeneration of metropolitan life. “In all our plans”, van Ginkel asserted, “this has been the basic philosophy: First to give man the sense of belonging, to give *identity* to the *cluster* whatever its size may be. Then to design it in very close contact with all other elements that make up the city, not only schools and convenient shopping, but the total complexity of the

⁶⁰ Van Ginkel would later state that this inner-city site (which was not coincidentally the location of their unrealised plan for Place Victoria, a separate urban development project) would avoid the “mistake of ‘Interbau’” because it was “within the fabric of the city”. See: van Ginkel, “Credo”, 52.

city.”⁶¹ Again, van Ginkel admitted a Team 10 conceit: “‘cluster’ which had obsessed us, along with so many others during the 1950’s... forced us to make as complete as possible a separation between automobile and pedestrian.”⁶² While van Ginkel linked “cluster” to megastructural works, the ideogram had broad signification, from Aldo van Eyck’s interpretation of vernacular forms to Alison and Peter Smithson’s “Cluster City idea” that, based on the reorganisation of road systems, emphasised, as they put it, “the question of social foci”.⁶³ Indeed, *Man in the City* had precursor in the Smithsons’ 1958 Berlin-Hauptstadt competition project, which advanced traffic-free enclaves as multilevel, interlinked podia – a “pedestrian net” – elevated above unimpeded roadways (fig. 1.11).⁶⁴ The van Ginkels pursued a similar strategy of *counterform* – namely, to establish an urban “fix” against the space endlessness of the motorised urban realm while recognising the promise of mass mobility.⁶⁵ The Smithsons had also enthusiastically adopted Kahn’s Philadelphia Plan in their “open city” thesis, with a permanently “ruined” urban form indicating that accelerated movement and change in the twentieth-century were incapable of

⁶¹ Van Ginkel, “Credo”, 48, emphasis added.

⁶² *Ibid.*, 47.

⁶³ Alison and Peter Smithson “Scatter” (April 1959), in Alison Smithson, ed., *Team 10 Primer*, (Cambridge MA: The MIT Press, 1968), 64.

⁶⁴ Alison and Peter Smithson in Alison Smithson, ed., *Team 10 Primer*, (Cambridge MA: The MIT Press, 1968), 58.

⁶⁵ Kenneth Frampton, *Modern Architecture: A Critical History* (London: Thames & Hudson, 1992), 275-276.

relating to the pattern of any pre-existing fabric.⁶⁶ Without sharing the Smithsons more ironic view on the city, the van Ginkels accepted the status of the automobile as a disruptive, dominant form of cultural expression. Even as the balsawood elements defining their presentation model betrayed traces of the functionalist organisation of space, the architects accepted the outward expansion of the modern city as inevitable. The role of planning was, therefore, to ameliorate past mistakes. The theory reflected Lemco van Ginkel's training at Harvard under Martin Wagner. As the powerful city architect, or *Stadtbaurat*, of Berlin during the Weimar Republic, Wagner had envisioned a solution to very large metropolises in his concept of a "world city square":

The new spirit is that of the *world-rank metropolis*, it is the spirit that works to draw out people's resources in labour and recreation, civilisation and culture – resources superior to those of all a nation's other cities – and bring them to fruition in the form of *unsurpassable* achievement. This world-metropolis spirit will by definition be national in underlying character, international in style. But its most essential characteristic is *self-belief*, its awareness of its significance and of the responsibility it bears vis-à-vis other cities in other countries.⁶⁷

Written in 1929 with the critic Adolf Behne, Wagner's polemic uncannily foreshadowed the van Ginkels' defence of *city as theme*. The debate – which turned, in Berlin during the 1920s, on the merits of *Amerikanismus*, the skyscraper, and capitalist society – rested on

⁶⁶ Ibid. The Smithsons were responsible for inviting Kahn to close the 1959 CIAM meeting in Otterlo. A year earlier, they had written, "Louis Kahn's Plan for Midtown Philadelphia demonstrates how movement can be organically reorganized so that it is one with its inter-related functions of parking, shopping, etc." At Otterlo, Kahn discussed his Philadelphia projects, defining the "meaning of street" as "a type of character, of movement, of go (as Smithson has pointed out)". See: Alison and Peter Smithson in Alison Smithson, ed., *Team 10 Primer*, (Cambridge MA: The MIT Press, 1968), 58; Louis Kahn "Talk at the Conclusion of the Otterlo Congress", in Oscar Newman, ed., *CIAM '59 in Otterlo* (Stuttgart: Karl Kramer Verlag, 1961), 208.

⁶⁷ Martin Wagner and Adolf Behne, "The New Berlin – World City" (1929), in Iain Boyd Whyte and David Frisby, eds., *Metropolis Berlin 1880-1940* (Berkeley CA: University of California Press, 2012), 348.

defining the proper form – at once aesthetic and political – of the city. The deeply modern conviction, whether in the 1920s or 1960s, was to see the city in a continuous state of flux (soon hallmark of the megastructure movement); hence, *circulation* – of people, of capital – as an effect of contemporary life to be made into a principle of design. Following Wagner’s schematisation, this was to consider the massive “city square” as adapted to existing context: “that function and form, plan and elevation, ground surface and street front fuse together into an *organic unity*.”⁶⁸ As such, differentiated traffic flows with separate lanes for people, vehicles, and streetcars, were juxtaposed against shops, restaurants, offices, and public spaces (fig. 1.12).⁶⁹ Crucially, the “World City” could only have a lifespan of about twenty-five years, after which it would be replaced. It was a sanguine view on the ongoing change and pace of urban experience. Man in the City shared the principle of the metropolis as incorporating and engendering different life cycles. In the parlance of automobile, it was a kind of planned obsolescence.

⁶⁸ Martin Wagner, “The Design Problem of a City Square for a Metropolis” (1929), in Iain Boyd Whyte and David Frisby, eds., *Metropolis Berlin 1880-1940* (Berkeley CA: University of California Press, 2012): 349.

⁶⁹ Peter Blake, the German émigré modernist and, by the 1960s, editor of *Architectural Forum*, would describe Marcel Breuer’s entry to the Potsdamer Platz competition of 1929 in terms similar to Wagner’s “world city” thesis: a “multi-level traffic scheme” marked by “his ‘Amerikanismus’”; see: Blake, *Marcel Breuer: Architect and Designer* (New York: Museum of Modern Art, 1949): 38-39; Mumford, *Defining Urban Design: CIAM Architects and the Formation of a Discipline, 1937-69*, 31, 215. For Wagner’s “world city” as well as his critical texts, see: Iain Boyd Whyte and David Frisby, eds., *Metropolis Berlin 1880-1940* (Berkeley CA: University of California Press, 2012): 315ff. For Wagner’s teaching at Harvard, which came to emphasise decentralised and prefabricated new settlements in proximity to nature and linked by fast highways, see: Alofsin, *The Struggle for Modernism: Architecture, Landscape Architecture, and City Planning at Harvard*, 182-184. For Lemco van Ginkel’s studies on cities and circulation completed under Wagner at Harvard, see: Blanche Lemco, “Highway Research Problem: Topic 2” (December 1949), 27-D1-02, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

Part Team 10 counterform, part Tange-like linear city, the world's fair brought postwar modernist polemic to bear on the future of Montreal. The desire to impose order on cities, and accompanying technocratic optimism, resonated in the van Ginkels' repeated exhortation to see the world's fair as leveraging urban renewal, and *vice versa*. Indeed, they were prescient: Canada would, in the 1960s, become primarily urban. *Man in the City* aimed equally to develop tactics of conservation and restoration as it did to usher new building, thus anticipating a major shift in Canadian policy that would soon insist on city design in terms of rehabilitation as much as redevelopment.⁷⁰ While the first national public housing programme was created only in 1956, the federal government had, immediately following the war, accepted housing as a vital component of the new welfare state.⁷¹ *Man in the City* was not only purposely illustrated, for City of Montreal authorities, in terms of works like Interbau; it was deliberately placed on sites already associated with slum clearance schemes. The projection of Canadian pavilions on land earmarked for Radio Canada followed a bitterly contested urban renewal scheme. The intractable and ambitious Montreal politician Jean Drapeau had, during a brief stint as mayor in the mid-1950s, opposed the Habitations Jeanne Mance, a social housing venture right next to the city core, which had been mired in controversy over accusations of English political classes, linked to the corrupt

⁷⁰ H. Peter Oberlander and Arthur L. Fallick, *Housing a Nation: The Evolution of Canadian Housing Policy* (Vancouver: The University of British Columbia, 1992): 57. The change arose in 1964, when amendments to the 1954 National Housing Act first introduced the term "urban renewal".

⁷¹ The first major piece of legislation was the Housing Act of 1944. In 1946, the Canadian government created the Central Mortgage and Housing Corporation (CMHC), a "crown corporation" (an entity reporting to a government minister, open to public accountability, but independent in its operations) meant to develop and implement national housing policy.

provincial government, preserving downtown property values by controlling the relocation of poorer French-speaking residents (fig. 1.13). With an eye to establishing his political future, Drapeau instead proposed “Cité des Ondes” – a “Radio City” – to be built further east as an alternative financed, importantly, by the federal government (fig. 1.14). Drapeau immediately lost the 1957 municipal election on the issue – though by 1960, he had retaken city hall and begun an uninterrupted twenty-five year reign. Radio City contained no social housing; instead, it offered a middling tower-in-the-park.⁷² It was, however, harbinger of Drapeau’s grand political ambitions resulting in massive urban transformations, always accompanied by the desire for some monumental architectural symbol, and meant to secure Montreal as an undeniably modern city.

Advanced in July 1962, *Man in the City* was, by autumn, synonymous with the Montreal’s world’s fair. In early September, the City of Montreal passed a resolution: “To request the Government of Canada to make an official application to the International Bureau of Exhibitions in Paris for holding the World’s Fair in Canada, in 1967, and to take steps in order that this Fair be held in Montreal.”⁷³ The Montreal Citizens Committee’s petitioning of the political and business classes proved decisive. The van Ginkels’ links to

⁷² André Lortie, “Montreal 1960: The Singularities of a Metropolitan Archetype”, in *The 60s: Montreal Thinks Big* (Montreal: Canadian Centre for Architecture; Toronto: Douglas & McIntyre, 2004): 100-104. Drapeau wished to relocate the social housing in a new “Cité Famille”, with “garden city” touches, to be built in the city’s northern neighbourhoods along the new Metropolitan expressway. Drapeau was bitterly opposed to the 1954 Dozois Plan, which identified 13 redevelopment sectors including slum clearance; it would irrevocably shape Montreal’s planning. Drapeau’s opposition stemmed from a belief that Dozois Plan would be too “communitistic” and it would encourage immoral behaviour in residents – a paternalism that owed to his well-orchestrated political crusades against vice and municipal corruption in Montreal in the 1950s.

⁷³ “Extract from the minutes of a meeting of the Executive Committee of the City of Montreal, held on September 4th 1962”, Fonds du Secrétariat Général, VM3-S0-D3 [054-03-01-01], City of Montreal Archives.

the City Planning Department aided the cause. On October 9, a Canadian delegation departed for Paris. In the upcoming civic election, Drapeau, having won a second chance at the mayoralty two years earlier, campaigned on the world's fair as a plan for Montreal's future. On October 28, he swept to power with 88 percent of the popular vote. Two weeks later, Drapeau was in Paris, awaiting a decision by the BIE.

Drapeau had lobbied hard. He enlisted the favours of one Georges Marchais, a Parisian wine merchant with connections throughout European capitals and a fortune made by trafficking arms to Egypt and Saudi Arabia, who now served as the mayor's emissary to the BIE. With Marchais's fixing, Drapeau typically stayed at the Ritz, a fresh sheaf of City of Montreal stationary waiting on the polished desk.⁷⁴ Photographs of van Ginkels' model – the only architectural representation of Montreal's proposal – accompanied Drapeau to Paris. The city could not have better matched the mayor's ambitions, its Haussmannian legacy – shaped also by the previous century's *expositions* – informing his visions of *grands travaux*. (Later, when faced with Montreal's economic decline, he would imperiously declare, "Let Toronto become Milan. Montreal will always be Rome.") For Drapeau, Montreal was to fulfill its destiny as the *metropole* of Quebec. His philosophy of modernisation was rooted in a uniquely Quebecois nationalistic Catholic politics and, after 1960, coloured by the Quiet Revolution, a period of sudden societal upheaval marked by the nationalisation of industry, a new provincial welfare state, secularism, and the rise of French

⁷⁴ Terrance McKenna and Susan Purcell, *Drapeau* (Toronto and Vancouver: Clarke, Irwin & Company, 1980), 146-147.

séparatisme. Man in the City – at once fantastical and realistic, embedded as it was in changes like slum clearance or the underground city – expressed, however unwittingly, Drapeau’s modernising zeal, which took urbanism as an instrument of progress and control.

On November 13, 1962, the BIE awarded the 1967 International and Universal Exposition to Montreal. Delegates from thirty BIE member nations authorised the Canadian Government to begin soliciting international participation (while noting that this would be the very first officially sanctioned Category One exhibition “on the American continent”, a clear rebuke to the coming New York world’s fair).⁷⁵ Reporting from Paris, CBC radio journalists could only paraphrase the first of what became Drapeau’s incessant and grand pronouncements: “Unemployment will be ended as Montreal sets to work to build a city within a city.” “It is clear that the city will be unrecognisable”, they added, “with Mayor Drapeau wanting to turn it not only into the metropolis of Canada, but the metropolis of the world.” The journalists pithily concluded: “The fair will take up at least 500 acres on the island of Montreal. The exact site isn’t yet known.”⁷⁶ It was, however unintentionally, a statement on whether the *tabula rasa* of an exhibition site would be a matter of architectural design or political will.

For the van Ginkels along with their architect allies in Montreal and elsewhere, it was a mandate. Shortly before its Christmas recess, the Canadian Parliament passed Bill C-103,

⁷⁵ “Resolution Votée par Acclamation par le Conseil d’Administration du BIE le 13 Novembre 1962”, Fonds du Secrétariat Général, VM3-S0-D3 [054-03-01-01], City of Montreal Archives.

⁷⁶ “Montreal Gets the Call”, *CBC News Roundup*. Canadian Broadcasting Corporation (Ottawa, November 13, 1962); CBC Digital Archives, accessed May 24, 2013.

establishing the Canadian World Exhibition Corporation, providing a grant of \$40 million, and, crucially, granting Montreal the authority to choose a proper site. The world's fair was to be equipped with public services and accessed by public transportation – placed somewhere, as an inter-governmental committee had early insisted, “intra-muros”.⁷⁷ The City Planning Department, which the van Ginkels had done much to modernise, followed suite and recommended sites identified in *Man in the City*; several areas were already facing large-scale infrastructural change, especially with the building of new expressways.⁷⁸ Given the van Ginkels' architectural orientation, a New World city was to test CIAM theory and Team 10 correction.

The dream would be short-lived. In Drapeau, the van Ginkels soon encountered a fickle patron. The mayor erred on the grandiose, exceeding the modernist temperament – the taste – of the architects. Returning from Paris, he was to declare: “A fair is for the masses and not for the thinkers. What the masses want are monuments.”⁷⁹ Newspapers announcing the success in Paris never really showed the van Ginkels' proposal.⁸⁰ Within months, their plan faced an uncertain future. Drapeau began searching for a suitably heroic site, one unsullied by the real facts of living in the city. Later, with construction underway,

⁷⁷ “Memorandum prepared by the Federal – Provincial – Municipal group regarding the possibility of holding the 1967 International Exhibition in Montreal” (no date; likely May-June 1962): 13, Fonds du Secrétariat Général, VM3-S0-D3, City of Montreal Archives, Montreal.

⁷⁸ In countless early reports, the coincidental development of transportation networks – whether highways or the Metro – would be projected as driving down the fair's costs. This was often a sales pitch.

⁷⁹ McKenna and Purcell, *Drapeau*, 145.

⁸⁰ Yves Jasmin, *La Petite Histoire d'Expo 67: l'Expo 67 comme vous ne l'avez jamais vue* (Montréal: Québec/Amérique, 1997), 54.

he attempted to erect a massive tower as the fair's symbol, even seriously pursuing a scheme to bring the Eiffel Tower – disassembled, re-erected, and then returned – to Montreal.⁸¹ At each stage, *man* would be made to withdraw from the *city*.

With this, the *theme*, the very ethos the fair, had to change. The van Ginkels would shepherd a new round of polemical, and influential, discussions on visionary architecture and the world's fair. They organised architects and intellectuals to redefine the exhibition – and to occupy official positions of decision-making and power. Above all, they became the crucial to the transformation of the theme from Man in the City to Man and the World – a resounding intellectual reorientation unrecognised in official histories. It only remained what, exactly, Expo 67 would look like.

⁸¹ The Eiffel Tower scheme was pushed by Drapeau's close friend, the caricaturist Robert LaPalme; see: Adrienne Clarkson, "Mayor Jean Drapeau Aims for an Expo 67 Tower", *The Fifth Estate*, television (Canadian Broadcasting Corporation, September 16, 1980).

Chapter 2: Theme

It is much more difficult to believe that the forms of thought which permeate all our ideas – whether these are purely theoretical or contain matter belonging to feeling, impulse, will – are means for us rather than that we serve them, that in fact they have us in their possession. What is there more in us as against them? How shall we, how shall I, set myself up as more universal than they are?

G. W.F. Hegel, *The Science of Logic* (second edition, 1831)

*Your inside is out and your outside is in
Your outside is in and your inside is out
So come on come on*

The Beatles, “Everybody’s Got Something to Hide except Me and My Monkey” (1968)

As it stood in late autumn 1962, the 1967 International and Universal Exposition was to encompass a project of urban renewal. Montreal would be test bed of vanguard attempts to implement – and simultaneously to reform – aspects of the “functional city”. Urbanism was, as such, to be celebrated by all nations as both instrument *and* ethos of modernisation. Van Ginkels’ proposed plan, *Man in the City*, rejected any form of an *extra-muros* exhibition – that is, a spectacle divorced from everyday life and its amelioration by architecture. Their distaste for the upcoming New York World’s Fair – against which the Montreal exhibition was defined – was really to dismiss its self-contained fairgrounds as a commercialised *divertissement*. Nevertheless, they recognised perfectly the power of such miniature cities, which proposed new possibilities of spatial order that immediately formed an enviable contrast to embarrassingly inadequate existing arrangements.¹ With, or within, these short-lived events, the city could be redeemed.

This utopian hope had animated the conjuring of a nineteenth-century imaginary.

¹ Neil Harris, “American Fairs and Civic Identity”, in *Civic Visions, World’s Fairs* (Montreal: Canadian Centre for Architecture, 1993), 8.

Here, the greatest exhibitions, notwithstanding their innovative architectural technics, were extensions of the municipal apparatus, showcasing public infrastructures such as parks, sanitation systems, roadways, transportation, and new forms of energy that, quite literally, served as motors of modernity, bringing senses of the future into the grasp of mass audiences. Man in the City was equally to usher long-lasting, epochal change. As opposed to a transcendental event, however transformational, of six months, Man in the City would reshape Montreal by permanent works – for example, the proposed housing sector – compiled from world cultures, economies, and political systems.

The internationalism reflected the van Ginkels' sense of CIAM's civilising mission but also followed from new transatlantic relationships on city space, shelter, and design. This found, in the immediate postwar decades, a commitment by Western European and North American architects and intellectuals to *urban design* as a discipline.² With a common experience of metropolitan, industrial, capitalist societies, these designers saw the tools of city planning as the vehicle of non-revolutionary *reform*. The meliorative impulse assumed the authority of a technocratic welfare state, which extended its remit through urban renewal schemes – hence the calibration of Man in the City to slum clearance sites slated for federal

² Christopher Klemek, *The Transatlantic Collapse of Urban Renewal: Postwar Urbanism from New York to Berlin* (Chicago: The University of Chicago Press, 2011), 5ff. Klemek notes that the European and North American consensus on urban design would be subject to divergent criticisms and revisions by the 1960s: for example, “the confrontational political culture of Great Britain and the United States, by comparison with West Germany and Canada, created a backlash that hobbled all manner of urban initiatives.”

subsidy.³ While this liberal consensus would face often withering criticism by the end of the 1960s, Man in the City represented its zenith as a symbol of national and civic modernisation made possible by architecture design.

CIAM and Team 10; city planning versus urban design; ordered spaces or ephemeral events. Montreal's transformation by 1967 appeared inevitable: the Canadian government had committed its purse to the Centennial event, Mayor Drapeau began a new elected term by announcing massive urban change, and Man in the City stood as statement on modernist city planning. As soon as Drapeau returned from the BIE in Paris, the Quebec Association of Architects (PQAA) could declare in its monthly editorial:

The mere cogitation of last month is the reality of today and we must not waste a moment to get things moving. In a relatively short space of our years, we must cram the normal growth of more than twenty years.

If Montreal is to profit in every way by the International Fair, she must rejuvenate her appearance, revalorize her heritage, and proceed, without delay, to the realization of a master plan, not with the aim of stunning visitors, but with a specially designed plan for the welfare of her population.⁴

Never mentioned by name, Man in the City was made the future of Montreal.

Yet the closing months of 1962 would find tension between architectural aims and political ambitions. Well before the BIE's approval of the world's fair, the van Ginkels and their architect allies began manoeuvring to press an even deeper engagement on the *theme*.

³ Canadian governments would, in the postwar decades, or at least until the late 1970s, generally maintain a commitment to broadly progressive policies on housing and urban renewal. This held true for both Liberals and "Red Tories".

⁴ Gilles Marchand, "Message from the P.Q.A.A.: Gone is the Time for Imponderables", *Architecture, Bâtiment, Construction* (Montreal, November 1962): 23. Marchand was the Honorary Secretary of the PQAA.

In these debates on how, exactly, to constitute an exhibition, Man in the City would be displaced, made to yield to the seemingly greater concerns of Man and His World – a suggestion, well before its consecration as *leitmotif* of the Montreal exposition, of both programmatic advance and retreat: on the one hand, demonstrating the architects’ growing preoccupation with imbuing the world’s fair by a more universalising spirit of symbolising the communion of peoples and nations, now registered in the move from *city* to *world*; on the other hand, indicating a diminishing horizon of expectation, with urban design inevitably yielding to architecture *qua* architecture.

A THEME

“Group Urges New Formula”. “‘New Look’ In Fairs Urged”. Only weeks after Jean Drapeau’s triumphant return from Paris, and just shy of the Canadian Parliament’s Royal Assent, Montreal newspapers announced a radical elaboration on the future world’s fair:

Montreal can open a new era in international exhibitions in 1967 by staging a World’s Fair based on co-operation between nations rather than national competition.

This is the core of a new and important World’s Fair concept formulated here in recent weeks by a group of local architects, planners and interested citizens....

This can be achieved by rejecting the standard type of World’s Fair dominated by national pavilions....

What the committee has in mind is a Fair composed primarily of international pavilions, each illustrating a distinct theme.... The international pavilions would illustrate the problems, aspirations, needs, environment, spirit and family of modern man.⁵

The “concept” was, unsurprisingly, the handiwork of the van Ginkels working once again

⁵ Peter Desbarats, “Group Urges New Formula”, *The Montreal Star* (December 10, 1962).

under the auspices of the Montreal Citizens' Committee (MCC). It followed a PQAA meeting, held in late November 1962, on discussing a confidential report by the van Ginkels, their friend and sponsor Michel Chevalier of the MCC, and a few architect allies.⁶ The small group had first met a month earlier. Despite the upcoming BIE review of Montreal official bid for the world's fair, the architects suddenly shifted focus with a conjecture even more schematic – that is, without any architectural rendering – than Man in the City. Once again, they envisioned an entirely new kind of international exhibition:

Montreal '67 should represent a return to the spirit of the International Exhibitions of a century ago. This means complete adherence to a universally applicable theme.

MAN AND HIS WORLD is a theme of such scope as to interest all people and encourage the participation of all nations. However, in its strength as a theme of universal appeal, also lies its weakness. In the comprehensive scope of the theme there lies a danger of focus. This would defeat the intention of effecting an exchange of ideas in a manner which could be internationally stimulating and profitable. A positive reaction can be achieved only if there is a basis of comparison between exhibits – otherwise universality is lost. For this reason, and also to make quite clear the intended spirit of the exhibition, the theme should be divided into major components.⁷

The still undefined architecture was still to follow the imperative of a theme – or, suddenly,

⁶ The architects were Roy Le Moynes, Raymond Affleck, and Hazen Sise. Affleck and Sise were partners in Affleck, Desbarats, Dimakopoulos, Lebensold, Sise, an important Montreal office that had begun advancing large-scale works exhibiting a refined brutalism and, later, megastructural overtones; the projects would shape Canadian architectural discourse in the 1960s. Sise had worked for Le Corbusier in the early 1930s and attended the fourth CIAM meeting that produced *The Athens Charter* in July 1933. He had also joined the famed Canadian surgeon Norman Bethune in Madrid during the Spanish Civil War, sympathising with the “Loyalists” while driving a Red Cross ambulance; the experience marked Sise’s lifelong commitment to social justice.

⁷ R. Affleck, Michel Chevalier, R. Lemoyne, Hazen Sise, H.P.D. and B.L. van Ginkel, “1967 Montreal World’s Fair” (October 29, 1962): 2, Series 27-A21-13, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

themes, extending beyond the limits of *city* to more existential notions on *problems*, *aspirations*, *needs*, *environment*, *spirit*, and a *family* comprising the totality of “modern man”.

The confidential memorandum drew on popular precedent. The very last subject purposely evoked *The Family of Man*, the photography exhibition first shown in 1955 at the Museum of Modern Art in New York and still touring the world in 1962, *en route* to stopping in thirty-seven countries on six continents; more than nine million would view it, with countless others discovering its images either in the bestselling book of the same name or by a 26-minute documentary film that was translated into 22 languages and screened in more than 70 countries in 1957 alone.⁸ Curated by the famed photographer Edward Steichen, the exhibition followed his belief in photography as a universal language – and mass medium – suited to making “an affirmative contribution to life” by giving “abstract meanings to very literal photographs” (fig. 2.1).⁹ The project was political – not least owing to Steichen’s directing of aerial surveys for the American military during both world wars and his resulting conviction that photographic images could be tools of peace – but ahistorical: the collected photographs, enlarged without respecting original sizes and installed for an overall effect, were accompanied by texts from world religions, folk sayings and literature, all to project a post-nationalist post-religious nuclear world and, at times, a triumphalism in the

⁸ Blake Stimson, *The Pivot of the World: Photography and Its Nation* (Cambridge MA: The MIT Press, 2006), 65.

⁹ Edward Steichen quoted in Monique Berlier, “Readings of *The Family of Man*”, in Bonnie Brennan and Hanno Hardt, *Picturing the Past: Media, History and Photography* (Urbana and Chicago: University of Illinois Press, 1999), 210. From 1947 to 1962, Steichen was director of the Photography Department at the Museum of Modern Art.

face of Cold War adversity. (Under the auspices of the United States Information Agency, which also managed American participation in world's fairs, the exhibition toured the world for eight years and was shown at the American National Exhibition in Moscow, site of the famous "kitchen debate" between then Vice-President Richard Nixon and the Soviet Premier Nikita Khrushchev.¹⁰) *The Family of Man* had an enormous popular appeal, its images meant to create optimistic narratives of a wellspring of human feeling and achievement in the face of international division and domestic insecurity (not least race relations or the paranoia of McCarthyism). Yet leading intellectuals condemned the exhibition as trite, middlebrow, and kitsch – or as the young critic Hilton Kramer scornfully put it, "a self-congratulatory means for obscuring the urgency of real problems under a blanket of ideology which takes for granted the essential goodness, innocence, and moral superiority of the international 'little man,' 'the man in the street,' the abstract, disembodied hero of a world-view which regards itself as superior to mere politics".¹¹ The view was echoed on the other side of the Atlantic by Roland Barthes, who, noting the reworked title *The Great Family of Man* upon

¹⁰ Stimson, *The Pivot of the World: Photography and Its Nation*, 64, 66. The United States Information Agency would conclude that, among the massive display of American culture and technology, the *Family of Man* had the strongest impact on Soviet audiences. See: Jack Masey and Conway Lloyd Morgan, *Cold War Confrontations: US Exhibitions and Their Role in the Cultural Cold War* (Baden Switzerland: Lars Müller Publishers, 2008), 248-249. In 1945, Steichen had produced *Power in the Pacific*, a photographic exhibition that followed the *Road to Victory* show he had created in 1942; the successful exhibitions served to boost morale in the war effort. In 1951, Steichen organised *Korea – the Impact of War in Photographs*. He believed that all the exhibitions would help viewers hate warfare but admitted failing in his attempt. See: Monique Berlier, "Readings of *The Family of Man*", in Brennan and Hardt, *Picturing the Past: Media, History and Photography*, 211; Fred Turner, "*The Family of Man* and the Politics of Attention in Cold War America", *Public Culture* 24:1 (2012): 58-59.

¹¹ Hilton Kramer, "Exhibiting the Family of Man", *Commentary* (October 1955): 367.

the exhibition's opening in Paris, summarily dismissed "all this Adamism".¹² The ecumenical project was seen as moralising.

The Montreal architects shared little of this criticism. *Man and His World* was considered in the terms of *The Family of Man* precisely to evoke perceptions of a fraternal order arising outside of politics and by aesthetic means. The *Family of Man* installation, designed by Paul Rudolph (who had studied under Walter Gropius at Harvard), offered an array of images, displayed in various sizes, hung at different heights, seen at all angles, with multiple pathways allowing visitors to fashion individual and intimate narratives while navigating a plethora of world peoples and cultures. The contrived internationalism resonated with a Canadian mindset marked by diplomat and Nobel laureate Lester B. Pearson's definition of Canada as a "middle power" brokering new kinds of international alliances between Cold War polarities. Pearson, who would become Prime Minister in 1963, thus committing his Liberal government to the world's fair, had played instrumental roles in founding both the United Nations and NATO. (Upon leaving office in 1968, Pearson would deliver the important BBC Reith Lectures, which he titled "Peace in the Family of Man".¹³) Indeed, it was the pacific, moral order symbolised by the UN that allowed the van Ginkels to imagine this most modern of political organisations participating in the "promotion for the Fair with a concept as outlined", using its "special agencies and other

¹² Roland Barthes, "The Great Family of Man" (1957), in *Mythologies* (New York: Hill and Wang, 1972), 100-102. Believed the exhibition "removes History", Barthes argued against the apparently apolitical contextualisation of things like "work" as "natural" instead of "profitable".

¹³ Lester Pearson, *Peace in the Family of Man* (London: British Broadcasting Corporation, 1969).

international organizations whose interests would parallel the selected components of the theme.”¹⁴ The gesture of telescoping from *man* to *world* was implied by closing pages in *The Family of Man* book, with portraits of husbands and wives accompanied by the caption “We two form a multitude” followed, however accidentally, by a spread showing the United Nations General Assembly in session (fig. 2.2). The didactic foreshortening of cultures, peoples, and nations found one reviewer favourably describing *The Family of Man* as an innovative “theme show” that “fuses science, photography, architecture, layout and writing into a compelling synthesis.”¹⁵ The utopian ambition was to project the endeavours of “man” outside political limits. Thus did one Henry Strub, a senior executive at Alcan (the Aluminium Company of Canada), when solicited for ideas on Man and His World, provide a remarkably prescient meditation of the future fair, in which “Exhibitors would be invited to use space in buildings provided by the exhibition authorities and to use smaller rather than larger spaces so that there would be no occasion for Australia, which is large but sparsely populated, to have a larger or smaller exhibit than Holland, which is small but densely populated.”¹⁶ The premise tied the architectural – an elimination of competing national

¹⁴ Affleck, Chevalier, et al., “1967 Montreal World’s Fair”, 4.

¹⁵ Barbara Morgan, “The Theme Show: a Contemporary Exhibition Technique (1955), quoted in Turner, “*The Family of Man* and the Politics of Attention in Cold War America”, 82.

¹⁶ Henry E. Strub, “World Fair – Montreal – 1967” (26 October 1962): 3; Hazen Sise, Memorandum (November 9, 1962), n.p., 27-A21-13, Fonds van Ginkel, Canadian Centre for Architecture, Montreal. In the early 1960s, Alcan was active in promoting design in Quebec; Strub was central to petitioning the Quebec government in this regard and represented a nexus between corporations and industrial design and the arts. See: Martin Racine, “The Ambiguous Modernity of Julien Hébert”, in Rhona Richman Kenneally and Johanne Sloan, eds., *Expo 67: Not Just a Souvenir* (Toronto: University of Toronto Press, 2010), 101, and Réjean Legault, ed., *Norman Slater: Design Lessons* (Montreal: Centre de Design de l’Université du Québec à Montréal, 2011). With the planning of Expo 67 underway by 1963, Daniel van Ginkel would include Strub as a member

pavilions – to the political – a rearrangement of countries by thematic comparison and not geopolitical reach.

The confidential report, steered by the van Ginkels, was decisive. Once again the intellectual work of architects was to define *avant la lettre*, ahead of the BIE decision, the very terms and conditions of the exhibition. The appellation “Montreal ’67” shortly became Expo 67 and Man and His World its well-known theme. Even when later shorn of its polemical origins, the broadly humanistic appeal would offer refuge to nations and corporations wishing to express sentiments of global fraternity in 1967.

The plan was no longer to remake Montreal but to re-present the world. An insistence on the “comparison between things” was to oppose a typical form of representation: “The national pavilion as such has no place in a true international exhibition.”¹⁷ The idea – that through architecture the world could be situated outside geopolitics – would animate every aspect of the van Ginkels’ future designs. This followed trends in twentieth-century world’s fairs toward themes over industrial displays.¹⁸ The encyclopedic dimension, which architecture would soon be made to define, was a parsing of

of a consulting committee for his invaluable “knowledge of foreign and local artists”; see: H.P. Daniel van Ginkel, “Memorandum to Mr Claude Robillard, Director of Planning and Development, Canadian World Exhibition Corporation” (May 9, 1963): 2, Series 27-A21-03, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

¹⁷ Affleck, Chevalier, et al., “1967 Montreal World’s Fair”, 3.

¹⁸ Pieter van Wesemael, *Architecture of Instruction and Delight: A Socio-historical Analysis of World Exhibitions as a Didactic Phenomenon (1798-1851-1970)* (Rotterdam: Uitgeverij 010, 200), 22-23. The van Ginkels and their architect allies noted: “By the end of the 19th century, industry was no longer a source of wonder.... If the international exhibition is to survive as a medium for the exchange of ideas, if it is to be a potent force in international affairs – it must find a new *raison d’être*.” See: Affleck, Chevalier, et al., “1967 Montreal World’s Fair”, 1.

knowledge as well as a definition of society – *the family of man* – as an organic entity made the basis of the exhibition. Categories like *problems* or *needs* or *environments* were to be constructed by contrasting a multitude of objects collected from around the world, at times shorn of their national characters, and reassembled to comprise a greater inventory of humankind. The *theme* proposed seeing elements of human culture in terms of their relations to an overarching system. The *world exhibition* was to make intelligible these interrelations.

BORROWINGS

Here lay a mediation of history. Like the van Ginkels' earlier plans, the shift toward *Man and His World* opened with a discourse on nineteenth century expositions. With origins in “the time when the shift from handwork to machine production made itself obvious”, the great exhibitions – 1851, 1867, 1889 – “left an indelible mark on our environment – not only in their stimulus to industry, but in their innovations in engineering, construction and architecture.”¹⁹ In the “very complete surveys”, the voluminous official reports describing and justifying each exhibition upon its close, was discovered “a contemporary realization of their unique importance”. Both phenomena, aesthetic and bureaucratic, were evidence of an admirable self-awareness of history and modernity.

To emphasise these heroic events was to construct precedents of the present. In reimagining world's fairs, the Montreal architects, led by the van Ginkels, unwittingly

¹⁹ Affleck, Chevalier, et al., “1967 Montreal World's Fair”, 1.

echoed the philosopher Walter Benjamin's argument, made a quarter century earlier, on finding sources of modern life in the ferro-vitreous innovations of an earlier epoch: the Parisian arcades of the 1820s, Charles Fourier's Phalanstère, or the "phantasmagoria" of the world exhibitions.²⁰ Benjamin sought "residues" of past forms – often works of engineering – that, freed from their original function, could be repositioned alongside similar objects into a new configuration, thus to challenge the qualities of contemporary life.²¹ He had, in fact, celebrated exactly the kinds of long-span structures recalled by van Ginkels; as opposed to "artistic" architecture, he privileged "engineering" architecture and argued that in things like the Eiffel Tower, with its vertiginous effects (seen especially in photographs), there had arisen a new social condition: "the magnificent vistas of the city provided by the new construction in iron... for a long time were reserved exclusively for the workers and engineers" – two agents of modernity uniquely armed with a privileged aerial view, floating above the world (and, it seemed, history), with a perch on the future, "that alone made it possible to recognize that was new and decisive about these structures: the feeling of space".²²

Benjamin's discovery of aesthico-technical bases of a classless society in nineteenth-century

²⁰ Walter Benjamin, "Paris, Capital of the Nineteenth Century" (1935), in Peter Demetz, ed., *Reflections: Essays, Aphorisms, Autobiographical Writings* (New York: Schocken Books, 1978), 146-162; Benjamin, *The Arcades Project*, trans. Howard Eiland and Kevin McLaughlin (Cambridge MA: The Belknap Press of Harvard University Press, 1999). *The Arcades Project*, unfinished upon Benjamin's death in 1940, was a representation and critique of the nineteenth century and bourgeois life; it includes "Expose of 1939", a revision of his seminal "Paris, Capital of the Nineteenth Century".

²¹ David Frisby, *Fragments of Modernity: Theories of Modernity in the Work of Simmel, Kracauer and Benjamin* (Cambridge MA: The MIT Press, 1986), 226-227.

²² Benjamin, *The Arcades Project*, 459, 156; Detlef Mertins, "Walter Benjamin and the Tectonic Unconscious: Using Architecture as an Optical Instrument", in *Modernity Unbound* (London: Architectural Association, 2011), 118, 122, 127-128.

architectural phenomena owed to a careful reading of Sigfried Giedion's canonical book *Building in France, Building in Iron, Building in Ferroconcrete* published in 1928. Writing on the eve of his immersion in CIAM but having already embraced modernism (which stemmed from a visit to the 1923 Bauhaus Exhibition in Weimar), Giedion consciously tied avant-garde expressions of the 1920s to heroic experiments in iron of the past century; in so doing, he opposed *construction* to architecture:

Aside from a certain *haut-goût* charm the artistic drapery of the past century has become musty. What remains unfaded of the architecture is those rare instances when construction breaks through.... Construction in nineteenth century plays the role of the subconscious. Outwardly, construction still boasts the old pathos; underneath, concealed behind facades, the basis of our present existence is taking shape.²³

Benjamin deeply admired the passage. He tried, in a manner following Freud's characterisation of dreams, also to conjure "wish-fulfilling images" that "direct the visual imagination, which has been activated by the new, back to the primeval past" – or, as Giedion put it when describing the modern historian's task, "to extract from the vast complexity of the past those elements that will be the point of departure for the future."²⁴ Despite reservations on the "phantasmagoria" – the spectacle of commodities and

²³ Sigfried Giedion, *Building in France, Building in Iron, Building in Ferroconcrete* (1928; Santa Monica CA: The Getty Centre for the History of Art and the Humanities, 1995), 87.

²⁴ Benjamin, "Paris, Capital of the Nineteenth Century", 148; Giedion, *Building in France, Building in Iron, Building in Ferroconcrete*, 85; Mertins, "Walter Benjamin and the Tectonic Unconscious: Using Architecture as an Optical Instrument", 115-116, 124-125. Giedion had asked his publisher to send a complimentary copy of *Building in France* to Benjamin in Berlin. Benjamin wrote to Giedion immediately and admitted being "electrified" by it given "my own related investigations" – likely a reference to his *Passagen-Werk (Arcades Project)*, which he had initiated a year earlier. For a copy of Benjamin's letter, see: Sokratis Georgiadis, "Introduction", in Sigfried Giedion, *Building in France, Building in Iron, Building in Ferroconcrete* (1928; Santa Monica CA: The Getty Centre for the History of Art and the Humanities, 1995), 53.

architectures – of the nineteenth-century exhibitions, Benjamin recognised these events as providing new forms of *experience*, a re-enchantment of daily life in the industrial world.

The new iron constructions were to usher new forms of socialisation, and *vice versa*. It was an argument not only on architectural form but for mass culture.

The projection of the Montreal world's fair in the technics of past great exhibitions borrowed directly from Giedion. The van Ginkels' polemic adopted Giedion's urgent view on the past – namely, that previous aesthetic and social forms could figure in society's present conception of itself and its future possibilities. *Man in the City and Man and His World* would bear the influence of Giedion's first major work, *Space, Time and Architecture: The Growth of a New Tradition*, published in 1941, reissued in five enlarged editions with numerous impressions, translated into eight languages, and forcefully shaping what constituted modern architecture for a generation. Arising from lectures given as the Charles Eliot Norton Professor at Harvard in 1938-1939, and drawing on his training in both mechanical engineering and art history, Giedion's book, as its subtitle suggested, appealed to a *zeitgeist* by identifying in parallel disciplines – architecture and urbanism, science and technology – developments dovetailing in shared senses of *space-time*, a thesis provocatively expressed in illustrations juxtaposing, say, Picasso's cubist paintings, Walter Gropius's Dessau Bauhaus building, or Harold "Doc" Edgerton's stroboscopic photographs revealing moving phenomena imperceptible to the human eye (fig. 2.3).²⁵ In modern architecture, the

²⁵ Martin S. James, "Giedion, Sigfried", in Adolf K. Placzek, ed., *Macmillan Encyclopedia of Architecture* Vol. 2 (London: The Free Press, 1982), 200; Harry Francis Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968* (Cambridge UK: Cambridge University Press, 2005), 324-325.

new concept of space – cubist, anti-perspectival – was its simultaneity, dynamism, transparency, and multi-sidedness.²⁶ This “new vision”, polemically captured in Laszlo Moholy-Nagy’s jacket design for *Building in France* that used Giedion’s negative photograph of a *pont transbordeur*, issued from the dematerialising effects of the previous century’s ferro-vitreous structures (fig. 2.4).²⁷ It reflected a modern consciousness of the penetration into “things” achieved in the natural and human sciences (whether the x-ray or psychoanalysis). Visualised in this manner, the iron architectures of the great exhibitions released, in Giedion’s eyes, “the new potentialities in construction, the use of mass production in industry, the changed organization of society”; in so doing, the structures represented “constituent facts”: “those tendencies which, when they are suppressed, inevitably reappear”.²⁸ Hence the van Ginkels’ periodisation: “Montreal ’67” was to be placed within the transformative effects of the nineteenth-century exhibitions and against the aesthetic and spiritual exhaustion of twentieth-century fairs. “Constituent facts” would again be summoned in the cause of modernism, with a new “space-time” felt, in Lemco van Ginkel’s view, in the effects of the automobile (and superhighway) or atomic energy – not in their

²⁶ Hilde Heynen, *Architecture and Modernity: A Critique* (Cambridge MA: The MIT Press, 1999), 33, 40.

²⁷ Moholy-Nagy’s *Von Material zu Architektur* (1928), based on his Bauhaus *Vorkurs*, was retitled *The New Vision* upon its English publications in 1930 and 1947. As Sokratis Georgiadis observes: “Equipped with the visual apparatus of modern man – formed and educated, above all, through the study of Cubism and Neoplasticism – he [Giedion] wanders through his objects in cinematographic fashion.” *Building in France* would instill in Giedion a lifelong pursuit of architectural photography. See: Georgiadis, “Introduction”, in Sigfried Giedion, *Building in France, Building in Iron, Building in Ferroconcrete* (1928; Santa Monica CA: The Getty Centre for the History of Art and the Humanities, 1995), 43.

²⁸ Sigfried Giedion, *Space, Time and Architecture: The Growth of a New Tradition* (Cambridge MA: Harvard University Press, 1956, third edition), 18.

outward destructiveness but, as *The Family of Man* had offered, by some inner pacific equilibrium waiting to be harnessed. Thus the PQAA's swift endorsement of the new world's fair plan: "Montreal wants to be at the nuclear time, but through peaceful undertakings meant to revalorize the dignity of man."²⁹ Extending Giedion's teleology, such *revalorisation* was the exclusive domain of architecture.

Man and His World owed an additional philosophical debt. Aside from his canonical account of modern architecture, Giedion's discourse was hardly alien to the van Ginkels. Not only had Lemco van Ginkel worked with Giedion on CIAM 6 in Bridgewater, England, but she had begun studying architecture at McGill exactly during its embrace of modernism at the very moment that saw the publication of *Space, Time and Architecture*; moreover, she later initiated a CIAM chapter in Philadelphia (at the behest of Jacqueline Tyrwhitt, who had worked with Giedion) and continued to encounter Giedion during visits to Harvard in the 1950s. The discursive influence lasted. In 1959, when invited by the Central Mortgage and Housing Corporation (CMHC), a federal government agency, to propose an exhibition on Canadian design, the van Ginkels advanced a thesis on the transformation of daily life by objects bearing the creative and functional criteria of *concept*, *production*, and *use* whether at the scale of the tool or the city.³⁰ The unrealised exhibition,

²⁹ Marchand, "Message from the P.Q.A.A.: Gone is the Time for Imponderables", 23. The van Ginkels' report on "Man and the World" was discussed at PQAA meetings on November 23 and 27, 1962.

³⁰ H.P. Daniel van Ginkel and Blanche Lemco van Ginkel, "Draft Prospectus for a Design Exhibition: for Central and Mortgage and Housing Corporation" (May 4, 1959): 5. Created in 1946, CMHC was a "crown corporation" (an entity reporting to a government minister, open to public accountability, but independent in its operations) meant to help implement and develop national housing policy.

imagined at the size of a city square, was to be organised by a series of linked pavilions through which visitors proceeded “either systemically or whimsically”. The circuit, which suggested the open-ended installation of *The Family of Man*, lead to several sections – “Tradition”, “Function” (rendered in characteristically Team 10 categories of “The House”, “Industry”, “The City”, “The Child”), or “The Challenge” of the future – with the largest one devoted to “Space-Time” defined as “relativity, metamorphosis, transition, interpenetration, intangible content, reflection, simultaneity” and evoked accordingly:

A glass wall between indoor and outdoor space
on continuous floor surface;
beside it a photo display of the same wall
under different conditions – transparency
opacity
reflection
simultaneity

Or:

Space-time in the city –
a series of photographs to stimulate the
unfolding view of building,
looking up to the tower,
looking down from it into the square

And:

Continuum – the cycle of water (rain, river, sea, cloud)
of energy
of vegetable (oak and acorn)
of mineral

Physics – time-space in the Foucauld [*sic*] pendulum

Architecture – the spacial [*sic*] relationship of buildings
– the rowhouse as single entity and

as group entity, simultaneously³¹

The list continued. The aesthetic links between natural and human made, biological and mechanical, or organic and artificial reflected Giedion's programmatic and pastoral concept of modernity, one contingent on the active subject moving in space and time.³² Modernity was to be experienced by a kind of collective *gestalt* felt in the effects of constructions made of new synthetic materials.

This materialist, *sachlich*, view animated the van Ginkels. Aside from outlining an exhibition, their CMHC proposal, couched in Giedion, was a statement on bringing Canadian cultural development in line with ascendant artistic and technical tendencies of the age. The sentiment crystallised, somewhat oddly, in an opening three-page free verse poem:

This is Canada
Power from an abundance of water
Energy in coal and oil
Harbours on two great oceans
Wheat, timber and cattle
Iron, zinc, and lead, gold and uranium
The land is rich

Up the rivers we built a thousand towns
A thousand more followed the railway across the great plains
.....and north now on the air routes,
Mechanization took command
New technology bore newer technology
Goods of all kinds for all people
Medical magic lengthens the life-span
More people, more goods, more productivity, more leisure

³¹ Ibid., 14.

³² Heynen, *Architecture and Modernity: A Critique*, 29; Detlef Mertins, "Anything but Literal: Sigfried Giedion and the Reception of Cubism in Germany", in *Modernity Unbound* (London: Architectural Association, 2011): 49.

In describing the exploitation of natural resources, industry and mass production, science and progress, prosperity, automation, insalubrity, and finally culminating in the coming redemption of the city, stanzas would repeatedly turn on the phrase “Mechanization Took Command” – an evocation of Giedion’s book *Mechanization Takes Command*, his remarkable “contribution to anonymous history” published in 1948, which reread modernity through non-architectural but engineered objects in a bid to reclaim “human needs” (whether in light of Taylorism or the horrific destruction wrought by the recent world war).³³ The poem appropriated Giedion’s title to map simultaneously the phenomena of modernity and a rise of Canadian modernisation. The van Ginkels’ thus proposed exhibiting the kinds of objects covered in Giedion’s survey: not simply design objects but all the instruments of progress, from furniture to machines, shaping the built environment. Yet it was in the van Ginkels’ repeated invocation in their proposal of the term “interpenetration” – a keyword in Giedion’s lexicography of modernity (and modernisation) – that a spatial ideal emerged. Giedion had, in *Building in France*, defined *interpenetration* (*Durchdringung*) through the prism of nineteenth-century ferro-vitreous technics that gave sensations of motion and experiences of intermingling space; this, in turn, presaged a new emancipatory social reality.³⁴ The view was evocatively rendered in *Space, Time and*

Architecture:

³³ Sigfried Giedion, *Mechanization Takes Command: A Contribution to Anonymous History* (New York: W.W. Norton, 1948).

³⁴ Heynen, *Architecture and Modernity: A Critique*, 30ff; Mertins, “Anything but Literal: Sigfried Giedion and the Reception of Cubism in Germany”, 44-47.

The volume of free space included by the 1889 Galerie des Machines represented an entirely unprecedented conquest of matter.... And it is not as a building circumscribed within definite limits that the Galerie des Machines is important. The girders in its skeleton could have been either more or less numerous without thereby effecting any distinctive alteration. The aesthetic meaning of this hall is contained in the union and *interpenetration* of the building and outer space, out of which there grows *a completely new limitlessness and movement* in keeping with the machines it contains.³⁵

Again, the implication was of the *interpenetration* of new forms of construction and social life. This was also to allow historical epochs to breach one another – not in style but as ethic. Giedion saw a single vast evolutionary pattern underlying architecture, developing linearly, and culminating in modernism.³⁶ Accordingly, and prophetically, modern architecture could, in its perfection, right the wrongs of the past:

If our culture should be destroyed by brutal forces – or even if it should be terrorized by them – then the nineteenth century will have to be judged as having misused men, materials, and human thought, as one of the most wretched periods. If we prove capable of putting to their right use the potentialities which were handed down to us, then the nineteenth century, in spite of the human disorder it created and in spite of the consequences which are still developing out of it, will grow into new and heroic dimensions.³⁷

The call, made at the start of the crucial chapter on “The Evolution of New Potentialities”, which showcased the nineteenth-century exhibitions, resonated with a generation facing nuclear holocaust, to say nothing of the past ravages of world war. Despite aesthetic and

³⁵ Giedion, *Space, Time and Architecture*, 268-269, emphasis added.

³⁶ Kenneth Frampton, “Giedion in America: Reflections in a Mirror”, *Architectural Design* 51, 6/7 (1981): 45-51; Heynen, *Architecture and Modernity: A Critique*, 35. Frampton argues that Giedion stubbornly resisted dialectical materialism as a theory of history. Heynen notes that as a historiographical approach, Giedion’s model was non-dialectical, standing for a weakening of hierarchical models on all levels.

³⁷ Giedion, *Space, Time and Architecture*, 162.

technical advance, “the equilibrium that went out of human life with the coming of the Industrial Revolution has not been restored to this day.”³⁸ Yet works like the Galerie des Machines offered a key to modern aesthetics: “the play of enormous forces is held in equilibrium, an equilibrium that is floating rather than rigid”:

It is the equilibrium of a balance beam daringly poised against continually varying forces.

A new oscillating harmony is created

An elastic counterpoise is achieved which absorbs changes in the interior, the exterior, and the foundation.

This counterpoise adjusts itself to fluctuations of the ground.

An equilibrium is achieved against changes in the molecular structure of the building itself.

An equilibrium is achieved against external pressure, wind, and snow.

Construction passes over into expression.³⁹

The inventory of material improvement was equally to suggest social progress. *Equilibrium, oscillation, or counterpoise*: in each instance, the *interpenetration* of material, spatial, and temporal forces – “constituent facts” to be awakened from the slumber of history – was to

³⁸ Ibid., 163.

³⁹ Ibid., 273. On one hand, Giedion saw structures like the Galerie des Machines as almost enchanted, at least in their “space-time” effects. On the other hand, he was utterly sanguine when faced with the *sachlich* effect on social reality. As he would note in a brilliant aside on Edgar Degas’s painting *The Dancer*: “Degas, the most daring experimentalist among the painters of the period and the exact contemporary of Eiffel, projects his dancers stripped of all erotic façade. He shows their distended nostrils and all the tenseness of straining effort. Max Lieberman remarks (in ‘Pan’, the most ‘precious’ of the German avant-garde reviews, p. 195) that ‘he seems to disguise his models and to see the nascent prostitute in the young dancer: no other painter has so completely subdued the novelistic element.’ This painting exhibits in its field the impersonal, precise, and objective spirit which produced constructions like the Galerie des Machines” (271).

spur the dis-alienation of “man” (from the city, from history).⁴⁰ Hence the universalising ideal of the van Ginkels’ CMHC exhibition proposal now passing through Man in the City and leading directly to Man and His World: the construction of a transcendent modernist imaginary, evoked through the unifying force of a *Zeitgeist*, was here to challenge a sclerotic Canadian architectural modernism especially given the country’s otherwise robust technological modernisation and, importantly, young history.

One crucial borrowing still remained. Lemco van Ginkel had, with Aldo van Eyck, assisted Giedion on preparing a presentation on “Architectural Expression” at CIAM 6, held in Bridgewater, England, in 1947.⁴¹ The discussion extended Giedion’s interest in a “New Monumentality”, which he had outlined only a few years earlier in collaboration with the painter Fernand Léger and the architect Josep Lluís Sert. Léger, Sert, and Giedion argued for public spectacles and civic centres – “the expression of man’s highest cultural needs” – as necessary components of democratic institutions during postwar reconstruction. Drawing on his *interpenetration* and *space-time*, Giedion believed that the aesthetics of monumentality were foreshadowed by the spatial and plastic conceptions of Picasso, Léger, Arp, and Mirò but also had to flow from the “emotional life of the community” that could only arise in face-to-face contact (and not via radio or television).⁴² These places were best realised in

⁴⁰ Elsewhere, Giedion employed terms like *interrelation*, *hovering*, and *penetration*.

⁴¹ For a synopsis of the CIAM 6 debate on “Architectural Expression”, see: Sigfried Giedion, *A Decade of New Architecture* (Zurich: Editions Girsberger, 1951), 30-37.

⁴² Sigfried Giedion, “The Need for a New Monumentality”, in Paul Zucker, ed., *New Architecture and City Planning* (1944; Freeport NY: Books for Libraries Press, 1971), 556ff; Eric Mumford, *The CIAM Discourse on*

community centres and public plazas, an image Giedion derived from his experience of crowds among the pavilions at the 1937 Paris Exposition and the 1939 New York World's Fair: "great spectacles capable of fascinating the people".⁴³ While seemingly ephemeral, Sert, Léger, and Giedion actually gave such spaces an architectural contour:

Today modern architects know that buildings cannot be conceived as isolated units, that they have to be incorporated into the vaster urban schemes. There are no frontiers between architecture and town planning, just as there are no frontiers between the city and the region. Co-relation between them is necessary. Monuments should constitute the most powerful accents in these vast schemes....

A new step lies ahead. Postwar changes in the whole economic structure of nations may bring with them the organization of community life in the city which has been practically neglected up to date....

Modern materials and new techniques are at hand: light metal structures; curved, laminated wooden arches; panels of different textures, colours, and sizes; light elements like ceilings which can be suspended from big trusses covering practically unlimited spans.

Mobile elements can constantly vary the aspect of the buildings. These mobile elements, changing positions and casting different shadows when acted upon by wind or machinery, can be the source of new architectural effects.

During night hours, color and forms can be projected on vast surfaces. Such displays could be projected upon buildings for purposes of publicity or propaganda. These buildings would have large plane surfaces planned for this purpose, surfaces which are non-existent today.⁴⁴

Urbanism 1928-1960 (Cambridge MA: The MIT Press, 2002), 151ff; Joan Ockman, *Architecture Culture 1943-1968* (New York: Columbia Books on Architecture and Rizzoli, 1993), 27-28.

⁴³ Giedion, "The Need for a New Monumentality", 568.

⁴⁴ J. L. Sert, F. Léger, S. Giedion, "Nine Points on Monumentality" (1943), in Joan Ockman, ed., *Architecture Culture 1943-1968* (New York: Columbia Books on Architecture and Rizzoli, 1993), 29-30. The full manifesto would be published only a decade later, thus returning it to postwar architectural debate and resting on Giedion's authority with the third edition of *Space, Time and Architecture* published in 1956; see: Giedion, *Architecture, You and Me* (Cambridge MA: Harvard University Press, 1958), 48-52.

The new forms followed Giedion's reach into the nineteenth century: on the one hand, inorganic, synthetic materials creating an *interpenetration* of planes, forms, and surfaces to give impressions of coincident "space-time"; on the other hand, the technics of long-span structures capable of housing a mass public (fig. 2.5). The van Ginkels' 1959 design exhibition read similarly: "the exhibition must be considered as being one design"; pavilions were to possess a similar structural and material system as well as a modular design but "have a different aspect and character through the use of different wall and panel materials and a very positive use of colour"; and the ensemble would, notably, be set in a "large space open space with a number of buildings grouped around it – like a city square."⁴⁵ Their proposal respected Giedion's call for "emotional training" in the postwar world, thus to "humanize the industrialization of the building process through architectonic form"; a different rhetorical quality could, therefore, be given in the suggestion of ever-changing – "mobile" – environments of panelised forms and moving colours.⁴⁶ At the same time, it fulfilled a CIAM maxim on "The Heart of the City": "Urbanism is the framework within which architecture and other plastic arts must be integrated to perform once more a social function"; the aim was to create the symbols of community within an urban framework that was still rationalistic.⁴⁷ As such, the van Ginkels' 1959 CMHC report foreshadowed the

⁴⁵ van Ginkel and Lemco van Ginkel, "Draft Prospectus for a Design Exhibition: for Central and Mortgage and Housing Corporation", 8.

⁴⁶ Giedion, "The Need for a New Monumentality", 549ff.

⁴⁷ J. Tyrwhitt, J.L. Sert, and E.N. Rogers, eds., "A Short Outline of the Core", in *The Heart of the City: Towards the Humanisation of Urban Life* (London: Lund Humphreys, 1952), 168; Alan Colquhoun, *Modern Architecture* (Oxford: Oxford University Press, 2000), 218-219. Colquhoun notes that Team 10 opposed New

social function assumed of both Expo 67 and the Canadian Centennial: an exhibition as “its own environment” and a national event shaping public sentiment by occurring in several cities simultaneously.

Such an enterprise, the van Ginkels knew, could only result from an enlightened administrative force. Again, they drew on the lessons of past exhibitions. Their first outline of Man and His World recalled, *pace* Giedion, “the supervision of men who possessed real foresight and initiative” – qualities embodied by Michel Chevalier (“who worked tirelessly to promote industry”), the *polytechnicien*, statesman, and Saint-Simonist responsible for the 1867 Paris Exposition.⁴⁸ (“The Saint-Simonians: a salvation army in the midst of the bourgeoisie”, Walter Benjamin once noted when compiling notes on Chevalier and the *expositions universelles*.⁴⁹) Coincidentally evoking the namesake of their friend and world’s fair interlocutor Michel Chevalier of the Montreal Citizens Committee, the van Ginkels and their architect colleagues insisted, ahead of the BIE decision, on a uniquely “non-managerial” governing body for the world’s fair:

One great weakness of the recent fairs is that they lacked an overall design concept.... A strong idea concept is the first step to achieving a strong design concept and an exhibition which has truly international validity.

This would require a rather special coordinating function within the

Monumentality: whereas the latter “accepted architecture as a mediated representation, the other sought a primal language in which form and meaning would be one.” This was not entirely true for the van Ginkels, who were in a position to borrow from (and contribute to) both camps. Moreover, Team 10 (and the van Ginkels) drew inspiration from Le Corbusier’s rationalist urban theory.

⁴⁸ The van Ginkels’ mention of Chevalier, while neglecting to note his Saint-Simonianism, followed Giedion’s description in *Space, Time and Architecture*.

⁴⁹ Benjamin, *The Arcades Project*, 594.

administrative structure of the exhibition design board, possibly made up of people drawn from the appropriate professions and disciplines, either an all-Canadian group, or including members from other parts of the world.... Its role would be solely to settle problems of design as related to the theme and concept....

The danger is, as with all non-managerial functions, that it will be lost sight of as the administrative structure is developed.⁵⁰

The synthesis of “idea” (theme) and “design” (architecture) was to be matched in an administrative scheme rejecting typical demands to organise a multiplicity of national and commercial interests, thereby opposing any fragmentation – by competing displays – of “man” and the “world”. Here, an artistic vanguard was to supplant the admired example of technical elites at the helm of the nineteenth-century exhibitions; the animating spirit evoked, however accidentally, Saint-Simon’s dictum that modern society would pass “from the government of men to the administration of things”. “Man and His World” implicitly echoed the sentiment that world history was social (without being paternal).

This was, in a sense, a statement on power. In raising the new theme Man and His World, the van Ginkels and their architect allies defined a role for the public intellectual. Traditional managerial structures – the bureaucracy of Brussels 1958, the authority of Robert Moses at New York 1964 – were to be supplanted by select leaders in all fields of human knowledge. Stressing that this administrative structure “CAN SERVE AS THE BASIS OF A MOST EFFECTIVE SALES CAMPAIGN”, the Montreal architects argued that each theme component would be defined by groups of international “scientists and specialists”, already in contact through their disciplines and mobilising support for the exposition in their

⁵⁰ Affleck, Chevalier, et al, “1967 Montreal World’s Fair”, 3.

home countries.⁵¹ The scenario recalled the rise of scientific and political congresses convened in the atmospheres of nineteenth-century exhibitions – in 1889 there had been sixty-nine congresses; by 1900, there were 127 (the largest assembly for medicine, with over 6,000 delegates; the smallest for fencing, with only seventy-five).⁵² In 1962, the preferred example of such “cooperative international action was the I.G.Y”, the International Geophysical Year, which, in 1958, created scientific exchange between East and West and saw the participation of 67 countries on various endeavours, including expeditions to Antarctica. (Originating in ideas on rocketry, the I.G.Y. was presaged by the Soviet Union’s launching the Sputnik satellite on October 4, 1957, and, two months earlier, firing the world’s first intercontinental ballistic missile.) The belief in an objective, universalising worldview of science and scientists was simply to mark the discursive arc of the world’s fair outside the limits of politics – hence the earliest call to abolish the national pavilion and its associated aesthetic, cultural, or political norms. Indeed, the grouping of all intellectuals, regardless of discipline, under the aegis of “design” granted the architect a unique degree of agency and, in turn, leadership. Collectively, the *specific* interests of “scientists and specialists” could be made *universal* – communicated to a mass public in a popular event – through a point of transition provided by architecture.⁵³ Thus the presaging of Man in the

⁵¹ Ibid., 4.

⁵² Richard D. Mandell, *Paris 1900: The Great World’s Fair* (Toronto: University of Toronto Press, 1967), 69.

⁵³ Michel Foucault, “Truth and Power”, in *Power/Knowledge: Selected Interviews and other Writings 1972-1977* (New York: Pantheon Books, 1980), 126ff. Foucault describes the postwar emergence of the “specific intellectual” over the longstanding “universal intellectual” (namely, the “great writer”), especially given the contribution of specialists and professionals – doctors, lawyers, and teachers – to research and public discourse.

City and Man and His World in the van Ginkels' 1959 CMHC design exhibition proposal: the specific, or local, climes of Montreal and the universal, or modernising, ethos of world's fairs were conjoined in the insistence on pavilion designs functioning as civic centres (fashioned from prefabricated components). It was means to make the techno-scientific – artefacts, displays, knowledge – appreciable in the ambit of the aesthico-technical – again, the lessons of Joseph Paxton's Crystal Palace, Frédéric le Play's Colisée de Fer, or Contamin and Dutert's Palais des Machines, which by their very technics were systems for collecting, organising, and exhibiting peoples and things together. Here lay the desire for a new kind of managerial structure, with an almost moral authority bestowed on the world's fair as a public "good".

The lessons of 1867, notwithstanding Saint-Simonism or Liberal ideologies, had been lifted from Giedion to inculcate 1967 with the spirit of an enlightened administration spurring a modernist imaginary. Still, as much as these expositions had been the effects of progressive-minded elites, the van Ginkels exhibited little enthusiasm for a wholly new technocracy: theirs was a reaction to the Weberian notion of a rational bureaucracy providing the rationalisation of the modern world. Yet by virtue of a world's fair, the van Ginkels inevitably faced an encyclopedic project: the assemblages of "man" – whether constituting a *family* or a *world* – were to be wholly reconsidered by the vanguardist modern architect leading the cooperative efforts of other intellectuals. The grand paradigm was, of

This process, he argues, accelerates around 1960. Without mentioning architects, Foucault's schema would surely include the van Ginkels' approach to preparing Expo 67. Apropos techno-science, Foucault identifies the atomic scientist Robert Oppenheimer "who acted as the point of transition between the universal and specific intellectual."

course, premised on the ascendance of modernism, the final “victor” in Giedion’s “new tradition”.

DECEMBER

Still, the issue of patronage remained. No matter how evocative, the van Ginkels’ plans were inevitably bound by the limits of government control and financing. This was understood from the very start – in spite of Jean Drapeau’s maneuvering, the BIE bid had been domain of the Canadian government. Thus, immediately upon finishing their first memorandum on *Man and His World* in late October 1962, Daniel van Ginkel and Michel Chevalier of the Montreal Citizens’ Committee met the Assistant Secretary to the Cabinet at the Privy Council Office, the body advising and supporting the Canadian Prime Minister and Cabinet, gave him a copy of their *Man and His World* prospectus, pressed specifically for their “rather special” administrative structure, and repeatedly warned of all being lost should the fair be overtaken by bureaucrats.⁵⁴ Van Ginkel and Chevalier’s attempt was to safeguard the architect’s authority against political whim. It may have been impossible to anticipate what the Conservative government felt, with Prime Minister John Diefenbaker generally cool to the world’s fair. Yet the real challenge was Drapeau, whose use of *Man in the City* was aligned to his recently victorious election campaign promising a world’s fair to usher Montreal’s renaissance. The Mayor’s agenda for slum clearance, which built on a

⁵⁴ Michel Chevalier, Letter to Mr J.S. Hodgson (November 1st, 1962): n.p., 27-A21-13, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

longstanding crusade to extinguish vice, was scarcely tied some avant-garde project. His coming declaration – “A fair is for the masses and not for the thinkers. What the masses want are monuments.” – was, of course, hardly a paean to New Monumentality and the new forms of socialisation it presupposed. Modernity meant, to Drapeau, modernisation, not modernism.

The van Ginkels’ petitioning of government, industry, and architects, was to argue that a progressive project would only be best realised by the superior credit of the state. Not coincidentally, Giedion’s argument on a “new monumentality” had advanced precisely this nexus. Invoking the liberal economist John Maynard Keynes, who argued for active public sector investment to stabilise output during recessions, Giedion asked, “Why not keep the economic machinery going by creating civic centres?”⁵⁵ If “hope of our period is that diverse groups are moving unconsciously in parallel directions”, then Giedion’s neo-Keynesian formulation – for publicly financed urban ensembles – embodied perfectly the extension of CIAM doctrine to Canada, circa 1962: building architectures for a welfare state and outside any historical crisis. Thus did the Montreal *Gazette*, in an editorial written right before the Canadian Parliament’s Royal Assent to the Montreal exposition in December 1962, discover “a new urgency to many things” with a world’s fair possibly spurring massive public works previously realised only “piecemeal” by City Hall.⁵⁶ The idea would be echoed in other

⁵⁵ Giedion, “The Need for a New Monumentality”, 566. Giedion’s neo-Keynesian view likely owed to his American vantage of Depression-era works such as the Tennessee Valley Authority.

⁵⁶ “World’s Fair: Chance to Plan”, The Montreal *Gazette* (Friday, December 14, 1962).

articles and editorials, some written by architect allies, championing the world's fair as spurring new forms of urbanism – and hinting at creeping political opportunism.⁵⁷ In December 1962, immediately after parliamentary passage of Bill C-103 establishing the Canadian World Exhibition Corporation (CCWE) and rules on intergovernmental financing of the world's fair, the PQAA would demand that the van Ginkels' intertwined visions on a plan and an administration be made official policy: “only an architect, taking part in all discussions of the afore mentioned Board of Directors, can convince the members of the esthetical importance of the Fair; indeed, the artistic and functional value of the master plan, as well as the co-ordination of the architectural aspect of the buildings designed by hundreds of architects of various countries must be subordinate to a master idea.”⁵⁸ “Political men” were to be thanked for having obtained the fair; but only those possessed by the greater consciousness of aesthetics could “prevent its sinking into mediocrity”. Without a master plan, the fear was of losing artistic control.

As 1962 drew to a close, the Montreal world's fair remained in the outlines of modernist polemic. The van Ginkels' plans followed perfectly Giedion's evocation of New Monumentality:

Not haphazard world's fairs, which in their present form have lost their old significance, but newly created civic centers should be the site for collective emotional events, where people play as important a role as the spectacle itself, and where a unity of the architectural background, the people and the symbols conveyed

⁵⁷ Campbell Merret, “Four Locations Instead”, *The Montreal Star* (December 5, 1962).

⁵⁸ Paul O. Trépanier, “Message from the P.Q.A.A.: The World's Fair”, *Architecture-Bâtiment-Construction* (Montreal, December 1962): 23. Trépanier wrote in his capacity as President of the PQAA.

by the spectacles will arise.”⁵⁹

To see public gathering space as a designed cultural realm was to believe that a synthesis of the arts could transform the city. *Man in the City* had provided an approach to reshape Montreal; now *Man and His World*, though still without accompanying architectural rendering, offered a way to reimagine humanity.

It was in this gap between polemic and design that the uses of Giedion – history committed to a contemporary cause – mattered. The declarative tone of the van Ginkels’ reports meant to collapse space and time between 1962 and 1967. Rhetorically, it was to dispel any doubt on the feasibility of creating a world city *ex nihilo* within four years. Politically, it was to safeguard the intellectual origins of the plan. Newspaper and PQAA editorials could only end 1962 by obliquely warning of a withering of the plan by political expediency and ambition. Drapeau had already begun to distance himself from *Man in the City*. Soon, it would be the turn of other governments. The onus remained on the architects. To preserve their vision, a design was required.

JANUARY

From July to December, the van Ginkels had gone from informally discussing a hypothetical world’s fair to finding their polemic possibly the official line on Expo 67. The creation of the Canadian Corporation for the World Exhibition (CCWE) by Parliament, along with the earmarking of federal funds, made the BIE decision a reality. To the public – as well as

⁵⁹ Giedion, “The Need for a New Monumentality”, 568.

many politicians – this may have seemed an insurmountable task. To the van Ginkels, it was only a matter of making Man and His World as architecture. It simply required intellectual consensus.

In early January 1963, the PQAA announced that its upcoming annual convention would be devoted solely to the Montreal world's fair. The programme grew from closed-door meetings instigated by the van Ginkels throughout December. A key gathering found Claude Robillard, director of the City Planning Department and ardent supporter of the van Ginkels' ideas on placing the fair in the city, vigorously defending their concepts in Drapeau's presence.⁶⁰ "Man and His World" was made the official line of the province's architects.

At stake was not only defining a design but protecting the authority of the existing theme. In a study prepared under the auspices of the PQAA shortly before its retreat, the Montreal architect Ray Affleck, who had worked alongside the van Ginkels on proposing Man and His World, insisted, "The protection of the concept is crucial because it is, in our view, essential that the Corporation engage with enthusiasm to defend the concept, which will be under constant assault for many reasons over the course of the next four years."⁶¹ To defend the concept was also to secure its aesthetic aims. In this, the theme underwent a kind

⁶⁰ Yves Jasmin, *La Petite Histoire d'Expo 67: l'Expo 67 comme vous ne l'avez jamais vue* (Montréal: Québec/Amérique, 1997), 308-309.

⁶¹ R. Affleck, "Congrès de l'Association des Architectes de la Province de Québec, Janvier 1963, Exposition Universelle et Internationale de 1967, 'Méthodes pour assurer une Exposition de grande qualité visuelle'" (17 January 1963): 2, Box 39-1990-002-35, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal; translation by author.

of transmutation: Man and His World had, in the interregnum between the BIE decision and announcement of the PQAA congress, become *Terre des Hommes*. The transliteration, coincidentally appeasing a French-speaking host city and political class, was duly given an intellectual origin. Both architects and world peoples, Affleck argued,

believe a manifestation of great style can result from an awareness of the “TERRE DES HOMMES” and can be an important marker in the history of the world if it is the result of a concerted effort by all men on Earth. “Un spectacle n’a point de sens sinon à travers une culture, une civilisation, un métier”. (St-Exupéry, *Terre des Hommes*.) A fair of national pavilions will have no place in 1967; but an exposition ordered and programmed by the components of “TERRE DES HOMMES”, and to which all people contribute through their own activity rather than under the banner of their nation, will be a true image of our time.⁶²

The repeated trope of a supra-national, extra-statist spectacle now found additional grounding in the late French pioneering aviator and writer Antoine de Saint-Exupéry’s book *Terre des Hommes* of 1939. Recounting long-distance and often dangerous flying expeditions in South America and to French colonies in North Africa, Saint-Exupéry, writing with the extraordinary power of aerial perspective, offered ruminations on the human condition, especially of a fraternal order arising in experiences of facing the obstacles and dangers of natural phenomena.⁶³ The renamed world’s fair theme owed to Robillard, an admirer of Saint-Exupéry’s writings, who had noted the coincident titles when previously discussing the exhibition aims with the van Ginkels and others. (The book’s English title, *Wind, Sand and*

⁶² Le Comité du Congrès de l’Association des Architectes de la Province de Québec, “Exposition Universelle 1967, ‘Terres Des Hommes’”, press release (8 January 1963): 2-3, Box 39-1990-002-35, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal; translation by author.

⁶³ S. Benyon John, *Saint-Exupéry: Vol de Nuit and Terre des Hommes* (London: Grant & Cutler Ltd, 1990), 38ff.

Stars, could hardly have illustrated their ambitions.) In willfully transposing Man and His World to *Terre des Hommes* the PQAA architects directly took a contextualising phrase from Saint-Exupéry's opening chapter: "a spectacle has no meaning except it be seen through the glass of a culture, a civilization, a craft."⁶⁴ The manifold aspects of "man" – already identified as *problems, aspirations, needs, environment, spirit, and family* – still awaited registration through an architectural prism. In announcing its upcoming retreat, the PQAA stated that its world's fair studies would be largely "theoretical" and not "immediately practical".⁶⁵ The caveat was to allow deferring decisions on specific kinds of architectural form.

Gathering in the small parish town of Lac Beauport outside Quebec City on the last weekend of January, groups of PQAA delegates, from both established and emerging practices, delivered a series of position papers on *Terre des Hommes*. One overarching philosophical demand, already publicised in the newspapers, guided the proceedings: to design a *universal* exhibition, not an *international* one.⁶⁶ Four committees presented ideas on parcelling the exhibition by "Concept" (to establish "the real 'raison d'être' for a World's Fair at this time and in this place"), "The Theme" (to outline "exhibition subjects which concern many nations"), "Mise-en-Scène" (to define "a great and thrilling spectacle rather than an

⁶⁴ Antoine de Saint-Exupéry, *Wind, Sand and Stars*, trans. Lewis Galantière (1939; London: Heinemann, 1954), 6.

⁶⁵ L'Association des Architectes de la Province de Québec, Communiqué de Press (January 1962): 1, Box 39-1990-002-35, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

⁶⁶ Réal Pelletier, "Les architectes: une expo universelle, non pas 'internationale'", *Le Devoir* (Montreal, 9 January 1963): 1, 3.

illustrated lecture or a museum experience”), and “Methods” (“to control the quality of design and content”).⁶⁷ In each, the organisation of spatial systems and knowledge categories were together to fashion a heightened social vision. Ideologically, this was, as would be repeatedly suggested, a fetish for organisations like the United Nations, UNESCO, and the World Health Organisation – not as institutions but in their representations of multiple kinds of cultural forces and pacific realignments of peoples. Architecturally, the challenge lay in approximating these “human relationships” as meaningful “visual relationships” (a key Team 10 trope), which Lemco van Ginkel, chairing the “Concept” group (comprising her husband and the architects responsible for advancing “Man and His World” a few months earlier), presented as a large-scale building system:

Each of the components of the theme could be housed in a distinct section of the exhibition grounds – a single structure, a group of buildings, or a compound – as seems most suitable. Each nation could buy space or erect a structure within one or more of these functional subsections. The functional division of theme is proposed in another paper, but as an example of the concept, one might imagine that there be a compound devoted to the environment of man, his aspiration, his achievements in the north, in which Canada, Russia, the U.S.A., Sweden, Finland, and Denmark might participate.... A nation could erect its own pavilion within the functional ensemble or exhibit within the key pavilion of the group. The approach would give equal opportunity to the big nations and small – to the long established and to the formative.⁶⁸

Mindful of decolonisation, the proposal recalibrated power relations between nations by suggesting, however obliquely, contemporaneous trends in “plug in” architectures that

⁶⁷ “The 1967 International Exhibition at Montreal: PQAA Discusses Concept, Theme ‘*Mise en Scene*’ and Methods to Produce a Fair of Top Quality”, *Journal of the Royal Architectural Institute of Canada* (April 1963): 70-71.

⁶⁸ Blanche Lemco van Ginkel et al., “A Concept” (Province of Quebec Association of Architects Convention, January 1963): 17, Box 39-1990-002-35, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

presumed to release buildings from traditional fixity by making possible structures in which all components could be flexible and mobile. Accordingly, countries were simply to link to a greater “functional ensemble”, thus losing political status but acquiring cultural standing with displays on shared scientific endeavour. Against atomisation by national pavilions, the notion of some determining superstructure – as architecture – was to resist reducing things to individual, triumphal concerns. Works of art or science were no longer to be seen simply as objects but as common though necessarily changing human practices.

The other PQAA study groups followed Lemco van Ginkel’s reasoning. Those exploring “The Theme” now extended her team’s ideas to architecture. Reiterating both the subthemes of “man” and the earliest ambitions for a permanent project of urban renewal, the committee asked, “Can these examples be translated in concrete, visual, and three-dimensional terms?”⁶⁹ Aesthetics or forms were not yet privileged; instead, the design was to proceed by granting “the spectator the privilege of choice”.⁷⁰ This was fundamentally a problem of *circulation*:

In treating the subject of *Terre des Hommes*, the exhibition architect and organiser must recognise and respect the nature of “man the visitor”.

This unique agent of the fair, multiplied across cities and nations, offered any number of ways of seeing things and occupying space:

⁶⁹ H. Mayerovitch et al., “Le Thème” (Congrès de l’Association des Architectes de la Province de Québec, Janvier 1963): 5, Box 39-1990-002-35, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal; translation by author.

⁷⁰ Ibid., 9, translation by author.

Thus, a visitor should be able to change his subject of attraction or stimulation of his various sense, visual, aural, tactile, artistic, etc.

As such,

The spectator must play a subjective role as creator in the process of linking together the exhibits”.⁷¹

The gesture of consistently reorganising – that is, re-perceiving – an infinite array of objects by travelling on changing pathways was to criticise museumification, thus world’s fairs as ossified institutions for presenting the world. If the agency granted to the visitor had architectural corollary, then it lay in ideas on creating forms that could change over time but retain coherence and meaning – hallmark of “Structuralism”, a tendency emerging in Dutch architecture circles that Daniel van Ginkel, part of the Theme study group, knew intimately, not least by his friend Aldo van Eyck bringing it to Team 10 discourse. Yet the formal-spatial suggestion also likely owed to another committee member: Alfred Neumann, an Israeli émigré teaching at Laval University in Quebec City, who had, in the 1950s, realised a series of remarkable projects marked by non-orthogonal cluster geometries (notably Bat Yam City Hall of 1963). Neumann, a Czech who had studied under Peter Behrens and worked for Auguste Perret, immigrated to Israel in 1949 and attended CIAM congresses in 1947 (where Lemco van Ginkel participated with van Eyck and Giedion), 1951, and 1953 (which saw the rise of Team 10).⁷² Neumann’s inventive work, which he called “Morphologic

⁷¹ Ibid., 10, 11, translation by author.

⁷² Mumford, *The CIAM Discourse on Urbanism, 1928-1960*, 204, 245, 337; Rafi Segal, *Unit, Pattern, Site: The Space Packed Architecture of Alfred Neumann, 1949-1968*, PhD Dissertation, Princeton University (Ann Arbor: ProQuest/UMI Dissertations Publishing, 2011), 123-125. At the 1947 CIAM meeting, Neumann presented regional planning schemes for Czechoslovakia. He also attended a CIAM planning meeting in La Sarraz in

Architecture”, bore conceptual overtones of Structuralism, largely in adopting bio-mechanical models of cellular growth as paradigms for design *and* society, with a typically related interest in the prefabrication of recognisable building units capable of myriad combinations.⁷³ The conscious projection of an informal organisation was, at its most anarchistic, to imply a purposeful breakdown of architectural order into forms that were to be more culturally accessible.⁷⁴ There was, here, the suggestion of a self-regulating element in the ways a large building – pavilion-*cum*-exposition-*cum*-city – was conceptualised: instead of following predetermined configurations, users were, in theory, given means to alter their own environment and to choose their own patterns of behaviour.

For now, the spirit of self-organising structures – architectural as well as social – reflected a political sentiment. The Theme group based its recommendations on condemning “chauvinistic nationalism” that only arrested human and scientific development, a condition writ large in competing national pavilions incapable of symbolising any kind of “mutual cooperation”. Yet an altogether different nationalism lay in “a political form taken by man as emancipation toward liberty or equality”; here, again, the rise of new nations was to temper the hegemony of “super-pavilions erected, for example, by the United States and the USSR with the sole aim of accentuating their antagonism and

1955. He was joined at Laval University by Zvi Hecker, a protégé from the Technion (where Neumann taught in the 1950s) who had also collaborated on key projects in Israel. Neumann would die in 1968.

⁷³ Alfred Neumann, “Morphologic Architecture”, *Journal of the Royal Architectural Institute of Canada* (May 1963): 40-47.

⁷⁴ Colquhoun, *Modern Architecture*, 222.

reducing other national exhibits to the state of pygmies.”⁷⁵ (It was a prescient sense of the American and Soviet pavilions facing one another at Expo 67, and recalled Albert Speer’s classicising vision of the Third Reich confronting Boris Iofan’s social realist monument to the USSR at the 1937 Paris Exposition Universelle.) The exhaustion of nationalism was, in the immediate postwar decades, a topic of popular concern – as Reinhold Niebuhr, then called “greatest living political philosopher of America”, put it, “Our problem is that technics have established a rudimentary world community but have not integrated it organically, morally, or politically.”⁷⁶ Here, in the most perverse sense, “mutually assured destruction” by nuclear weapons – the most modern of *technics* – was a means of assuring peace by stalemate. Indeed, while never mentioning it, the van Ginkels and the PQAA architects were surely attuned to fundamentally opposing visions of the very themes they wished to champion – sentiments captured by Franz Fanon’s in his recently published book *Les Damnés de la Terre* of 1961, which explained the dehumanising effects of colonialism and justified violence against colonialist regimes. Europeans “never stop talking of Man”, he wrote; “today we know what sufferings humanity has suffered for every one of their triumphs of the mind”.⁷⁷ It was hardly the thematic of the world’s fair plans. Yet Fanon’s call to action was answered differently elsewhere, notably Martin Luther King Jr.’s borrowing of Gandhian non-violence to mobilise a mass movement for civil rights. The indictment of

⁷⁵ Mayerovitch et al., “Le Thème”, 5-6, translation by author.

⁷⁶ Reinhold Niebuhr quoted in Stimson, *The Pivot of the World: Photography and Its Nation*, 13.

⁷⁷ Franz Fanon quoted in Stimson, *The Pivot of the World: Photography and Its Nation*, 14.

Enlightenment rationality – of “man” – was inevitably Janus-faced: on the one hand, to be the “wretched of the earth”; on the other hand, to discover the *terre des hommes* anew. Confronted by events – the Cuban Missile Crisis unfolded at the very moment the van Ginkels turned to “Man and His World” in late October 1962 – many commentators and intellectuals in the non-communist world could only approach the question of political identity by appealing to some supranational basis of expression.⁷⁸ A committee of intellectuals officially charged to define *Terre des Hommes* in May 1963, would insist that every aspect of the world exhibition– from design to theme, from objects to nations – serve “the need for transhumanism”.⁷⁹ To the architects considering the world’s fair, only the *city* provided an ideal medium for this synthesis.

The role given to the visitor as “creator” – surveying, thus making public, artefacts and ideas comprising the many themes – implicitly drew on notions of a liberated political subject. As programme, the endless construction of new experiences of space – “a method of approach ‘by function’”, the Theme committee insisted – would, the architects believed, become “prototypical” for future fairs.⁸⁰ The gesture of non-hierarchical spaces extended the political equilibrium to be set by the world’s fair, an ambition surely resonant to van Ginkel and Neumann, who had both spent the war under German occupation, the former in the

⁷⁸ Stimson, *The Pivot of the World: Photography and Its Nation*, 13ff. Stimson outlines the nexus of popular philosophy and the arts in establishing frameworks, such as the famous *Family of Man* exhibition, for supranational expressions on artistic and political fraternity.

⁷⁹ “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, Report of the Montebello Conference (May 1963), 7, Box 39-1990-07-001, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

⁸⁰ Mayerovitch et al., “Le Thème”, 13, translation by author.

Netherlands where he was active in the Dutch Resistance, the latter in the Theresienstadt ghetto in Czechoslovakia.⁸¹ Indeed, explaining his theory on “morphologic architecture” in an article published in the *Journal of the Royal Architectural Institute of Canada* soon after the PQAA deliberations, Neumann would attempt “a mixture of biology and esthetics” by noting important lessons in “space packing” (of Platonic and Archimedean solids) gleaned from crystallography, which gave insight on reimagining modern building types – specifically attributes of rectilinearity – and, therefore, inherited social structures (and the classical rationalism guiding them).⁸² The argument paralleled trends in divining in biological models a notion on form and structure as a totality, while seeing constituent parts as forever changing and adapting. While exhibiting less of the technological determinism accompanying such discourses (espoused by Buckminster Fuller, among others), and despite openly setting his argument at a remove from modernist teleology that traced conceptual origins to the Baroque (with veiled reference to Giedion’s *Space, Time and Architecture*), Neumann nevertheless proposed a new historical plateau:

⁸¹ For an overview of Neumann’s work and life, see: Noam Dvir, “A look into the life of one of Israel’s most important, yet forgotten architects”, *Haaretz* (Tel Aviv, January 19, 2012), <http://www.haaretz.com>, accessed July 8, 2013. With interests in morphology and prefabrication, Neumann advanced a unique modular system, Mø, which originated in a theory of proportion. Walter Gropius, who remained concerned by prefabrication, would note: “The EM-PHI System (Humanization of Space) by Alfred Newman represents, in my opinion, an important contribution to the whole field of design, planning, architecture, and industrial design. It is the first attempt I know to create a modular system which comprehends the whole range of possibilities of proportion.... The only system akin to the new investigations of Alfred Neumann is Le Corbusier’s Modulor, which has been conceived intuitively. Mr. Neumann goes beyond this system and gives it an all-embracing mechanical background.” See: Letter from Walter Gropius (January 7, 1953), quoted Rafi Segal, *Unit, Pattern, Site: The Space Packed Architecture of Alfred Neumann, 1949-1968*, 1.

⁸² Alfred Neumann, “Morphologic Architecture”, *Journal of the Royal Architectural Institute of Canada* (May 1963): 40-47.

Different stages of civilization have different optimal population densities and use corresponding space packing. Hunting and fishing communities lived in loosely packed round houses, of the topological kind, in accordance with low population density. Agricultural civilizations created the rectangular euclidean [*sic*] pattern. Industrial civilization with its high population density is still packed into an outlined agricultural frame work and has yet to create its own pattern. The rotational symmetries of the new patterns which were meaningless before the space age now become the exact bearers of widely understood contemporary symbolism.⁸³

While “new patterns” of “contemporary symbolism” awaited elaboration, the discovery of such forms – or at least their sources in bio-mechanical phenomena (“What is important is *thinking* in analogies”, Neumann insisted) – also revealed an insidious aspect of “contemporary symbolism”:

Stone minarets still tower above the cupolas of the mosques. Not far from them on some missile launching site rise identical shapes, the rockets no more built of stone. These containers built of modern synthetic materials fly into outer space to destroy themselves and perhaps to spread destruction. Two identical shapes but what a difference in function. The cupola of today might be one of the inflatable structures which blow here today and there tomorrow.... The nostalgic longing for the stable, symbolic architecture of yesterday, and maybe of tomorrow, remains stronger than ever, the eternal polarity of all human endeavour.⁸⁴

The minaret and rocket – culture and science, tradition and innovation – embodied precisely those archetypes imagined harmoniously aligned in the trans-historical project of a world’s fair. The nostalgic levelling of past and future could, Neumann suggested, only but carry hidden ironies: the cupola transformed into some lightweight, floating structure was simply Buckminster Fuller’s geodesic dome transported by United States Marine Corps helicopters as mobile shelters and elsewhere deployed as radar installations for the Distant Early

⁸³ Ibid., 46.

⁸⁴ Ibid.

Warning (DEW) Line built across the Canadian North as a frontline system guarding against Soviet bomber attack (fig. 2.6).⁸⁵ Completed in October 1962, the very moment of the first rumblings of Man and His World, the DEW Line, an uninterrupted 6000-mile surveillance chain from the Aleutian Islands to Iceland, hardly epitomised, despite its engineering triumph, what Lemco van Ginkel's Concept group sought in a "compound" – a pavilion – devoted to a greater "environment of man" (which they offered in the Arctic). The rocket and minaret were to overcome the menace of Cold War hostility and Third World poverty; they were also symbols of the ways in which the Montreal exhibition – as world map – waited to be divided.

One critical concept of space remained undivided – the city as site. Throughout their weekend deliberations, the PQAA study groups stayed committed to the van Ginkels' Man in the City – not necessarily in terms of its particular sites but as a counterpoint to the existing environment. While the van Ginkels had outlined a project of urban renewal – a mix of Team 10 counterform strategies and North American slum clearance schemes – the shift to *Terre des Hommes* gave broader scope by displacing concerns from the needs of *city* to the values of *theme*. The PQAA study group on "Mise en Scène", concerned by "the problems of and possibilities of presenting an international exhibition of this nature as a great and thrilling spectacle rather than as an illustrated lecture or a museum experience", insisted: "The spectacle thus depends (for better or for worse), for its character and the

⁸⁵ Fuller's geodesics were familiar to Montreal architects. A Canadian branch of the Fuller Research Institute opened in 1950, with the first aluminium geodesic dome built in the Montreal suburbs and published in Canadian architecture journals. Fuller also had led a well-publicised geodesics workshop at McGill in 1956, published in *The Canadian Architect* (March 1957).

quality of its inspiration, on the city that houses it.”⁸⁶ The city was “to house” the fair; reciprocally, the fair would “make the city visible”, remain “centred between the two poles of the city, its *genius loci*: the Mountain and the River”, and appear “grafted to the urban tissue as much as possible”.⁸⁷ On the one hand, the exhibition would return Montreal to its origins between the St Lawrence River and Mont Royal, the hill immediately west of downtown that gave the city its name. (The van Ginkels had, in fact, earlier worked to prevent encroachment on the mountainside park.) On the other hand, any siting was to respect the Theme committee’s edict on *Terre des Hommes*: “For us it implies man’s possession of the world or active manipulation by man of natural forces and social structures.”⁸⁸ The idea was endorsed by a powerful voice: Louis Kahn, who arrived in Lac Beauport as the PQAA’s keynote speaker. In an excursus otherwise coloured by characteristic mythico-poetic overstatement, Kahn first praised the PQAA committees and made suggestions on the world’s fair by describing its public function:

Therefore, in thinking just briefly, as I said to day [*sic*] and only yesterday, one of the things I realize is that probably it is not an institution. An exhibition – a world exhibition – is not an institution but is a kind of inspiration.... And then you begin to say, “Is it architecture as we know it?” I would say, No, because it is not an institution. Because every building that a man makes is answerable to an institution, either it be the institution of learning or the institution, I’ll say, of home or the

⁸⁶ “The 1967 International Exhibition at Montreal: PQAA Discusses Concept, Theme ‘*Mise en Scène*’ and Methods to Produce a Fair of Top Quality”, *Journal of the Royal Architectural Institute of Canada* (April 1963): 70-71; V. Prus et al., “*Mise en Scène*” (Province of Quebec Association of Architects Convention, January 1963): 4, Box 39-1990-002-35, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal; translation by author.

⁸⁷ V. Prus et al., “*Mise en Scène*” (Province of Quebec Association of Architects Convention, January 1963): 1, Box 39-1990-002-35, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

⁸⁸ “Heigh Ho Come to the Fair/Exhibition”, *The Canadian Architect* (March 1963): 104.

institution of business or government, there is something which is tangible and continuous, is changing in its rules, which has to do with architecture, but that of exhibition somehow transcends this necessity of holding to that which may be a continuant in the light of established institutions.... It isn't a question of fantasy, it's a question of starting from a beginning which has no precedence whatsoever....⁸⁹

To be uncoupled from institutional precedent – from architectural type – meant to be free of history and precedent. No longer seen as “buildings”, the world’s fair “will merely be, you might say, spaces, a realm of spaces”; “therefore to get around the buildings should be your main concern, architecturally. And the residual spaces which come from your system of movement throughout the entire exhibition should be the architecture of the exhibit.”⁹⁰ The solution lay in “viaduct architecture”, a recent manifestation of Kahn’s ongoing Philadelphia Centre City studies that had previously so influenced the van Ginkels and Team 10. In 1961, a grant from the Graham Foundation enabled Kahn to develop his ideas in a new project gathering public administration, commercial buildings, transport systems, and sports facilities within a civic complex connected by a system of elevated multilevel “viaducts” for the circulation of people, traffic, and infrastructure (specifically water).⁹¹ Kahn had spoken publicly about “architecture of movement” at the Team 10 meeting in Otterlo in 1959, where the van Ginkels were present.⁹² By the time he addressed the PQAA, he had rendered

⁸⁹ Louis Kahn, “Address Delivered by Louis I. Kahn, F.A.I.A. on Saturday, January 26th, 1963, at the P.Q.A.A. Convention”, 2, Box 39-1990-002-35, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

⁹⁰ *Ibid.*, 5.

⁹¹ Peter S. Reed, “Philadelphia Urban Design”, in David B. Brownlee and David G. De Long, eds., *Louis Kahn: In the Realm of Architecture* (New York: Rizzoli, 1991), 306-307.

⁹² Louis Kahn, “Talk at the Conclusion of the Otterlo Congress”, in Oscar Newman, ed., *CIAM '59 in Otterlo* (Stuttgart: Karl Krämer Verlag, 1961), 205-214.

his raised viaduct architecture as encircling the city and connecting to massive circular and triangular multipurpose interchanges that functionally permitted changes in direction and symbolically served as counterpoints to the existing grid (fig. 2.7). A powerful argument for concentrated urban life – thus opposing decentralisation – the idea was likely familiar to the PQAA delegates, not least given an interview of Kahn by the van Ginkels published a year earlier in the journal *Canadian Art*, with van Ginkel comparing Kahn’s theory to Le Corbusier’s *viaduc autostrade* plans circa 1930 and Kenzo Tange’s very recent Tokyo Bay proposal with its massive floating spine of civic institutions and ancillary axes of housing. Notwithstanding his interest in “institutions”, Kahn’s insistence on only “viaducts” reflected a consensus emerging at the PQAA congress for some kind of large-scale architecture animated by the movement of peoples and things and not dictated by the concerns of cultural representation.

The PQAA conference concluded with a resounding endorsement of *theme, concept, and mise-en-scène. Terre des Hommes, or Man and His World* (the perfect bilingual rejoinder necessary to Canadian identity politics), became the official statement on the world exhibition by the province’s architects. This massive elaboration on the *world* came with a price – \$40 million dollars, established by an agreement between the federal, provincial, and city governments signed ahead of the PQAA retreat.⁹³ The magazine *Canadian Architect*,

⁹³ “Agreement between the Government of Canada, the Government of the Province of Quebec, and the City of Montreal” (18 January 1963), n.p., Series VM3-S0-D3, Fonds du Secrétariat Général, City of Montreal Archives. The funding was divided between the federal (50%), provincial (37.5%) and city (12.5%) governments.

while reporting on the PQAA deliberations, thought the figure “impossibly low”.⁹⁴ The tripartite accord also gave a place – specifically on the island of Montreal, at least 500 acres in area, as free as possible of existing buildings, and near highways and infrastructure.⁹⁵ There was, finally, a deadline – land acquisition and expropriation was to be completed within six months and the site cleared exactly one year later, in June 1964.⁹⁶ In this, the van Ginkels’ ideas largely remained intact. As Montreal newspapers would report in early February, a waterfront site – among the areas first pinpointed in *Man in the City* – slated to receive federal assistance for slum clearance efforts was now “known to be under consideration as a site for the 1967 World’s Fair”.⁹⁷ At the very same moment, Claude Robillard, Montreal’s planning director and the van Ginkels’ ally who had advanced *Terre des Hommes* as theme, was made director general of planning of what was now officially called the Canadian World Exhibition.

In six short months, the Montreal world’s fair had seemingly crystallised a series of claims on the future of modern architecture as the basis of a federally funded and internationally symbolic urban experiment. Following the PQAA congress, *Man in the City* and *Man and His World* appeared reconciled. In a sense, this only required the former, as

⁹⁴ “Heigh Ho Come to the Fair/Exhibition”, 104.

⁹⁵ “Agreement between the Government of Canada, the Government of the Province of Quebec, and the City of Montreal”, n.p.

⁹⁶ *Ibid.*

⁹⁷ “Waterfront Area to Be Renovated”, *The Montreal Star* (February 14, 1963); Bill Bantey, “Fair Choice Down to Four Sites”, *The Gazette* (Montreal, February 11, 1963).

site, making public the latter, as *concept*. Yet as Lemco van Ginkel knew, there was a tension between the two. Two weeks before the PQAA meeting, she wrote to Lewis Mumford, the American historian and architecture critic who had long countered CIAM functionalism by insisting on decentralised regional planning (while also decrying humankind's alienation from metabolic life by its use of instrumental technology). Enclosing memoranda on Man in the City and Man and His World, Lemco van Ginkel alerted Mumford to efforts behind defining the world's fair. Mumford had in fact worked on the film *The City*, which, shown at the 1939 New York World's Fair, took as its theme the contrast between existing industrialised cities and planned "green towns". He saw world's fairs as fundamentally utopian sites, arguing in 1937:

The key to the Fair is the plan. In essence, a World's Fair is a miniature city, a very special kind of city, but still a city. If one is going to portray the possibilities of communal life in the remaining decades of the twentieth century – and that seems to be the general idea – it is with the primary visualization of the modern city, *any* modern city that the designers might have begun.⁹⁸

Unfortunately, "From this standpoint, the skeleton plan is incredibly old-fashioned." Now facing Robert Moses again at the helm of another New York world's fair, Mumford quickly replied to Lemco van Ginkel and encouraged her on "building a portion of the new city" and

⁹⁸ Lewis Mumford, "The World's Fair", *The New Yorker* (May 8, 1937) in Robert Wojtowicz, ed., *Sidewalk Critic: Lewis Mumford's Writings on New York* (New York: Princeton Architectural Press, 1998), 181. For Mumford, the ideal scenario was for the New York Architectural League, which was then exhibiting the upcoming 1939 world's fairs plans, to have "become an American version of the *Deutscher Werkbund*" – in other words, an institution committed to full-scale exhibitions of social housing.

eliminating any need for “national buildings”.⁹⁹ Lemco van Ginkel had, when writing to Mumford, actually conceded that even as “the mayor announced ‘Terre des Hommes’ as theme” it “was evident, however, that everyone still was thinking in terms of a conventional chauvinist free-for-all, complemented by the sales pitches of major industries – paying lip service to a theme.”¹⁰⁰ Thus,

Our two points can be separated – site and concept – although both result from the same philosophy. Being concerned with the future of Montreal, perhaps site is most important to us. All other proposals involve ancillary public works which would damage the future growth of the city.¹⁰¹

Prey to political manipulation, the Canadian World Exhibition could preserve its ethos – “we think of IGY and the Aswan Dam, and the international success of the ‘Family of Man’ exhibition” – by revivifying the city. To Lemco van Ginkel, only this could resist the drive toward short-lived spectacle.

The van Ginkels’ earliest hopes were remarkable statements on culture and design advanced ahead of a turbulent decade. Their insistence on a radical project was, however, to force a crisis within postwar modernism: the progressive thematisation of an ephemeral event like a world’s fair could only but be coopted by the inherently conservative basis of the nation state. It remained whether some sufficiently visionary statement – recalled in nineteenth-century exhibitions, drawn from suggestions on “open” structures, evoked in

⁹⁹ Lewis Mumford, Letter to Blanche Lemco van Ginkel (18 January 1963): 1-2, Series 27-A21-02, Fonds van Ginkel, Canadian Centre for Architecture, Montreal; van Wesemael, *Architecture of Instruction and Delight: A Socio-historical Analysis of World Exhibitions as a Didactic Phenomenon (1798-1851-1970)*, 465-466.

¹⁰⁰ Blanche Lemco van Ginkel, Letter to Lewis Mumford (January 11, 1963): 1, Series 27-A21-02, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

¹⁰¹ Ibid.

“viaduct architecture” – could achieve the utopian demands of the past six months. 1963
waited. So did a master plan and its architecture.

Chapter 3: Plan

The truth is that my ethmoid sinuses broke down on the eve of Fair Day, and this meant I had to visit the Fair carrying a box of Kleenex concealed in a copy of the Herald Tribune. When you can't breathe through your nose, Tomorrow seems strangely like the day before yesterday.

E.B. White, "The World of Tomorrow" (May 1939)

The demand was, finally, to organise the “world” singularly through architecture. To achieve it, Daniel van Ginkel was made chief planner of Expo 67 in January 1963. By December, he was gone. Public confusion on his being fired or resigning would only obscure the fact that the master plan was never to become “Man in the City”. Finally built on a pair of artificial islands in the middle of the St Lawrence River, and prey to political expediency, Expo 67 would be splintered into national, cultural, and corporate pavilions, each competing by its progressive or kitsch architecture, sometimes both.

Despite van Ginkel’s appointment, little would evolve as imagined. Soon after the approval of the world exhibition by the Bureau International des Expositions, Montreal mayor Jean Drapeau began signalling a retreat from Man in the City, finally insisting on a site outside the downtown core. Notwithstanding real concerns on sequestration and compensation accompanying urban renewal, Drapeau’s vision for Montreal lay in wily negotiating a cityscape, defined along linguistic lines, by forms of architectural patronage, with new cultural and corporate complexes built to satisfy shifting political alliances.¹ In this terrain, the world’s fair was simply to be kept at bay – it could never enter the everyday

¹ Drapeau had started his political career as an ardent Quebec nationalist, believing that French Canadians had a special mission to fulfill on the North American continent. By the 1960s, his view would be tempered by political expediency – a soft nationalism, perhaps, and one designed carefully to manipulate relations with the federal government.

politics of the city. The final islands site, actually adjacent to but forever divorced from the van Ginkels' original urban plan, was to be a spectacle of "monuments" for the "masses" as the mayor had already deemed. The provisional relation to the city centre served strictly to lend prestige to perceptions of wholesale urban change.

Still, a visionary project remained. The insistence on a site (in the city), a theme (of the facets of *man*), and an administration (by architects) gave contour to a massive complex that awaited architectural elaboration. Ahead of Drapeau's machinations, van Ginkel's authority over the Expo 67 master plan allowed vestiges of Man in the City to crystallise in remarkable architectural studies that, in their very technics and grounded in *au courant* concepts on city design, attempted to organise – and to make public – all forms of global cultural production. A belief remained in finding architectures capable of ordering a mass public outside the typical atomisation of world's fairs into competing pavilions. Indeed, by leaving behind *man* in the *city*, Expo 67 would gain an unexpected authority – a space, outside marketplace demands, for an honest test of theory.

THEME, REDUX

The PQAA had, during its retreat in late January 1963, advanced *Terre des Hommes* as both an intellectual and architectural preoccupation. Along with committees exploring *concept*, *theme*, and *mise-en-scène*, a group led by Raymond Affleck (the important Montreal architect who had assisted the van Ginkels on defining "Man and His World") addressed *methods* on "defending" the social and spatial values of the exhibition, which "will constantly be

threatened during the next four years”.² It was perhaps already the anticipation of Drapeau’s manoeuvrings and the realisation of a tepid commitment by a federal government holding the purse strings.

At stake was always preserving the theme against its cooption by private interest. Just as the van Ginkels had earlier argued for some kind of enlightened administration (attuned to the aesthetic and cultural project of setting the exhibition in the city), Affleck and his colleagues suggested two commissions – “without executive powers but impossible to ignore” – comprising experts from various fields working to define the theme along with “créateurs-techniciens” developing the actual design.³ Entering into joint venture, the van Ginkels and Affleck’s office Arcop continued to recommend a similar division of labour: sketched as a flow chart were, on the one hand, the architect, engineer, and planner working on the “Preliminary Site”; on the other hand was a “Brains Trust” tasked with “Development of Concept and Theme” (fig. 3.1). Both groups, while exchanging ideas but remaining within their disciplinary silos, were to produce the “Finalization of Theme & its Concretization as a Preliminary Plan”. From this, a series of “theme groups”, led by architects, would transform *Terre des Hommes* into discourses on built form. The deadline for ideas was September.

The links between design and society were, so far, conceived in the privileged view and aesthetic sensibility of the architect. This was, in fact, precisely what made the Montreal

² R. Affleck et al., “Méthodes pour assurer une Exposition de grande qualité visuelle” (Province of Quebec Association of Architects Convention, January 1963): 2, Box 39-1990-002-35, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal; translation by author.

³ Ibid., 3ff., translation by author; “PQAA Discusses Concept, Theme ‘*Mise en Scene*’ and Methods to Produce a Fair of Top Quality”, *Journal of the Royal Architectural Institute of Canada* (April 1963): 71.

exhibition so unique: its origins lay in the realm of “creative-technicians” and not by virtue of a vested technocratic class, no matter how progressive. The worldview was not only to define a scope for architecture as an equally didactic (a pavilion) and ameliorative (an urban plan) force – thereby ensuring a societal embrace of modernism – but to insist that any conceptualisation, periodisation, and selection would be done outside the norms of political sentiment and control. Hence the “Brains Trust”: architects were, in defining the exhibition architecture, to be aided by intellectuals and specialists – imagined responsible for things like *The Family of Man* or the International Geophysical Year – tasked with compiling the artefacts and ideas totaling the sub-themes of *Terre des Hommes*.

This search for a new globalism was to replace but remain as inspiring as the old nationalisms. *The Family of Man*, which had so influenced the van Ginkels’, exemplified this quest for a new political subjectivity in the aftermath of world war. On the one hand, the impetus was to declare modern man to be obsolete; on the other hand, the emergent late modernism was still based on a residual and fully modernist – deeply nineteenth-century – formal principle of a *system* or *plan* for modern life. Sigfried Giedion’s teleology – the great exhibitions as organisational forms for contemporary subjectivity – made the latter utterly clear to the architects. These very same kinds of systems of rationalisation had also produced horrors – Giedion’s excursus in *Mechanization Takes Command* on nineteenth-century Cincinnati slaughterhouses was a less than veiled reading of the Nazi concentration camps. Nevertheless the “function” of art – including architecture and, presumably, world’s fairs – was, as Laszlo Moholy-Nagy, whose “new vision” had shaped Giedion’s approach to history,

put it in a 1943 lecture on “The Contribution of the Arts to Social Reconstruction” to be “a seismograph of the relationships of the individual to the world, intuitive re-creation of the balance the emotional, intellectual and social existences of the individual.”⁴ Moholy-Nagy’s argument, advanced in the same year as Giedion’s “New Monumentality”, concluded on noting the Federal Art Project, a Depression-era Works Progress Administration undertaking that had only finished in 1943: “It represented a gigantic educational work, not in the sense that it ‘brought art to the people’ or created art for the people, but that it tried to anchor it in, with, among, and of the people.”⁵ There was, of course, an appeal to the state as provider of such social reconstruction – a sentiment echoed in New Monumentality and, of course, the van Ginkels’ plans. There was equally a rhetorical construction, marking the 1940s and 1950s, of a supranational ambition that was self-consciously public in orientation and broadly noble, eager, and magnanimous in spirit.⁶ By the end of the 1950s, the liberal idea of a global political identity may well have become fraught – somewhere, a Non-Aligned Movement further bifurcating Cold War lines; elsewhere, “Coca-Colonialism” carrying the cultural imperialism of American industry. Indeed, efforts to shape Canadian identity often responded to the looming spectre of *l’americanisme*, its popular culture to be resisted in the creation of homegrown institutions for the arts and communications, its military-industrial

⁴ Laszlo Moholy-Nagy, “The Contribution of the Arts to Social Reconstruction” (1943), in Richard Kostelanetz, ed., *Moholy-Nagy: An Anthology* (New York: Da Capo Press, 1970), 21; Blake Stimson, *The Pivot of the World: Photography and Its Nation* (Cambridge MA: The MIT Press, 2006), 16.

⁵ Moholy-Nagy, “The Contribution of the Arts to Social Reconstruction”, 21.

⁶ Stimson, *The Pivot of the World: Photography and Its Nation*, 18.

complex to be challenged by asserting a global “middle power”, as Lester B. Pearson, the Nobel Peace Prize laureate and soon-to-be Prime Minister, demanded; the Canadian Centennial certainly owed to this condition of nation building. The Montreal world’s fair was early imagined as a laboratory on the *problems, aspirations, needs, environment, spirit, and family* of “man” – categories, tinged by a popular embrace of existentialism that equally coloured Team 10’s apparent rejection of CIAM rationalism, redolent of the ways in which *culture*, elevated by ideas on and sentiments of a new postwar subjectivity, would, here by virtue of an urbanistic demand, constitute a new public sphere.⁷ Just as in the van Ginkels’ 1959 CMHC design exhibition prospectus or the counterforms of Man in the City, artistic and social imaginaries were, it was believed, fundamentally intertwined.

Thus, again, the Brains Trust. The architects’ ideals – to define the exhibition as arising from uniquely new aesthetic, social, and technological possibilities – would crystallise at the famed Montebello Conference. In late May 1963, a select group of leading Canadian intellectuals, chosen from a list of one hundred eminent thinkers for “their depth of culture and originality of thought”, gathered inside the august Seigniory Club in the picturesque village of Montebello, Quebec, to define the very ethos of the Montreal world exhibition. In journalistic accounts, popular histories, and official reports, Montebello would be elevated to the status of myth, regularly given the distinction of having invented *Terre des Hommes* as

⁷ Stimson, *The Pivot of the World: Photography and Its Nation*, 19. Stimson notes the 1962 publication of Jürgen Habermas’s book *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society* (*Strukturwandel der Öffentlichkeit. Untersuchungen zu einer Kategorie der bürgerlichen Gesellschaft*). Though not translated into English until 1989, Habermas’s book is symptomatic of postwar efforts to elevate *culture* to a level of public, thus political, discourse.

theme, thus of creating the exhibition *ex nihilo*. While mistaken – *Terre des Hommes* owed, of course, to the January PQAA retreat and earlier discussions in the van Ginkels’ circle – the statement, incessantly repeated until the fair’s completion, indicated, first, how little the original deliberations had circulated outside Montreal, and, second, the need to establish a popular sense of origins.⁸ That the world’s fair could be seen arising from a host of concerns – advancements in science, elevation of the arts, rise of new universities, and bases of a bilingual nation – was to ensure publicly that the grand gesture of the Centennial was truly a homegrown but worldly project. As newspaper headlines reported, “Le Colloque des ‘12’ a donné à l’Exposition sa Grande Charte”.⁹ Privately, the conferees would work tirelessly to buttress the theme against its cooption by narrow political interests.

The members of the Montebello Conference were appointed by the Board of Governors for Canadian Corporation for the World Exhibition. Alan Jarvis, Director of the Canadian Conference on the Arts, Wilder Penfield, the ground-breaking neurosurgeon known in his lifetime as “the greatest living Canadian”, and Gabrielle Roy, the acclaimed French Canadian author, joined colleagues from the arts, sciences, and law. Among them

⁸ *The Canadian Architect* and the *Journal of the Royal Architectural Institute of Canada*, the main organs of architecture culture, featured the PQAA event in their respective March and April issues. *Terre des Hommes/Man and His World*, a widely circulating and popular book officially published by the Canadian Corporation for the World Exhibition at the close of Expo 67, would, in a preface by the Montebello conferee and famed author Gabrielle Roy, make Montebello the source of *Terre des Hommes*. In April 1963, Michel Chevalier could suggest that “identification with the exhibition hardly exists outside Montreal, or possibly the Province of Quebec” while insisting that it was already “one of the great Canadian undertakings – to rival the C.P.R.” – the transcontinental railroad completed in 1885 – “and the [St Lawrence] the Seaway” that opened in 1959. See: Chevalier, “The World’s Fair – A Planning Challenge”, *Revue Canadienne d’Urbanisme* Vol. XIII, No. 4 (1963): 29.

⁹ “Le Colloque des ‘12’ a donné à l’Exposition sa Grande Charte”, *La Presse* (Montreal, 25 May 1963): 3, 6.

were the Montreal architects Victor Prus and Raymond Affleck, who had respectively chaired the sessions on *Mise-en-Scène* and *Méthodes* at the PQAA retreat, and Claude Robillard, the recently appointed exhibition master planner (seconded from his role as Director of the Montreal City Planning Department) and the van Ginkels' ally, who had rendered "Man and His World" as *Terre des Hommes* while retroactively couching it Antoine de Saint-Exupéry's book. Their participation continued the mission to transform *Terre des Hommes* into constituent themes and architectural plans.

Arguing in terms of the universalising nature of undertakings like *The Family of Man*, the Montebello group called for a project of "transhumanism". This was not, the conferees decided, something that fully existed; it was, rather, an idea, a feeling, felt emerging in human consciousness and requiring concrete expression. Transhumanism had been outlined only a few years earlier by the British evolutionary biologist Julian Huxley. Descended from a distinguished family of scientists (his grandfather Thomas Henry Huxley was a friend and supporter of Charles Darwin) and intellectuals (his brother being the novelist Aldous Huxley), Huxley had been the force behind the "modern evolutionary synthesis", the union of biological ideas shaping a widely accepted account of natural selection. He was, moreover, an internationalist, the first Director-General of UNESCO in 1946, and a prominent populariser of science to the public by the 1950s.¹⁰ Huxley's humanism drew on his abiding belief in evolutionary theory, thus in *progress* (a notion that would condition the

¹⁰ On Huxley's framing of UNESCO, see: Huxley, *UNESCO: its Purpose and its Philosophy* (Washington Public Affairs Press, 1948). Following his work with UNESCO, Huxley helped to found the World Wildlife Fund.

Montebello deliberations).¹¹ Believing that humankind could better itself through science and technology – “The scientific and technical explorations have given the Common Man all over the world a notion of physical possibilities” – Huxley posited,

The new understanding of the universe has come about through the new knowledge amassed in the last hundred years – by psychologists, biologists, and other scientists, by archaeologists, anthropologists, and historians. It has defined man’s responsibility and destiny – to be an agent for the rest of the world in the job of realizing its inherent potentialities as fully as possible.¹²

This deeply *modern* experience and consciousness – which matched the historical arc borrowed by the van Ginkels from Giedion and coincided with the Canadian centennial – was, for Huxley, intimately tied to improving the social environment; any agency provoking change – that is, social benefit – was essentially “good”.¹³ Huxley had in fact written *TVA:*

Adventure in Planning, published by The Architectural Press in Great Britain in 1943, which

¹¹ The author Gabrielle Roy, a members of the Montebello conference, described “faith in progress” as an abiding concern among the Montebello group: “Rather than the acquisition of more material and spiritual ease, progress should signify an increasingly equitable human distribution of misfortune and advantage. To progress then would mean to work toward a gradual ‘rapprochement’ of all men of every condition and origin.” See: Roy, “The Theme Unfolded by Gabrielle Roy”, *Terre des hommes. Man and His World* (Ottawa: Canadian Corporation for the 1967 World Exhibition, 1967), 26.

¹² Julian Huxley, “Transhumanism”, in *New Bottles for New Wine* (London: Chatto & Windus, 1957), 13-17; reprinted as *Knowledge, Morality, Destiny* (New York: Mentor, 1960). Huxley’s “transhumanism” extended to defending the French Jesuit-palaeontologist Pierre Teilhard de Chardin, who he believed had been unfairly maligned by the Catholic hierarchy for accepting evolutionary theory and coining the idea of “Omega Point” (an evolutionary moment culminating in some supreme consciousness). Huxley wrote the introduction to Teilhard’s *The Phenomenon of Man* (1959). Lending gravitas to their deliberations, the Montebello conferees concluded their proposal on the Expo 67 theme by quoting Teilhard; see: “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, Report of the Montebello Conference (May 1963): 13, Box 39-1990-07-001, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal. Huxley defended the ideals of democracy, humanism, and science in a series of books – including *Man in the Modern World* (London: Chatto & Windus, 1947) – written during and immediately after the Second World War. Given its publication date, his 1961 book *The Humanist Frame* may well have influenced the Expo 67 architects.

¹³ Peter Medawar, “Evolutionary Humanism”, in Alan Bullock and Oliver Stallybrass, eds., *The Fontana Dictionary of Modern Thought* (London: Fontana Books, 1977), 219.

sympathetically detailed the regional planning efforts – shown in countless photographs of dams, parks, and new homes – of the Tennessee Valley Authority: “The initials TVA are beginning to be familiar as the symbol of a new possibility for the democratic countries – the possibility of obtaining the efficiency of a co-ordinated plan without totalitarian regimentation.”¹⁴ Here given clear architectural and urbanistic contour, *transhumanism* was a riposte to authoritarianism but stood for the statist control of resources – “planning” – as necessary to popular democracy. Inspired by Huxley, the Montebello group declared:

Modern man is transcending the boundaries which so long contained and directed his spiritual and material aspirations. He must impose on the world of 1967 new concepts of community, permitting unity and harmony between peoples to develop within their external diversities and in a spirit of respect for the human personality. The knowledge he has acquired of the world around him has brought modern man to a point where, having learned to escape the law of universal gravitation, the abilities he has developed now impel him to attack the evils which heretofore have been part and parcel of his existence: hunger and thirst, anxiety and war, suffering an disease, cold and drought, degrading labour, natural disaster, etc.¹⁵

Against the horrors of war and disease, the march of science and technology – outer space having been reached in the years between Huxley’s “Transhumanism” essay and the Montebello conference – brought not only the mechanisms for but a consciousness of social change. If some architectural idea was emerging, then it arose in the suggestion of *imposing* “new concepts of community”. At the level of the “world”, this meant a polemical definition

¹⁴ Julian Huxley, *TVA: Adventure in Planning* (Cheim, Great Britain: The Architectural Press, 1943), 7. Huxley’s sentiment neatly coincided with the exact moment that British and Canadian planners began imagining postwar urbanism. The MARS group, the British CIAM chapter, had issued its plan for London in 1942. While the British looked, in part, to solving wartime destruction of cities, Canadian efforts – among the very first instances of modernism in the country – were largely focused on housing and regional planning.

¹⁵ “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, Report of the Montebello Conference (May 1963): 1, Box 39-1990-07-001, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

of *themes* challenging established political orders by “transcending the boundaries” of cultures and nations.

Before explaining just what this architectural space might be, the Montebello group insisted on a further evocation of transhumanism. They returned to Saint-Exupéry. Noting that *Terre des Hommes*, the title of Saint-Exupéry’s book, “has been chosen as the central motif”, the “intent will be to examine the behaviour of man in his environment, extolling this achievements in the fields of ideas, culture and science”.¹⁶ As such,

One of the principle ideas contained in “Terre des Hommes” is the exaltation of man’s occupation. St. Exupéry [*sic*] speaks of its importance on almost every page; “The requirements of an occupation transform and enrich the world.” “The grandeur of an occupation lies perhaps most of all in its ability to unite men.” The fair will show men at their work: men chosen from various occupations, some humble and undistinguished....

Thus,

The striking complexity of a group working together should be communicated – from the small team formed by a mason and a carpenter to the group of 20,000 required to launch man into space. “To be a man,” said St. Exupéry [*sic*], “is to feel that one’s own stone contributes to building the edifice of the world.”¹⁷

The closing phrase later would be ceaselessly quoted as the exhibition’s motif. For now, the emphasis on the complexity of *work* was expressly to convey Robillard’s argument against technology as artefact: “I thought the time was over when we could have world exhibitions of

¹⁶ Ibid.

¹⁷ Ibid., 8. Saint-Exupéry’s words were abridged from a passage in which he described “The Men”, the pioneering pilots to which he belonged: “To be a man is, precisely, to be responsible. It is to feel shame at the sight of what seems to be unmerited misery. It is to take pride in a victory won by one’s comrades. It is to feel, when setting one’s stone, that one is contributing to the building of the world.” See: Antoine de Saint-Exupéry, *Wind, Sand and Stars*, trans. Lewis Galantière (1939; London: Heinemann, 1954), 49.

the latest screwdriver, and that it was time the accent was placed on man rather than on his inventions.”¹⁸ Saint-Exupéry’s definition of “man”, not necessarily doctrinal and always vaguely spiritual, stressed the power of the creative imagination, the importance of fraternal bonds, the appeal of moral idealism, and the organic rootedness of culture (often rurality); his resulting ideal society was to be curiously liberated from machinery and industry, a paradoxical evocation for someone whose fame was associated with aviation.¹⁹ Borrowing from this sense of humankind’s collective shaping of its environment, the Montebello committee would request, to no avail, “that the English translation be ‘Man in His World’ rather than ‘Man and His World’.”²⁰ The notion of being immersed “in” things was to resist any sense of the “world” as a mediated appendage to “man”. The liberal humanism of the theme aimed at arousing emotion, to attract but also to disturb, while remaining educational even as some millenarian impulse was awakened:

The Canadian World Exhibition, unlike preceding exhibitions, will lay considerably less stress on contemporary technical advances. It will be concerned more with the craftsman than with his tools; it will be centred around man as he works to achieve his destiny and as he carries out his myriad occupations on earth.²¹

¹⁸ Claude Robillard quoted in Pierre Berton, *1967: The Last Good Year* (Toronto: Doubleday Canada Ltd, 1997), 258.

¹⁹ S. Benyon John, “Saint-Exupéry’s *Pilote de Guerre*: Testimony, Art and Ideology”, in Roderick Kedward and Roger Austin, eds., *Vichy France and the Resistance: Culture and Ideology* (London and Sydney: Croom Helm Ltd, 1985), 91.

²⁰ Lucien Piché, Letter to Paul Bienvenu (May 31st, 1963): 2, Fonds van Ginkel 27-A21-04, Canadian Centre for Architecture, Montreal. Piché, vice rector of the Université de Montréal, was member of the exposition’s administrative council.

²¹ “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, 1.

Even as Saint-Exupéry's reactionary romanticism grew from finding needs for "order", the Montebello group's invocation of "craft" was not an appeal to an idealised notion of organic community (versus society) or culture (versus civilisation). Never acknowledged, it drew on Saint-Exupéry's opening chapter of *Terre des Hommes*, "La Ligne", or "The Craft", which here stood for the skill of flying.²² The pilot was not to be classed "with toreadors and gamblers", risk-takers heedlessly contemptuous of death.²³ Rather, the pilot—like the preferred examples of the shepherd, the peasant farmer, or the village craftsman—serving *la ligne* was to be judged as fulfilling a greater purpose. As aviator for the Compagnie Générale Aéropostale, Saint-Exupéry repeatedly evoked the urgency of delivering *les postes* no matter the conditions; the lesson was one of overcoming narrow self-interest and serving some greater common ideal. The very idea of the airline, as a network of communications, was, therefore, raised to an idea on human fraternity and community.²⁴ Modernity was evinced not in the supremacy of technology but in its capacity progressively to narrow differences between peoples.

Thus, the airplane—"The Tool"—became a crucial symbol. On the one hand, Saint-Exupéry looked warily at the advance of instrumental technology, fearing its dehumanising capacity. On the other hand, he insisted that "thanks to the metal, and by

²² *La ligne* was also shorthand for Société des Lignes Latécoère, also known as Lignes Aériennes Latécoère, which became Compagnie Générale Aéropostale.

²³ Saint-Exupéry, *Wind, Sand and Stars*, 49.

²⁴ S. Benyon John, *Saint-Exupéry: Vol de Nuit and Terre des Hommes* (London: Grant & Cutler Ltd, 1990), 52-53.

virtue of it, the pilot rediscovers nature.”²⁵ Nature, consistently rendered as sublime, was to be feared for its awesome power but celebrated in the possibilities of limitless discovery:

The central struggle of men has ever been to understand one another, to join together for the common weal. And it is this very thing that the machine helps them to do! It begins by annihilating time and space.²⁶

The collapse of peoples – considered not in racial terms but by bonds of fellowship – was irrevocably tied to the rediscovery, granted by technology, of the world. The Montebello deliberations, free from nostalgic evocations of craftspeople and their products, were couched in a repeated refrain of “exploration”: “This spirit of challenge and questioning, rather [than] a self-satisfied sense of achievement, should also animate the presentation of all thematic material.”²⁷ There would be neither an appeal to a mythic past nor an acceptance of arriving at a historical plateau: not “a museum of inventions” but “language... from ideograms, the alphabet, algebra, graphic symbols, up to the symbolic codes of chemistry, electronics, road signs and others”; the goal was “not to set up a general Museum of Man” – “We do not envisage a pantheon of thinkers, artists, saints of champions” – but to offer “a vivid representation of the exercises of craft occupations as they relate to different societies”.²⁸

Again, the *crafts* were any number of ways and means – ideas and technologies – by which

²⁵ Saint-Exupéry, *Wind, Sand and Stars*, 55.

²⁶ Saint-Exupéry, *Wind, Sand and Stars*, 56. When describing the experience of flying, Saint-Exupéry consistently subordinated the power of the machine to that of natural phenomena: “Air and water, and not machinery, are the concern of the hydroplane pilot about to take off” (59).

²⁷ “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, 12.

²⁸ *Ibid.*, 9, 7.

people were changing the world. As much as *things* (artefacts) were important – there was, after all, a didactic purpose of communicating to a mass public – emphasis was to be placed on *processes* of scientific and artistic discovery. “Exploration” – *leitmotif* of Huxley’s transhumanism: “exploration of human nature and its possibilities has scarcely begun. A vast New World of uncharted possibilities awaits its Columbus.” – was, adumbrated by the Montebello group’s respective disciplines, to be the overarching theme:

Human exploration, whether it be of the earth or of the mind, past, present, or future affords unusual opportunities for significant exhibits. Biological and physical research, the development of medical therapy or of mechanized, the visual and auditory arts, all these are explorations peculiar to the different members of the family of nations. Molecular biology, the theory of stress, the techniques of neurosurgery and the problems of longevity are fields of modern research that have special interest and actuality.

It should be emphasized that scientific research is not the only form of exploration in which man is engaged today. Humanity is also devoting many of its resources to research in the field of culture and ideas.²⁹

The mapping of human endeavour – the conferees now identified “Man the Explorer” as agent of the theme – could realign very different engagements of the world. Transhumanism also meant illustrating “examples of collective transnational undertakings”. To display the efforts of these kinds of undertakings – namely UNESCO – was to prove “the need for expanded systems of government”; this would, in turn, “point up the archaic lack of functionalism in certain types of government and the newly discovered value

²⁹ Julian Huxley, “Transhumanism”, in *New Bottles for New Wine* (London: Chatto & Windus, 1957), 13-17, reprinted as *Knowledge, Morality, Destiny* (New York: Mentor, 1960); “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, 6.

of supranational governments.”³⁰ Lest any ambiguity have remained in the radical political suggestion, the Montebello group emphatically declared:

The entire development of the Exhibition on the site shall reflect the premacy [sic] given to human values and aspirations in the theme “Terre des Hommes”. It must not be presented as a “Terre des nations” or a “Terre des machines.”³¹

It was, in short, the eclipse of nations and corporations. The lack of *functionalism* evinced in outmoded forms of governance could very well have been an architectural critique. The sentiment soon came to define the ideal – but short-lived – master plan.

It was the status of humans and not necessarily their objects that was to be terms of critique, thus display. There was, *pace* the van Ginkels, a residue of Team 10 theory – namely, an insistence on reintroducing into modern architecture the experience of “community”; this was meant to resist the social “mass” as the departure point for design by substituting the figure of “man” when solving “problems of the human habitat” (the theme of the 1956 CIAM congress prepared by Team 10). In similar terms, the Montebello group drew on Saint-Exupéry to offer the dis-alienation of “man” from the “world” via themes confronting the supremacy of instrumental technology by the liberative force of creative work. That this indicated some conceptual affinity to Hannah Arendt’s notion on “*vita activa*” was likely not accidental given the popularity of her 1958 book *The Human*

³⁰ “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, 9.

³¹ Ibid., 2. The wording stemmed from a subcommittee that included both Affleck and Robillard, who had been present at the PQAA retreat; see: Claude Robillard, Jean-Louis Roux, Alan Jarvis, and Ray Affleck, “Report of Sub-Committee #3”, Montebello Conference (May 24, 1963): 1, Series D03.9-109-26-TD, Fonds Guy Desbarats, Canadian Centre for Architecture, Montreal.

Condition. In this study on modern humanity and political freedom, Arendt designated three activities as fundamental to a *vita activa*: *labour*, which “corresponds to the biological processes of the human body” and as *private* and *impermanent* aims only at the renewal of life; *work*, which “corresponds to the unnaturalness of human existence” and as *public* and *permanent* provides an artificial world of things; and *action*, “the only activity that goes on between men without the intermediary of things and matter” – thus corresponding, in terms of *Terre des Hommes*, to the condition of “plurality, to the fact that men, not Man, live on the earth and inhabit the world.”³² *Action* was, therefore, political activity; but *work* produced *homo faber*, an agent of modern life and consciousness responsible for producing the “world of things”: “If *animal laborans* needs the help of *homo faber* to ease his labor and remove his pain, and if mortals need his help to erect a home on earth” – at Montebello, an echo of Saint-Exupéry’s exhortation on “building the edifice of the world” – “acting and speaking men need the help of *homo faber* in his highest capacity, that is, the help of the artist, of poets and historiographers, of monument-builders or writers, because without them the only product of their activity the story they enact and tell, would not survive at all.”³³ The resulting suggestion of some kind of tangible public realm – “the human artifice must be a place fit for action and speech” – fit the discursive framework of the world exhibition (with its origin in *Man in the City*) and its agents: “monument-builders”, or architects. Just as Arendt had insisted that “the measure can be neither the driving necessity of biological life

³² Hannah Ardent, *The Human Condition* (1958; Chicago: The University of Chicago Press, 1998), 7-9; Kenneth Frampton, “The Status of Man and the Status of His Object”, *Architectural Design* 7/8 (1982): 7.

³³ Ardent, *The Human Condition*, 173.

and labor nor the utilitarian instrumentalism of fabrication and usage”, the Montebello group imagined an exhibition defined by “man” responsible not only for creating “tools, arts, science, rules of moral behaviour” but the “powerful method of scientific research”.³⁴ A subcommittee including the architects Robillard and Affleck put it succinctly: “Man and his many metiers is a major component of ‘Terre des Hommes’ and the Montreal Fair provides a unique and timely opportunity to express this aspect of the human condition.”³⁵ The world’s fair was, in other words, to communicate ever-changing relations between peoples and things, thus privileging inquiry and debate as bulwark against, again, the determinations of nations and machines.

In setting *exploration* as theme, the Montebello group’s use of Saint-Exupéry introduced, however unknowingly, a unique vision on modern architecture. Saint-Exupéry and his pioneering aviator friend Jean Mermoz had flown Le Corbusier over North Africa and South America during an especially fertile period, beginning in the late 1920s, of his considerations on urbanism.³⁶ The airplane was early upheld by Le Corbusier as *gestalt* entity of functionalism; his famous phrase “The house is machine for living in” was, in fact, preceded by the observation that “The airplane is a product of close selection”, thus “The

³⁴ “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, 6-7.

³⁵ Robillard, et al., “Report of Sub-Committee #3”, Montebello Conference (May 24, 1963): 4; Michel Chevalier, “Position Papers Theme Development No. 1” (June 17th, 1963): 7, Box 27-A21-04, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

³⁶ Le Corbusier also flew with the aviator François Durafour over the Atlas Mountains. In *Terre des Hommes*, Saint-Exupéry writes movingly of Mermoz’s courage and skill as a pilot when describing his disappearance at sea in December 1936.

lesson of the airplane lies in the logic which governed the statement of the problem and its realization.”³⁷ The aesthetico-formalist argument, on perfected mechanical forms described by the criteria evolutionary biology, would change as Le Corbusier took to the air. From above, the world appeared to Saint-Exupéry and Le Corbusier as an abstract and perfectly ordered visual pattern punctuated by cities appearing as indistinct foci to be discovered only upon landing.³⁸ Like Saint-Exupéry, Le Corbusier found in the synoptic aerial view – whether taken over the Maghreb or flying between Rio de Janeiro, São Paulo, and Montevideo – a profound pathos owing to a perceived fissure between the rootless character of modern technology (here paradoxically affording initiation to the cosmic laws governing the universe) and the rootedness of pre-industrial cultures.³⁹ Nevertheless, the freedom of movement – “The airplane flies direct from one point to another indifferent to the contours of the earth”, he declared in his book *Aircraft* of 1935 – gave lessons on an urbanism capable of overcoming alienation from nature: the forceful vistas of endlessly winding rivers in Brazil – “a vast programme of organic town planning came like a revelation” – were suddenly rendered as viaduct cities following a new “law of the meander” and extending over the landscape with Olympian force (fig. 3.2).⁴⁰ Beyond previous modernist technologies of

³⁷ Le Corbusier, *Towards a New Architecture*, (1923; New York: Dover, 1986), 107.

³⁸ Davide Deriu, “The Ascent of the Modern *Planeur*: Aerial Images and Urban Imaginary in the 1920s”, in Christian Emden, Catherine Keen, and David Midgley, eds., *Imagining the City Vol. 1: The Art of Urban Living* (Oxford UK: Peter Lang, 2006), 201.

³⁹ Kenneth Frampton, *Le Corbusier* (London: Thames & Hudson, 2001), 107; Stanislaus von Moos, *Le Corbusier: Elements of a Synthesis* (Cambridge MA: The MIT Press), 289-290.

⁴⁰ Le Corbusier, *Aircraft* (1935; London: Trefoil Press, 1987), n.p., captions 8 and 112; Frampton, *Le Corbusier*, 107. Le Corbusier described his “law of the meander” in *Precisions: On the Present State of*

vision, whether panoramic or panoptical (modes of beholding central to world's fairs), the aerial view gave sense of an Archimedean point at which the world could be observed as a totality and transformed. (To a previous generation, this had been the apocalyptic realisation of death from above; Le Corbusier had, in *La Ville Radieuse*, fantastically rendered tall buildings as preternaturally resistant to aerial bombardment. To a newer generation, like those gathered at Montebello, and notwithstanding the fear of invisible air bursts of thermonuclear weapons detonated far above the earth, it was now a more hopeful vision bestowed by an awareness of the Earth as seen from outer space; indeed, Arendt's opening to *The Human Condition* was the mention of Sputnik.) Thus the *viaduc autostrade* that, simultaneously conforming to and confronting the landscape, displaced the abstract division of space assumed in *The Athens Charter*: it was precisely this kind of architecture that Daniel van Ginkel had, when describing an architecture of movement, upheld as paradigm for contemporary works like Kenzo Tange's Tokyo Bay plan, not least given the well-known bird's eye views of a model forcefully juxtaposing the linear city across water and land, with its distant reaches extending into the landscape as if vascular lines of a leaf (fig. 3.3). Still, if the view from the air was to expose the limits of town planning, then it was also to neutralise the boundaries of political power. Le Corbusier had sensed as much (and likely saw himself in the mould of a pioneering aviator). Like Saint-Exupéry, he was seduced by the double vision of analysis and revelation: in the *temps nouveaux* of a second machine age, the ancient

Architecture and City Planning, trans. by Edith Schreiber Aujame (1930; Cambridge MA: The MIT Press, 1991), 142.

concentric city, which continued to exist into the twentieth century, would be rendered obsolete by geomorphic structures reaching across the land.⁴¹ The seedbed of “transhumanism”, or “Man and His World”, lay precisely in this ability to envision entirely new kinds of geopolitical alignments.

The terrestrial projection was finally to lend the world exhibition an architectural plan. Arendt’s Archimedean point – defined as revealing, on the one hand, an awe-inspiring view onto the world and, on the other hand, a techno-science reducing all human activity to *process* – was couched in understanding “that both despair and triumph are inherent in the same event.”⁴² Thus,

If one wishes to draw a distinctive line between the modern age and the world we have come to live in, he may well find it in the difference between a science which looks upon nature from a universal standpoint and thus acquires a universal mastery over her, on the one hand, and a truly “universal” science, on the other, which imports cosmic processes into nature even at the obvious risk of destroying her and, with her, man’s mastership over her.⁴³

Recognising that the very same destructive power was also a creative one, the Montebello members noted, when drawing on Saint-Exupéry’s idea that some kind of omniscient view could both parse and unite the attributes of “man”, that the world exhibition could express the liberative aspects of science while revealing instances of human misery. This conjoined sense of “exploration”, as facet of *transhumanism*, would, in a discursive step critical to the

⁴¹ M. Christine Boyer, “Aviation and the Aerial View: Le Corbusier’s Spatial Transformations in the 1930s and 1940s”, *Diacritics* (Autumn-Winter 2003): 96.

⁴² Arendt, *The Human Condition*, 262.

⁴³ *Ibid.*, 268.

future exhibition, find the Montebello delegates updating the van Ginkels' original categories of "man" (*problems, aspirations, needs, environment, spirit, and family*) with the new concept of a "Theme Area". This "precinct" would announce "THE EARTH, HOME OF MANKIND (MYSTERES DE LA PLANETE)" in "a grand entry hall" feeding into "three major halls leading one to the other" – showing "The earth and space", "The resources of the earth", and "The problems of man on the earth" – with "satellite rooms branching off it, where subordinate aspects of the theme could be entrusted to large industrial corporations".⁴⁴ The spirit of subordinating things like corporations to a *theme* was to define the master plan. This meant, first, a *Place des peuples* "organized in such a way that all nations, large or small, will be represented with more or less the same importance and space".⁴⁵ To the planner Robillard and the architect Affleck, it also meant a *Place du Canada* conceived not as an architectural contrivance but in terms of moral agency granting ways to spatialise the fair: "Canada should undertake the financing, organizing and construction of a significant number of exhibition precincts related devoted to definite aspects of the theme".⁴⁶ Canadian nationhood – a project considered only 100 years old, thus made truly modern – was to encapsulate global concerns – "based on significance to mankind [*sic*] as opposed to Canadiana", as another report soon insisted – by exhibiting three things: the "development of the Arctic lands in relation to human population and production", the "phenomenon of

⁴⁴ "The Theme 'Terre des Hommes' and its Development at the Canadian World Exhibition in Montreal, 1967", 4-5.

⁴⁵ *Ibid.*, 3.

⁴⁶ *Ibid.*, 2ff.

the urbanization of mankind and the questions it raises about the possibilities of the ‘ideal city’ as against the present reality”, and the “development of arid lands, also in relation to the population explosion”.⁴⁷ Together, these unfolding facets – themes and sub-themes – of “Man the Explorer” would actualise the master plan: “each of these precincts might be thought of as a small campus” but “maintenance of urban coherence within and between precincts must be a primary visual aim”.⁴⁸ In a sense, the dialectic of fragmented cultures or landscapes (the places, perhaps, of *animal laborans*) and their unification under the aviator’s omniscient view (the acts of *homo faber*), as gleaned from Saint-Exupéry (or seen in Arendt’s Archimedean point), was made the method of realising the exhibition architecture.

The “precincts” preserved an idea developed months earlier by Affleck and the van Ginkels. They had envisioned *themes* serving as “components” of a “single structure”, “a group of buildings”, or “a compound”.⁴⁹ The spatial implication, updated at Montebello, was clear: architectures registered at the critical mass – the public space – of the city. There was something more. It was a recollection, however faint, of the nineteenth-century structures meant to inspire ideas on the Montreal exhibition: engineered, modular, prefabricated architectures reorganising “man” by the qualitative equalisation of “things” – the “world” synthesised in miniature by appropriately massive forms.

⁴⁷ Robillard et al., “Report of Sub-Committee #3”, 4.

⁴⁸ “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, 2-3.

⁴⁹ R. Affleck, Michel Chevalier, R. Lemoyne, Hazen Sise, H.P.D. and B.L van Ginkel, “1967 Montreal World Fair” (October 29, 1962): 3, Fonds Gilles Gagnon, 39-1991-02-005, Canadian Centre for Architecture, Montreal. Well before the seminal Montebello conference, these Montreal architects had identified “Man and His World” as an organising principle.

ISLANDS

Convened by the CCWE, Montebello defined the world's fair. The twelve members "*de grande envergure*" were fêted for their wisdom.⁵⁰ Their *Grande Charte* was circulated in the two national languages, translated into Spanish, Italian, German, and Russian, and immediately sent to 150 countries and international agencies. *Terre des Hommes* was made the unifying motif. "Transhumanism" became the basis of formally inviting nations to join in 1967. The Universal and World Exhibition would, in a masterstroke of marketing, be rechristened Expo 67.

There was, however, a note of hesitation, even desperation. The Montebello group, not least Robillard and Affleck, had concluded its deliberations by insisting on the *city* as measure: "Montreal and its environs provide a uniquely challenging and exciting site for a Universal Exhibition, if the 'sense of place' is to be realized to its full potential".⁵¹ Asking that the fair be linked to "the complex life of the city itself", the conferees echoed Louis Kahn's earlier endorsement of the PQAA proposals when recognising the St Lawrence River as staging the site. Kahn had seen the river in heroic terms with a series of gateways leading from it to the exhibition, thus to the city. It was partly a statement on his "viaduct architecture" but otherwise a confirmation of the van Ginkels' preferred site of Point-Saint-

⁵⁰ "Le colloque des '12' a donné à l'Exposition sa Grande Charte", *La Presse* (Montreal, 25 May 1963): 3, 6; "Une 'Place des Nations' devrait illustrer le theme de l'Expo", *Le Devoir* (Montreal, 25 May 1963).

⁵¹ "The Theme 'Terre des Hommes' and its Development at the Canadian World Exhibition in Montreal, 1967", 13.

Charles, a riverside working class district officially slated for slum clearance that had appeared as a major node in their Man in the City proposal (which had been sent to the BIE, was now on display in the CCWE offices, and encapsulated the sites preferred by Robillard's City Planning Department).⁵² Yet the Montebello delegates did not press further. The river was only to orchestrate an "arrangement of vistas looking outward from the Exhibition site itself" – or to be seen from boats. The mood was uncharacteristically picturesque.

The architects had counted on the authority of *city* as crystallising the future needs of "man". Urbanism was made a moral imperative. Kahn's approval was soon followed by that of André Wogenscky, the French architect and formerly the head of Le Corbusier's *atelier*. Visiting Montreal shortly after the PQAA retreat and speaking publicly to the Club des Beaux Arts, Wogenscky argued for building in an old area without historical interest and, as the *Montreal Star* reported, "urged World's Fair planners to build 'an ultra-modern city within a city' for 1967 – instead of the 'grand visual cacophony' into which such exhibitions usually blossom."⁵³ It was, of course, the van Ginkels' Man in the City, now contextualised by someone responsible for transforming *La Ville Radieuse* into works like the Unité d'Habitation.

Yet in their appeals to modern architecture, the architects had discounted the authority of "visual cacophony" – of spectacle. Here, they encountered a mayor's

⁵² Guy R. Legault, *La ville qu'on a bâtie: Trente ans au service de l'urbanisme et de l'habitation à Montréal 1956-1986* (Montreal: Editions Liber, 2002), 73ff; Yves Jasmin, *La Petite Histoire d'Expo 67: l'Expo 67 comme vous ne l'avez jamais vue* (Montréal: Québec/Amérique, 1997), 54.

⁵³ "World's Fair Planners Urged to Build Own City", *The Montreal Star* (February 1963).

machinations. Jean Drapeau had, ever since winning the world's fair, distanced himself Man in the City. Steadfast in his belief that Montreal was the veritable *metropole* of Canada, Drapeau saw the world exhibition, with the Centennial made an international event, as cementing his city's legacy. Thus the site: in the months leading from the PQAA retreat to Montebello, Drapeau began removing the fair from the city. He turned to an opportune study prepared by the Port of Montreal, which held Pointe-Saint-Charles – among the slum clearance areas of the van Ginkels' Man in the City scheme – as its extended territory and insisted that any expropriation would not only be prohibitive but have to be returned following the exhibition.⁵⁴ The dissuasion came with a suggestion: to enlarge three islands lying in the St Lawrence River and facing the downtown skyline and to provide a new bridge leading westward to Mackay Pier, a harbourfront site.⁵⁵ Entirely removed from the urban fabric, the dramatic vista was admirably suited to Drapeau's penchant for the grand gesture. The mayor immediately petitioned Prime Minister John Diefenbaker by announcing the discovery of an especially economical site, claiming the full support of the CCWE Commissioners Paul Bienvenu and Cecil Carsley (corporate leaders who were, in fact, the federal government's appointees), and believing the islands could only offer “des possibilités illimitées à l'imagination des architectes qui prépareront l'aménagement du territoire pour

⁵⁴ G. Beudet, Letter to Mr C.F. Carsley, Deputy Commissioner General (5th March 1963): n.p., VM74, S3, D91, Fonds du Comité exécutif, City of Montreal Archives, Montreal. Beudet was Manager of the National Harbours Board in Montreal; resolutely opposed to the Pointe-Saint-Charles site, he convinced Drapeau to look elsewhere.

⁵⁵ “The National Harbours Board Report of March 3, 1963” (March 11, 1963): n.p., Series 27-A21-06, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

l'Exposition".⁵⁶ With Bienvenu and Carsley entirely reticent toward the islands and the architects firmly committed to Man in the City, it was a remarkable sleight-of-hand. It was, however, perfectly timed, with the Conservative Diefenbaker fighting a bitter campaign ahead the federal election in April 1963; he quickly cabled his agreement.⁵⁷ In late March, exactly two months after the PQAA congress, the islands site was officially announced in Montreal newspapers.⁵⁸ Drapeau had maneuvered wilily. In full control of the City Council, he had also convinced the provincial Minister of Municipal Affairs to cede the surrounding waters, thus the new islands, to Montreal.⁵⁹ The *Journal of the Royal Architectural Institute of Canada* could only dryly observe:

In approving Mayor Drapeau's proposal, St Helens Island, Federal and Provincial government authorities have not lost sight of the political implications the

⁵⁶ Jean Drapeau, Letter to the Très Honorable John G. Diefenbaker (25 March 1963): 4, P67, S1, D17, Collection de la compagnie de l'Exposition universelle de 1967, City of Montreal Archives, Montreal. Sensitive to growing French nationalism in Quebec, the CCWE – an arm of the Canadian government – would repeatedly note that both Bienvenu and Carsley – who occupied positions of enormous power in leading industrial and financial concerns – were bilingual; see: "Bienvenu And Carsley Named To World's Fair Posts", The Montreal *Gazette* (January 19, 1963): 1.

⁵⁷ Apropos Drapeau's islands, the Prime Minister noted that the inter-governmental agreement, which had stipulated that any exhibition be mounted in the city, would be changed; see: "Diefenbaker télégraphique", *La Presse* (Montreal, 29 March 1963): 26.

⁵⁸ Albert Tremblay and Raymond Masse, "L'Expo 1967: sur le fleuve", *La Presse* (Montreal, 29 March 1963): 1, 26-27; Marc-Henri Côté, "Le Métro sera prolongé jusqu'à Longueuil à la faveur de l'expo sur l'île Ste-Hélène", *Le Devoir* (Montreal, 25 March 1963): 1-2; Al Palmer, "Point St. Charles Would Cost \$80,000,000, Couldn't Be Done in Time. Objections to other Sites Explained", The Montreal *Gazette* (29 March, 1963): 9.

⁵⁹ "L'emplacement de l'Exposition universelle relèvera de la seule juridiction de Montréal", *Le Devoir* (Montreal, 30 April 1963). Minister of Municipal Affairs Minister Pierre Laporte's finally appropriated land belonging to St Lambert, a municipality opposite Montreal on the south shore of the St Lawrence River, thus allowing the islands to be created. Elected in 1960 Laporte's Liberal government was at the height of the Quiet Revolution, the epochal modernisation of Quebec society that had in Expo 67 a ready symbol. The Port of Montreal's suggestion of the islands was, in fact, preceded an independent study proposing exactly the same sites by the very same means; see: Bédard, Charbonneau et Langlois, "Projet d'Emplacement pour l'Exposition Universelle Internationale de 1967", *Architecture-Bâtiment-Construction* (Montreal, January 1963): 22-27.

selection of a site was bound to arouse. Not only is St Helen's Island on the main axis of the predominantly French-speaking east end (a factor could have had some bearings before a certain chilly April day), but part of the land to be reclaimed around the islands falls under jurisdiction of South Shore's St Lambert, thus giving newly appointment Minister of Municipal Affairs, Pierre Laporte, an opportunity to lead mediation over an issue involving the temperamental metropolis.⁶⁰

Federal political parties contesting an election against the backdrop of Quebec's *Révolution tranquille* – the newly unfolding project of secularisation, a welfare state, and nationalist politics – were attuned to a restive Quebec divided along linguistic lines. Drapeau had begun his career crusading against the vice and corruption he assumed festering in insalubrious *quartiers*, for which the instruments urban renewal were, he thought, ideally suited. Yet his belief, bordering on the megalomaniacal, in the supremacy of his political vision would quickly bring grandiose visions for civic monuments aligned to the “two solitudes” of Montreal.⁶¹ The very real division was historically marked by the north-south axis of St Laurent Boulevard: English to the west, French to the east.⁶² Leading southward, the line invisibly marked exactly the westernmost tip of Île Notre-Dame.

Drapeau's enthusiasm for modern architecture was never an embrace of progressive ideals. It lay, instead, in the possibilities of grand gestures. The Montebello group, with

⁶⁰ Jean Gareau, “The 1967 International Exhibition at Montreal: PQAA Discusses Concept, Theme ‘*Mise en Scène*’ and Methods to Produce a Fair of Top Quality”, *Journal of the Royal Architectural Institute of Canada* (April 1963): 71. Affleck and van Ginkel later privately mused: “the City is acting independently, and probably endeavouring to keep ahead of the corporation”; see: A. B. Nichol, “Minutes of Meeting No. 2, Management Committee – World's Fair” (April 15, 1963), Series D.03.9-109-26TD, Fonds Guy Desbarats, Canadian Centre for Architecture, Montreal.

⁶¹ The idea was popularised in the Canadian author Hugh McLennan's allegorical novel *Two Solitudes* (1945).

⁶² The French elite and bourgeoisie was an exception, cloistered in Outremont on the south side of Mont Royal.

Robillard grimly accepting the islands, had publicly announced its categorical opposition to any kind of “monument symbolique vertical, tel le ‘Trylon’ de la Foire de New York en 1938 [sic].” Drapeau had once vaingloriously hoped to relocate, albeit temporarily, the Eiffel Tower to Montreal. He remained undeterred. In December 1964, with construction on Expo 67 underway, Drapeau announced a “Tour de Montreal” to be built by the cities of Montreal and Paris as “a hyphen between the old world and the new.”⁶³ A shrouded model, regally carried by three police constables, was marched into the City Hall chambers, where Drapeau awaited to assist in the unveiling (fig. 3.4).⁶⁴ The assembled chamber saw emerging a tapering profile akin to the Eiffel Tower and a tilt reminiscent of the Leaning Tower of Pisa. The city councillors applauded, it was noted, for eight seconds. Drapeau called it his “poem in concrete”; it was, of course, 1,967 feet tall. Speaking directly to the television cameras, he insisted that the tower would pay for itself.⁶⁵ It was soon dismissed as too expensive.

Notwithstanding Drapeau’s machinations, the creation of the islands was an undeniably powerful event. By early July, the federal government, now under the leadership of Liberal Lester B. Pearson (the Nobel Peace Prize laureate who embraced nuclear missiles

⁶³ Jean Drapeau quoted in Terrance McKenna and Susan Purcell, *Drapeau* (Toronto and Vancouver: Clarke, Irwin & Company, 1980), 153.

⁶⁴ Adrienne Clarkson, “Mayor Jean Drapeau Aims for an Expo 67 Tower”, *The Fifth Estate*, television (Canadian Broadcasting Corporation, September 16, 1980).

⁶⁵ John Lownsbrough, *The Best Place To Be: Expo 67 and Its Time* (Toronto: Penguin, 2012), 31-32. Architects called the tower “Drapeau’s erection”. Undeterred, Drapeau finally prevailed several years later with another scheme bearing a similar form for the 1976 Olympic Stadium; the project, designed by the French architect Roger Taillibert, would take 30 years to pay off.

in his bid to unseat the Conservative Diefenbaker), approved diking operations in the St Lawrence River. Île Sainte-Hélène, the site of an early nineteenth-century British fort, would be extended by embankments enclosing two small nearby islands, Île Ronde and Île Verte. Île Notre Dame, entirely new and huge, would emerge from mudflats (fig. 3.5). The Mackay Pier breakwater would be transformed into Cité du Havre, a peninsular departure point to the world's fair connected to the islands by a bridge. Existing islands provided rocks for dikes shaped to manage the strong currents; sand and silt were dredged to create the land masses; a boom was built upstream to manage ice floes; the islands were equipped with water, sewer, and power systems; most spectacularly, trucks rumbled day and night bringing and dumping fill, some of it from the tunnels being excavated for the new Metro system (which would link to the Expo 67 fairgrounds).⁶⁶ In the river, a bird sanctuary was destroyed.⁶⁷ Thousands of gulls, terns, ducks, and herons were seen circling the city as the geotechnical operations, as “man”, intruded.

The islands marked an end to the first efflorescence of Expo 67. The Parliamentary Act, which demanded an exhibition in the city itself, was amended. The BIE granted its approval to the new scheme. Bienvenu, the CCWE commissioner, attempted to resign in July and finally stepped down in August. Carsley and Robillard soon followed suite. All had been troubled by threatening cost overruns and, especially, the abrogation of the original

⁶⁶ Guy Legault, “Choosing the Site for Expo 67”, *Plan Canada* (Summer 2005): 38-39.

⁶⁷ Kingsley Brown, “Expo 67: Building the World's Fair”, *CBC Newsmagazine*, radio (November 5, 1963).

ideals in favour of the islands.⁶⁸ Bienvenu was replaced by the seventy-one year old career diplomat Pierre Dupuy (and cousin of Drapeau's wife), brought from retirement to press his old world charm and secure worldwide participation at Expo 67.⁶⁹ Obligated by Parliament, Montreal was to ensure delivery of the islands to the CCWE within a year. Rarely at a loss for the theatrical, Drapeau led invited dignitaries on a river crossing to *La Nuit des Îles* on June 30, 1964.⁷⁰ At the stroke of midnight, the guests and crowds, gathered against a backdrop of dump trucks and bulldozers, looked across the river and watched as Montreal landmarks were lit up. On the twelfth stroke, to the thunder of fireworks, Dupuy signed the agreement: the City of Montreal would lease the island to the CCWE for the sum of one dollar a year until December 31, 1969, when the world's fair would, according to BIE rules, be entirely dismantled. To Dupuy, the islands would be "transformed into a sanctuary of civilisation, where nations and peoples, in a spirit of competition and fraternity, will compare

⁶⁸ In a meeting of the CCWE board in early May 1963, with Drapeau in attendance, Bienvenu noted that certain consulting engineers had already mentioned the impossibility of preparing the islands by June 30, 1964. He moved that the BIE, scheduled to review the islands proposal in the coming weeks, be informed of this. With Drapeau insisting that the islands would be ready by the deadline "or not long thereafter", the CCWE adopted a motion that the federal government approve the islands while secretly establishing reserve sites – a proviso not to be divulged publicly. See: "Procès-Verbal de la Huitième Assemblée des Administrateurs de la Compagnie de l'Exposition Universelle Canadienne" (3 May 1963): 3, Canadian Corporation for the World Exhibition Fonds, RG71, Library and Archives Canada, Ottawa.

⁶⁹ Among his highhanded manoeuvres, Dupuy secretly invited Eugène Beaudoin, the French modern architect, to create a new master plan. Van Ginkel and his staff architects decried the manoeuver, suggesting that Beaudoin, who had designed the 1937 Paris Exposition Universelle, was somehow conservative given his professorship at the Ecole des Beaux-Arts in Paris. In fact, Beaudoin, with his partner Marcel Lods, had advanced key prewar modern works including the important Maison de Peuple completed in Clichy outside Paris in 1938. Yet his classicised French embassy in Ottawa, built in 1936, may have led the Expo 67 architects to see him as retrograde. Dupuy quickly relented and claimed the action as only a provisional study

⁷⁰ "*La Nuit des Îles*, Programme de la remise des îles à l'Exposition Internationale et Universelle de 1967" (30 June 1963): n.p., Series VM 3, S0, D3, City of Montreal Archives, Montreal.

their achievements, and where the Canadian nation, essentially young, will rise in fate up to her own destiny”.⁷¹ He later attempted to fashion a master plan where “civilised nations” – France, Britain, the United States, and Canada – would exist in their own compound. To Drapeau, it was proof “that Montreal cannot, that Montreal will not, be shackled by lack of imagination”.⁷² Of the planned four square kilometres, the city delivered less than half.⁷³ In the end, rather than ameliorate a part of the city, Drapeau would create a new piece of it.

PLANS

Drapeau had succeeded at keeping Expo 67 in the tradition of world’s fairs – a spectacle. Montreal would not, it seemed, be a testbed of urbanism. For the architects, it was not necessarily outright injury but a withering of expectations.

In March 1963, Van Ginkels Associates, Architects and Planning Consultants entered a joint venture with Affleck, Desbarats, Dimakopoulos, Lebesold, Sise, Architects (also known as Arcop) as official consultants to the CCWE. They were invited by Robillard, who had joined the CCWE as Planning Director.⁷⁴ The intellectual nexus of the PQAA

⁷¹ Jacques Fauteux and Jean-Paul Nolet, “La Nuit des îles à l’Expo”, Société Radio-Canada, television, Les Archives de Radio-Canada; <http://archives.radio-canada.ca/emissions/1550>, accessed 27 July 2013.

⁷² Ibid.

⁷³ Legault, “Choosing the Site for Expo 67”, 38-39. The city provided 1.5 acres at a cost of \$20 million dollars; it was the full amount originally slated as the federal government contribution. See also: James Stewart, “Montreal Acts On Fair Site Construction”, *The Montreal Star* (July 8, 1963); Charles Lazarus, “Fair Site Acreage To Be Cut”, *The Montreal Star* (November 27, 1963); Myer Negru, “Some Problems In Creation Of Fair Site”, *The Montreal Gazette* (November 29, 1963).

⁷⁴ R.T. Affleck and W.H. Beaton, Letter to C.F. Carsley (March 18, 1963): 1, Series D03.9-109-26-TD, Fonds Guy Desbarats, Canadian Centre for Architecture, Montreal; C.F. Carsley, Letter to Glen Bannerman (April

retreat and Montebello was now officially placed “to develop the theme, prepare master plans which would give form to the resulting ideas” – including preliminary designs of buildings.⁷⁵ Crucially, Daniel van Ginkel was soon put in charge of developing the Expo 67 master plan. The van Ginkels’ immediately tried returning attention to Pointe-Saint-Charles, couching their arguments not only in the ethics of urbanism but as a financial concern.⁷⁶ Their effort would prove futile. If a residual project, however avant-garde, was to remain, then it could only appear in bringing Man in the City to the islands.

On May 14, 1963, the BIE gave its approval to Drapeau’s islands. On the very same day, Blanche Lemco van Ginkel mailed letters worldwide to key architects urging them to petition authorities in their home country on supporting the “concept” that had informed the PQAA conference. The CCWE was, she believed, privately supportive of their ideas but remained afraid of participating nations rejecting any radical reformulation of the principles behind a world’s fair. Writing to the Dutch architect Jaap Bakema – and noting that she

22, 1963), n.p., Series 27-A21-06, Fonds van Ginkel, Canadian Centre for Architecture, Montreal. The joint venture, aimed at fulfilling the Parliamentary Bill C-103 that created the CCWE and demanded a city site, would include the Montreal architects Roger D’Astous and Jean-Paul Pothier along with the consulting engineers Beauchemin, Beaton, Lapointe. Importantly, Claude Robillard’s appointment as Planning Director was accompanied by an insistence that the firms of his architect friends Affleck and van Ginkel be engaged as consultants; see: “Procès-Verbal de la Sixième Assemblée des Administrateurs de la Compagnie de l’Exposition Universelle Canadienne” (19 April 1963): 4-5, Canadian Corporation for the World Exhibition Fonds, RG71, Library and Archives Canada, Ottawa.

⁷⁵ Affleck and Beaton, Letter to Mr C.F. Carsley, 1.

⁷⁶ Van Ginkel Associates, “Notes on Construction in Connection with World Exhibition” (April 4, 1963), Series 27-A21-03, Fonds van Ginkel, Canadian Centre for Architecture, Montreal. Arcop produced a detailed study on the city sites, with the van Ginkels’ ideas appearing in appendices; see: Affleck-Desbarats-Dimakopoulos-Lebesold-Sise and Beauchemin-Beaton-Lapointe, Professional Opinion on Choice of Site for the Canadian World Exhibition Corporation (March 14, 1963), Series 39-1999-06-013, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

had spoken to “fellow architects abroad” including fellow Team 10 members Ralph Erskine, Aldo van Eyck, and Jerzy Soltan, as well as Andre Wogensky (who had publicly supported *Man in the City* when in Montreal some months earlier), Kenzo Tange, and Jeffrey Lindsay (an expert on space frames structures and soon crucial to some of the most visionary pavilions at Expo 67) – she asked that he circulate *Man in the City* by speaking “to the appropriate government people who would be responsible for Netherlands participation” and “via the ‘Post Box’” (the clearing house of Team 10 correspondence that he maintained as the group’s official “postmaster”).⁷⁷ Concepts on Expo 67 were, therefore, to be upheld as deriving from and now contributing to postwar modernist discourse.

While largely an effort at public relations, Lemco van Ginkel’s letters included an architectural suggestion. When sending the PQAA report to Kenzo Tange, who the van Ginkels likely met at the final CIAM congress in 1959, she remarked,

It should be noted that the “concept” as outlined in the paper is only a first basic idea. We believe in the principle – but the details can change with study. As for the question of national pavilions, many variations are still possible within this framework.... The bulk of expenditure we would like to see go into the functional groupings, where a country might have one or more pavilions on a particular topic, or could rent space in a central building if preferred.

The van Ginkels elsewhere admitted admiring Tange’s 1960 Tokyo Bay proposal and their work had absorbed aspects of its heroic planning: an unrealised 1961 master plan for the new town of Meadowvale, Ontario, found massive pyramidal “clusters” of civic buildings,

⁷⁷ Blanche Lemco van Ginkel, Letter to Jaap Bakema (May 14, 1963): 1, Series 27-A2102, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

industrial sectors, and housing complexes attached to a transport spine facilitating “as complete as possible a separation between automobile and pedestrian” (fig. 3.6).⁷⁸ Partially in the spirit of Man in the City, Meadowvale at its most heroic reflected concerns being concurrently advanced by the Japanese Metabolists for whom Tange served as *éminence grise*. Drawing on biological connotations of “growth”, Fumihiko Maki’s influential concept of “collective form”, which acknowledged debts to Team 10 ideas, aimed to represent “groups of buildings and quasi-buildings... not a collection of unrelated, separate buildings, but of buildings that have reasons to be together” by systems of “linkage”.⁷⁹ These links were, in the van Ginkels’ schema, the very *themes* to which nations would be subordinated and divided among “sections or sub-sections” but creating “the required unity of presentation, design and impact and at the same time permit the diversity which is essential to any spectacle.”⁸⁰ (*Unity* of form and *diversity* of programme were already hallmark of burgeoning megastructural works.) Thus the “many variations” – or “functional groupings” – imagined possible within a “framework”: as the van Ginkels began approaching the islands, these notions on realigning popular perceptions of cultural production took a certain utopian cast in suggesting a provisional and flexible architecture designed to challenge nation-state hegemonies.

⁷⁸ H.P Daniel van Ginkel, “Credo”, *The Canadian Architect* (July 1964): 46-47.

⁷⁹ Fumihiko Maki, *Investigations in Collective Form* (St Louis: Washington University, 1964), 5, 29ff.

⁸⁰ “Summary of Proposals for the 1967 Canadian International Exhibition at Montreal” (no date): 1, Series 27-A21-04, Fonds van Ginkel, Canadian Centre for Architecture, Montreal. Lemco van Ginkel enclosed this two-page document, which summarised the PQAA deliberations, with her letters to architect friends.

Despite their unwavering resistance to the site, the islands afforded the van Ginkels a remarkable opportunity. The *tabula rasa* provided an ideal realm free of constraint. The existing city would no longer be the measure of solutions but only their distant foil. The possibility of testing theories on architecture and city marked Daniel van Ginkel's newly recruited core of young designers charged with advancing the Expo 67 master plan: Adèle Naudé, a South African émigré previously in Team 10 circles; Jerry Miller, a Montrealer responsible for inviting Buckminster Fuller to conduct a geodesics workshop at McGill in 1957; and Steven Staples, a white Rhodesian experienced in self-help housing with USAID but now in voluntary exile from Ian Smith's racist regime – all of whom had, crucially, studied urban design at Harvard.⁸¹ (They were later joined by Moshe Safdie, van Ginkel's former student, who had assisted on the Meadowvale project and would famously develop the Habitat 67 housing project.) Tasked with the physical realisation of the Expo 67 theme, the young designers, continuing a Montreal-Boston intellectual axis established by Lemco van Ginkel, would bring to bear a nexus of late CIAM thought and its critique coloured by new techniques – often in the demands for “urban renewal” – of imagining city space.

Ever since *Man in the City*, the governing idea remained for all nations to be subservient to a *theme* – which, by extension, meant a *plan*. When first recalling the nineteenth century as means to reimagine their own epoch, the van Ginkels explicitly noted

⁸¹ Staples had completed the city planning degree at Harvard in 1960. Naudé and Miller were recent graduates of its replacement programme in urban design. All were previously trained as architects.

the 1867 Exposition Universelle. Their understanding took from Sigfried Giedion's, *Space,*

Time and Architecture:

The aim of the exhibition can be gathered from a quotation taken from an official publication of 1867: "To make the circuit of this palace, circular, like the equator, is literally to go around the world. All peoples are here, enemies live in peace side by side. As in the beginning of things on the globe of waters, the divine spirit now floats on this globe of iron."⁸²

Engineer, sociologist, and Saint-Simonian Frédéric Le Play's "globe of iron", a massive ferrovitreous world museum, followed a broad ovoid plan giving an ingenious method of comparative study: products of the same class – heavy machinery, food, the arts – were ranged in concentric rings while the varying output of a single country traversed across seven successive zones leading from a perimeter band of restaurants to a central garden; a pathway along the long axis explained the history of the world. Travelling transversely, visitors saw the whole output of a country; journeying elliptically, they experienced cosmopolitan exhibits of a single type across different nations (fig. 3.7). The layout, suggesting orientations of the compass, and the garden, dedicated to the arts and but free of monumentalising gesture, conformed to ideal city plans from utopian literature. Le Play borrowed from Tommaso Campanella's early seventeenth-century *The City of the Sun*, which proffered a model in which a perfected society was combined with a visual form of

⁸² Sigfried Giedion, *Space, Time and Architecture: The Growth of a New Tradition* (Cambridge MA: Harvard University Press, 1956, third edition), 259. Giedion noted that chief constructor's assistant was Gustav Eiffel: "it was from him that the real inspiration for the Galerie des Machines came."

education.⁸³ Histories and cultures were accommodated in a living environment – writ large in a prefabricated architecture at the scale of the city – for acquiring universal knowledge.

Considered a century later, the thematic was critical. In 1867, a pacific equilibrium between peoples was to be actualised in acts of circumnavigating the globe reproduced as large-scale architecture. Whether in 1867 or 1967, the resulting re-enchantment of the world, the new “divine spirit” of technology, followed themes of discovery, of *exploration*.

This sense of modernity, as an endless vista of new encounter and experience, remained resonant. Finding its appropriate cultural expression quickly informed architectural approaches to the Expo 67 islands. The van Ginkels had consistently upheld the Arctic as precisely the kind of concern capable of registering scientific and cultural endeavours of different nations, thus establishing an ecumenical parsing of *Terre des Hommes* and manifesting the preferred meta-theme of Man the Explorer. The idea served as the basis of a design. Over the summer of 1963, as they relinquished hopes on Man in the City, the van Ginkels’ young staff architects, mainly Naudé and Miller, advanced the very first architecture, necessarily diagrammatic, of Expo 67:

The Project on “Man and the Polar Regions” is particularly suited to multinational treatment, since there already exists among nations involved in polar research a tradition of successful co-operation. All these countries, large and small, will be invited to contribute exhibits dealing with the subjects in which they have an interest.⁸⁴

⁸³ Pieter van Wesemael, *Architecture of Instruction and Delight: A Socio-historical Analysis of World Exhibitions as a Didactic Phenomenon (1798-1851-1970)* (Rotterdam: Uitgeverij 010, 200), 241.

⁸⁴ *Man and the Polar Regions* (no date): n.p., Canadian Corporation for the World Exhibition Fonds, RG71, Library and Archives Canada, Ottawa; Adèle Naudé Santos, interview with author (October 17, 2008), Montreal.

Noting that “Man and the Oceans” and “Man in Space” were being similarly considered, and drawing on the Montebello idea of “Theme Areas”, the architects envisioned a “thematic approach” to the design: nations were rendered as individual silos, each exhibiting “vertical coherence”, but tied together by interweaving pathways – “the threads of the story” – giving the greater complex “a horizontal coherence” (fig. 3.8). These “storylines” were not simply devices for organising displays; rather, they would be made “visible” as mechanised circulation systems allowing visitors “to enter and leave each project at different levels and in many directions”; consequently, “One should be able to pick up the thread of the story at any point and to leave it any point without loss of coherence.”⁸⁵ (The immersive experience recalled *The Family of Man*, where visitors followed multiple paths through the exhibition from “birth” to “death”; designed by Paul Rudolph, the origins lay in the German émigré and former *Bauhaus Meister* Herbert Bayer’s concept of “extended vision” produced by a three-dimensional hanging technique.⁸⁶) Strategies of “discontinuous” movement – thus of open-ended histories – were purposefully to upend nation-state hierarchies: countries could exhibit on some or all levels of any project; others would simply attach to certain theme zones, expanding to accommodate special exhibits or moving further afield, but remaining connected, if having “a tenuous relationship to the project”; those not wishing to participate

⁸⁵ Ibid.

⁸⁶Fred Turner, “The Family of Man and the Politics of Attention in Cold War America”, *Public Culture* 24:1 (2012): 65ff; Olivier Lugon, “Dynamic Paths of Thought: Exhibition Design, Photography and Circulation in the Work of Herbert Bayer”, in Francois Albera and Maria Tortajada, eds., *Cinema Beyond Film: Media Epistemology in the Modern Era* (Amsterdam: Amsterdam University Press, 2010), 117-144.

in certain areas were, polemically, to leave a void in the plan. An emblematic sector showed a cavernous “Ice City”, set slightly below grade, and a roof garden sandwiching exhibition levels linked by ramps and moving sidewalks and intersected by a continuous “thread” leading beyond to the next areas. As Michel Chevalier, the van Ginkels’ friend and patron now serving as consultant on the Expo 67 theme, put it:

The method which has been chosen combines factors of flexibility, an evolving process related to design and exhibitor requirements and estimated resources, elements representing a complete picture of Terre des Homes....

A territorial (also in its context of environmental) basis has been used. Where in the past national boundaries were the main consideration of exhibit entities, the present formula accepts national boundaries when desired by the exhibitor, but offers territorial (or environmental) choices for alternative or additional participation by a country (or by a domestic Canadian exhibitor).⁸⁷

Like Le Play’s ideal diagram, Man and the Polar Regions gave a radical sense of experiencing trans-historical “organic” laws: “Transportation could be traced from sledge and kayak, through the ships of Vikings and later explorers, up to the nuclear submarine”, the tool *par excellence* of Cold War polarisation of the North; “The shelter sequence would begin with non-permanent shelters – the igloo and the yurt – used by nomadic peoples... and the modern housing now being used in Northern industrial centres”, a recognition perhaps of Team 10 member Erskine’s Ecological Arctic Town (1958) but especially of Canadian efforts to create a veritable megastructural city in Frobisher Bay on Baffin Island, which followed the Conservative government’s popular platform of “road to resources” and

⁸⁷ Michel Chevalier, “Method of Creating Exhibit Subjects Based on the Theme “Terre des Hommes”” (September 20, 1963): n.p., Series 39-1990-07-001, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

northern development following the 1957 federal election (fig. 3.9).⁸⁸ In this expansive taxonomy, the link between igloo and yurt (a decidedly non-Nordic form of shelter) suggested relating notions on the Arctic to other synchronic expressions of world cultures. Moreover, like Le Play's "globe of iron", the spatial didactics were modelled not only on cartography but on urbanity: positing a city, the designers would draw on new theories of "movement", advanced by Team 10 and others, offering an experiential approach to urbanism – a technological fix immediately visible in the architects' search for moving sidewalk systems.⁸⁹ Yet unlike Le Play's "globe of iron" (or the other nineteenth-century behemoths once recalled by the van Ginkels), here was a far more decentralised network without necessarily strict hierarchies of classification. The idea reflected Daniel van Ginkel's dismissal, shared by his young staff architects, of the CIAM "single function" building and resonated with megastructural notions on "plug-in" solutions.⁹⁰ Chevalier's mention of *flexibility* knowingly corresponded to diverse approaches united in redeeming functionalism from determinist excess by introducing concepts of time and the unknown.⁹¹ The political corollary was clear in the challenge to the nation-state and the control of territory.

Thus, the master plan. Like Thomas More's *Utopia*, the islands of Expo 67 were, in a sense, nowhere and everywhere at the same time, cut from the existing world by a trench

⁸⁸ *Man and the Polar Regions*, n.p.

⁸⁹ "Canadian World Exhibition 1967, Comparative Difference in Cost of 3 Site Proposals" (May 1963): n.p., Series 27-A21-03, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

⁹⁰ Van Ginkel, "Credo", 45.

⁹¹ Adrian Forty, *Words and Buildings: A Vocabulary of Modern Architecture* (London: Thames & Hudson, 2000), 142.

separating the old from the new, the past from the future, the historically grounded from the imagined ideal. Just as his crescent-shaped *no-place* allowed More to comment on society circa 1516, Île Notre Dame and Île Sainte-Hélène provided the architects an opportunity to confront prevailing norms of postwar urbanism. The CCWE officials had convened Montebello precisely in this spirit: facing the inevitability of the islands, they sought the most polemical ideas on realising what was, in effect, to be a world city, however temporary. The hope was openly expressed at a post-Montebello meeting of the CCWE administrators:

Monsieur Piché declared that it has become necessary to break the typical schema of universal expositions by inviting more nations to decentralise their national attributes and in soliciting their participation within large pavilions dedicated the Expo theme. Monsieur Jean Drapeau declared his agreement but said that from a practical point of view there will be huge obstacles to overcome. Monsieur Piché added that it is crucial to subordinate the concept of nations to that of peoples.⁹²

Despite Drapeau's predictable hedging, Lucien Piché, vice-rector of the Université de Montréal, who had presided over the Montebello summit on behalf of the CCWE, stood steadfast in the ambition "to break" any form of national supremacy; *decentralisation* and *subordination* were not only statements on political power but descriptions on the architectural translation – as *plan* – of the exhibition theme. However diagrammatically, Man and the Polar Regions made this an ultimate statement. The storylines-cum-movement systems were to create urban infrastructure giving an experiential sense – literally moving – of forever resituating *Terre des Hommes*. The principle followed closely ideas raised at the recent Team 10 meeting held at the Abbaye Royaumont, north of Paris, in September 1962

⁹² "Procès-verbal de la Dixième Assemblée des Administrateurs de la Compagnie de l'Exposition Universelle Canadienne" (7 June 1963): 3, translation by author, Canadian Corporation for the World Exhibition Fonds, RG71, Library and Archives Canada, Ottawa.

(just as Man in the City was finalised). Its invitation, which the van Ginkels surely received, stated the “Theme of Meeting”:

Focus on reciprocal urban infra-structure/building group concepts. That a communication system, offers both ‘structure’ and ‘building organisation potential’ is clear: what is less clear is how to sustain this building organisation potential in the actual building groups, in the ‘infill’ of the infra-structure.

There seem to be two modes of operation offered:

- An extension of the infra-structure idea into the building group, so that a system with growth potential is put forward and the ultimate form is not fully anticipated (the stem idea in its ideal sense)
- The ‘group form’ idea, in which all the components are directed towards the final preconceived form (The Japanese approach).

It being accepted that the general objective of both modes is towards the usefulness and comprehensibility of the group.⁹³

A handful of “building-group concepts” were noted for discussion, including Tange’s Tokyo Bay proposal, Maki’s “group form” concept, and Candilis-Josic-Woods’s “STEM projects” informing their new town schemes of Toulouse-Le Mirail and Caen-Hérouville. The latter was crucial to the Expo 67 plans. Adèle Naudé had, in fact, attended the important Abbaye Royaumont meeting (fig. 3.10). At the time, she was working closely with Shadrach Woods on the unrealised University of Bochum competition that conceived a continuous and public promenade – “stem” – with branch-like extensions to which buildings would link (fig. 3.11). Increasingly central to Team 10 debate, Woods had posited “stem” as “linear organisation” extending “all the *prolongements du logis*: commercial, cultural, educational, and leisure

⁹³ Invitation to the Team 10 meeting at Abbaye Royaumont, quoted in Alison Smithson, ed., *Team 10 Meetings* (New York: Rizzoli, 1991): 27.

activities, as well as roads, footpaths and services”.⁹⁴ This “basic structure” could adapt to a landscape and be phased over time. Patterns of *movement* would mark urban experience.

Having extended “stem” to Man and the Polar Regions, Naudé now redistributed the pavilion as components of a master plan on Île Notre-Dame. In drawings developed in late summer 1963, the principle of Man and the Polar Regions was transformed into a large horizontal network (fig. 3.12). A tartan grid of exhibition “precincts” spread evenly across the two islands and onto the mainland; “moving belts” and pedestrian paths connected “theme structures”, “national pavilions”, and “grouped pavilions” shown as magnified versions of a typical sector in Man and the Polar Regions. (The effect was not unlike the new “web” solutions being proposed by Woods and epitomised by the “groundscraper” form of the Berlin Free University competition project of 1963.⁹⁵) The evenly dispersed but interlinked precincts were to house a *Terre des Hommes* now refined as “six environmental exhibit subjects”: The Polar Regions, The Tropics, The Oceans, Space, The City, and “Others” (which “cannot in itself be an entity” but would somehow present the output of nations from the “mid-latitudes”).⁹⁶ The islands sites would be connected by a “Terre des Hommes’ bridge:- expressing the significance of the theme in a general sense, and acting as

⁹⁴ Shadrach Woods, “Urban Environment: The Search for System”, in J. Donat, ed., *World Architecture 1* (London: Studio Vista, 1964): 153; Shadrach Woods, “Stem”, *Architectural Design* (May 1960): 181.

⁹⁵ Berlin Free University was completed in 1973, with only part of the original scheme finally realised.

⁹⁶ Michel Chevalier, “Theme Development, Position Papers No. 9” (August 12, 1963): 1, and “Thematic Development, Position Papers No. 10” (August 26, 1963): 1, Series 27-A21-04, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

an introduction to the sub divisions of the theme shown in the precincts”.⁹⁷ Originally titled the “Realto bridge”, the misspelling of the Rialto Bridge in Venice likely meant the Ponte Vecchio in Florence, with its inhabited structure and the Vasari Corridor being upheld in megastructural discourse as ur-model of multifunctional buildings. The form – a massive podium housing an array of pavilions connected by raised pedestrian pathways and hemmed by a double transport spine – was again a nod to Tange’s Tokyo Bay proposal (fig. 3.13). Throughout, Naudé’s plan attempted to convey a sense of nomadic flow facilitated by mechanised movement. The social realm of the world’s fair was to be in ceaseless states of change as visitors continuously renegotiated the terms – the “storylines” – by which the artefacts and ideas comprising the totality of *Terre Des Hommes* were displayed.

Naudé’s studies indicated a new urban paradigm for the world exhibition. The implication of “movement” was immediately to change the urban morphology: “an elongated site as compared to previous centralized exhibits.”⁹⁸ The suggestion came from Moshe Safdie, who, upon graduating from McGill University in 1961, had worked for the van Ginkels on the Meadowvale new town and was, by early September 1963, among their young Expo 67 staff architects. Safdie had contributed some of the more heroic elaborations of Meadowvale in massive pyramidal housing, commercial, and industrial sectors set along a

⁹⁷ Affleck, Desbarats, Dimakopoulos, Lebensold, Sise, “Preliminary Report on Theme – Site Study” (July 17, 1963): 1, and “Preliminary Design Program – World’s Fair” (April 29, 1963): 1-2, Series D03.9-109-26-TD, Fonds Guy Desbarats, Canadian Centre for Architecture, Montreal. By August 1963, it was labelled “Pont des peuples”.

⁹⁸ M. Safdie, “Internal Transportation System – Basic Concept” (October 29, 1963): 1, Series 39-1990-07-002, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

transportation system: each “productive unit depends on others just as they depend on it”; “Rapid transit unites the centre city”; the “key point is TRANSPORTATION”.⁹⁹ Still early in his career, Safdie – who had, under Daniel van Ginkel, designed a modular housing system as his McGill thesis project that would become the basis of Habitat 67 – saw the future city in terms of regional planning. His Meadowvale scheme, which brooked little distinction between town and country, recalled the linear city originating in the Spanish planner Arturo Soria y Mata’s *ciudad lineal* of 1882, with its sections of infrastructure – water, gas, electricity, and sewage – extending an optimal line to which components of the city would simply attach. The example persisted in modern planning theory, notably Nikolay Milyutin’s *Sotsgorod* of 1930, a scheme for “de-urbanisation” in a continuous ribbon of decentralised industry, and Le Corbusier’s *Ville Radieuse* as well as his viaduct cities (van Ginkel’s inspiration for “an architecture of movement”) also projected around 1930 as theoretically limitless urban forms.¹⁰⁰ The principle was of ever-increasing *speed*: whether by railway or automobile, the mechanised acceleration of human life was to make possible the infinite geographical reach of the modern city – a possibility heroically evoked by Soria y Mata: “A single street of some 500 metres width and of the length that may be necessary...

⁹⁹ Moshe Safdie, Sketchbook R, 26-27, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal.

¹⁰⁰ N.A. Miliutin, *Sotsgorod: The Problem of Building Socialist Cities* (1930; Cambridge MA: The MIT Press, 1974). Le Corbusier’s linear city ideas culminated in *Les trois établissements humains* (1944), which outlined ways to urbanise both town and country.

[a city] whose extremities could be Cadiz or St Petersburg or Peking or Brussels”.¹⁰¹ Safdie quickly began envisioning an exhibition-cum-world city in similar terms.

Following a stint under the van Ginkels, Safdie worked for Louis Kahn in Philadelphia, where he witnessed the final phases of the Philadelphia Centre City plans and spent time moonlighting on competitions. Participating in the important 1963 Manchica plan competition for a new city centre in Tel Aviv, Safdie, an Israeli by origin, looked beyond the city limits and imagined a transportation system moving at 300 miles per hour reducing the country to “a single urban region”; the project conceived “a highly accessible point” – announced by soaring helical structures openly recalling the Japanese Metabolist Kishi Kurokawa’s Helix City project of 1961 – “on an urban transportation spine running from the northern cities to the port of Elat” (fig. 3.14).¹⁰² Safdie had proposed a similar idea one year earlier in a competition project for resettling Arab refugees in Giza, Egypt, where enormous quasi-pyramidal forms of housing, commerce, and industry – recalling the Meadowvale scheme – were to be linked throughout by a transportation system leading far beyond the city (fig. 3.15):

The continuous-motion transit principle is here applied at the scale of an urban sector. Systems of movement replacing conventional subways, buses, elevators, and sidewalks are integrated into a single hierarchical network of mass transit moving at accelerating and decelerating speeds ranging from 60 miles per hour to 2 miles per hour. Starting on a journey, one would embark on a moving sidewalk or vertical elevator that, rather than stop, would accelerate at certain intervals to greater speeds where one makes a transfer in motion to the second and faster system. It traveling a

¹⁰¹ Arturo Soria y Mata quoted in Kenneth Frampton, *Modern Architecture: A Critical History* (London: Thames and Hudson, 1992), 27-28.

¹⁰² Moshe Safdie, *For Everyone a Garden* (Cambridge MA: The MIT Press, 1974), 14.

greater distance, one would then make another transfer when that system accelerates to meet the prime urban transit system, which again never comes to a stop, but rather accelerates and decelerates. In this way complete mobility is achieved without ever having to walk more than a thousand feet and without ever having to resort to personal vehicles, yet without ever having to wait for the public transit system.¹⁰³

The world of perpetual mechanised movement evoked precisely the evolution of the Expo 67 site plan, which drew on combining metabolic senses of strolling through the city with anticipations of speeding through it. Thus did Safdie and Jerry Miller, one of the three young Harvard urban design graduates working under van Ginkel on the master plan, advance a “Continuous Motion Transportation System” as means to organise the exhibition:

It is proposed that a system of non-stop continuous motion means of mechanical transportation be developed. Such a system will consist of two to three hierarchical systems which accelerate and decelerate – never coming to a stop. Loading and unloading of passengers occurs when two systems run side by side at identical speeds hence are stationary relative to each other.¹⁰⁴

Trains reaching from the city centre to the islands at 15 to 30 miles per hour, “carts” (or “horizontal elevators”) running at 5 to 15 miles per hour, and moving sidewalks travelling at 2 to 5 miles per hour composed the synchronised system (fig. 3.16).¹⁰⁵ *Transportation* – “prime factor to the organization of man’s environment” – was, therefore, to become an

¹⁰³ Ibid., 10-11. Safdie envisioned the Arab refugee city resulting from compensation funds allowing the establishment of several industries, including building, with refugees given training in mass production techniques to build their own city. Safdie saw it as a personal model: “quite apart from the political ideas behind it, the refugee city became a kind of vehicle for constantly developing and expressing my image of the utopian city.” See: Safdie, *Beyond Habitat* (Cambridge MA: The MIT Press, 1970), 61.

¹⁰⁴ M. Safdie and J. Miller, “Proposal for a Continuous Motion Transportation System” (October 18, 1963): 1, Series 39-1990-07-002, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

¹⁰⁵ Ibid.; Safdie, *Beyond Habitat* (Cambridge MA: The MIT Press, 1970): 67.

exhibit in itself.¹⁰⁶ As showcases, the three systems would allow fairgoers to imagine a far greater and much faster network:

The core is a manifestation of the highest form of human organization. There is no apparent limit to this potential of extremely large cores, which embody the technological, cultural, and the social achievements of man. If the core can be made accessible to even large numbers with convenience and comfort it is conceivable than [*sic*] a more sophisticated and advanced organization can be allowed to develop with all of the advantages that this implies. Essential to this organization are the multiplicity of linkages that occur between people, goods, and establishments.¹⁰⁷

Unlike postwar CIAM debate demanding the “core” as a concentration of activities, a new hypothesis on “coreway” – leading to a “regional structure of cities” – was to be experienced in “an integrated system of continuous flow transit” transcending the world’s fair and challenging the city: “The existing radial growth of metropolitan regions is immediately replaced by a linear (more manageable) pattern relating to the transit system and its pulsation.”¹⁰⁸ In the biomechanical analogy, Safdie offered a model: the experimental engineer Robert Le Ricolais’s pioneering work on *dynamic* structures in applying topological deformation to the design of space frames – a vision manifested in the Skyrail, a multilevel elevated transport system with train cars carried inside soaring “Tension-Net” bridges (made of funicular cables rotated about circular diaphragms) meeting at massive piers containing

¹⁰⁶ M. Safdie, “Internal Transportation System – Basic Concept” (October 29, 1963): 1, Series 39-1990-07-002, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

¹⁰⁷ Safdie and Miller, “Proposal for a Continuous Motion Transportation System”, 2-3.

¹⁰⁸ *Ibid.*, 3, 4, 5. In 1958, Team 10 member Jaap Bakema had proposed a concept of “core wall” as a large-scale device closely tied to elevated motorways carrying high-speed vehicular movement either into or across existing cities; see: Kenneth Frampton, “Team 10 and the Challenge of the Megalopolis: Between Counterform and Infrastructure 1952-73”, in Dirk van den Heuvel and Max Risselada, eds., *Team 10 1953-81: In Search of a Utopia of the Present* (Rotterdam: NAI Publishers, 2005), 291-292.

stations and towering over the landscape (fig. 3.17).¹⁰⁹ Writing to Le Ricolais in September 1963, Safdie reminded the engineer, then teaching in the Institute for Architectural Research at the University of Pennsylvania, of their meeting several months earlier in Louis Kahn's office and described the world's fair transportation system studies. Wondering if Le Ricolais's "continuous motion system... could be of assistance to us, either for reference or even the possible application to this specific problem", Safdie asked for advice.¹¹⁰ Le Ricolais had, in fact, conceived his system in terms not unlike those sought by van Ginkel's staff architects:

The technical problems, though considerable, are negligible by comparison with those of financing such a project and that of land acquisition. The survival of our cities is, however, dependent on the successful solution of the ever increasing problem of traffic congestion.¹¹¹

In Montreal, financing and land were, indeed, presumed readily available given government debt expenditures for the future world's fair. Yet when replying to Safdie, Le Ricolais, while admitting "an extreme pleasure in reading your proposal" and "the boldness of the scheme", switched the terms of reference. Acknowledging that the "Reclamation site" and its "future use" would be perfectly suited to his project, he eschewed thinking about the urban dimension; hinting at a nervousness on the lack of programme, thus the unknown

¹⁰⁹ Larry Busbea, *Topologies: The Urban Utopia in France, 1960-1970* (Cambridge MA: The MIT Press, 2007), 152-154; R. Le Ricolais, "Le Skyrail", *Architecture: Formes et Fonctions* 11 (1964): 84, 85-87. For appraisals of Le Ricolais contemporaneous to the early Expo 67 plans, see: Tim Vreeland, "Robert Le Ricolais", and Robert Le Ricolais, "Survey of Structural Researches – 1959-1960", *Architectural Design* (October 1960): 412-416.

¹¹⁰ Moshe Safdie, Letter to Robert Le Ricolais (September 13, 1963): n.p., Box PF11, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal.

¹¹¹ Le Ricolais, "Le Skyrail", 84.

magnitude of investment, he focused only on structural research: “In a much more limited way we are concerned at our Institute with the feasibility of those suspended bridges and with the use of our models we will see whether our expectations are fulfilled or whether we have to discard the whole idea.”¹¹² Le Ricolais had, in fact, elaborated the Skyrail as sections of an ideal city spread in what he called a “Starhex network” – a challenge to orthogonality – with enormous sectors, made of tensile rings, floating in the air. There may have been bases of comparison to 1960s megastructural discourse, but Le Ricolais appeared to demur from any association – especially with similar expressions on “spatial urbanism” then being evinced in the *architecture mobile* of Yona Friedman and others (fig. 3.18).¹¹³ He later declared:

I know a guy in Paris who can make fantastic dreams come true: taking the world for some kind of garden, you draw a whole future city in the sky; you reduce all the complex function of a city into a ready-made form. It may have some scenic value, but the danger of such an exhibit lies probably in its seductive power, the fascination with image for its own sake, based on some uncritical attitude or a desire for publicity.¹¹⁴

¹¹² R. Le Ricolais, Letter to Moshe Safdie (September 22, 1963): 1-2, Box PF11, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal.

¹¹³ Busbea, *Topologies: The Urban Utopia in France, 1960-1970*, 82-83, 91. Busbea notes that Le Ricolais was a distant correspondent to the French art and architecture critic Michel Ragon’s Groupe International d’Architecture Prospective (GIAP), whose founding manifesto Friedman had signed. Friedman would otherwise preoccupy himself with Groupe d’Etudes d’Architecture Mobile (GEAM) until its dissolution in 1962.

¹¹⁴ Robert Le Ricolais, “‘Things Themselves are Lying, and so are Their Images’”, in *VZA 2* (University of Pennsylvania, 1973): 86.

It remained whether these technologies were meant as an “exhibit”, in the traditions of world’s fairs, or really as the technics of utopian cities.¹¹⁵ Safdie’s appeal to Le Ricolais indicated just how much the master plan remained in the realm of prognostication.

There was, in all this, an almost desperate, maybe cynical, rejection of the city. Unlike previous world’s fairs offering cities in miniature, the new paradigm provided a version of a *megalopolis* in miniature.¹¹⁶ Discourses first animating the plans – the trope of “human scale” introduced in postwar CIAM discourse – were now confronted by a city displaced far beyond its borders. Eschewing the limits of architecture *qua* architecture for the technologies of *movement*, the architects appeared untroubled by parallel processes of decentralisation, with transportation routes leading to new suburbs and leaving the city to the fates of urban renewal. The ambition somehow to find in the world’s fair a way of returning to the existing, albeit improved, city seemed increasingly fraught.

IMAGES

The “elongated” exhibition plan, created and united by mechanised movement, brought another critical intellectual project to bear on the plan. Urban renewal had been central to

¹¹⁵ Exactly one year after Louis Kahn, Le Ricolais would speak at the PQAA meeting in January 1964 and introduce his Skyrail concept in a paper titled “Expo et Cité; une liaison aérienne”. While creating a stir among the attendees, there was little impact on the world’s fair plans. See: Robert Le Ricolais, “An Aerial Mass Transit System”, *Journal of the Royal Architectural Institute of Canada* (April 1964): 59-62.

¹¹⁶ The French geographer Jean Gottmann’s book *Megalopolis: The Urbanized Northeastern Seaboard of the United States* (1961) had explored the heavily urbanised area stretching from Boston to Washington D.C. Safdie and Miller similarly described a massive “urban entity” epitomised by “the Oshawa-Toronto-Hamilton-London” region in southern Ontario; see: Safdie and Miller, “Proposal for a Continuous Motion Transportation System”, 5.

the new Harvard postgraduate degree in urban design that Naudé and Miller had pursued. Joining them on Van Ginkel's CCWE staff was Steven Staples, who would continue elaborating the transportation systems and was among the last graduates of the Harvard *city planning* course (which Lemco van Ginkel had completed in 1949) before it was remade as *urban design* under Josep Lluís Sert in 1960. Sert's postwar CIAM arguments on the "core" presaged North American policies advocating civic centres – imagined in Giedion's "New Monumentality" – for renewing blighted areas. (An inescapable fixation on "Man in the City"-like projects found Frank Vigier, an adjunct professor at Harvard, assisting Daniel van Ginkel on desperately convincing the CCWE to reject the island in favour of a project of urban renewal.¹¹⁷) Sert's work, especially campus design, provided the backdrop for Harvard's pioneering programme, which also grew out of the influential Urban Design Conferences first convened in April 1956.¹¹⁸ Studios undertook projects of both decentralisation (continuing approaches by Martin Wagner, under whom Lemco van Ginkel had studied) and civic renewal. Yet in terms of urbanism as preoccupation in the 1960s, perhaps the most critical links – and divisions – between *city planning* and *urban design* emerged in an accompanying seminar. Giedion and Sert had introduced the phrase "urban

¹¹⁷ Francois C. Vigier, "General Memorandum No. One" (21 June 1963), 1-8, Series 27-A21-11, Fonds van Ginkel, Canadian Centre for Architecture, Montreal. Vigier sent his comments on the site directly to Robillard.

¹¹⁸ Eric Mumford, *Defining Urban Design: CIAM Architects and the Formation of a Discipline, 1937-69* (New Haven: Yale University Press, 2009), 157ff; Richard Marshall, "Josep Lluís Sert's Urban Design Legacy", in Eric Mumford and Hashim Sarkis, eds., *Josep Lluís Sert: The Architect of Urban Design, 1953-1969* (New Haven: Yale University Press; Cambridge MA: Harvard University Graduate school of Design, 2009), 134ff. The Harvard urban design studio often selected sites officially slated for renewal schemes in cities comprising the "megapolis" stretching from Boston to Baltimore.

design” at Harvard in 1954.¹¹⁹ In a subsequent seminar on “The Human Scale”, which grew from concerns on “humanization of urban life”, a theme of CIAM 8 that produced “The Heart of the City”, Giedion included studies on proportion (including Le Corbusier’s Modular) as lessons on “how to place volumes in space”; a 1957 version was tied to a studio on “The Residential Sector” that, with Lemco van Ginkel as a visiting instructor, proposed mid-rise housing and community facilities as alternatives to suburbia and high-rise public housing (fig. 3.19).¹²⁰ In each instance, new techniques of visualisation – new *aesthetic* means of reading and organising space – were tied to the creation of civic form.

Yet the clear senses of order – the residual functionalism – of such schemes were not necessarily reconciled with new discourses on urbanism. Indeed, a growing interest in the *disorder* of cities would inform the “new” discipline of urban design. The theory was captured in the planner Kevin Lynch’s influential book *The Image of the City* of 1960. As member of the Harvard-MIT Joint Center for Urban Studies, Lynch had undertaken studies on the “Perceptual Form of the City” with his colleague Gyorgy Kepes. Kepes, an émigré Hungarian painter based at MIT, had, since the 1940s, been situating *design* as “the sensory qualities of the visual field and the organizing of them” with “the shaping of sensory

¹¹⁹ Sert appears to have used the term “urban design” first in public during a 1953 lecture delivered at the Regional Conference of the AIA-Middle Atlantic District held in Washington, D.C. and devoted to the theme “The Architect and Urban Design and Urban Redevelopment”; on this, see: Eric Mumford, “The Emergence of Urban Design in the Breakup of CIAM”, in Alex Krieger and William S. Saunders, eds., *Urban Design* (Minneapolis: University of Minnesota Press, 2009), 17.

¹²⁰ Mumford, *Defining Urban Design: CIAM Architects and the Formation of a Discipline, 1937-69*, 114, 134, 135-136, 147-148. As Mumford notes, Giedion’s interests in urban design began waning by the end of the decade; a 1959 seminar would see his interests shift to early cities and the ways in which art and architecture developed in them.

impressions into unified, organic wholes” – an ambition informing his book *The New Landscape in Art and Science* of 1956. In it, Kepes ceaselessly juxtaposed a stunning collection of images, comparing natural forms to modern artworks, from magnified crystals to geodesic domes, as arguments on ways to navigate the modern city: “Leading us away from the system of fixed things, and toward the system of spatio-temporal patterns, the newly revealed visible world brings us to the threshold of a new vision” (fig. 3.20).¹²¹ The discovery of *patterns* – existing in any number of stimuli including buildings, and perceived by forms of movement (also made visible by the instruments of mass media) – was to create visual, psychological, and social harmony in the built environment.¹²² The argument rested on studying human perception – to Kepes, “pattern-seeing” – as the key to order in the world of artefacts. Through patterns, information began to create visual effects. Recognising, even troubled by, apparently unremitting accelerations of everyday life – highways, television, urban renewal – and a concomitant sensory overload, Lynch and Kepes’s analyses, dovetailing with postwar interests in the psychology of perception, would not focus on cities *per se* but on the perceptual apparatus through which people recognised the urban realm; or, as Kepes had early argued, the “dynamic basis of human beings is to

¹²¹ Gyorgy Kepes, *The Language of Vision* (1944; Chicago: Paul Theobald and Company, 1967), 15; Kepes, *The New Landscape in Art and Science* (Chicago: Paul Theobald and Company, 1956), 206. Kepes’s mention of “a new vision” was to recall his friend Laszlo Moholy-Nagy’s *The New Vision*, first published as one of the *Bauhausbücher* in 1928 and reissued as a revised English edition in 1947. The books collected both men’s pedagogical approaches at the Chicago Institute of Design in the early 1940s.

¹²² Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge MA: The MIT Press, 2003), 43, 45.

form whatever situation they face into an integrated whole”.¹²³ The almost apocalyptic tone, delivered not long after the Second World War, intimated a basis – a new visual language – for surviving in the modern world.

Lynch synthesised their ideas – while eschewing Kepes’s striking photographs – in *The Image of the City*. The book offered, as its title suggested, a theory on “*imageability*”, codifying individuals’ perceptions of urban environments to demonstrate that they used specific features (paths, edges, nodes, landmarks, and districts) to “read” their cities. The proposed *experiential* approach to urbanism, while providing coherent designs, would not impose total solutions inhibiting future patterns of activity: “A city must have both an obvious structure that can be grasped immediately and also a potential structure which will allow one gradually to construct a more complex and comprehensive picture.”¹²⁴ Marked by Kepes’s admitted influence of Gestalt psychology, the argument also absorbed the impact of cognitive sciences then shaping many disciplines at MIT, notably cybernetics, the “new science” of regulatory systems that one of its key founders, Norbert Wiener, had already proposed as way to understand the social realm: “society can only be understood through a study of the messages and communication facilities which belong to it”.¹²⁵ The psycho-aesthetic “feedback” between *perception* and *design* rested, according to Lynch, on recognising

¹²³ Forty, *Words and Buildings: A Vocabulary of Modern Architecture*, 241; Gyorgy Kepes, “Planning Man’s Physical Environment” (1946), quoted in Mumford, *Defining Urban Design: CIAM Architects and the Formation of a Discipline*, 25.

¹²⁴ Kevin Lynch, *The Image of the City* (Cambridge MA: The MIT Press, 1960), 158.

¹²⁵ Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (1950; New York: Avon Books, 1967), 21, 25.

that although “the city itself is five hundred years old, the metropolis is a new phenomenon, dating from a mere hundred years ago”.¹²⁶ The periodisation allowed claiming a modern aesthetics for a modern environment, and *vice versa*. The “new vision” still aspired to Giedion’s phenomena of “interpenetration” described in *Space, Time and Architecture*: “In order to grasp the true nature of space the observer must project himself through it”.¹²⁷ If this was also an argument on mechanised movement, then it faced Lynch’s eclipse of *city* by *metropolis*, where “a vast organism whose scale far transcends individual control” now arose.¹²⁸ Lynch thus recognised the power of the automobile not only for navigating these enormous distances (possibly wastelands following urban renewal) but as giving a new “view from the road” on reimagining city space (literally, the “esthetics of highways”).¹²⁹ Such ideas had, in fact, informed *Man in the City*. Editing a 1961 special issue of *Canadian Art* on “the Automobile”, Lemco van Ginkel argued,

Moving at high speed in the automobile has created new visual images of place in time. The larger landscape which is explored tediously on foot, unfolds rapidly at higher speeds.... We see in a different way when we move rapidly – many images are received at high frequency and superimposed in the mind’s eye to form a composite image. This everyday excursion into the world of space-time – the realization of the true dimensions and relationships in our visual environment –

¹²⁶ Kevin Lynch and Lloyd Rodwin, “A World of Cities”, *Daedalus* vol. 90, No. 1 (Winter 1961), 4. The remarks appeared at the start of a special issue on “The Future Metropolis”.

¹²⁷ Giedion, *Space, Time and Architecture: The Growth of a New Tradition*, 432.

¹²⁸ Lynch and Rodwin, “A World of Cities”, 4.

¹²⁹ Donald Appleyard, Kevin Lynch, and John R. Myer, *The View from the Road* (Cambridge MA: The MIT Press, 1964).

brings us closer to the world of the artist and to his quest for the realities of imagery.¹³⁰

The claim was for “speed”: as a “tool” it “increases our visual capacity” to “stimulate the creation of new forms of aesthetic merit”. Lemco van Ginkel would, in suitably Giedion-like terms, later find “a new form for the centre city which is spatially akin to the sculpture of Max Bill or Jean Arp, the mobiles of Alexander Calder, the engineering Robert Maillart or Robert Le Ricolais, the landscape of Noguchi – and commensurate with the spirit of man who still is a biped but not necessarily ‘pedestrian’”.¹³¹ These very artists and engineers, save Noguchi, had appeared in Kepes’s *The New Landscape*, mentioned or illustrated in a section on “Symmetry, Proportion, Module” (fig. 3.21). Describing processes of “feedback” central to self-regulating systems, as inherited from cybernetics but also biological sciences, Kepes noted how certain artists and architects – “those willing to face industrial civilization and accept its premises” – had unconsciously adopted “modular logic” well before developing “a plastic technique”.¹³² Bill’s sculptures appeared among Georges Seurat’s pointillist views of the Eiffel Tower, Francesco di Giorgio’s study of human and architectural proportion, or

¹³⁰ Blanche Lemco van Ginkel, “Editorial”, *Canadian Art* (January-February 1962): 19. Edited by Lemco van Ginkel, the special issue considered “Design of the Automobile”, “Design by the Automobile”, and “Design for the Automobile”. While theories on “movement” were part of Team 10 discourse, for Lemco van Ginkel this also followed also a sustained immersion in practices of North America urbanism. A year before beginning the Expo 67 plans, she had participated in the Fifth Harvard Urban Design Conference that took as its theme “The Institution as a Generator of Urban Form”. Offering a critique of the Detroit Civic Complex originally conceived by Eero Saarinen, Lemco van Ginkel emphasised the need for “pedestrian links and visual scale” and evoked new perceptual qualities associated with mechanical movement systems. See: Harvard Graduate School of Design, *The Institution as a Generator of Urban Form, Fifth Urban Design Conference, April 1961* (Cambridge MA: Harvard GSD Alumni Association, 1961).

¹³¹ Blanche Lemco van Ginkel, “The City Centre Pedestrian”, *Architecture Canada* (August 1966): 39.

¹³² Kepes, *The New Landscape in Art and Science*, 346.

Eduardo Catalano's studies on hyperbolic paraboloids; a Calder mobile rested opposite an aerial view of a new interstate cloverleaf; Le Ricolais's experimental space frames were juxtaposed to standardised chair parts by Charles and Ray Eames and the magnetic core of an MIT computer. Throughout, the portfolio elevated aesthetic, biological, and technological entities as ways to imagine organising more perfected instances of the built world.

There was an architectural consequence for the world's fair. In Lemco van Ginkel's aesthetics of "speed", following Lynch, *pace* Kepes, architecture may well have become one among many interchangeable mediums, all exhibiting organisational patterns, of design.¹³³ Despite its search for order, the effect of Kepes's compilation of scientific and artistic works was akin to what Marshall McLuhan had described as the "whirling phantasmagoria" of what "stems from the laboratory, the studio, and the advertising agencies" – all of it, as the subtitle of his 1951 book *The Mechanical Bride* stated, "the folklore of industrial man".¹³⁴ In terms not unlike those of Kepes or McLuhan, the van Ginkels had, when first advancing *Man and His World* (in lieu of *Man in the City*), warned of "aesthetic weakness" in an "exhibition which was difficult to comprehend as a totality and induced extreme fatigue on the part of the visitors."¹³⁵ Indeed, a sense of exhaustion permeated Kepes's visual narrative. At the

¹³³ Martin, *The Organizational Complex: Architecture, Media, and Corporate Space*, 75.

¹³⁴ Herbert Marshall McLuhan, *The Mechanical Bride: Folklore of Industrial Man* (1951; Berkeley CA: Ginko Press, 2001), v. On overlaps between the respective projects of Kepes and McLuhan, see: Martin, *The Organizational Complex: Architecture, Media, and Corporate Space*, 72.

¹³⁵ R. Affleck, Michel Chevalier, R. Lemoyne, Hazen Sise, H.P.D. and B.L. van Ginkel, "1967 Montreal World's Fair" (October 29, 1962): 3, Series 27-A21-13, Fonds van Ginkel, Canadian Centre for Architecture,

same time, a utopian hope lay in the willful integration of art and science that offered new ways of *imaging* – of conquering *fatigue* by discovering patterns – when traversing the urban realm (or navigating the onslaught of information emanating in the postwar world). Here, the new landscape began to reveal architecture. The blurred, hovering, kinetic expressions seen by Lemco van Ginkel as animating new kinds of urbanism – aesthetics shared by the young architects designing Expo 67 – culminated in Kepes’s catalogue of *modules*, *proportions*, and *symmetries* with a series of long-span structures – thin shell vaults, hyperbolic paraboloids, Buckminster Fuller’s tensegrity structure (cleverly contrasted to a polystyrola microorganism), and, crucially, one of the visionary architect Konrad Wachsmann’s utterly remarkable space structures studies (fig. 3.22). Shown as a vanishing perspective taken deep inside the structure, the project repeated sections of a single twisted three-legged unit into a seemingly infinite lattice. In a quick succession of terms – *flexibility*, *standardization*, *crystalline*, *space-packing*, *modular*, *hexagons*, *symmetry*, *interlocking* – Kepes emphasised “a minimum of interconnection, a maximum of stability and strength” redolent of space frames, which he believed ascendant in architectural culture.¹³⁶ Already suggested in

Montreal. Lemco van Ginkel may well have discovered McLuhan’s work, notwithstanding its popularity, from Jacqueline Tyrwhitt, a key interlocutor when teaching city planning at the University of Pennsylvania in the 1950s. (Tyrwhitt encouraged Lemco van Ginkel to help establish GAI, the Philadelphia chapter of CIAM.) Tyrwhitt was Giedion’s principal collaborator in CIAM and facilitated his exchanges with McLuhan, with whom she had worked on media studies as part of the Explorations group at the University of Toronto in the 1950s; see: Michael Darroch, “Bridging Urban and Media Studies: Jaqueline Tyrwhitt and the *Explorations* Group, 1951-1957”, *Canadian Journal of Communication*, Vol. 33 (2008): 147-169.

¹³⁶ Kepes, *The New Landscape in Art and Science*, 352. Kepes’s project, partly culminating in descriptions of architectural technics, hewed closely to a deeply modern – that is, late-nineteenth century and twentieth century – project of dovetailing *technology* and *applied science*, especially in a postwar world marked by “research and design”, the transformation of universities by large-scale government projects (especially MIT, where Kepes taught), and warnings of a “military-industrial complex”. Kepes was also in the midst of fashioning a

Giedion's "New Monumentality", space frames emerged in the 1950s as an almost alternative trajectory to postwar modernism, offering, theoretically at least, heroic structures capable of housing a mass public. Indeed, Wachsmann had, in his book *The Turning Point of Building* of 1961, purposely situated the origins of modernism in the Crystal Palace; the very title was to confront notions on "space-time" by arguing for a universal *joint* as critical to making architecture. Informed by techniques of *prefabrication*, space frames provided aesthetic and technical succour to the megastructural movement; accompanied by rhetoric on *temporariness*, they offered the kinds of forms envisioned in the van Ginkels' recollection of nineteenth-century ferro-vitreous works.

Expo 67 would, upon opening, be seen in these effects. The magazine *Progressive Architecture*, which had been championing megastructures, renamed the world's fair "Man and His Space Frame".¹³⁷ Page after page showed detailed assemblies, photographs judiciously cropped, even inverted to negative, emphasising the extraordinary effects of cantilevers, lightweight envelopes, and serialisation (fig. 3.23). Whether "Space-Frame Cocoon" (the Netherlands), "Triangulated Daylight" (Fuller's dome), "Tensioned

realignment of aesthetics and science that had generally been divided since the mid-nineteenth century – a tendency seen, for example, in scientists dismissing the likes of Goethe and his interests in optics, morphology, and comparative anatomy (precisely the things resurrected in Kepes's "patterns" discourse) as merely artistic intuition and not scientific concepts. On this split between art and science, see: Lorrain Daston and Peter Galison, *Objectivity* (Brooklyn NY: Zone Books, 2007), 246-251.

¹³⁷ Forrest Wilson, "How the Pavilions Were Designed", *Progressive Architecture* (June 1967): 133. Among the first important compilations of megastructural tendencies for American audiences, *Progressive Architecture* produced a special issue on "Aesthetics and Technology of Preassembly" in October 1964. It opened with a portfolio of ideal cities – from the Japanese Metabolists to projects by Candilis-Josic-Woods – and concluded with detailed studies on industrialised building techniques. Later, at Expo 67, "space frame" was liberally applied to any number of so-called "experimental" structures; see, for example, in James Ackland, "Expo: The Space Frame Fair" *Arts Canada* (April 1967): 4-8.

Membrane” (Ontario), “Anchored Cable Nets Mesh” (Frei Otto’s West German pavilion), “Wide Flange Jewel” (Cuba), “Geometric Inclination” (Israel), or “Space-Frame Integration” (Man the Producer and Man the Explorer), among many others, the demand was the same: “Where else but in the atmosphere of ‘let’s find out’ of a fair are these experiments to be made?”¹³⁸ The question was rhetorical, intentionally capturing any number of exercises in prefabrication and alternative geometries as polemics on “cellular” or “cluster” structures.

The celebration of innovative architectural technics could, in 1967, only recall a missing project. Alone among publications, *Progressive Architecture* would open its detailed look at the exhibition by printing four drawings of “the fair that nearly was: A fair planned but shelved, which would have made architectural history.”¹³⁹ Never named, it was Man and the Polar Regions shown in its unseen diagrams, mentioned as the work of three Harvard graduates, and imagined as “a form of plug-in architecture less esoteric but certainly more tangible than any projects published in Archigram.” Faced by remarkable works, from Buckminster Fuller’s geodesic dome for the United States to Frei Otto’s tensile membranes for West Germany, which its editors duly admired, the magazine nevertheless admitted nostalgia for a future that never was, for a map of the world that, in early autumn 1963, unknowingly awaited splintering.

¹³⁸ Wilson, “How the Pavilions Were Designed”, 133.

¹³⁹ “How the Fair Was Planned”, *Progressive Architecture* (June 1967): 127. The journal may have taken a cue from the previous month’s issue of *The Canadian Architect*, which included an appraisal of Expo 67 by Jerry Miller. Miller had, of course, worked with Adèle Naudé on Man and the Polar Regions, and included its diagrams in his article. See: Miller, “Expo 67: A Search for Order”, *The Canadian Architect* (May 1967): 44-54.

PLANS, REDUX

Still, the problem of the plan remained. Safdie and Miller's "elongated" vision was, in a sense, to reject the world exhibition entirely, to replace its architecture by movement systems that were meant only as ciphers of an ideal, massive future conurbation. If their "elongated" plan was perhaps to return some vestige of Man in the City, then it was only in making the exhibition a matter of urbanism. The core argument carried since the PQAA deliberations on the world's fair – namely, the aesthetics of *movement* offering "varied visual experiences" by a "principle of the linear-cellular operation of space" – was somewhat at odds with the entirely fantastic scape – a high-speed linear city – being proposed.¹⁴⁰ This was not an argument on form *per se* (though it would become one); rather, it was, again, an issue of *speed*. Seen in terms of the van Ginkels' demands always to reduce "fatigue" by the kinds of aesthetics that Giedion would have described as exhibiting effects of "interpenetration", the visual narrative – a city seen through a constellation of overlapping but newly appreciable images – was to reintroduce the *human motor* as measure of perceiving the city anew.¹⁴¹ Unlike deeply modern – that is, emergent in the nineteenth century – notions on labour power as converting the making of things (including the very buildings upheld by the van

¹⁴⁰ V. Prus et al., "Mise en Scène" (Province of Quebec Association of Architects Convention, January 1963): n.p., Box 39-1990-002-35, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

¹⁴¹ Anson Rabinbach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (Berkeley and Los Angeles: The University of California Press, 1990). Rabinbach defines the "human motor" as a *metaphor* of work and energy that provided nineteenth-century thinkers with a way of describing a new scientific and cultural framework. It was, in short, both a mechanism for and a result of the industrial revolution.

Ginkels as necessary to reconceptualising postwar architecture) into visions of social modernity, this late modern restoration of physiognomy was accompanied by a challenge to modernist orthodoxy: the urban discourse borrowed from Lynch, via Kepes, *pace* Wiener – namely, an argument on repairing the urban environment by processes of visual “feedback” – owed to cybernetics as a bulwark against entropy. Against disorder, the exhibition movement systems – literally, *loops* of repeating but always perceptually different circulation – were to restore both the individual’s view of the “world”, now arrayed in any number of buildings, themes, and nations. The technical fix was already part of Safdie and Miller’s plan: not the high-speed trains but “horizontal elevators” and moving sidewalks, in other words the slowest of the proposed movement systems – on the one hand, fast enough to approximate driving in the city; on the other hand, slow enough to feel like walking in it. In both, the condition of a mass but communal movement of people past things would be paramount.

The idea was not necessarily novel. Moving platforms had animated visions of the modern city since the late-nineteenth century – and showcased as prototypes in world exhibitions. A two-speed system running in a one-mile loop was built at the 1893 Columbian Exposition in Chicago. The same engineers realised the 2.5-mile *trottoir roulant* at the 1900 Paris Exposition Universelle, where two parallel platforms, raised above the fairgrounds, moved at speeds of 2.5- and 5-miles per hour, allowed people easily to step on and off, and ran for twelve hours a day; over eight months, six-and-half million people would ride the “*rue de l’Avenir*”. Throughout the early twentieth century, such systems – really, any

kinds of technologies of *transmission*, including radio, believed to upend the limits of the city – were popularised in sources like *Scientific American* or *Amazing Stories* as anticipating a millenarian shift from work to leisure proffered by the liberating mechanisation of life. Such technologies would reappear – as *discourse* – in the early 1960s, not only for their obvious science fiction charm but as possibilities, once again, to upend CIAM urbanism. Team 10 member Brian Richards, who had assisted Daniel van Ginkel and others on preparing the “Doorn Manifesto”, was busy circulating photographs of and data on movement systems in efforts to counter “the destruction of construction of city centres today” produced by the private car while recognising its convenience and “delight”.¹⁴² Eventually published as *New Movement in Cities* in 1966, Richards’s research – with its repeating images of precisely those moving sidewalks (with notably Japanese provenance and appearing in airports worldwide) and monorails described by Safdie and Miller – exhibited a particular technological utopianism largely alien to Team 10 but otherwise kept with the group’s desire to discover alternative means of designing the city. It was, in other words, an argument for the non-orthogonal – again, the discovery of means to reduce “fatigue”.

The Expo 67 plan was conditioned by these concerns for more “open” experiences of movement. Prior to pursuing urban design at Harvard, Naudé had been strongly influenced by Richards while studying at the Architectural Association.¹⁴³ When tasked with designing the spaces – literally the fairgrounds – meant to lead visitors from one theme precinct to the

¹⁴² Brian Richards, *New Movement in Cities* (London: Studio Vista, 1966), n.p., inside cover.

¹⁴³ Adèle Naudé Santos, interview with author (October 17, 2008), Montreal.

next, she would combine Richards's discourse with that of Shadrach Woods, her other mentor. In his 1962 concept of "web", Woods began seeking a way "to set up systems (intellectual frames)" – *themes*, in the parlance of the world's fair designers; *imageability*, in Lynch's lexicon – "that can relate activities" through specific kinds of forms: "non-centric initially, poly-centric through use".¹⁴⁴ The resulting urban plans, particularly for new towns in France, were predicated on a certain aspect of Team 10 discourse that drew on the German geographer Walter Christaller's prewar research, which showed how normal market activity in southern Germany invariably producing a hexagonal network of towns and roads. Elements in postwar international planning circles took this as proof that pure geometry was found not only in nature but also appeared as the effect of normative, unplanned human behaviour.¹⁴⁵ Naudé's studies on "Activity Areas" followed suite. Anticipating needs to accommodate instantly a mass population, Naudé sought a "planning tool", like "web", to organise spaces for visitor services, commercial facilities, and small exhibitions. She began conceiving of complexes – "highly urban" and "highly imageable" – that, by "using a repetitive system", would create "clarity" in the exhibition.¹⁴⁶ The conscious turn to Lynch – to consider how fairgrounds of buildings, parks, and civic life could be made intelligible –

¹⁴⁴ Shadrach Woods, "Web", *Le Carré Bleu* 3 (1962): n.p.

¹⁴⁵ For Team 10, and especially in projects like Toulouse-Le Mirail, this was often the somewhat cynical translation of medieval fabric in functionalist terms as means of engendering everyday life. The impact of Christaller's theories on Candilis-Josic-Woods is discussed by Roger Sherwood in "Toulouse or Not Toulouse: Le Mirail after 20 Years", *Modulus* (1980-1981): 98-99. Le Corbusier also drew on Christaller's theory when developing ideas on the linear city in the 1930s that led to his book *Les Trois Etablissements Humains* of 1944; see: Frampton, *Modern Architecture: A Critical History*, 182.

¹⁴⁶ A. Naudé, "Activity Areas" (June 25, 1964); 1-2, Series 39-1999-05-02, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

led to Woods's "web" geometries: with "movement" as "the organising element", a series of honeycomb clusters with staggered branches – "the areas create nuclei, but also the spines which cross the major paths" – were to provide "a change of experience in density, in activity, and atmosphere" (fig. 3.24). Like Man and the Polar Regions, what mattered above all was creating "connector buildings in physical and mental terms". On the one hand, returning to Lynch's imageability and resituating human perception as agent of the city, the fairgrounds were, as diagrams, to formalise what Walter Benjamin had once described as the pedestrian's "serpentine gait". As Naudé put it, the "angle of horizontal movement relates to the angle of pedestrian flow i.e. 120° (not 90°)".¹⁴⁷ On the other hand, the very idea of providing *a priori* patterns seemed to contradict the heuristic procedures that would give life to things like Man and the Polar Regions as the utopian paradigm of Expo 67.

This tension appeared in one final and critical step leading to the master plan. It resulted from Safdie and Miller's studies. The ideas on movement systems would be taken up by Steven Staples, one of the three Harvard graduates working under van Ginkel, and transformed into the Expo Express, a train linking the Cité de Havre (the gateway to the world exhibition and site of its permanent structures, including Habitat 67) to the islands, and the Minirail, a monorail bought as surplus stock from the 1964 Swiss National

¹⁴⁷ Ibid., 3. Jerry Miller, who had worked on Man and the Polar Regions, described these unfulfilled plans after Expo 67 officially opened: "The paths and storyline (particular parts of which had special interest for particular nations) resulted in an organization to which the nations could "plug-in". It is important to note that this was not a megastructure, but a three-dimensional organization with established rights-of-way." Miller's somewhat disingenuous defence against a *post facto* misreading of the first intentions on the master plan indicates the popularity of "megastructure" in the late 1960 – a term not necessarily in popular parlance when Naudé and others were working under van Ginkel.

exhibition in Lausanne and used for circulation within the fairgrounds (fig. 3.25). When developing the final design of the Expo 67 transportation networks in 1966, Staples would write:

The stations of the primary transportation system were to be closely linked with the Theme structures so that not only was the Theme exhibit the first thing a visitor was exposed to as he came onto each area, but he could also capture the essence of the Exhibition by riding the primary system and stopping only at the Theme exhibits. The plan was to be analogous to the human body with the transportation network as the skeletal structure, the subdivisions of the Theme as the vital organs and the other pavilions as the fleshing out of the body.¹⁴⁸

Staples described the final master plan, in which the themes had been made to retreat into individual pavilions positioned as nodes throughout the fairgrounds. In the bio-physical analogy, transportation was obviously to be the means of *circulation*. It was the Minirail, running on three different loops around the islands at speeds similar to the slowest systems first outlined by Safdie and Miller, that, in Staples's view, provided experiences most akin to Lynch's theory: "Their transportation function is not as important as the exposure they give to all parts of the areas they serve."¹⁴⁹ Staples had studied under Lynch and his approach was strongly marked by *The Image of the City*.¹⁵⁰ To ride the transportation systems was to

¹⁴⁸ S.M. Staples, "Transportation Network at EXPO 67", *Architecture Canada* (August 1966): 33. The transportation systems were examined carefully by the planning establishment, especially those seeking to redefine "urban design" in the 1960s. For a symptomatic (though not always complimentary) appraisal, which mentions Staples and his designs, see: Denise Scott Brown, "Planning the Expo", *Journal of the American Institute of Planners* (July 1967): 268-270. Critics with a penchant for technological fixes found much to admire; see, for example, Reyner's Banham's enthusiastic review of the "transportation marvels" ("the best fun of the fair"): "L'Homme à l'Expo", *New Society* (1 June 1967): 811-813.

¹⁴⁹ Staples, "Transportation Network at EXPO 67", 34.

¹⁵⁰ Steven Staples, interview with author (October 14, 2008), Toronto. Staples notes that Lynch's seminar, given at MIT in the late 1950s, was essentially the same as *The Image of the City*. Staples was equally shaped by

encounter a kind of personal planning device. Lynch's *imageability* proposed a city "apprehended over time as a pattern of high continuity with many distinctive parts clearly interconnected"; as such, the "sensuous grasp upon such surroundings would not be simplified, but also extended and deepened":

...we must learn to see the hidden forms in the vast sprawl of our cities. We are not accustomed to organizing and imaging an artificial environment on such a large scale; yet our activities are pushing us toward that end.¹⁵¹

There was, perhaps, something almost cynical in the effort to restore meaning to the blighted cityscape at the very moment it underwent urban renewal.¹⁵² Lynch was, after all, attempting to render the sentimental as statistical. Yet his "artificial environment" was, at least for the Expo 67 architects, far removed from any existing city – it stood to be idealised and tested on its own terms. Technologies like the Minirail would allow visitors to stitch together aspect of the plan while floating above the fairgrounds. If the original impetus was to negotiate the "world" through the many aspects of "man" made appreciable in an immersive experience of endless loops of circulation, then the Minirail could never really facilitate the movement *through* things but simply *between* them. In one of the very few – maybe only – instances of experientially entering the "world", the monorail would penetrate Buckminster Fuller's geodesic dome, bringing people deep inside a new "globe of iron".

the planner David Crane's notion of "capital web". Crane, who had been a research assistant to Lynch and Kepes, began teaching urban design at the University of Pennsylvania in 1957 and was the chief planner for the Boston Development Authority between 1961 and 1965, when he elaborated the concept of "capital web" as a network of links between public infrastructures in the city core.

¹⁵¹ Lynch, *The Image of the City*, 10, 12.

¹⁵² Martin, *The Organizational Complex: Architecture, Media, and Corporate Space*, 138.

Otherwise, visitors simply travelled over the fairgrounds and pavilions. Looking down, at what was largely a grid of *Terre des Hommes*, they would see an enormous spectacle but, perhaps, little more.

In a sense, the transportation systems marked the end of the first and perhaps most utopian ideas on Expo 67. The critique of orthogonality coded in Naudé's landscape studies or in Staples's transportation networks was levelled against the Cartesian organisation of space of modernism. Yet the spatial division – Activity Areas below, monorails above – left nothing in between. The plan could only but become fragmented, made into a series of episodes that, finally, became individual pavilions on separate plots of land.

As they elaborated the master plan in autumn 1963, Daniel van Ginkel's architects faced the political realities of the world exhibition. The aim had always been to see architecture and urbanism in concert: forced to relinquish the city site, the architects had transposed this ideal to Man and the Polar Regions. Even as this pavilion-cum-master plan synthesised the ambitions sketched out at Montebello, there was, however unconsciously, something almost fatalistic in the idea of the theme "precincts" – namely, the eventual isolation of things in the plan.

By the end of the summer, the original CCWE commissioners, Cecil Carsley and Paul Bienvenu, had resigned. Like many others, they were disappointed by the move to the islands and fearful of future costs.¹⁵³ Robillard would soon depart, leaving van Ginkel as

¹⁵³ Bob Hayes, "Carsley Resigns World's Fair Post", *The Montreal Gazette* (August 27, 1963): 1. For Bienvenu and Carsley's travails, see: Ramond Grenier, *Regards sur l'Expo 67* (Montreal: Les Editions de l'Homme, 1965), 65-72.

master planner. Yet with the new Commissioner General Pierre Dupuy, a seasoned diplomat brought out of retirement, came a new administration, including Edward Churchill, the new Director of Installations, and Eduoard Fiset, the chief architect, under whom van Ginkel was now be obliged to work. Carsley and Bienvenu had been deeply sympathetic to the Montebello ideals and desired an exhibition that subordinated nations to themes. Dupuy brooked little of this ambition and began seemingly ceaseless *grands tours* to press worldwide participation at Expo 67. With each step, with each additional country committed to the fair, the architects' plans splintered. The loss of the city site was the first retreat; the division of the islands into nations was a final defeat.

On December 3, 1963, the van Ginkel team delivered its master plan. On December 4, van Ginkel was no longer in charge of the design. Charges of being fired or having resigned were levelled.¹⁵⁴ It mattered little. The plan – “This will be expo 67... 600 acres of the greatest spectacle the world has ever seen!” – bore little trace of the counterforms that were to organise a city, indeed a world, in miniature (fig. 3.26).¹⁵⁵ Instead, following Dupuy's missions, the islands appeared atomised into plots, each awaiting individual

¹⁵⁴ “Planner's Contract Over – He's Amazed”, The Montreal *Star* (December 4, 1963); H.P. Daniel van Ginkel, Press Release (December 5, 1963), n.p., Series 27-A21-03, Fonds van Ginkel, Canadian Centre for Architecture, Montreal. The *Star* carried news that the CCWE had terminated its contract with van Ginkel Associates as consultants. In the same article, van Ginkel was quoted as saying that he had resigned a weeks earlier in his capacity as chief planner. In a press release, van Ginkel noted: “We are preparing at present a full report which deals with the more underlying causes which led to my resignation”. Released in mid-December, the report criticised the islands plans and mentioned the ongoing cost overruns for dredging and fill. As remedy, van Ginkel recommended abandoning the island, depositing the fill at Point-Saint-Charles site, and returning the exhibition to its thematic basis. See: Untitled report (December 17, 1963), Series 27-A21-11, Fonds van Ginkel, Canadian Centre for Architecture, Montreal

¹⁵⁵ Moshe Safdie claimed authorship of the final master plan concept; see: Safdie, *Beyond Habitat* (Cambridge MA: The MIT Press, 1970), 16, 65-71.

expressions of nations and corporations, precisely those powers once wished banned at Montebello. Instead of the networks proposed by Naudé and others, everything now seemed to follow a gridiron. Huge tracts of water showed throughout – a last-minute provision of lakes by designers suddenly realising that, despite Drapeau’s promises, Montreal could never complete the dredging and filling promised within the coming half year.

Van Ginkel’s resignation marked the end of an extraordinarily fertile project. In eighteenth months, the Montreal architects had gone to the heart of debates on the ideal modern city, recalling prewar aspirations and shaping postwar reforms. In a complete reversal, the plan would be presented to Dupuy in terms that he may well have advanced:

A further reason for the proposed layout is that it splits up the pavilions in such a way that it is possible to avoid the problems which arise under geographic distribution. That is to say, it is no longer necessary to place the small Polish pavilion close to the large Russian pavilion, or the South African pavilion with other African countries, or small Canadian Provinces with large Canadian Provinces, or Israel next door to other Middle Eastern countries....

Finally, by avoiding formal groupings of pavilions, we emphasize that our theme is “Man and His World” rather than “Man and His Group”.¹⁵⁶

The unsigned memorandum, likely owing to Robert Shaw, the new deputy commissioner general under Dupuy, would note, “I believe that the planners have done an excellent job of taking full advantage of the beauties of our river site through this type of plan.”¹⁵⁷ Here, in

¹⁵⁶ “Memorandum to Mr. Pierre Dupuy, Draft” (December 3, 1963): 4, Box PF12, Folder 58/100/Pf5/27, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal.

¹⁵⁷ “Memorandum to Mr. Pierre Dupuy, Draft” (December 3, 1963): 6, Box PF12, Folder 58/100/Pf5/27, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal. Shaw made the same declaration when publicly announcing the final master plan; see: Peter Desbarats, “Master Plan Unveiled For 1967 World’s Fair”, *The Montreal Star* (December 23, 1963): 1.

finally defining the veritable *Terre des Hommes*, the picturesque finally trumped the political. There could be neither the utopian gesture of countries realigned nor an ironic signal of geopolitics clashed.

Over 65 nations, 20 corporate interests, five non-governmental organisations, two religions, seven official theme pavilions, and many administrative structures, to say nothing of a popular amusement park added to the easternmost tip of Ile Ste-Hélène, would divide the Expo 67 master plan. If any cohesion remained in 1967, then it lay in a series of official theme pavilions to be designed by different architects. The “distinctive visual character” of each pavilion would, the CCWE hoped, make the Expo plan “recognizable as theme”.¹⁵⁸

Terre des Hommes was finally divided into five themes: Man the Explorer, Man the Producer, Man the Creator, Man in the Community, and Man the Provider. Each was to be defined throughout 1964 and 1965 by advisory committees on science, medicine, and fine arts elaborating “aspirations towards building a better world”.¹⁵⁹ Yet the accompanying pavilions – generally all exceptional designs – would be scattered throughout the fairgrounds, upheld by the CCWE as “backbone” of the exposition but really bringing the earliest idea on “precincts” to an inevitable conclusion. It was a difficult proposition to maintain, given the final crowding by national, corporate, and cultural pavilions – “A Phantasmagoria of Expo 67”, as the magazine *Progressive Architecture* would note (fig. 3.27). There remained, then, a

¹⁵⁸ Affleck et al., “Preliminary Report on Theme – Site Study” (July 17, 1963): 1; Canadian Corporation for the 1967 World Exhibition, *Pavilion Architecture* (Ottawa, 1965), 1.

¹⁵⁹ Canadian Corporation for the 1967 World Exhibition, *The Theme Man and His World* (Ottawa, 1965), 3.

lingering desire for a possibly lost project: not only to present types of knowledge (“themes”) as the binding agent of Expo 67, but to advance architectural innovation as a public culture in itself. As *Progressive Architecture* also noted when recalling the forgotten, indeed unknown, plan for Man and the Polar Regions:

The major theme pavilion concept that was squashed in 1963 lingered long enough to influence the final planning stages, and, in bastardized form, was eventually built for the fair. Theme pavilions are now relatively small, because they shrank with successive budget appraisals and the will of Expo executives outside the planning department.¹⁶⁰

In fact, the pavilions were all quite large. None seemed, however, to satisfy the more visionary impulse believed resonant in the early Expo 67 plans.

Still, the “bastardized form” recognised by *Progressive Architecture* would actually appear in two critical ways. Both were to become theme pavilions, emerging from concepts begun as *design* and extended as *discourse* over the previous eighteen months. In entirely different ways, both were to stand as proof of theories, whether burgeoning or failing, on “megastructure”.

The first appeared in the December 1963 master plan. The islands were fragmented by pavilions; but Cité du Havre, the newly reclaimed city site providing a gateway to the exhibition, appeared as a series of chevrons and triangles, each drawn to suggest terraced half-pyramids. In comparison to the rest of the master plan, the shapes were positively enormous. They formed, in fact, a massive housing complex proposed by Safdie as a permanent exhibit

¹⁶⁰ “How the Fair Was Planned”, *Progressive Architecture* (June 1967): 127.

at Expo 67. Safdie had joined the Expo 67 team by insisting that he be allowed to moonlight on a housing project, the subject of his McGill thesis project completed under van Ginkel. Now, he had converted one of the three world's fair sites to his project. The preliminary drawings, reminiscent of plans he had developed for the Meadowvale new town, appeared at the scale once imagined for things like Man and the Polar Regions. It would soon be known as Habitat 67. For now, it was called by a forgotten name: Man in the City.

The second arose in the coming year, when the theme pavilions were put out to competitive bid. It was to be the closest approximation of Man and the Polar Regions realised at Expo 67 – not necessarily in the polemic of realigning themes but in the ambition to advance an utterly novel architectural technics. (It would, for entirely different reasons, also convey the labyrinthine qualities of space imagined in Man and the Polar Regions.) Designed by Arcop, the Montreal office whose partners had assisted the van Ginkels from the start, this work, Man the Producer, would, along with its sister pavilion Man the Explorer (which had, after all, been the first articulation on “man” vis-à-vis the borrowings from Saint-Exupéry), draw on a host of postwar discourses on situating long-span structures as the ultimate means for organising a new mass public.

It is in this last that the CCWE made a critical contribution to the architecture of Expo 67. In late-1964, as nations began considered what, exactly, their national architectures were to be, the world's fair authorities would promote “‘cellular’ construction” – a “‘new direction’ to the architects of the world” to be seen in “the building that will house Expo displays” with “flexible” space permitting “expansion or reduction as the need presents

itself”.¹⁶¹ The building was unnamed; but the preferred aesthetic suggested the lightweight and the demountable, the prefabricated and the flexible. In both “cell” and “flexibility” were evocations of Team 10 ideas on “change and growth” or Fumihiko Maki’s “collective form”. Crucially, the spatial analogy was equally a social metaphor. In the bio-structural model, which both pavilions would pursue, was, once again, an argument against rationalism. Instead of linear organisation, continuous “threads” of circulation; instead of symbolic forms, “modular” structures without appreciable hierarchy; instead of singular functions, many practices and programs. It was a diagrammatic dream. All that remained, given the pressing reality of the world’s fair, was to see just what such a theme pavilion looked like.

¹⁶¹ “‘Cellular’ Construction”, *Expo Digest*, Vol. 1, No. 20 (November 18, 1964): 1-2.

Chapter 4: Tetrahedra

Arithmetic! Algebra! Geometry! Grandiose trinity! Luminous triangle! Whoever has not known you is without sense!

Comte de Lautreamont (Isidore-Lucien Ducasse), Les chants de Maldoror (1869)

The earliest desire was to organise the “world” singularly through architecture. Well before the official announcement of Expo 67, Daniel van Ginkel and Blanche Lemco van Ginkel, along with their architect allies, made proposals in which “The Problems of Man”, “The Aspirations of Man”, “The Needs of Man”, “The Environment of Man”, “The Spirit of Man”, and “The Family of Man” were to constitute components of a “single structure” meant to replace inherited notions on the national pavilion, which they insisted had little place in a late-twentieth-century international exhibition.¹ Here lay a tension in the *late modern* view on contemporary history: on the one hand, the themes were to help introduce new nations, especially decolonising ones, into the “family” or “world” of “man”; on the other hand, the very same themes were to create a space of cultural appearance well beyond the lines of geopolitical alliance – in other words, outside typical norms of comparison. As such, the attempt to design the fair as a uniquely massive pavilion was to unite (or reconcile) all forms of human production via common “storylines”. Inside and throughout, a comparative narrative of “man” would unfold. Nations would be subordinated to peoples; politics to knowledge; ideologies to themes. Like the colossal and still influential nineteenth-century precedents consistently invoked by the architects conceiving Expo 67, this pavilion –

¹ R. Affleck, Michel Chevalier, R. Lemoyne, Hazen Sise, H.P.D. and B.L van Ginkel, “1967 Montreal World Fair” (October 29, 1962), Fonds Gilles Gagnon, 39-1991-02-005, Canadian Centre for Architecture, Montreal.

as the fundamental mechanism and vessel of the fair – drew power from the belief that no other cultural manifestation, apart from a universal exhibition, could properly achieve the ambition to synthesise the disparate output of humankind.

The dream was short-lived. As the van Ginkels soon discovered, Expo 67 became prey to political expediency, its site atomised by the typical – and inevitable – demands to showcase nations. The resulting heterogeneity of pavilions, could little convey the aspiration to discover a universal building system appropriate to organising peoples and things and the mass experience of them. It was perhaps left to the popular transport systems, and the apparently omniscient view they afforded, to suggest that the site below composed some sort of meandering but unifying cultural map.

The parsing of “Man and His World” nevertheless continued to inform the master plan. The earliest site studies had envisioned the entire fair organised by “Thematic Precincts” that would be essentially autonomous – each “should allow great flexibility in the development and presentation of exhibition content” – but demonstrating “strong architectural cohesion”.² A “precinct” was a key theme pavilion; any other zone or building would, the planners believed, be secondary.

This was to be the crucial legacy of the van Ginkels’ propositions. It appeared in one of the most consequential architectures at Expo 67: the theme pavilion Man the Producer, a hulking steel colossuses derived from combinations of a single tetrahedral unit. With its

² Affleck, Desbarats, Dimakopoulos, Lebensold, Sise, “Preliminary Report on Theme – Site Study” (July 17, 1963): 1, Folder 9, Series 2, D03, 109-26-TD, Fonds Guy Desbarats, Canadian Centre for Architecture, Montreal.

sister pavilion Man the Explorer, it embodied the earliest aims of exhibition: to express its modernity by experimental architecture and to house a mass public. As such, Man the Producer would draw on a unique trajectory in postwar architecture – advanced technics of space frames – to appear, at Expo 67, as proof of visionary ideas on the megastructure.

X'S AND O'S

Two desires had motivated initial ideas on the theme pavilions. The pavilion was, first and foremost, to synthesise all forms of human knowledge and material production, thereby obviating any national display or sentiment. Consequently, it was conceived as being *flexible*, not least owing to the unknown nature of exhibition contents. As much as this suggested a breathtakingly massive structure – in effect projected at the scale of all participating nations and corporations – it was, as the preliminary studies had projected, also to be “essentially inward looking”.³ Such architecture would constitute a deliberate withdrawal from the kitsch scenography of the more populist or celebratory aspects of world’s fairs by creating an expansive inner realm for the qualitative comparison of peoples and things.

In this new “world” set apart from the old, a new history of “man” was to be written. The resulting themes – Man in the Community, Man the Creator, Man the Provider, Man the Explorer, and Man the Producer – were not only to blur distinction between nations by enhancing common humanistic value and purpose of art, science, and industry; the creation

³ Ibid.

of “storylines” was also an approach to the spatial organisation of the fair. This had been the basis of *Man and the Polar Regions*, developed by van Ginkel’s staff architects Adèle Naudé and Jerry Miller. In it, narrative “threads” offered means to organise perceptual paths through the pavilion and its contents, providing alternative schemas of human production; they also functioned, quite literally, as means to build the architecture.

Working on the Expo 67 master plan in November 1963, soon before its final fragmentation into national plots, the young Expo 67 architects continued to imagine some kind of unifying structure capable of situating the entire exhibition. Drawing on *Man and the Polar Regions*, they began considering a “Flexible service grid integrated with the structural system.”⁴ Inside it, “interwoven thematic sub-divisions” were to obviate divisions between nations and themes by “cyclical” movement patterns allowing “the exhibition” – as architecture – “to be continuous”.⁵ The resulting form, made of “continuous vertical circulation on inclined planes”, followed from the “interwoven” thematic sub-divisions. Naudé gave it spatial elaboration: a sketch showing stacked box-like units, each one differentiated by Xs and Os or dots and voids, arranged to express the clustering of groups and extensions across a site (fig. 4.1). Seen together, the overall composition indicated some form of standardised assembly, piled high without hierarchy and, importantly, lacking preconceived formal order.

⁴ Adèle Naudé and Jerry Miller, “Organization of the Thematic Area” (November 19, 1963): n.p., Private Collection of Steven Staples, Toronto.

⁵ Ibid.

The idea was to provide a universal form of knowledge as expressed by a universalising architectural technology. Without using the term “megastructure”, Lemco van Ginkel had, when writing to Kenzo Tange several months earlier to rally support for the world’s fair, suggested some kind of sufficiently massive and organising “framework” to which nations could add respective architectural components.⁶ Well before Naudé and her colleagues submitted their ideas on a new mega-pavilion, the van Ginkels’ confrere Michel Chevalier, working throughout 1963 on elaborating the world’s fair theme, argued that the exhibitionary basis of Expo 67 could be aggregates of specialised information collected from across disciplines – a process that would also have direct architectural corollary. Writing in a series of “Position Papers” developed throughout the summer of 1963, Chevalier posited defining the Expo 67 theme by “a rigorous system of analysis and feedback” that could establish areas of agreement and dissent, eliminate “bias”, and arrive at “a broad consensus of agreement”.⁷ Feedback – the principle of informational self-regulation crucial to the increasingly popular science of cybernetics – would help to winnow choices, creating an ideal framework both designable and appreciable (by the public). It would, as a tool, also enable the rapid collection and synthesis of information in a “consensus”, but one presumably open to change. This approach had, for Chevalier, architectural precedent: “In this connection... Alfred Neumann, Dean of Architecture at the University of Jerusalem (Emeritus?), and

⁶ Blanche Lemco van Ginkel, Letter to Kenzo Tange (May 14, 1963), Series 27-A21-02, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

⁷ Michel Chevalier, “Thematic Development, Position Papers No. 8” (Tuesday, 23 July, 1963): 1-2, Series A21-04, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

leading architect of Vienna and Paris in the past, sheds some light on means to make a coherent whole of the thing by interweaving a multi-dimensional pattern.”⁸ Neumann, participant in the first postwar CIAM congresses and exponent of a “morphological architecture” of clustered geometries, was, in fact, teaching at Laval University in Quebec City and had contributed to the “Theme” study group at the seminal Quebec Order of Architects meeting in January 1963, when the van Ginkels and their colleagues conceptualised the recently announced world’s fair.⁹ Neumann’s group, which included Daniel van Ginkel, asked whether the notion of “theme” could, indeed, “be translated into terms concrete, visual, and three-dimensional?”¹⁰ The “spectator”, it was argued, “must play a subjective role as creator in the process of linking exhibits”; as such, “the architect must not forget that man needs to make his own choice, to make his own discoveries, to reach his own conclusions, otherwise his unique individuality is denied”.¹¹ In other words, the visitor was made central to the actualisation of the pavilion architecture. Hence the “multi-dimensional

⁸ Ibid. Neumann, Chevalier explained, “talks in terms of occupying a much smaller area than is usually the case to create a tightly-knit and comprehensive show. The space factor, if restricted in this way, would help solve some of the site planners’ difficult problems.”

⁹ Alfred Neumann, “Morphologic Architecture”, *Journal of the Royal Architectural Institute of Canada* (May 1963): 40-47.

¹⁰ M. H. Mayerovitch, “Le Thème” (January 1963): 5, translation by author, Fonds Gilles Gagnon, 39-1990-02-05, Canadian Centre for Architecture, Montreal. The study group comprised Neumann, van Ginkel, Gilles Gagnon (who, as Layout Architect with the CCWE Architectural Branch, would take charge of implementing the Expo 67 master plan in 1964), Guy Legault (a staff architect with Montreal’s Service de l’urbanisme, who had consulted with the van Ginkels on early choices for the site), and the Montreal architects David Bourke and Harry Mayerovitch.

¹¹ Ibid., 12-13.

pattern”: as much as visitors would see actual things (artefacts, displays), it was the emphasis on “choice” (“storylines”) that inspired an architectural solution.

Naudé’s sketch drew on this formulation. Her previous work on the master plan had evinced the influence of Team 10 member Shadrach Woods’s “web” theory that sought a limitless urban form in networks of circulation and support systems aimed at unifying diverse activities.¹² The notion of using movement patterns to organise “storylines” as the basis of the theme pavilion architecture precisely followed this concept. Now, another influence appeared to Naudé and her colleagues: the visionary architect Yona Friedman’s “mobile urbanism”.¹³ As a participant in the Groupe d’Etudes d’Architecture Mobile (GEAM) in the late 1950s, Friedman proposed not the architecture of moving parts but of *flexibility*, one that could be adapted to changing social needs and personal desires. “New constructions”, he insisted, must “be demountable and moveable” and “be transformable at will by the individual inhabitant.”¹⁴ In his impressionistic sketches, Friedman’s interventions took the form of a multilevel inhabitable lattice floating above the existing city (fig. 4.2). A grid of elongated pilotis supported a continuous three-dimensional framework connected by crosswise struts or by circular braces. The expression was explicitly anti-formal.

¹² Tom Avermaete, *Another Modern: The Postwar Architecture of and Urbanism of Candilis-Josic-Woods* (Rotterdam: NAI Publishers, 2005), 303.

¹³ Adèle Naudé Santos, interview with author (October 17, 2008), Montreal.

¹⁴ Yona Friedman, “Program of Mobile Urbanism” (1958), in Joan Ockman, ed., *Architecture Culture 1943-1968* (New York: Columbia Books on Architecture/Rizzoli), 274. As Ockman observes, Friedman developed his ideas partly as a critique of Team 10 and what he felt was the group’s vague notions about its adopted themes on “growth and change”, “development”, and, of course, “mobility”. Friedman attended the Team 10 meeting at Bagnols-sur-Cèze, France, in July 1960.

The schematic affinity of Naudé's drawing to Friedman's *urbanisme spatiale* was hardly coincidental. The repetitive but equally dematerialised quality reinforced precisely what was demanded by the theme pavilion: ease of construction and, importantly, temporariness. Crucially, Friedman and his GEAM colleagues had declared that "the mobility of component parts" – the "interchangeable elements of construction", including "moveable floors and ceilings" as well as more massive things such as shipping containers – will "lead to the reintegration of those functions that have become divided."¹⁵ Like many sources first informing the world's fair, this was a critique of CIAM functional town planning. In the schema of Expo 67, it offered a way to actualise the deeply humanistic project of re-presenting the "world" to "man": the "reintegration" of human associations and knowledge, via the experience of apparently never-ending "storylines", could, it was hoped, be transmitted by the capacity of a modular, thus reconfigurable, architecture.

In the coding of Xs and Os, infill and void, the presentation of both the fair and its architecture was to be essentially interchangeable. As much as the patterns evident in Naudé's key diagram indicated lines of organisation (through the apparent linking of informational "threads"), the equally dispersed arrangements pointed to a more open-ended approach to building. "Where possible the threads of the story should be externally as well as internally visible", the Expo 67 architects argued.¹⁶ This was not simply a demand for didactic displays; rather it was to propose that, just as in the evolution of never-ending

¹⁵ GEAM, "Programme for a Mobile Architecture" (1960), in Ulrich Conrads, *Programs and Manifestoes on 20th-century Architecture* (Cambridge MA: The MIT Press, 1970), 168.

¹⁶ Naudé and Miller, "Organization of the Thematic Area", n.p.

“storylines”, the enmeshing of interior and exterior tended toward engendering a spontaneous building (and the experience of it). The pavilion “Structure”, as drawn by Naudé, was thus accompanied by a single demand: “Temporary”. This came with six corresponding conditions:

1. System to be used for 5 parts of the theme in Ile Ronde, Ile Verte.
2. Modular space system to give a variety of spaces of the same order (for services, for exhibits).
3. System to allow for numbers of links between thematic sub-divisions.
4. System to accommodate movement patterns: services, people.
5. System to be able to grow or shrink.
6. System to allow variations in space closure.¹⁷

Growth, movement, order, variation, variety: expressions of function and space stemmed from the demand to create a “modular space system”. Regardless of its configuration, the theme pavilion was presumably to arise from standardised assemblies, adaptable to any landscape.

This was not only an architectonic limit but a social ideal. The insistence on providing the “same order” throughout the building – regardless of what was displayed or by whom – meant that received cultural norms could be totally reorganised. Since the nineteenth century, the typical taxonomies of world’s fairs registered the unequal division of things and hence the uneven distribution of power among peoples. Yet as fraternal (though equally paternal) calls to order, the accepted mission of world’s fairs – from 1851 to 1939, the largest gatherings of people, in war or in peace, of all time – was fundamentally to effect mass education.¹⁸ This most daunting of mandates was what the van Ginkels had hoped to

¹⁷ Ibid.

¹⁸ Paul Greenhalgh, *Ephemeral Vistas: The Expositions Universelles, Great Exhibitions and World’s Fairs, 1851-1939* (Manchester UK: Manchester University Press, 1988), 1. Greenhalgh notes: “By 1867” – the year of

conjure in the scope of a “total” architecture. The belief was, in Naudé’s words, that through “strong design” the thematic pavilions “can be used to organise the exhibition”.¹⁹ “Strong” did not mean monumental. Rather, it signified a capacity – a *system* – for overcoming conventional ideas on symbolising nations and peoples as the by-product of world’s fairs.

Yet any notion on architecture *qua* architecture – its formal or representational qualities – was here subordinated to the efficiencies of, first, quick assembly, and, second, endless re-composition. In this, the van Ginkels’ invocations of behemoth nineteenth-century ferro-vitreous architectures were now finding fulfillment. Extendable and capable of limitless permutation, Joseph Paxton’s Crystal Palace had emphasised the *how* (process) over the *what* (form) (fig. 4.3).²⁰ Moreover, it served as a vessel organising a viewing public and its perception of peoples and things collected from around the world. Still, even with the precedence of *how* over *what*, there remained in 1851 a discrepancy between a building-as-

Frederic Le Play’s Colisée de Fer for the Paris Exposition Universelle, which comparatively organised human production according to paths crossing both through nations and across similar trades – “and increasingly so until the end of the century, it was the lower middle and artisan classes who were the desired audience for educational exhibits. By 1900, the ‘masses’ proper were referred to as being the true beneficiaries of learning, their intellectual development apparently being vital for the survival of Western civilization” (21). As Richard D. Mandell observes, world’s fairs also became the backdrop for academic conferences. The Paris show of 1900 included conferences on fisheries, libraries, publishing, dentistry, education systems, hypnotism, philately, photography, public health, numismatics, ornithology, and medicine (the largest at 6,000 delegates). See: Mandell, *Paris 1900: The Great World’s Fair* (Toronto: University of Toronto Press, 1967).

¹⁹ Adèle Naudé, “Visitor Needs on Site” (27th October, 1963): n.p., Box PF12, Folder 50/100/PF5/27, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal.

²⁰ Kenneth Frampton, “Industrialization and the Crises in Architecture” (1973), in K. Michael Hays, ed., *Oppositions Reader* (New York: Princeton Architectural Press, 1998), 47-49. Frampton argues: “Clearly the Palace would not in any classical sense of the word said to have been *composed* and indeed, had it not been for a last minute outcry over tree preservation, it would have been erected without its central transept – the one feature which served to impart a certain fortuitous symmetry to its otherwise undifferentiated facade.”

exhibition and the exhibition as an array of objects: the former crystallising primary systems of production and distribution, the latter completing the creation of instant cultures of consumption and the consequent establishment of a totally new class.²¹ The Expo 67 theme pavilion was not to brook such a split. Lemco van Ginkel's earliest exhortation to "return to the spirit of International Exhibitions of a century ago" meant the "complete adherence to a universally applicable theme."²² "Theme" was interchangeable with "architecture": human knowledge and spatial experience would be seamlessly integrated and made visible – thus universalised – in the pavilion's technics. As indication of how the entire exposition was hoped to be built, the standardised components of the "modular space system", along with its varied assemblies, were quite literally expected to restructure the objects and nations on display, and the changing experience of them. Questions of monumentality, so crucial to the symbolic purpose of world's fairs, were to be strictly avoided.

A SYSTEM

All that remained was to realise a suitable architecture. There was, however, a fundamental limitation: no one yet knew, in autumn 1963, what things – which artefacts – were to be displayed. The theme pavilion could not be designed according to the constraint of its contents. It could, however, be projected as forcefully re-conceptualising its subject matter,

²¹ Ibid.

²² Blanche Lemco van Ginkel, "1967 Montreal World Fair" (October 29, 1962), Box 39-1990-02-005, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

whatever it may be, according to entirely new standards – that is, writ large in architectural “storylines” serving to reorder the “world” of “man”.

The very idea of “storyline” implied forms of *continuity*. In architectural terms, this corresponded to the call for creating a “system”. As van Ginkel’s young staff architects continued to advance the pavilion diagrams, his office issued further thoughts on the Expo theme. A memorandum on the “CWE Theme”, prepared concurrently with the Naudé’s plans on “Organization of the Theme Area”, gave “context of ‘Terre des Hommes’ in 1967”:
a “world in which isolation is no longer possible. A world which recognizes the interdependence of matter and the interdependence of man.”²³ With “physical barriers to communication having been overcome,” the notion of “interdependence” rested on eliminating “the intangible barriers to communication between men”. Having done so, “common problems” would be “recognized” and solutions achieved as “one people may draw upon the experience of another in the realm of metaphysics as well as in the new technology.” The utopian sentiment was, coming from the architects, tied to the double-coding of the “storylines”: first, as an organising principle for the fair; second, as simultaneous means for rewriting world history and building its pavilion architecture. The “interdependence” of “matter” and “man” was here being formulated in the links between *theme* (“threads”) and *architecture* (“system”). Within this infinite loop, the experiential continuity between “storyline” and “structure” was to be seen in concert; both, in turn,

²³ Van Ginkel Associates, “CWE Theme” (October 15th, 1963): 1, Series A21-04, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

would work together to help shape the architectural proposition. Content (displays, knowledge, history) and form (pavilion) were to be mutually appreciable.

Here, then, lay the desire for “system”. The total reconceptualisation of the social and space relations of “Man and His World” could be actualised only by a “flexible”, architecture. On the one hand, the impression of modularity jibed with the idea of maintaining a continuous datum of information (the actual circulation paths outlining a given “theme”); on the other hand, the deliberate parsing of a theme in interweaving “threads”, as first sketched in *Man in the Polar Regions*, implied both a perceptual and informational mixing achievable only by standardised, interchangeable architectural components.

This suggestion of “feedback” – of endless modification to a result (a theme, a building) by the factors producing it – lay at the heart of the pavilion as “system”. In it was invocation of ascendant ideas of “systems theory” in the postwar human sciences. Systems theory was the application of the principle of biological self-regulation (“homeostasis”) to machines and society. It followed from a particular view of “organicism” in biology developed in the 1920s by Ludwig von Bertalanffy, who sought an appreciation of wholeness (regulation), organisation (hierarchy and laws proper to each level), and dynamics (process). By the early 1960s, von Bertalanffy had evolved a “General Systems Theory” that offered a “theory of organization” applicable to any number of social, economic, or technological

questions.²⁴ What mattered above all was the construction of “wholes” – whether social systems (here “themes” or, really, world’s fairs), economic models, or, indeed, architectural works – predicated on a continuous loop of information or user input. Taken to its extreme, it could only lead, in architectural terms, to the constant rebuilding of the structure itself.

In this was a nascent but fundamental critique of modernism crucial to the planning of Expo 67. Whereas the holism espoused by the likes of Aldo van Eyck – Daniel van Ginkel’s chief interlocutor – was posited on objective “structures” (existing independent of the subject) that established long-term cultural norms, the “systems” view held these very same criteria as dynamic thus open to change.²⁵ The van Ginkels’ experience of Team 10 was steeped in such sentiment. If there was still to be some relevant idea of “universal man”, as assuredly assumed in the Expo 67 theme, then it was to be modified by re-actualising human agency in the creation and perception of the urban realm. Naudé’s use of Team 10 member Shadrach Woods’s “web” concept on her master plan studies consequently brought to bear an approach to urban design informed by the cybernetic qualities of systems thinking. In late 1962, the moment of the van Ginkels’ early ideas on the world’s fair, Woods had written:

As long as societies were evolving within the limits of perceivable human groupings (villages and towns, classes, castes and sects), so long could architecture operate within the limits of purely visual disciplines. With the breakdown of these limits and as man evolves towards a universal society, the need is felt to discover a clear framework for planning and architecture at the new scale.... New systems of

²⁴ Ludwig von Bertalanffy, “General Systems Theory: A Critical Review”, in *General Systems, Yearbook of the Society for the Advancement of General Systems Research* 7 (1962), 1-20.

²⁵ Alan Colquhoun, *Modern Architecture* (Oxford: Oxford University Press, 2002), 262 n25.

architecture are required.... The approach can no longer only be visual; we must call upon the whole range of sense, intellect and emotion to elaborate an architecture consonant with our aspirations....

Total space and universal society are interdependent; the one engenders the other.²⁶

Not unlike calls by prewar modernists, the postwar world was seen as becoming “universal”.

Yet there was difference. The Modern Movement had, as CIAM announced in its epochal

“La Sarraz Declaration” of 1928, espoused a human subject, guided by forces of

“rationalisation and standardisation”, accepting the “revision of his demands in the direction of a readjustment to the new conditions of social life.”²⁷ Woods insisted on the opposite.

Instead of fixed limits (“perceivable human groupings”, “purely visual disciplines” – the very

criteria of typical world’s fair pavilions), architectural design was to be open to far greater

number of stimuli: “sense, intellect and emotion” – in other words, cognitive, subjective

bases for creating the built world, each intimately related and open to modification.

Thus, “interdependence”. The van Ginkels’ definition of Expo 67 – “A world which

recognizes the interdependence of matter and the interdependence of man” – not only

conveyed the sentiments of the Montebello conference but echoed Woods’s influential

formulation of a year earlier: “Total space and universal society are interdependent; the one

engenders the other”.²⁸ (It also followed Sigfried Giedion’s “interpenetration”.) In the

²⁶ Shadrach Woods, “Web”, *Le Carré Bleu* 3 (1962): n.p.

²⁷ Congrès Internationaux d’Architecture Moderne, “La Sarraz Declaration”, in Conrads, *Programs and Manifestoes on 20th-century Architecture*, 110. The 1928 declaration emphasised *building* rather than architecture, indicating a certain constructivist line adopted by CIAM during its initial formation.

²⁸ Van Ginkel Associates, “CWE Theme”, 1; Woods, “Web”, n.p.

reciprocity of “total space and universal society”, Woods sought “systems” or what he further called “intellectual frames”. The argument was for things “sufficiently flexible to permit growth and change within themselves throughout the course of their lives”; “open in both directions, i.e. in respect to smaller systems within them as well as in respect to greater systems around them”; and presenting “in their beginning, an even over-all intensity of activity in order not to compromise the future.”²⁹ At stake was achieving what the Man and the Polar Regions report called “coherence”. Just as Woods argued for “openness”, with a “web” that can be “plugged-into” or “plug in to greater systems at any point”, so the Expo architects sought “horizontal coherence” (across “the threads of the story”) and “vertical coherence” (among independent “national exhibits”) in their modifiable pavilion. The shared wish was, above all, not to establish any dominant narrative; thus the strategy of all nations “plugging-in” to the dominant “storylines” at any given point in the pavilion depending on cultural, material, or technological affinity (fig. 4.4). The idea was that “understanding” – or, for the Expo architects, “coherence” – would “come through the perception of parts, as the whole system can never be seen.”³⁰ The dismissal of the “whole system” was, in Woods’s view, an argument levelled against “symbols and monuments”, against “these crutches of authority”; in their place was to be alternate form of “planning” that gave authority to users: “The systems will be such that man can, within them,

²⁹ Woods, “Web”, n.p. Woods provided one example of “Web”: the “continuity of organization” lent by the *dalle*, an elevated pedestrian network, to the Caen-Herouville and Toulouse-Le Mirail projects, which had so influenced Naudé’s circulation patterns for the Expo master plan. He noted that “Web” was meant “to designate Stem” – an earlier concept of Woods informing Toulouse-Le Mirail – “to the next degree”.

³⁰ Ibid.

contribute to the creation of his own environment, and in doing so, ameliorate the total environment”.³¹ It was an uncanny echo of, first, the van Ginkels’ early charges levelled against typical world’s fairs and, second, their justificatory quotation of Saint-Exupéry’s humanism – “To be a man is to feel that through one’s own contribution one helps to build the world” – that had set the tone of Expo 67 and its design. That *system* could be thought synonymous with *pavilion* (as an exposition in itself) was crucial: the world was, after all, being re-presented by “intellectual frames” construed specifically by architects. Technics of building would, therefore, comprise the primary element of mass communication.

The demand for *growth*, *flexibility*, and *coherence* in a theme pavilion was to connect knowledge – theme, history, display – to both the structure and the experience of an “open” architectural form. Instead of linear organisation, continuous loops of circulation; instead of symbolic forms, structures without appreciable hierarchy; instead of singular functions, different practices and programmes. It was a diagrammatic dream. All that remained, given the pressing reality of building the fair, was to see just what its pavilion would look like.

TRIANGLES

With Daniel van Ginkel’s resignation as chief planner of Expo 67 in early December 1963, the impetus to design the theme pavilions took on added urgency. While the young staff architects lost control over the pavilion design, turning their energies instead to master planning and site co-ordination, the thrust of their initial speculations continued, for now,

³¹ Ibid.

intact. By early 1964, the actual thematic subdivision became formalised, with the parsing of “Man” into five categories, each with its own pavilion. The CCWE would consequently commission consulting architects for each theme pavilion. Private firms were to follow guidelines set by the CCWE to interpret a given theme, later to be expanded by committees of outside experts, into architecture. The bidding process – on single buildings – was now the same as the national and corporate pavilions.

Nevertheless, a residual attempt at “coherence” would remain – and appear in twinned pavilions dedicated to Man the Producer and Man the Explorer. These two giant works, hulking steel structures made by combining tetrahedral cells into massive space frames for both floors and walls, were, along with Habitat 67, the only results of the van Ginkels’ very first ideas on the fair: namely, how to organise an entire exposition within a single built form (fig. 4.5). Man the Producer and Man the Explorer became among the most-noticed and polemical architecture at Expo 67. Of the two, Man the Producer, would be seen as fulfilling ambitions of the megastructural movement, not least by the simple fact that it exhibited less formal symmetry, thus lending an aura, especially when photographed, of remarkable spatial complexity and technological advance.

The CCWE awarded Man the Producer and Man the Explorer to Arcop, an important architecture firm in Montreal. Founded in 1957 by Ray Affleck, Guy Desbarats, Dimitri Dimakopoulos, Fred Lebensold, and Hazen Sise, Arcop, which stood for “Architects in Co-partnership”, had quickly achieved a national profile with large and important cultural commissions, especially arts complexes and university buildings, in Canadian cities. Much

of their work carried an idiom of refined concrete with Brutalist overtones. Affleck had contributed to both the PQAA retreat and the Montebello conference, and his firm had, in April 1963, entered into joint venture with the van Ginkels to study the theme and site. By June, the CCWE made Arcop responsible for “Physical Realization of the Theme” in a “semi-abstract sense” – in other words, not an architectural but a diagrammatic outline of the dedicated “Thematic Precincts”.³² These areas, not yet programmed, would define van Ginkel’s master plan, placed as legible markers for the crowds anticipated as lost among the competing spectacles of national pavilions. As such, Arcop’s approach to designing the Man the Producer and Man the Explorer would negotiate these conceptual poles: first, the ambition to map a world’s fair at the scale of the city itself; second, the projection of a larger “humanistic” project that sought visionary architecture as the only means to convey the manifold aspects of *Terre des Hommes*.

While the Expo 67 master plan showed thematic precincts, they were entirely without architecture. By late January 1964, this was of pressing concern. To members of the recently formed Advisory Committee on Architecture for the Canadian World Exposition, the design criteria were many – and unknown. Writing to his fellow committee members, all *bona fide* postwar Canadian modernists, Douglas Shadbolt, an architect and leading pedagogue, listed the conditions: first, the theme buildings could not be designed until a finite space requirements became available; second, this finite programme could not

³² Affleck, Desbarats, Dimakopoulos, Lebensold, Sise, “Preliminary Program for Theme – Site Study” (July 17, 1963): 2, Fonds Guy Desbarats, D03.9-109-26-TD, Canadian Centre for Architecture, Montreal.

be determined until the space was sold to exhibitors; third, foreign exhibitors had yet to be approached; fourth, the actual themes were not yet elaborated (there were no governing “storylines”); fifth, it could take up to one year, at minimum, to determine a detailed programme for the buildings; sixth, the construction schedule would necessitate starting the pavilions well before programming; and seventh, there would be a host of technical problems – site conditions, climatic variables, and transportation exchanges – that “these so-called temporary buildings will have to cope with”.³³ Given this, the design possibilities were, in Shadbolt’s view, clear:

Under these circumstances there appear to be two solutions:

- a. to decide arbitrarily on the building size and shape, and sell off space on a package basis and get on with it.
- or b. to design and prototype a building “system” of prefabricated components which could be manufactured on the site and which would allow the decision on the final plan to be deferred until the last possible moment by using the interim period to develop the building system.

“These two alternatives”, Shadbolt concluded, “lead to different results”:

The first would sabotage the theme idea as it is presently conceived as it would lead to pavilions of Science and Industry, Fine Arts, etc. The second would require that all theme buildings are built of the same system for economic reasons, which would provide the unity that the master plan suggests, providing it is flexible enough to meet widely varying plan conditions. This system gives the exhibition designers considerably more freedom to suggest modification of the building and should result in a more integrated total result.³⁴

With the Expo 67 master plan unveiled only a month before his assessment, Shadbolt already recognised the growing pressures bearing on the fair: either to follow typical norms of

³³ Douglas Shadbolt, Letter to John C. Parkin (January 20, 1964): 1-2, Parkin Archive PK-290, Canadian Centre for Architecture, Montreal.

³⁴ *Ibid.*, 2.

allowing individual pavilions, however engaging; or to adhere to the early ambitions, as developed by Naudé and others, for “unity” of the master plan achieved specifically by a comprehensive building “system”.

Even as the fair began to fill with national and corporate pavilions, just as Shadbolt had predicted, there remained the ambition to achieve an aspect of formal and spatial “unity”. The theme pavilions would soon serve this purpose. On April 9, 1964, at the first meeting of the Executive Committee of the CCWE, Arcop was given “limited mandate for the preparation of preliminary plans and cost estimation”.³⁵ Two months later, the firm was granted approval “to undertake the design of both buildings” (at this stage simply known as “the Theme pavilions on Ile Verte and Ile Notre Dame”).³⁶ This came, however, with a singular contractual demand: that “the consultant”, Arcop, undertake “extensive studies on the development of an unusual design of the structural system.”³⁷ In this single bureaucratic edict lay a growing ambition: to see experimental architecture as a showcase in itself, expressive of the very kind of modernity Expo 67 was to embody.

Between April and late June 1964, Arcop initiated its first designs of the theme pavilions. The functional need was, of course, to provide clear, unobstructed space for exhibiting the kinds of objects and things – still unknown – conjured by “Production” (and

³⁵ “First Meeting of the Executive Committee of the Canadian Corporation for the 1967 World Exhibition” (April 9, 1964): 6, Canadian Corporation for the World Exhibition Fonds, RG71, Vol. 445, Library and Archives Canada, Ottawa.

³⁶ “Details of Request to the Executive Committee: Theme Complexes – Pavilion Buildings & Exhibits”, No. 100 (December 21, 1964): 1, Canadian Corporation for the World Exhibition Fonds, RG71, Vol. 445, Library and Archives Canada, Ottawa.

³⁷ *Ibid.*

“Exploration”). As such, the initial but formative studies were on long-span structures. A longitudinal section, drawn in mid-June, revealed a grid of raised boxes, hovering over the master plan canals, connected by walkways to a transportation station, beyond to cantilevered platforms of a restaurant tower, and down to the waterways below (fig. 4.6). The scheme was unremarkable; still, the kernel of an idea emerged. In sketches accompanying the sectional drawing, Ronald Williams, a young architect working for Arcop, outlined different steel structural systems according to six criteria: “Structural Possibilities”, “Visual Possibilities”, “Integration of Services (Mech.)”, “Relation to Exhibits”, and “Relation to Site” (fig. 4.7).³⁸ Short- and long-span systems (including Vierendeel trusses), cantilever construction, and suspension structures (some with hanging modular units) were shown. The goal was a “frame” providing “overall visual unity”, an “effect of lightness” and “transparency”, and “a variety of volumes and backgrounds for different types of exhibit” that “may be used for ‘representational’ exhibits but is not visually sympathetic to them”.³⁹ The possible structure was posited as being “value-free”: while giving an overall coherence, it was to offer an “open” spatial organisation and remain disentangled from any exhibits.

One week later, the scheme irrevocably changed. The elevated boxes, with their thin struts and hovering walkways, were gone. Instead was a plan of hexagonal geometries with pathways obliquely crisscrossing the site and capturing and enclosing multi-sided spaces.

³⁸ “Steel System”, n.p., Series 64-20-34, Fonds Arcop, Canadian Centre for Architecture, Montreal; Ronald Williams, interview with author (November 4, 2009), Montreal. Williams, a young architect at Arcop in 1964, authored the “Steel System” sketches while researching structures appropriate to the theme pavilion programme.

³⁹ Ibid.

The section rose similarly, with angles meeting to form triangulated spaces past which the floors now cantilevered (fig. 4.8). As notes on an accompanying sketch indicated, the need was to “let people below be aware of the activities up above and vice versa”. The overall impression was of much greater spans and of far more links, both spatially and visually, between different levels and across the site.

The search for an appropriate building “system” rested on discovering a singular, repeating constructional element. Arcop’s first study kept with Naudé’s initial diagrams and compared systems essentially “sympathetic to ‘Cartesian co-ordinate’ geometry with 3 mutually perpendicular axes”.⁴⁰ With this, “the use of steel frame in several structural expressions forms a spatial system of lines and planes in many combinations.”⁴¹ In the emphasis on a “spatial system” was, however, the hexagonal exception: amidst the diagrams of “modular” steel constructions appeared a sketch of a “cellular system” derived from “120° horizontal angles” and “sloping walls”.⁴² A description of somewhat unusual planimetric and sectional space, it was the only sketch of its kind. It was not, however, a coincidence.

As the Arcop team had continued to advance modular steel frames, its designers were summoned to a meeting. It was pivotal. On a warm, sunny Sunday afternoon in June 1964, the Arcop staff, all young designers, arrived at the home of Jeffrey Lindsay, an architect living in Beaconsfield, a western suburb of Montreal. A few months earlier, Lindsay had been

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Ibid.

contracted by Arcop to research experimental structures for the theme pavilions.⁴³ Invited by Lindsay's wife to join him in their backyard, the architects strolled down the gently sloping lawn bringing them to the edge of Lac St-Louis, part of the St Lawrence River. They found Lindsay waiting behind a table. Scattered on it were yellow cardboard models of triangulated structures: some with clipped corners, joined end-to-end at their apices; others arranged one on top of another, face-to-face, as diamonds (fig. 4.9). Many were composed only of thin frames while others were made entirely of planes. The impression was one of maximal points of contact and minimal wasted space between solids. Linked together by paper clips, the identical units combined to produce endlessly zigzagging clusters, where any notion of hierarchy or centrality appeared trumped by dispersal.

The effect was galvanising. Nothing was left of "Cartesian" geometries, of grids. Instead were repeating nested shapes simultaneously expressing structural design, with the tetrahedrons forming truss-like planes, and space enclosure. Here, then, was indication of a "system" towards a pavilion: a single element, when combined, offering seemingly limitless combinations.

The tetrahedral experiment was not without precedent. It was, in fact, rooted in Lindsay's immersion in the work and theories of Buckminster Fuller, the autodidact inventor and architect, whose geodesic domes became increasingly popular in the 1960s. Throughout the 1950s, Lindsay had advanced experimental architectures that borrowed principles from

⁴³ Ronald Williams, interview with author (November 4, 2009), Montreal. As a junior architect at Arcop, Williams attended the meeting at Lindsay's home.

Fuller's famed geodesics and applied them to the broader applicability of space frames.

These approaches, which would profoundly shape *Man the Producer* and *Man the Explorer*, offered an alternate, if iconoclastic, vision for postwar modernism, one based on finding a synthesis between industrial production and theoretical principles of "growth" as found in natural phenomena – in short, a stab at discovering flexible, adaptable solutions for "universal" design and need.

Central to this ambition were questions on prefabrication and desires for lightweight structures. Fuller saw architecture not as end in itself but part of what he called "design science", a long-range economic and technological programme that related the problems of shelter to other survival tasks of transportation, food resources, and energy harvesting; the aim was "to make man a success in the universe".⁴⁴ Fuller repeatedly asked, "How much does your building weigh?" An exhortation against material waste, thus for optimised structural and spatial efficiency, it led to Fuller's portable Dymaxion Deployment Unit of 1940 (otherwise a single-family house) and, by the late 1940s, his "autonomous living package" of a geodesic half-dome as a basic unit of shelter. Fuller would, indeed, be celebrated for his spectacular 250-foot diameter geodesic dome for the United States pavilion at Expo 67.⁴⁵ Yet he could also lay claim to other residual effects at the fair – notably, by Lindsay, who had, by the very early 1950s, already materialised Fuller's nascent theories on

⁴⁴ E.J. Applewhite, "Fuller, Buckminster R.", in Adolf K. Placzek, ed., *Macmillan Encyclopedia of Architects* Vol. 2 (New York: The Free Press, 1982), 125.

⁴⁵ Fuller had previously contributed smaller domes to exhibitions organised by the United States Information Agency (USIA), notably in Kabul (1956) and Moscow (1958). USIA also commissioned Fuller's dome at Expo 67.

geodesics. Lindsay's indebtedness to Fuller and, more broadly, discourse on space frames research would decisively shape the design and experience of *Man the Producer*.

GEODESICS

Lindsay's first and crucial engagement with Fuller occurred as student. In 1948, demobilised after having served four years as a bomber pilot with the Royal Canadian Air Force, he joined a special seminar conducted by Fuller at the Chicago Institute of Design where, in 1937, the émigré artist László Moholy-Nagy had sought to re-establish the Bauhaus legacy of experimental design education. Without any previous formal training in architecture or engineering, Lindsay worked with Fuller for the next two years, first at the Institute and then at Black Mountain College in North Carolina, a progressive liberal arts college that held arts learning at the core of its teaching philosophy (fig. 4.10). Fuller found both schools ideal sites for experiment, initiating intensive modelling-based studios eventually culminating in the design and construction of geodesic domes by student teams.

Lindsay's immersion in this applied pedagogy coincided with an especially decisive and fertile moment in Fuller's research. It stemmed from twinned investigations on the interrelations of geometry and structure. Two overlapping concerns preoccupied Fuller. First, exercises in topology, principally the segmenting and folding of spheres that could then be quantised into geodesic shapes – a process having produced the Dymaxion map of 1943, which minimised distortion when transferring data from a globe to a flat surface. Second, beginning in the late 1940s, studies on the close packing of solids, which followed from the

realisation that spheres grouped tightly around a central nucleus do not form a larger composite sphere but produce instead a cuboctahedron (a polyhedron with 14 faces comprised of six squares and eight triangles, with all sides of equal length) – a effect Fuller dubbed “Vector Equilibrium” and represented in models that, when seen, seemed made of infinite matrices, an expressive transmutation of solids into lines, a dematerialisation of definable shapes into things appreciably more weightless (fig. 4.11).⁴⁶ Both instances provided Fuller a way of designing “as Nature sees herself”, an approach owing to a belief that natural forms operate with co-ordinates other than the Cartesian system.⁴⁷ While abandoning assumed norms of material and spatial order, this view on “Nature” quickly coalesced in actual structural form: Fuller’s “octet” (octahedral-tetrahedral) truss, a unit of two parallel surfaces with a fully triangulated structure (fig. 4.12). Here, the phenomena of triangulation evinced in the close packing studies provided the basis for a primary constructional unit. As *Architectural Forum* observed in 1952, this was a work in which “the

⁴⁶ The Dymaxion Map resulted from rendering a globe as a cuboctahedron. Fuller described his experiments in the close packing of spheres in “Energetic Geometry”, an appendix to his book *Earth Inc.* (1947), reprinted in Joachim Krause and Claude Lichtenstein, eds., *Your Private Sky: R. Buckminster Fuller, The Art of Design Science* (Baden, Switzerland: Lars Müller Publishers, 1999), 280. See also: R. Buckminster Fuller and Robert Marks, *The Dymaxion World of Buckminster Fuller* (Garden City NY: Anchor Books, 1973), 41ff. Leonardo da Vinci had drawn a cuboctahedron for the friar and mathematician Luca Pacioli’s book *De Divina Proportione* (1509), which studied mathematical and artistic proportion including the application of the golden section in architecture.

⁴⁷ Krause and Lichtenstein, eds., *Your Private Sky: R. Buckminster Fuller, The Art of Design Science*, 286. Fuller stated: “...the discovered synergetic system” of the octet truss “is probably nature’s spontaneously employed coordinate system, for it accommodates transformations by systemic, complementary symmetries of concentric, contractual, involutorial, turbo-gear positive-to-negative-to-equilibrium-to-vice-versa coordinate displacements.” See: Buckminster Fuller, “Influences on my Work”, in Robert Marks, ed., *Ideas and Integrities: a Spontaneous Autobiographical Discourse* (1963; New York: Collier Books, 1969), 21.

strength of the whole is greater than the sum of its parts” – an effect Fuller called “synergy”.⁴⁸ The “corollary” to synergy was “ephemeralisation”, of “man continually doing more with less”, a “trend” Fuller believed, when writing in 1950, of an “epochal nature”.⁴⁹ That the octet truss could provide the faceted skin of a geodesic envelope – a spherical shape promising maximal enclosure with minimal material – was to follow from this millenarian formulation (fig. 4.13). Building outward from organisational clues and capacities found in nature, a process of structural refinement would invariably give rise to more efficient, more *ephemeral* forms projected for an irreversible shift – that is, humanity’s more efficient use of its resources – in both social need and architectural value.

Fuller’s research on geometry and structure dovetailed with contemporaneous desires to fashion a new “organicist” project, one aimed at reinvigorating modernism and modern life. It would be posited on achieving models of wholeness by finding conceptual and visual affinities between artistic, biological, industrial forms. Moholy-Nagy had, in 1937, defined the New Bauhaus pedagogy as “bio-technique”: “an attempt at a new science which shows how natural forms and designs can be translated without great difficulty into human production. This means that nature’s ingenious forms can be reduced to technical ones.”⁵⁰

⁴⁸ “Thru-way Floor Truss”, *Architectural Forum* (November 1952): 149. As the magazine observed, the octet truss “of tubular steel less than 6’ deep supports 42 times its own weight”. *Architectural Forum* reported on the octet truss from North Carolina State College, a key site of Fuller’s work and teaching. Throughout the 1950s, the *North Carolina State College Student Publication of the School of Design* would be a crucial forum for discussions on experimental structures, including geodesics, in architectural design.

⁴⁹ R. Buckminster Fuller, “Comprehensive Designing”, *Trans/Formations: Arts Communication Environment* 1 (1950): 22.

⁵⁰ László Moholy-Nagy, “The New Bauhaus and Space Relationships” (1937), in Richard Kostelanetz, ed., *Moholy-Nagy: An Anthology* (New York: de Capo Press, 1970), 105. Moholy-Nagy attributed “bio-technique”

Immersed in the experimental teaching at the postwar Chicago Institute of Design, which continued the New Bauhaus programme, Fuller correspondingly advanced his comprehensive notion of “synergy” as a “principle... manifested both in the inorganic and organic.”⁵¹ In the context of his architecture, it echoed Fuller’s unremitting attempt at correlating his geometries with a naturally occurring economy of means, which he and others saw as the basis for a new unity of art and science.⁵² Links between these realms were to be made by upholding phenomena found in the natural realm as visual evidence for the rational structuring of things in the “man-made” world.

This search found Fuller in agreement with allied reformulations of architecture’s relation to other disciplines, especially in the work of Gyorgy Kepes. Kepes, a Hungarian émigré painter and designer who taught at the Chicago Institute of Design and later at MIT (where he established the Centre for Advanced Visual Studies), had, beginning in the mid-1940s, become a key supplier of scientific images of natural patterns to architectural discourse. Many images resulted from advanced techniques of magnification and revealed remarkable properties of geometric order and structural efficiency. The result was not only

to Raoul Francé. Francé was Hungarian biologist active in Berlin around 1900, whose book *The Plants as Inventors* (1920) emphasised that every natural “process produces for itself its technical form”; thus, “all natural forms are crystalized processes”. The New Bauhaus also brought University of Chicago faculty to teach courses in the science and humanities – including the philosopher Charles Morris, an advocate of the Unity of Science framework, which was influenced by theories of pattern recognition advanced by Gestalt psychology. See: Eric Mumford, *Defining Urban Design: CIAM Architects and the Formation of a Discipline, 1937-69* (Yale University Press, 2009), 22-23.

⁵¹ R. Buckminster Fuller, “Comprehensive Designing”, *Trans/Formations: Arts Communication Environment* 1 (1950): 22, emphasis added.

⁵² Reinhold Martin, “Crystal Balls”, *ANY* 17 (1997): 36.

to suggest a compelling aesthetic but to offer equivalencies between biological and industrial processes, thus to see things always in dynamic stages of transformation. The discourse crystallised in Kepes's influential book *The New Landscape in Art and Science* of 1956, in which prominent artists, architects, engineers, and scientists theorised parallels between organisational patterns visualised in their respective fields.⁵³ The work, which offered an utterly breathtaking visual narrative, was instrumental to new kinds of theories on speed, perception, and the redesign of postwar cities – an aesthetic-mechanical discourse that had, of course, resonated with the van Ginekl's when first positing the world's fair.

Above all, Kepes sought to describe the discovery of fundamental organising elements in design work as a necessarily unselfconscious process. He argued:

Some creative minds, those willing to face the industrial civilization and accept its premises, developed solutions to their own technical problems based on the artistic use of the module. This happened even though most of them seemed to have no conscious interest in modular logic. It was as if these artists had to absorb the basic techniques of the industrial world before they could develop a plastic technique that would be truly of their own time....

While painters and sculptors explored the problems in an imaginative realm, architects, engineers and planners attacked them on the practical level of concrete social dimension....

The standardization of building materials and mechanical equipment has stimulated the study of their structural and functional combinations, of the principles of symmetry and the mathematics of space packing....

⁵³ Kepes's book expanded his *The New Landscape* exhibition mounted at MIT in 1951. Having taught at MIT in 1951, when the first wood strut geodesic was erected by his student Zane Yost, Fuller likely saw *The New Landscape*. Another exhibition stemming from Kepes's book and sharing its title would travel to various art museums throughout the United States in 1958-1959. (For an image of Yost's work, see: Robert Marks and R. Buckminster Fuller, *The Dymaxion World of Buckminster Fuller* [Garden City, NY: Anchor Books, 1973], 187.) Kepes continued his project into the 1960s as editor of the Vision + Value series issued by the publishers George Braziller, with titles including *Structure in Art and Science* (1965) and *Module, Proportion, Symmetry, Rhythm* (1966). See: Reinhold Martin, "Crystal Balls", *ANY* 17 (1997): 35-39.

The contemporary approach to symmetry and proportion shows awareness of nature's methods of partitioning space.⁵⁴

Modular, standardisation, space packing: these were keywords for extrapolating lessons on architecture from natural phenomena. Accompanied by images of paintings by Piet Mondrian and Josef Albers, sculptures by Harry Bertoia and Max Bill, and a remarkable “space structure study” by the architect Konrad Wachsmann, Kepes culminated his synthetic description by juxtaposing a drawing of a polystyrola organism and a photograph of Fuller's octet truss (fig. 4.14). Here was evidence of organisational and structural principles – the properties triangulation – shared in both the natural and the built worlds. Moreover, nature provided not only examples of structure but, importantly, of space enclosure. The geometries evident in the polystyrola were further indication of the challenge to be mounted against Cartesian certainties of organising space – and society – inherited from the Modern Movement.⁵⁵ Just as in the combinations found in Fuller's experiments in close packing (Kepes's “space packing”), so in the polyvalent combinations of the hexagon lay a more “open” model for occupying space.

Kepes's – and Fuller's – assumed ascendancy of “industrial civilization” was an argument against waste, whether aesthetic clutter or structural inefficiency. The ravages associated with previous industrial expansions were now to be countered by what Fuller

⁵⁴ Gyorgy Kepes, *The New Landscape of Art and Science* (Chicago: Paul Theobald and Co., 1956), 347, 352. Kepes made his remarks in a chapter devoted to “Symmetry, Proportion, Module”.

⁵⁵ When later contributing the article “Conceptuality of Fundamental Structures” to Kepes's *Structure in Art and Science* (1966), Fuller provided illustrations replacing three-way, 90-degree Cartesian organisation by his four-way, 60-degree tetrahedral co-ordinate system.

called “doing more with a less”, a conscious reversal of the Miesian dictum (“less is more”) and aimed at countering Malthusian inevitabilities of resource scarcity. The apparent simplicity of the octet truss was to indicate as much. More importantly, this basic unit, itself derived from fundamental geometries, could be combined to produce geodesic shapes of ever-increasing lightness.

Lindsay’s engagement with Fuller lay in this broader arc of experiment. Party to Fuller’s intellectual exchanges and programme, Lindsay also sought a universal structural solution that could be thought as improving the demands of contemporary life. His own work was initially of a more technical nature. Building on results of the octet truss, Lindsay became instrumental to nascent research on the “framing” of domes. At the Institute of Design, he was credited with having built the first model of an applied geodesic structure (fig. 4.15).⁵⁶ Soon thereafter, Lindsay began undertaking direct translation of Fuller’s theories, thereby complementing those of Kepes and others, from pedagogical exercise to full-scale implementation, groundwork instrumental to his contribution at Expo 67.

Upon returning home to Montreal in 1950, Lindsay immediately took to propagating Fuller’s work. The Fuller Research Foundation had been created in 1946 to foster inventions and the development of patents. Lindsay established its Canadian Division, quickly realising a series of prototypical works: the first wood and plastic geodesic (1951); a similar but much larger structure for a barn outside Montreal (1954); a study with Fuller for a 250-foot diameter radio telescope (1954); and his “Shell Truss” Theatre (1955) in

⁵⁶ Stanley Dodds, “The Work of Jeff Lindsay”, *The Canadian Architect* (March 1957): 19.

Vancouver (fig. 4.16).⁵⁷ Yet it was Lindsay's earliest work that would provide immediate, perhaps irrevocable, proof of Fuller's theories and their spatio-material possibilities. The 8C270 Weatherbreak, built in Ste Anne-de-Bellevue, the westernmost suburb of Montreal, was a 49-foot diameter semi-spherical aluminium dome with plastic skin, erected by Lindsay and a team of six untrained assistants in eight hours, and moved to its site by ten men on a winter's day in December 1950 (fig. 4.17).⁵⁸ It was the very first large-size tube and skin geodesic structure. Photographs presented two appreciable qualities of Fuller's mandate; first, *lightness*, seen in views of only a few men carrying the structure; second, *strength*, shown by individuals climbing atop the dome. Echoing Fuller that the weight of building is the index to its performance, *Architectural Forum* breathlessly observed that the Weatherbreak's "efficiency is as beautiful as its silhouette..."⁵⁹ Form, material, and structure were united by an economy of appearance and of means. "Look again", promised the magazine, "and you see Technology in building."⁶⁰ In its eclipse of architecture – or, as *Architectural Forum* put

⁵⁷ Ibid., 22. Dodds described Lindsay's patented "shell truss" as "an almost perfect structural system, capable of being adapted to any geometric form, be it a plane, a hyperbolic saddle or a spherical section, and as a simple, logical and economical way to construct large buildings." The appreciation appeared in a special issue on "Space Frame Systems" devoted in part to Lindsay's work as well as to a geodesic dome built under Fuller's supervision by students at McGill University's School of Architecture in Montreal. Among the students coordinating Fuller's McGill seminar was Jerry Miller, who, with Adèle Naudé, later contributed the first and critical studies on the Expo 67 theme pavilion. Miller then served as the CCWE liaison to the theme buildings during construction.

⁵⁸ The 49-foot diameter dome provided 1,500 square feet of uninterrupted area. Lindsay's Montreal Weatherbreak had an orlon skin stretched inside a framework of aluminium. Aluminium remained rationed in the United States; hence Fuller's turn northward. Indeed, Fuller had conceived of domes specifically for Arctic installation, and his Radome structures were soon installed as part of the Distant Early Warning (DEW) Line, a system of radar stations along the polar circle and aimed to detect incoming Soviet bombers.

⁵⁹ "Geodesic Dome", in *Architectural Forum* (August 1951): 145.

⁶⁰ Ibid., 145.

it, in the realm that would follow now that “Bucky Fuller ‘starts the one architectural revolution’” – *technology* was endowed with the properties of and responsibilities for space-making.

Proof positive of Fuller’s ambitions, images of Lindsay’s Weatherbreak circulated widely. Detailed reviews were written and the dome accompanied, largely unattributed, countless exposés on Fuller’s work.⁶¹ Yet it was its inclusion in Kepes’s *The New Landscape in Art and Science* that signalled a newer and broader spatial-structural project emanating from geodesics research.

Lindsay’s dome appeared as a culminating image in *The New Landscape*, accompanying the closing article solicited by Kepes and written by Paul Weidlinger on “Form in Engineering”. Weidlinger, a structural engineer, argued that the “most urgent task of the engineering sciences may well be the creation of a comprehensive theory of design, i.e., a theory of form.”⁶² In keeping with Kepes’s mandate, Weidlinger also turned to correlating technology and nature and art:

...the “ability” of Nature to produce manifold patterns serving a multitude of purposes through the repetition of a single unit seems to be in line with modern economic concepts of our society.

⁶¹ Lindsay’s efforts, including photographs of Weatherbreak as well as an 85-foot diameter wood strut and fiberglass skin dome built outside Montreal, appear fully attributed Robert Marks, *The Dymaxion World of Buckminster Fuller* (Carbondale IL: Southern Illinois University Press, 1960).

⁶² Paul Weidlinger, “Form in Engineering”, in Kepes, *The New Landscape in Art and Science*, 360. “In this respect”, Weidlinger wrote in anticipating a “comprehensive theory” for engineering, “advance in technology will be closely related to the contemporary arts” – precisely the focus of Kepes’s book. Weidlinger taught at MIT, as did Kepes.

If a redefinition of technological design criteria could be made possible (in a society of abundant resources), the resulting formal expression should more nearly approach those forms of Nature.⁶³

The models of efficiency suggested by Weidlinger appeared in a closing spread: a photograph of soap bubbles as geometric clusters; sketches of radiolaria (amoeboid protozoa that produce intricate mineral skeletons) from the German biologist, naturalist, and physician Ernst Haeckel's *Report of the Scientific Results of the Voyage of H.M.S. Challenger* (1887), whose rediscovered imagery had, in the 1950s, strongly influenced architects searching for models to support experiments like geodesics; a microscopic view of the triangulating structure of a rush pith; and, finally, Lindsay's Weatherbreak (fig. 4.18).⁶⁴ The deliberate telescoping between micro- and macroscopic – from cells to geodesics – was precisely to visualise (“redefine”) the “technological design criteria” of the present moment. In other words, it was an argument against “waste”: a society of material abundance could, when properly managed, convey its “formal expression” – architecture – resulting from an economy of means but affording a surplus of space.

Weidlinger was already party to such experiment. In 1948, *Progressive Architecture* had identified him as the “brilliant young engineer... in full charge of engineering development” of Konrad Wachsmann's “Mobilar hanger”, a project for an enormous space

⁶³ Ibid., 363.

⁶⁴ Weidlinger's images were contextualised by an extensive quotation, set in the margin, by the visionary Franco-American engineer Robert Le Ricolais. Le Ricolais was also studying “pure” tensile structures and would undertake remarkable studies on the application of topological deformation to space frames. Le Ricolais's excerpted comments originally appeared as “Contribution to Space Structures” in the *North Carolina State College Student Publication of the School of Design* 3 (Spring 1953).

frame – here, a steel skeletal double-layer grid – to house military aircraft.⁶⁵ Wachsmann, an architect, was at the forefront of research on industrialised building. In 1941, he had collaborated with Walter Gropius and patented the Packaged House System, a solution to prefabrication based on standardised wood framing units and panels connected by a universal metal clip: “Its assembly is so simple an operation that the only tool needed is a hammer”, wrote one critic.⁶⁶ By 1945, he was advancing his “mobilar” concept, an attempt at achieving long-spans by combining a basic element – in this case steel tubes fitted with terminating “eye plates” and joined to one another by pins – into an assembly repeating *ad infinitum* (fig. 4.19). Commissioned by the United States Air Force, the work was to “permit very possible combination of construction, geometrical system, building type and span, expressed in a flexible, anonymous design” and “be easy to dismount at any time without waste of material”.⁶⁷ Taken to its extreme, the Mobilar concept – to build outward from a single joint – resulted in hangers of positively colossal dimension, with a floating lattice cantilevering 150 feet clear on either side from similarly-latticed pyramidal bearings.

⁶⁵ “Mobilar Structures”, *Progressive Architecture* (March 1948); 90-91.

⁶⁶ Herman Herrey, “Prefabrication System for Architects: Konrad Wachsmann and Walter Gropius produce The Packaged Building System”, *New Pencil Points* 4 (April 1943): 36. In an accompanying article, the American architectural historian Talbot Hamlin speculated: “After the war, if we are to spread the advantages of the economy of prefabrication, I believe it must come through a greater stress on the prefabrication of typical panel systems”. “In order to produce this desired effect”, Hamlin argued, “some kind of generalized solution of the joint problem” was crucial. See: Hamlin, “The Architecture of the Future”, *New Pencil Points* 4 (April 1943): 65-66. Wachsmann aimed at achieving this “universal joint”. The Packaged House, an attempt at anticipating postwar housing needs, was to be developed by the General Panel Corporation, headquartered in New York and Los Angeles, which Wachsmann established with the financial backing of Wall Street bankers in 1942. With an investment of \$6 million, the company existed for ten years but saw little success. See: Gilbert Herbert, *The Dream of the Factory-Made House* (Cambridge MA: The MIT Press, 1984).

⁶⁷ Konrad Wachsmann, *The Turning Point of Building* (New York; Reinhold Publishing Corporation, 1961), 170.

Fuller's geodesics and Wachsmann's "mobilar" dovetailed with burgeoning research and discourse on space frames. Three-dimensional structural skeletons, space frames were upheld as materialising the evidence of "natural" triangulation and its efficiencies – that is, maximal spanning or loading capacity with minimal material use. In advancing their respective building technologies, Fuller and Wachsmann saw the totality the "whole" and the significance of its parts as reciprocal aspects of an integrated system.⁶⁸ Yet they also differed: Wachsmann's thought was, in principle, grounded in tectonic detailing and in the rational fabrication and assembly of structural components (his admitted paradigmatic source being the Crystal Palace); Fuller's approach regarded construction as a special (and encompassing) interaction with nature, particularly where the specifics of this interaction could be defined in survival terms.⁶⁹ Nevertheless, both believed in a technological *zeitgeist*, especially given expanding postwar industrial production and the assumed ascendance of techno-scientific culture. As such, they maintained a late modernist faith in the imminence of a dematerialised world in which art, science, and technology were inextricably interwoven.⁷⁰ Indeed, in the expanded discourse on space frames – the same one in which Lindsay's Weatherbreak would endlessly circulate – what mattered were not always the literal aspects of technical achievement but the phenomenal ones. Commenting on his aircraft hangers, Wachsmann could conclude: "Quite indirectly, almost like by-product, there merged, at last,

⁶⁸ Herbert, *The Dream of the Factory-Made House*, 7.

⁶⁹ Kenneth Frampton, "The Technocrats of the Pax Americana: Wachsmann and Fuller", *Casabella* 542-543 (January-February 1988): 119.

⁷⁰ *Ibid.*, 120.

a structure capable of communicating a perfectly new spatial experience by technological means, while simultaneously expressing ideas of the conquest of mass and free dynamic space on a scale previously unknown.”⁷¹ “At last”: here was promise of a new aesthetic born of the culmination of theoretical research. Evocatively photographed by his wife Anna, Wachsmann’s models (and they were to remain as models) suggested just what the “new landscape” might look like.

In space frames lay an “alternate” trajectory of modern architecture, but with a no less prophetic and universalising mission. To enthusiasts, space frames – inexpensive, easy to produce, and structurally efficient – were an argument against an arid functionalism; this was the gist of Wachsmann’s promised “new spatial experience by technological means”. Thus when *Architectural Forum* editor Douglas Haskell looked into his “crystal ball” in 1951, he divined that space frames would not only lead toward “a new order of construction” but produce “a vast new industrial creation” – a future he projected a quarter century ahead, with the emblematic building of 1975 singularly illustrated by none other than Lindsay’s Weatherbreak.⁷² From 1951 to 1954, no fewer than ten articles on space frames appeared in *Forum* alone.⁷³ In early 1953, the magazine asked “Is this Tomorrow’s Structure?” – a question answered in a lead article by the British structural engineer Felix Samuely, who,

⁷¹ Wachsmann, *The Turning Point of Building*, 186.

⁷² D.H. [Douglas Haskell], “The Crystal Ball”, *Architectural Forum* (June 1951): 198-200.

⁷³ Sarah Goldhagen, *Louis Kahn’s Situated Modernism* (New Haven and London: Yale University Press, 2001), 66. In describing Louis Kahn’s interest in long-span structures, Goldhagen provides an overview of the American reception of space frames during the 1950s.

having designed the remarkable space frame roof over the Pavilion of Transport at the 1951 Festival of Britain, felt himself “on the eve of a great revolution”: “Hundreds of years hence, people will look back on this time as the one when construction changed over from ‘plane’ to ‘space’ and saw the birth of a new architecture.”⁷⁴ From *plane* to *space*: Fuller had also prefigured this millenarian hope in his concept of “ephemeralisation”, first articulated in 1950 and signalling an already present “epochal transformation” in which the “problem” of “industrialization” was “not one of countering the trend but of accelerating it exquisitely.”⁷⁵ Space frames and geodesics were seen as symptoms of this “acceleration”, their very lightness addressing architectural, technological, and societal need and value.

The theory of minimal material achieving maximal strength was seen as an entirely new aesthetic-spatial experience owing to the structural properties of “growth”. Hence the lesson of biomorphic images upheld as guides towards design: the ready emphasis on visual evidence connecting the organic (nature) and human-made or inorganic (architecture) was a self-conscious project of *naturalisation*, of converting processes of nature into works of

⁷⁴ Felix Samuely, “Is this Tomorrow’s Structure? Space Frame Enthusiasts Marshal Many Reasons for Predicting It Is”, *Architectural Forum* (February 1953): 152. *Forum* invited “space frame enthusiasts” to reply to its question and included responses by Walter Gropius, Robert Le Ricolais, Konrad Wachsmann, and Buckminster Fuller. Elsewhere, key works began to appear: Louis Kahn’s tetrahedral concrete floor slabs at the Yale Art Gallery, 1951, and his remarkable unrealised tetrahedral tower for Philadelphia City Hall of 1954; Mies van der Rohe’s massive intersecting trusses for his Chicago convention centre project of 1953; Konrad Wachsmann’s ongoing “mobilar” studies; and the increasingly relentless output by Fuller, including a 1959 exhibition at the Museum of Modern Art in New York, where he displayed his “octet” truss and “tensegrity” mast.

⁷⁵ R. Buckminster Fuller, “Comprehensive Designing”, *Transformation: Arts Communication Environment 1* (1950): 18.

culture.⁷⁶ The paradigm of self-organising “wholes” believed found in cellular structures was meant to inform the spatiality of building systems. As such, linking Haskell’s “new industrial creation” and Samuely’s move from “‘plane’ to ‘space’”, space frames represented, to the likes of Fuller, Weidlinger, Wachsmann, and Lindsay, a critical argument on “design”: to oppose any preordained aesthetic programme and to see social needs (again, against “waste”) as commensurate to technological innovation. Wachsmann took this to its extreme. In a stunning theoretical elaboration of what he termed “dynamic structure”, he designed “a single, universal structural element which, industrially produced... could be used in building construction for every conceivable purpose”.⁷⁷ Delineated, curiously enough, in perspective, the resulting work refused apparent distinction between horizontal and vertical members, with continuous strands intertwining and bifurcating to produce a seemingly infinite web (fig. 4.20).⁷⁸ “The unexpected and fantastical nature of this system”, Wachsmann declared, “arises not from a preconceived idea, but from rational reflection.”⁷⁹ However “rational”, it

⁷⁶ Reinhold Martin, “Naturalization, in Circles; Architecture, Science, Architecture”, in Philip Beesley and Sarah Bonnemaïson, eds., *On Growth and Form: Organic Architecture and Beyond* (Halifax: TUNS Press, 2008), 100-102. Martin argues that naturalisation “can be understood as the process of converting works of culture into acts of nature” (especially for the likes of Kepes and others) by “constructing self-evidence, of legitimizing – not through argumentation, but through an epistemological sleight-of-hand”, in other words through the determined juxtaposition of organic and inorganic imagery according to shared formal attributes. Given their penchant for “feedback”, the champions of this organicist project arguably also saw the conversion of acts of nature into works of culture – especially for any resulting *representational* value as architecture.

⁷⁷ Konrad Wachsmann, *The Turning Point of Building: Structure and Design* (New York: Reinhold Publishing Corporation, 1961), 194.

⁷⁸ Not surprisingly, Wachsmann’s perspective was included in Kepes’s *The New Landscape* and immediately followed by Fuller’s Tensegrity Mast. Wachsmann actually designed a connecting plate for the horizontal and vertical elements, but it appeared absent in his visionary drawings.

⁷⁹ Konrad Wachsmann, “On Building in Our Time” (1957), in Joan Ockman, ed., *Architecture Culture 1943-1968: A Documentary Anthology* (New York: Columbia Books on Architecture/Rizzoli, 1993), 268.

became difficult to differentiate between structure and space. The effect was no longer to project hovering space frames, however heroic; it was, finally, to make them inhabitable.

TETRAHEDRA

As a work of technology and of enclosure, with a requisite aesthetic of lightness, the space frame was posited as harbinger of things to come. While at times fantastic, discourses on space frames filled architecture magazines and advanced through applied research in schools of design, notably by Fuller's itinerant experiments on geodesic domes with teams of students at MIT, Yale, North Carolina State College (a hotbed of advanced structures), and McGill (invited by Jerry Miller, who would later work with Adèle Naudé on Man and the Polar Regions and the Expo 67 master plan), among others. Konrad Wachsmann had, in fact, advanced his "dynamic structure" at the Chicago Institute of Design beginning in 1949 – precisely the moment of Jeff Lindsay's immersion there. The shared examples of Fuller and Wachsmann, whether in explicit research or the mediatic circulation of concepts, informed Lindsay's contribution to *Man the Producer*.

By the mid-1950s, Lindsay had emerged as budding expert on space frames in his own right. His work and teaching began appearing in architectural magazines. In 1957, he established Jeffrey Lindsay and Associates – Space Frames with offices in Montreal and Hollywood, California. While still influenced by Fuller, Lindsay started to subsume *geodesic* under the more generalised appellation of *space frame* – a conceptual shift signifying a desire

for a more “open” building system with multiple geometric permutations and spatial applications. Writing in the July 1957 issue of *Arts & Architecture*, the important Southern Californian magazine that had popularised the Case Study Houses and their aesthetic of “light” construction, Lindsay predicted:

From the pattern now established, it is unlikely that Space Frames as such will ever be a division of architectural engineering. The trend is away from steel and concrete systems and towards the newer high speed techniques of the structural physicist, specifying natural configurations comprised of mass-produced components of few different types made from high performance alloys and plastics. The resulting constructions are astonishingly efficient, economical and architecturally valid.

The major limitations of space frames are their anathema to planning and combination with other geometric systems. Everything is dominated by the form and character of the space frame. Specific products are now appearing, but the vital facility is the one which can process the unique case.

It is not coincidence that Nervi, Candela, Fuller and myself have found it necessary to provide total services in order to build at all. Neither is it strange that even in a specialized field we also specialize, for nothing short of perfection will any longer compete effectively, and it is not given to man to frequently find himself a custodian of perfection.⁸⁰

On the one hand, the “dominance” of the space frame was its vital characteristic. Lindsay later realised such a work in the early 1960s at Simon Fraser University in Vancouver, where a massive space frame covered the academic quad and extended to the surrounding faculty buildings designed by the leading Canadian architect Arthur Erickson, whose work would soon contribute to the megastructure discourse (fig. 4.21). It functioned in a somewhat

⁸⁰ Jeffrey Lindsay, “Space Frames and Structural Physics”, *Arts & Architecture* (July 1957): 18. Lindsay was teaching at the University of Southern California (USC), then a centre of thinking on experimental building technologies; the *Arts & Architecture* issue included his students’ work. In its issue of May 20, 1957, *Life* magazine published images of geodesics, including ones by Fuller, along with a space frame kite designed by Lindsay at USC. The kite, which borrowed from Alexander Graham Bell’s turn-of-the-century experiments, showed how the space frame proposition – really, triangulated form – was, rhetorically, lighter than air.

typical manner, solely as a massive shelter. On the other hand, space frames promised something more, away from traditional notions of statics and toward presumably more theoretical speculations – “high speed techniques” – that could result in “natural configurations” (litmus of the “perfection” embodied by space frames). Here, again, technology – “mass-produced components” – was thought to mirror nature in creating an endless permutation of forms from a few basic “components”.

It was with this background that Lindsay joined Expo 67. During the early planning of the fair, long before the individual pavilions were advanced, Lindsay was contacted by Blanche Lemco van Ginkel. Writing to Lindsay in May 1963, just before the formative Montebello conference, Lemco van Ginkel enclosed a copy of her speech at the PQAA convention in January, and reminded him of their discussion on Daniel van Ginkel’s “‘concept’ for an exhibition”.⁸¹ Her letter was one of many to international colleagues so “that they may press for a new kind of participation in their country as we do here” – in other words, to lobby for the concept of large-scale theme pavilions in which all nations could participate. Lindsay quickly replied, acknowledging that “there seems to be a case for a concise exhibition within one large dome.” “Properly presented”, he argued, “the exhibitors will accept the concept of renting space in an environmental control. It will... psychologically enable the exhibits to be grouped as you suggest.”⁸² Lindsay’s replacement of

⁸¹ Blanche van Ginkel, Letter to Jeffrey Lindsay (May 14, 1963), Van Ginkel Archive 27-A21-02, Canadian Centre for Architecture, Montreal.

⁸² Jeffrey Lindsay, Letter to Blanche van Ginkel (May 19, 1963), Van Ginkel Archive 27-A21-02, Canadian Centre for Architecture.

“architecture” (or pavilion) by “environmental control” indicated just how much any notion on form, composition, or style, were to be obviated by what was, concurrently arising in Naudé’s first concepts, a drive towards finding a flexible building “system. His unprompted mention of “dome” suggested an aesthetic.

With this came Arcop’s retention of Lindsay. The CCWE had requested Arcop for “an unusual design of the structural system”. Several months later, the suggestion would be elevated to almost official policy with the CCWE openly calling for “‘cellular’ construction” – for all architectures anticipated at the future fair – as a “‘new direction’ to the architects of the world”.⁸³ The discourse now took on the cast of a *zeitgeist*, with a radically new kind of architecture demanded as necessary to the universalising mission of a world’s fair.

The polemic shaped Arcop partner Guy Desbarats’s invitation to Lindsay to consider space frame solutions for Man the Producer and Man the Explorer. While in charge of the theme pavilions, Desbarats ultimately had little impact on the design; he would, however, be instrumental to retaining another key consultant: Janos Baracs, a Hungarian émigré engineer who had been designing hyperbolic paraboloid concrete structures in Montreal.⁸⁴ Desbarats expressed an interest in experimental geometries, likely following prevailing tendencies in architecture culture.⁸⁵ Baracs had already been working on questions of “geometrical avant-

⁸³ “‘Cellular’ Construction”, *Expo Digest*, Vol. 1, No. 20 (November 18, 1964): 1-2.

⁸⁴ Janos Baracs, interview with author (November 22, 2010), Montreal. Baracs fled Hungary after the 1956 revolution and arrived in Montreal the following year. He joined the local engineering firm Eskenazi de Stein & Associates specifically to pursue “geometrical avant-garde” designs. Baracs would enjoy a long career researching “structural topology” at Université de Montréal.

⁸⁵ Ibid.

garde” design and was especially interested in the close-packing of solids.⁸⁶ There was an additional directive: a “system” flexible enough to respond to changing needs, since the pavilion was to be designed well before the exhibits could be determined. With these conditions in mind, Baracs produced two different sets of cardboard models: one of tetrahedrons defined by planes, another of tetrahedrons composed by edge members. The latter would ultimately be adopted. Invited by Desbarats to meet Baracs, Lindsay was immediately taken by the engineer’s studies and borrowed the models to have them mass-produced in die-cut yellow cardboard.⁸⁷ These became the very same shapes that Lindsay would present to the Arcop team at his house in June 1964.

The tetrahedral solution resulted from the CCWE’s planning demands. The basic criteria for the “building system” were, the CCWE insisted, that it “be of a temporary nature”, “accommodate spans of over 100 feet”, “form large volumes for exhibits”, “be able to change its configuration during latter stages of working drawing production”, and “be easily demountable”.⁸⁸ Published just before the CCWE’s open call for “cellular’

⁸⁶ Ibid.

⁸⁷ Baracs’s responsibilities included proposing a geometric concept, calculating stresses, and devising modes of fabrication and erection; see: Janos Baracs, “Spatial Perception and Creativity”, in Marjorie Senechal, *Shaping Space: Exploring Polyhedra in Nature, Art, and the Geometrical Imagination* (New York: Springer, 2013): 121. Baracs and Lindsay forged a lasting friendship during the theme pavilions design. Their bond was shaped by a mutual interest in space frames, but also by Baracs’s admiration of Lindsay’s intuitive sense of structures. According to Baracs, “Lindsay didn’t have any degrees in architecture or engineering. He was an autodidact, but he was a great model-maker and well understood problems of *connection*.” Baracs, interview with author, Montreal.

⁸⁸ Thomas Ewing Blood, “Theme Buildings/Expo ’67”, *Royal Architecture Institute of Canada Journal* (October 1964): 58. Blood was the Arcop project architect on the pavilions.

construction”, the first account of the theme pavilion design noted that the “solution to the program” was to discover a “principle of devising a structural system based on a ‘universal cell’... which might form walls, floors and roofs”.⁸⁹ As such, the “truncated tetrahedron” – notably an Archimedean solid – was “one of the least complex forms” that “‘nested’ or ‘filled space’ in such a manner as to disclose two parallel planes” and “also suggests a structural system”.⁹⁰ In an official brochure accompanying the preliminary design of Man the Producer, the CCWE explained that the most important task was to “accommodate exhibits, the size of which cannot be finalized until the building is underway”; hence, again, the “cellular nature capable of expansion and contraction without destroying the overall framework.”⁹¹ In other words, the pavilion had to anticipate changing programmes, contents, and users, even as it was being built.

Baracs and Lindsay’s studies leveraged the tetrahedral cell as a repeating unit. The purpose of the models was, simply, to allow the architects to *play* with them – thus intuitively to derive shapes, forms, and masses.⁹² The method, allowing for infinite recombination, was predicated on criteria set by the CCWE: the “building system” should “be of a temporary nature”, “accommodate spans of over 100 feet”, “form large volumes for exhibits”, “be able to change its configuration during latter stages of working drawing

⁸⁹ Ibid.

⁹⁰ Ibid. The thirteen unique Archimedean solids are highly symmetric, semi-regular convex polyhedrons composed of two or more types of regular polygons meeting in identical vertices.

⁹¹ Canadian Corporation for the World Exhibition, *Pavilion Architecture* (Ottawa, 1965), 2.

⁹² Baracs, interview with author, Montreal. As Baracs recalls: “When the models when presented to the CCWE and architects, people instinctively started to play with them.”

production”, and “be easily demountable”.⁹³ Faced by the CCWE demands of temporariness, long spans, flexibility, and demountability, the “solution to the program” lay in discovering a “principle of devising a structural system based on a ‘universal cell’ or ‘building brick’ which might form walls, floors and roofs”.⁹⁴ By July 1964, Arcop prepared an internal report, “Analysis of the Truncated Tetrahedron”, which provided a formula of design: a “basic unit cell” with truncated apices that, when combined, “can form walls and floor slabs”; with this, the designers could “recreate the form of the cell at a large scale” achieving “sound structure and maximum flexibility”. The truncated tetrahedron, cut at one-third of each edge dimension, nested to form two parallel planes; the truncated points formed smaller tetrahedrons, with the resulting surface creating a pattern of hexagons and triangles. The combination of tetrahedrons and truncated tetrahedrons defined both a module and a system for floors, roofs, and walls.

The result was unlike what had hitherto been seen in space frames, which were typically horizontal. In the Expo 67 theme pavilions, the very same cell was both a constructional unit and something much larger – namely, a building (fig. 4.22). Once subdivided, the tetrahedron would yield triangular and hexagonal levels that by being “combined” (with shared floor plates), “connected” (joined by projecting walkways), or a “combination of both”, could allow “connected intermediate spaces”, “connected and

⁹³ Blood, “Theme Buildings/Expo ’67”, 58.

⁹⁴ Ibid.

combined intermediate spaces”, and “by removing walls... large spaces”.⁹⁵ While the concern for *connection* and *combination* was structural and geometrical, there also appeared a remarkable spatial quality. Lindsay replaced the original cardboard models by tetrahedrons made of injection-moulded clear acrylic fitted with snaps that, when built up, showed both overall massings and specific conditions like the intersections of walls and structural piers (fig. 4.23). The combination and recombination of the plastic cells became the primary vehicle for design.⁹⁶ The models could be endlessly modified until achieving proper spatial and structural fit – what Lindsay had, in a perfectly Fullerian moment, so early called “perfection”. The acrylic studies were used at all stages during design and fabrication of the pavilions.⁹⁷ The “genetics of the pavilion”, Lindsay observed, “as finally realised were implicit in these cells.”⁹⁸ Once again, the pavilion *parti* was revealed in spatial terms not unlike the processes imagined at work in the magnified biomorphic imagery that had so sustained formative discourses on space frames.

⁹⁵ Affleck, Desbarats, Dimakopoulos, Lebensold, Sise, “Analysis of the Truncated Tetrahedron” (no date): 3-5, Series 64-20-34, Fonds Arcop, Canadian Centre for Architecture, Montreal.

⁹⁶ Thomas Ewing Blood, interview with author (July 7, 2011), Ottawa.

⁹⁷ “At all stages during development, design and fabrication of the buildings, models were found to be essential for proper visual assessment of the many problems associated with the structure.” See: J.L. De Stein, Ralph Leibe, et al., “Space Frame Exhibition Structures: The Design and Construction of Steel Space Frames for the Theme Pavilions at Expo ’67, Montreal, Canada”, in R. M. Davies, ed., *Space Structures* (New York: John Wiley & Sons, 1966), 550. Following Baracs’s formulation of the tetrahedron solution, Arcop would hire De Stein and Leibe as consulting engineers on the structural design of the theme pavilions.

⁹⁸ Jeffrey Lindsay, “Space Structure as a Preoccupation”, in Davies, ed., *Space Structures*, 950-951.

The tetrahedron manifested the aspiration for a universal system towards a pavilion. The “need” was “for a disciplined yet versatile structural unit”.⁹⁹ Its articulation was powerfully manifested a couple of months after Arcop’s formative internal reports on the tetrahedrons, when the first view of the theme pavilion appeared on the cover the *Journal of the Royal Architecture Institute of Canada* (fig. 4.24). Floors, walls, ramps, voids, and structure – all formed from the same repeating unit – made evident the ambition to achieve a kind of “total space”. Writing in an accompanying article, Thomas Ewing Blood, project architect on the pavilions, remarked that the “unit should enable the development of open spaces where required, yet withdraw into a quiet grid in those areas where the structure should become the background to individual exhibits.”¹⁰⁰ Here, devoid of exhibits, the “quiet grid” was writ large, an expansive honeycomb at once intimate and overwhelming, telescoping as it did from discernible units to endless patterned fields. It was a condition powerfully elaborated in a study model, one-sixth full size, which, photographed indifferent to scale, drew viewers deep into the lattice (fig. 4.25). Developed by Lindsay, the model served “to demonstrate the potential of the system and the space.”¹⁰¹ The impression was entirely that of Wachsmann’s “dynamic structure”, a space that appeared both structural and occupiable but almost immaterial.

⁹⁹ Blood, “Theme Buildings/Expo ’67”, 58.

¹⁰⁰ Ibid.

¹⁰¹ Guntis Plesums, “Architecture and Structure as a System”, *Architecture Canada* (April 1969): 26.

The resulting triangulated clusters jibed perfectly with the pavilions brief. As the tetrahedral design progressed, the CCWE published eight booklets to explain the Expo 67 theme and its respective “Pavilion Architecture”. The covers carried versions of the same graphic motif: a single line from which additional vectors spread, split, or spiralled across the page, each terminating in arrowheads that presumably pointed to the multiple futures promised at Expo 67 (fig. 4.26). These lines of force, of organising “Man and His World”, were equally to indicate the myriad routes and paths – the “storylines” – presumed available in the labyrinthine quality already presupposed by the tetrahedral arrangements. “The architectural expression” of Man the Producer and Man the Explorer, the CCWE announced, “is directly related to its geometry, and is a combination of many forms possible due to the flexibility of the system.”¹⁰² The multiplication or division of the tetrahedron – as unit, as space frame, as building – was thus commensurate to both constructing and subdividing a theme – Man the Producer – by “storylines” – Resources for Man, Progress, Man in Control? – in turn parsed by “chapters” – “Man the Consumer”, “Era of Materials”, “The Ordeal of Change”, “Expanding Technology”, “Information Explosion”, among many others. The CCWE early insisted that “Unlike the classical humanism of the Renaissance which concerned itself the fulfillment of the individual, *contemporary humanism* integrates all activities in the fields of science, culture and thought for the overall benefit of mankind.”¹⁰³ Thus the CCWE’s corresponding demand for “Inter-relationship” within themes, with a

¹⁰² Canadian Corporation for the World Exhibition, *Pavilion Architecture*, 3.

¹⁰³ Canadian Corporation for the World Exhibition, *The Theme Man and His World* (Ottawa, 1965): 5.

“conceptual design” that “recognizes the increasing inter-disciplinary aspects of all Man’s activities; all crossroads shall be identified in all presentations where physically possible.”¹⁰⁴

Integration, inter-relation, inter-disciplinary: each form of synthesis was to be conveyed by the triangulated and hexagonated arrangements of the pavilions – a decidedly non-Cartesian scape that purposely gave oblique connections between themed areas, allowing larger demarcated zones but with multiple openings leading simultaneously to smaller exhibit spaces. Inside the pavilion were, then, interlinked “worlds”. The tetrahedral arrangement allowed the parsing of the theme among “a variety of spaces” while working as “a framework which can relate these and thus contribute to the expression of the story and its threads”.¹⁰⁵ The theme – Man the Producer, Man the Explorer – was thus organised and experienced by the multiplication or division of the same governing “cell”.

Arcop continued without direct knowledge of the exhibit contents. The architects were, after all, charged with providing a “system” that could change. Concurrently, a parallel process was underway to define what would actually be presented by the pavilions and how. First, consulting intellectuals and academics would write “storylines” for the pavilion; then, industrial designers could shape the exhibits. Arcop worked through series of cardboard models, their corrugation reflecting the tetrahedral geometries of the space frame. Easily manipulated, the models were taken to meetings with the exhibit designers and “moved about in relation to the storylines and all the other political manipulations for an

¹⁰⁴ Ibid.

¹⁰⁵ Canadian Corporation for the World Exhibition, *Pavilion Architecture*, 2.

advantageous position.”¹⁰⁶ Yet with at least five exhibit designers contributing to Man the Producer, along with a host of consultants on the “storylines”, Arcop faced the difficult task of continuously changing interior arrangements and, therefore, the building form. The problem would preoccupy the architects throughout 1965.

“Change” was, however, precisely the point. As Guntis Plesums, job captain on Man the Producer, observed following construction, “Acceptable building volumes resulted from the *natural tendency* of the truncated tetrahedrons to regroup themselves into larger tetrahedrons, truncated tetrahedrons, or less regular shapes of the same family.”¹⁰⁷ This “system of growth would create a discipline in design.” While “multiplication of form... could have become an amorphous growth impossible to control”, the “limitations imposed by the larger discipline of tetrahedral volumes proved to be a blessing by exercising some restraint”.¹⁰⁸ Plesums’s organicist analogy found the “unit” and its combinations as part of a “family” that could, almost willfully, “multiply” and therefore “grow”. The resulting “system” was thus abstracted into a drawn “discipline” of intersecting triangles and hexagons rendered as a flattened but extended matrix, the sharp edges between the tessellated forms indicating ridges and valleys along which tetrahedral shapes of infinite variety were actually to emerge (fig. 4.27). The simultaneously planimetric and axonometric expression was to provide the organising geometries: for the Arcop team, “Volumes were carved out of the

¹⁰⁶ Guntis Plesums, Email correspondence with author (February 22, 2010). Plesums worked at Arcop as job captain on the construction of Man the Producer and Man the Explorer.

¹⁰⁷ Plesums, “Architecture and Structure as a System”, 24-25, emphasis added.

¹⁰⁸ *Ibid.*, 30.

three-dimensional system of intersecting walls”.¹⁰⁹ The work of extrapolating form from patterns of plane figures was, in Plesums view, uniquely suited to the architect:

The architect in working with space structures must demonstrate thorough insight into the laws of geometry. This responsibility cannot be delegated to the engineer or fabricator, who are not equipped to recognize these intrinsic characteristics.¹¹⁰

Here was faint echo of a project, initiated by Kepes and others, for *recognising* – that is, *visualising* – in bio-organic patterns the innate properties of architectural design.

The design was largely finalised by 1965. Construction was to begin in 1966. As the architects completed working drawing while continually adapting the models, one element remained clear: the space frames were to be of steel. The final system became a bolted assembly made of 3’-3” lengths of bent six-inch-wide steel plates chords joined at gusset plates angled at 70- and 110-degrees, as dictated by the tetrahedral geometry.¹¹¹ Diagonal bars separated the two parallel planes of the space frame at a depth of 5’-3”, the thickened web integrating all electrical and mechanical services (fig. 4.28).

Even as certain exterior surfaces were finished in panels of stained cedar shingles, the frames dominated. If the “theme pavilion is a conscientious attempt to conceive architecture as a system for forming spaces”, Plesums wrote, then this affected “almost every building

¹⁰⁹ Ibid., 28.

¹¹⁰ Ibid., 33.

¹¹¹ George F. Eber, “Study of Expo ’67 Building Materials, Systems and Techniques” (March 29, 1967): n.p., Box 39-1999-05-014, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal. Prepared on the eve of Expo 67, the study was commissioned by the Canadian Department of Industry, a government ministry. Eber also served as local architect on Buckminster Fuller’s geodesic dome for the United States pavilion.

component” resulting in “*structure as the basis of architectural expression*”.¹¹² The *expressive* power was immediate. In April 1966, as the storied Dominion Bridge Company, contracted to build the pavilions, began to bolt the first sections, entirely assembled in an on-site shop, to concrete pilings, observers saw arising giant frames criss-crossing over, slipping past, and disappearing behind one another – hollowed ziggurats, their canted faces seemingly meshed together and receding to an endless latticed world beyond.

For all the typical precision of space frames, the effect was something altogether rougher, maybe even chaotic. Built of more or less standardised parts, the resulting assembly ultimately had to accommodate on-site modifications for structural loads by adding face plates to the webs. Yet the plates were all uniformly the maximum size, with excessive bolting even where not required. It was the result of achieving cost savings in the field as opposed to customising individual pieces in advance. With so many gusset plates blending together, the result was a dense mass of steel. This marked a crucial distinction between Man the Producer and Man the Explorer. Man the Explorer had some of its main exhibits known in advance, and site conditions did not require a close interdependence of spaces; it finally appeared as three similar forms with a central pedestrian plaza. Man the Producer was, however, designed as “an integrated exhibit complex” for “three closely interrelated scientific sub-theme exhibits” to be “viewed in sequence or individually from a central ‘interchange’ area about 40 feet in the air”.¹¹³ Combined with an unusual site – the pavilion

¹¹² Plesums, “Architecture and Structure as a System”, 30, emphasis added.

¹¹³ Ibid., 31.

was to hover over the fairground canals – the programmatic drive for *integration* produced an asymmetrical design. As such, the eccentric loads required face plates that, at times, obscured chord members (fig. 4.29). The unintended consequence was that “the resulting structure approaches some of the very early studies”.¹¹⁴ While the dense structure belied the “lightness” expected of space frames, the excess material suddenly gave rise to surprising spatial effects.

Lindsay admitted, curiously enough, to the unintentional aesthetic. Despite an obvious enthusiasm for prismatic forms, Lindsay saw in *Man the Producer* “a rudimentary appearance which successfully enriches and disguises the pristine symmetry, usually the distinction of space structures”.¹¹⁵ He passed his remark at the International Conference on Space Structures, held at the University of Surrey in England in June 1966. Addressing the theme “Design: The Present”, Lindsay spoke of “Space Structures as a Preoccupation” and showed the Expo 67 theme pavilions, then under construction. While largely devoted to theoretical concerns, the conference also offered a lengthy excursus on “Construction” in which actual built examples of space frames were shown, including a further presentation on the theme pavilions by its engineers J.L. de Stein and Ralph Liebe.¹¹⁶ Indeed, Expo 67 works – including Lindsay’s timber space frame roof for Arthur Erickson’s *Man in the Community*

¹¹⁴ Ibid., 33.

¹¹⁵ Lindsay, “Space Structure as a Preoccupation”, 951.

¹¹⁶ Among its many attendees, the conference also drew a handful of avant-garde engineers including David Emmerich, Robert Le Ricolais, Arthur Quarmby, and Z.S. Mazakowski as well as the likes of Yona Friedman, who, in a session on “Design: The Future”, spoke on “The Use of Three-dimensional Structures to Solving Certain Urban Problems”.

theme pavilion, and the Canadian engineer-entrepreneur D.G. Fentiman's aluminium "triodetic" structure used for both the Expo Place d'Acceuil and the Netherlands pavilions – were shown as immediate proof of a space frames *zeitgeist*, especially given the arrival of mass-produced technologies like the American Uni-strut system. Still, if technique and precision was the goal, then what of Lindsay's offhand comment? It rested on whether space frames were matters of technical or artistic concern. To be sure, the synthetic project inherited by Lindsay and others from the likes of Fuller, Kepes, and Wachsmann, saw aesthetics and technics as one in the same, collapsed together in "pristine symmetry", with the quality of "ephemeralisation" as sole arbiter. Yet Lindsay hinted at something more, a kind of surplus aesthetic value that, in a way, granted greater symbolic purpose to the pavilion. Perhaps it was in this phenomenal effect, of completely enveloping visitors within its seven levels totalling 190,000 square feet, that Man the Producer could justifiably project its mission to normalise "man" – not necessarily with the appreciation of a novel architectural technics but by the unintended discovery of a "world" of shadow, of depth, of mystery.

"DUMB AUTHORITY"

In the late spring of 1967, the critic and historian of modern architecture Reyner Banham found himself, much to his chagrin, stuck in a queue. Standing among the crowds at Expo 67, as correspondent to the British cultural magazine *New Society*, Banham paused to think long and hard about the fate of his fellow visitors. "When you think that this Expo is

officially subtitled ‘*La Terre des Hommes*,’ and what fun they had with *la Terre*, dredging up artificial islands and lagoons and things all over the Saint Lawrence, it is astonishing how little they do with *l’Homme*.”¹¹⁷ Toying with the Expo 67 theme, Banham quipped that *La Terre des Hommes* was hardly a paean to some supposed internationalism; rather, it was simply the culmination of a fifteen-month geotechnical operation in which 250 million tons of earth and gravel were shifted to form Île Ste-Hélène and Île Notre-Dame, the two fairground islands in the middle of the St Lawrence River. Banham’s sarcasm stemmed from his belief that the cultural and spatial experiment at work in the exposition was largely incapable of resolving “the \$64,000 problem of all great exhibitions – l’homme, Mensch, folks, gente, us lot.”¹¹⁸ Despite being “viewed through the filters of statistic and the lenses of rhetoric”, notwithstanding being “sentimentalised in technicolor and stereophonic sound”, and regardless of being “hectorated, directed and asked to respect the yellow line at the edge of the platform”, *l’Homme à l’Expo* was largely written out of the act – “hardly anyone has had the wit to put him on stage.”¹¹⁹ Architecture, it seemed, was inadequate to its task of representation.

Banham’s misgivings pointed to a larger cultural crisis. Like almost all world’s fairs before it, Expo 67 inevitably announced its modernity by its most visionary forms of architecture. Like the competitive celebration of commodities and the cultures they

¹¹⁷ Reyner Banham, “L’Homme à l’Expo”, *New Society* (1 June 1967): 813.

¹¹⁸ *Ibid.*, 812.

¹¹⁹ *Ibid.*

embodied, these architectures crystallised an exposition's claim to symbolise the civilising processes of humankind. The van Ginkels' exhortation to recall the colossal precedents of 1851, 1867, or 1889 was to harness the power of their modernity materialised in long-span structures simultaneously exhibiting advanced technics and a mass public. Yet this twinning, whether in 1867 or 1967, invariably revealed an internal tension. The architecture that was consciously articulated as mass-produced could not present a critique of the world in which it appeared – that is, along the symbolic realignment of geopolitical divides by a world's fair – without at the same time challenging its own right to existence.¹²⁰ John Ruskin had thus railed against the influence of Joseph Paxton's Crystal Palace erected for the Great Exhibition of 1851: "Must this little Europe, this corner of our globe, gilded with the blood of old battles, and grey with the temples of old pieties – this narrow piece of the world's pavement, worn down by so many pilgrims' feet, be utterly swept and garnished for the masque of the Future?"¹²¹ Ruskin anticipated that the rise of the modern nation-state would be necessarily emblematised by the most typical products of industrial culture – in this case a "masque", a performance, of ferro-vitreous construction. His "little Europe" was, in fact, being irreversibly shaped by networks of glass-and-steel railway stations linking the spread of capital throughout the continent (an expression of the very same Saint-Simonianism

¹²⁰ Paul Greenhalgh makes this comparison regarding nineteenth-century mass-produced consumer objects (once known as "design manufactures") and their uneasy relation to industrialisation – that is, as craft objects designed in resistance to the homogenizing tendencies of commodity culture. See: Greenhalgh, *Ephemeral Vistas: The Expositions Universelles, Great Exhibitions and World's Fairs, 1851–1939*, 142.

¹²¹ John Ruskin, "The Opening of the Crystal Palace" (1854), in Christopher Harvie et al., eds., *Industrialisation and Culture, 1830–1914* (London: The Open University Press, 1970), 303. Ruskin penned his lament in light of the re-erection of the Crystal Palace at Sydenham in 1854.

undergirding the nineteenth century fairs).¹²² Here, a new public sphere was, literally and figuratively, reflected in an aesthetic of advanced technique. The set pieces of Expo 67 – Buckminster Fuller’s geodesic dome for the United States, Frei Otto’s tensile roof floating above the West German pavilion, or Moshe Safdie’s Habitat 67 housing complex – exhibited the same condition. The experimental designs served as reminder that architecture achieved an intense form of means-ends rationalisation within the spaces of world’s fairs, owing to the demands of quick assembly, public exhibition, and removal from processes of everyday life.

What, then, of a world’s fair believed to project the future by modern architecture, circa 1967? Banham appeared at first unhopeful:

The official view of the world’s Establishment is about two jumps behind the human race. Ministers of culture, trade, information and other forms of glass-beads-for-the-Wogs have now arrived, mentally, at the late 19th century, and understand that great exhibitions are supposed to make major contributions to architecture. They therefore hand over the design of their pavilions to someone they understand to be a major architect – a knight in Britain, a professor in Venezuela or Germany, and so on – forgetting that the major contributions to architecture at great 19th century exhibitions were made, typically, by Eiffel (an engineer) and Paxton (a gardener).¹²³

The Crystal Palace had, of course, systematically arrayed “glass-beads-for-the-Wogs”. This was, after all, part of the imperial, “civilising” mission of its didactic displays – and construction. Nevertheless, a structure like the Crystal Palace remained exceptional: its techniques of utilitarian assembly were not necessarily equivalent or reducible to end-product

¹²² Ruskin’s romantic resistance to the railroad rested in his acute awareness of its commoditising purpose: “It transmutes a man from a traveller into a living parcel.” See: John Ruskin, *The Complete Works*, vol. 8 (London: George Allen, 1903), 159.

¹²³ Banham, “L’Homme à l’Expo”, 811.

processes of commodity production.¹²⁴ In fact, the potentially re-combinable structure offered a system for indeterminate programs; hence the van Ginkels' invocation of such precedents. In Banham's view Expo 67 could, then, only make its "major contribution" by presenting architectural work responsive to far more indefinite and open-ended needs than the typical desire for monumental display demanded by the fair's regime. In other words, architecture could reinsert "Man" into the "World" if, and only if, it had "the wit to put him on stage".

The conceptual continuity sought in the colossal precedents of the nineteenth century was to project singularly massive architectural works capable of representing the world's fair as a large social body. Yet as opposed to the strict ordering of things and space – the ultimate classificatory function of Paxton's Crystal Palace or Frédéric Le Play's Colisée de Fer of 1867 – Banham sought effects that were altogether more informal. Any "man-made feature of the landscape" – a pavilion – would, Banham believed, have to operate along the lines of the ever-changing "people-garden" – the public spectacle of *ad hoc* queues – he had encountered and enjoyed at the fair:

The only place where the human race was fully written into the act is in the most underrated, yet probably the best, building there – the Canadian theme pavilion "L'Homme à l'Oeuvre." Architected by the Affleck-Desbarats partnership (locals again) it is ... hum ... well ... like, *try to imagine* a cross between Piranesi, the Eiffel Tower, and the Fun Palace project. An incomprehensibly endless-seeming structure of rusting steel tetrahedra, rational but romantic.¹²⁵

While the pavilion was meant to exhibit humankind's mediation of the world by technology,

¹²⁴ Frampton, "Industrialization and the Crises in Architecture", 49-50.

¹²⁵ Banham, "L'Homme à l'Expo," 813.

Banham did little to promote this thematic “fix”. Instead, invoking the depths of Piranesi’s *Carceri* and the theatrics of Cedric Price’s Fun Palace, Banham emphasised a new kind of spatial experience revealed within the seemingly infinite web:

It has the dumb authority of a primitive industrial plant, and through it are threaded staircases and escalators, delivering the visitor to galleries and walks and platforms, on and from which he sees other visitors living, moving and having their being and vanishing from time to time into dark holes to view theme displays... and emerging, slightly to their surprise, on walks and galleries they didn’t remember seeing before. It is so vast and three-dimensionally complex that in three visits I know I didn’t visit every exhibit, work every gadget, walk every platform – *it is an Expo in itself*. And because it is so vast and complex, it swallows queues before they form, and permits almost random circulation inside.¹²⁶

Banham appeared lost in space. Man the Producer had, indeed, been organised to enable moving through its three themed sections – “Resources of Man”, “Progress”, and “Man in Control?” – without predetermined course. Raised above the ground, its multiple entrances arrived at a central “interchange” about 40 feet in the air, from which escalators, staircases, and stepped levels led towards the exhibits beyond. It was not only the absorption of his dreaded queues that impressed Banham; it was, really, the feeling that deep inside this “incomprehensibly endless-seeming structure” were found people “living” and “moving”, “vanishing” and “emerging”. In this, Banham refused to read the pavilion in terms of its actual function (fig. 4.30). Consciously disentangling visitors from the exhibits they supposedly saw and presumably enjoyed, Banham described instead an environment that favoured the itinerant and, accordingly, the fluid interactions between people themselves.

¹²⁶ Ibid., emphasis added.

To stress *circulation* and its effects was to advance alternate criteria for shaping the built environment. Emphasis was placed on the *temporariness* of things, whether programmes or the arrangement of space. Banham's evocation of Cedric Price's Fun Palace of 1964 was a deliberate attempt to place Man the Producer in this context. The unrealised Fun Palace had been projected as a massive demountable space for ever-changing popular entertainment and education. "The whole complex," Price wrote in 1965, "in both the activity it enables and the resultant structure it provides, is in effect a short-term toy to enable people, for once, to use a building with the same degree of personal immediacy that they are forced normally to reserve for a limited range of traditional pleasures".¹²⁷ These "traditional pleasures" were, of course, *social*; and the notion of a "short-term toy", as pavilion, jibed perfectly with the temporary – and festive – mandate of a world's fair. Yet, as Banham well knew, the Fun Palace was to be consistently modifiable, its "kit of parts" assemblies, gantry cranes, and technological interfaces providing for ceaseless adaptation as new needs and programmes arose. There was, then, a difference: Banham championed the Fun Palace as kind of "machine" because of what users could do to it; at Man the Producer, he celebrated only what visitors were doing – not necessarily by engaging machines or displays but, as he put it, simply by "moving and having their being".

The somewhat existential line was odd given Banham's penchant for technology as saviour. Banham's knock at the "Establishment" circa 1967 rested on his recollection of

¹²⁷ Cedric Price quoted in Nigel Whitely, *Reyner Banham: Historian of the Immediate Future* (Cambridge MA: The MIT Press, 2003), 214.

Eiffel and Paxton – a conscious distancing away from *architecture* and toward the production of autodidact inventor. In this, Banham hewed closely to his growing “futurologist” predilections, initially articulated at the start of the decade when, in closing *Theory and Design in the First Machine Age*, his revisionist history of modern architecture, he appealed to the contemporary architect to “discard his cultural load” and “run with technology”; if not, then “he may find that a technological culture has decided to go on without him.”¹²⁸ The seer of the Second Machine Age was, to Banham, none other than Fuller, given his “foothold in the world of technology”.¹²⁹ His self-construed “outsider” status and technophilia – a “boffin” sensibility shaped equally by his experience as an engine fitter with the Bristol Aeroplane Company during the Second World War and a view of British high-technology before its general decline – were admirably served by upholding Fuller’s concerns for the “life cycle” of buildings and their “obsolescence” (hallmark of any machine).

Yet at Expo, Banham would admit to an unfulfilled promise. Man the Producer “establishes the (admittedly very high) standard by which the US pavilion has failed”, Banham confessed.¹³⁰ While Fuller’s remarkable geodesic was “probably the best big dome he has ever done”, Banham dismissed its “internal circulation”, planned by the Cambridge Seven design group, as “tight, linear and non-permissive (by the standards of *L’Homme à*

¹²⁸ Reyner Banham, *Theory and Design in the First Machine Age* (1960; Cambridge MA: The MIT Press, 1981), 329-330.

¹²⁹ *Ibid.*, 327.

¹³⁰ Banham, “L’Homme à l’Expo”, 813.

l'Oeuvre, that is)".¹³¹ In the *permissive* and *non-linear* lay Banham's wish for a unique spatial experience when comparing Man the Producer and the Fun Palace. Banham saw in the Fun Palace "an entertainment kit that the non-institutionalised aspects of leisure can improvise upon".¹³² Price had similarly thought it "essential to eliminate unreal division between leisure time and work time".¹³³ Indeed, the Fun Palace and Expo 67 were contemporaneous to notions on a new "leisure society", believed ascendant by technological advance making human labour unnecessary. The result would, it was held, be not only an abundance of material goods but of personal time. In this, Banham betrayed his technological determinism.¹³⁴ His description of Man the Producer was simply a wilful reading of present conditions, as found at the pavilion, in terms of future aspirations – that is, what a "liberated" public would, in Banham's view, actually do once freed from the strictures of work, of "production".

If there was a utopian quotient, then it was surely this: the assumption that Man the Producer could function as some form of "social condenser". The discourse that united theme pavilion and Fun Palace was contextualised in broader arguments for "play" (or *leisure*) as agent of cultural change. Indeed, the notion of *homo ludens* – a term invented in the late 1930s by Dutch historian John Huizinga to describe *play* as the wellspring of all

¹³¹ Ibid.

¹³² Reyner Banham quoted in Whitley *Reyner Banham: Historian of the Immediate Future*, 214.

¹³³ Cedric Price quoted in Nigel Whitley *Reyner Banham: Historian of the Immediate Future*, 215.

¹³⁴ In 1962, Banham had claimed that technology was "morally, socially and politically neutral" – a view marking his technological determinism throughout the decade. See: Whitley *Reyner Banham: Historian of the Immediate Future*, 301.

cultures – held considerable currency in the 1960s. Dovetailing with broader questions on post-industrial society, the *ludic* powerfully informed the more fantastic megastructural ambitions, not only Yona Friedman’s Spatial Urbanism, which had so influenced the earliest thinking on the theme pavilions, but especially the Dutch “ex-artist” Constant Nieuwenhuys’s New Babylon and its vision of an infinitely networked future city with endless “sectors” meandering across the landscape or suspended over existing cities (fig. 4.31).¹³⁵ Inside this “enormous social space”, Constant declared, life “would be essentially nomadic”.¹³⁶ New Babylon grew from Constant’s short-lived but influential involvement with the Situationist International, a group that had, since the mid-1950s, sought a behavioural reorientation towards the city. Guy Debord, the Situationists’ intellectual nucleus, had formulated the *dérive* as “technique” of “playful-constructive behaviour” for “transient passage through varied ambiances”; “constructed situations” were, then, “ephemeral, without a future; passageways” – they led architecture away from “emotionally moving forms” and toward “emotionally moving situations”.¹³⁷ Well aware of Constant, who had lectured in 1964 at the Institute of Contemporary Arts in London and contributed to *Archigram 5*, Banham’s view of Man the Producer similarly evoked passageways giving

¹³⁵ In keeping with his commitment to the construction of situations, Constant declared himself an “ex-artist” at the 1956 First World Conference of Free Artists. See: Simon Sadler, *The Situationist City* (Cambridge, MA: MIT Press, 1998), 107.

¹³⁶ Constant Nieuwenhuys, “New Babylon: An Urbanism of the Future”, *Architectural Design* (June 1964): 305.

¹³⁷ Guy Debord, “Theory of the *Dérive*” (1958) and “Report on the Construction of Situations and on the International Situationist Tendency’s Conditions of Organisation and Action” (1957), in Ken Knabb, ed., *Situationist International Anthology* (Berkeley, CA: Bureau of Public Secrets, 1981), 50; 25, 22–3.

onto passageways, a labyrinth as a dynamic conception of space.¹³⁸ While sensing that *playfulness* was to be facilitated by the prosperity and technical advance of a Second Machine Age, Banham lessened his concern with architectural hardware by emphasising instead the *experience* created by an environment.¹³⁹ The possibility of immersive, subjective, visceral experience produced, in Banham's phrasing, by a "rational but romantic" structure allowed architecture to be truly a medium of social exchange. Constant believed as much and thought New Babylon heir to the nineteenth-century utopian socialist Charles Fourier's *phalanstère*, a building based on a desire for "*architecture unitaire*" – the Situationists called for a "unitary urbanism" – and designed for a self-contained community governed by "passional attractions". (Debord sought "lived ambiances and their transformation into a superior passionnal quality".¹⁴⁰) Walter Benjamin had described the *phalanstère* – in the context of related ferro-vitreous environments of the nineteenth century that he took from Giedion – in terms of the capacity of advanced building systems to change radically the processes of everyday life:

Its highly complicated organisation is like a piece of machinery. The meshing of passions, the intricate interaction of the passions mécanistes with the passion

¹³⁸ If Banham exhibited some sympathy for the Situationist line, then it was largely in terms of preparing quasi-utopian evocations of visionary architecture but without the group's Marxist cultural critique. When reconsidering Man the Producer several years later, Banham described it as having "nothing but alternative routes, to be selected at conscious will or simply at random – the Situationists' psycho-geographical drift." It was, Banham felt in hindsight, an "improvised learning machine for Homo ludens" – "an accidental but instructive approximation" of New Babylon. See: Reyner Banham, *Megastructure: Urban Futures of the Recent Past* (New York: Harper and Row, 1976), 116.

¹³⁹ Whiteley, *Reyner Banham: Historian of the Immediate Future*, 215-216.

¹⁴⁰ Debord, "Report on the Construction of Situations and on the International Situationist Tendency's Conditions of Organisation and Action", 22.

cabaliste, are primitive analogies to machinery in the material of psychology. This human machinery produces the land of milk of honey, the primeval wish symbol that Fourier's utopia filled with new life.¹⁴¹

The “intricate interaction” of “passions” inside the *phalanstère* was not unlike the social effects Banham wished to find within Man the Producer. The *phalanstère* functioned, in fact, by emphasising *circulation* through the entire structure, with long “rues-galleries”, or covered arcades, linking every wing and uniting new communal associations. Here, again, was echoed the promise of nineteenth-century precedents: simply, an architectural “machine” enabling the spectacle of “humane machinery” constructing “the land of milk of honey”, otherwise utopia.

RUST

Soon after Expo 67 opened, the magazine *Progressive Architecture* retitled the world's fair: “Man and His Space Frame”. Praising the many visionary structures, whether Fuller's geodesic dome or the surprising aluminium space frame of the Netherlands pavilion, the editors remained somewhat troubled by Man the Producer, its heavy gusset plates hardly symbolising the expectation of lightweight forms. Nevertheless, the magazine concluded: “It seems frivolous to judge the [theme] pavilions within the context of traditional architecture.... The pavilions set out to solve a complicated architectural problem unique to our time, which is probably more important than their meaning as ‘architecture,’ good or

¹⁴¹ Walter Benjamin, “Paris, Capital of the Nineteenth Century” (1935) in Peter Demetz, ed., *Reflections: Essays, Aphorisms, Autobiographical Writings* (New York: Schocken Books, 1978), 148.

bad.”¹⁴² Placed outside the limits of architectural “value”, the tetrahedra were made redolent of the epoch by virtue of their experiment.

The mediatic reception of the pavilion made clear its exceptionalism. Architectural journals consistently disregarded the exhibits inside, focusing almost exclusively on patterns and spaces formed by the space frames. Photographs appeared deliberately foreshortened, with triangles telescoping toward one another and layer upon layer of structure collapsing upon itself, as if mirrored or receding to infinity. Typical views started far within the pavilion, bounded on all sides by tetrahedra, and looking past a massive void – a canal, an atrium – beyond which other levels extended, revealing the entire structure raised off the ground, as if purposefully floating above the mundane world of the fairgrounds. The image accompanying Banham’s *New Society* article was the same, showing people distantly immersed inside the tetrahedral world (fig. 4.32). *Progressive Architecture* made it extreme: the cover of its special issue on Expo 67 simply a high-contrast representation of a gusset plate node, beyond which lay only black, emptiness, a few slivers of white offering openings to other spaces elsewhere (fig. 4.33). Magazine layouts presented an ambiguity between inside and out, a reversal fully completed at night when Man the Producer began glowing from within, its tetrahedra creating infinite triangular apertures, ghostly demarcating the pavilion against the dark sky. In these views, the tetrahedral behemoth appeared simply to dematerialise.

To observers, Man the Producer, circulating widely in magazines, may well have

¹⁴² “Space Frame Integration”, *Progressive Architecture* (June 1967): 144.

served as harbinger of things to come. It suggested, however partially, that architectures seen as only visions could perhaps be realised. Writing in the same year as Expo 67 for *Perspecta*, the influential Yale journal of architecture, in an issue devoted strictly to the architecture of the past two years, Peter Cook of Archigram summarised prevailing tendencies: “Is it a coincidence that [Archigram’s] Plug-in City, [Yona] Friedman’s scheme and the Japanese [Metabolist] scheme were more concerned with the opportunity of the multi-layer cage and the diagonal to respond to situations than to incarcerate events in flat, defined, boxes?”¹⁴³ Cook’s rhetorical question indicated how architecture was believed submitting to “situations”, to demands made by works like New Babylon.¹⁴⁴ In this socio-political statement, technics were critical: the evocation of a “multi-layer cage” was to favour steel structures – tensile and seemingly lightweight – over concrete, the medium of most megastructures achieved until then.¹⁴⁵ Yet the emphasis on steel also indicated how long-span structures – of Man the Producer, in New Babylon – were imagined ideally suited to the creation of transitory architecture with fantastic vistas and fecund space.¹⁴⁶ Again, in the most utopian hopes, the technics were to engender, whether in *homo ludens* or *homo faber*,

¹⁴³ Peter Cook, “Some Notes on the Archigram Syndrome”, *Perspecta* 11 (1967): 135. The *Perspecta* editors admitted how they had, around 1965, begun to pose the question, “Where are we now in architecture?” See: Peter de Bretteville and Arthur Golding, “About *Perspecta* 11”, *Perspecta* 11 (1967): 7.

¹⁴⁴ Sadler, *The Situationist City*, 155. Sadler notes that Archigram “attended Constant’s 1964 ICA lecture in London, read his notes, and invited him to contribute to *Archigram* no. 5, the ‘Metropolis’ issue” (133).

¹⁴⁵ Canada made definitive contributions to concrete megastructures during this period with Arthur Erickson’s Simon Fraser University (1964), John Andrews’s Scarborough College (1965), and Arcop’s Place Bonaventure (1968).

¹⁴⁶ Sadler, *The Situationist City*, 132.

new forms of social life.

This was, of course, a long held modernist dream. As found at Expo 67, space frames not only represented, in the words of *Progressive Architecture*, “the search for economic means of spanning and enclosing large spaces” but were “*social structures*”.¹⁴⁷ Long spans constructed this social scape – for a large public – by the immediate provision of massive shelter and enclosure; but there was something more: the direct, visceral, *collective* experience of an unadorned but breathtakingly huge architecture. Giedion’s influential reconsideration of the Crystal Palace as fundamental source – “the possibilities dormant in modern industrial civilization have never been, to my knowledge, so clearly expressed”¹⁴⁸ – found expression in Wachsmann’s fantastic projects. The exemplary statement was Mies van der Rohe’s unrealised 1953 Chicago Convention Hall, which collaged the body politic of the 1952 Republican National Convention under a soaring roof, 720-feet square, of massive 32-foot deep girders; the aim was to achieve an expansive and adaptable space capable of housing 50,000 people, what Mies called “universal space” (fig. 4.34).¹⁴⁹ Man the Producer similarly worked as a display in itself. With fairgoers inhabiting and reading outward from the basic “cell” to the overall “system”, the pavilion made evident both literal and phenomenal aspects of its own construction. Deep inside the tetrahedra was, then, conveyed

¹⁴⁷ “An Architect’s Expo”, *Progressive Architecture* (June 1967): 127, emphasis added.

¹⁴⁸ Sigfried Giedion, *Space, Time and Architecture: The Growth of a New Tradition* (Cambridge MA: Harvard University Press, 1956, third edition), 250.

¹⁴⁹ Mies based the Convention Hall on his earlier 1942 project for a concert hall, which he rendered in a collage of coloured planes floating underneath a photograph of a massive trussed roof (which was, in fact, taken from Albert Kahn’s 1937 Martin Assembly Building, an aircraft factory).

the feeling of a *technological sublime*: it was a collective awe for the technological conquest of matter.¹⁵⁰ It rested on the presumption that the space frames – and, by extension, the resulting megastructure itself – anticipated perfectly the technical needs and faculties of late modern society. By this collective, mass perception within and of the tetrahedra – as an utterly novel building system, space enclosure, *and* aesthetic – Man the Producer was seen as evidence of technological progress illustrating the exultant sense of human possibilities.¹⁵¹ Yet as a statement on history, on its timeliness, Man the Producer may have seemed Janus-faced: originating in the prismatic – to Fuller, “ephemeral” – qualities of space frames, the ambition to achieve something sublime, of being overwhelmed by architecture, was, quite literally, materialised in the anachronistic quality of corrosion.

From the start, the genealogical affiliations between the massive nineteenth-century world’s fair architectures and Man the Producer were drawn to find in long-spans the capacities to fashion a new social compact. In a pavilion dedicated to “production”, the space frames conjoined notions of *structure* and *machine*: the former, something custom-made for a specific purpose; the latter designed to be temporary and dynamic.¹⁵² The dialectic between

¹⁵⁰ Leo Marx, *The Machine in the Garden: Technology and the Pastoral Ideal in America* (1964; Oxford: Oxford University Press, 2000), 197; David Nye, *American Technological Sublime* (Cambridge MA: The MIT Press, 1994), xiv. Nye argues that, over time, “the constant is not the technological sublime per se, it is the continual redeployment of the sublime itself” – in other words, as expressed in new technologies as apotheosis of their age.

¹⁵¹ Marx, *The Machine in the Garden: Technology and the Pastoral Ideal in America*, 230.

¹⁵² Howard P. Segal, *Technological Utopianism in American Culture* (Chicago: The University of Chicago Press, 1985), 12-13.

ferro-vitreous and tetrahedral – to leverage the past in the visions of the present, to find the present in suggestions of the past – was to dream of uniting aesthetic-technical and socio-spatial phenomena (as collectively beheld and experienced). Giedion’s reading of the nineteenth-century world’s fairs as truly modern was to believe in an original “aesthetic response”, driven by innovations in iron construction and the temporary demands of world’s fairs, in which “a new poised equilibrium of all the parts of a structure began to appear” – *and, perhaps, to disappear*, “in the overcoming of gravity in apparently floating constructions”.¹⁵³ Thus did the Crystal Palace, for all its prefabrication and serial production, have “the impact of a fairy story”: “Industry, after all the blight and disorder it had brought about, now displayed another and gentler side, aroused feelings that seemed only to belong *to the world of dreams*.”¹⁵⁴ Quoting a German exile observing the 1851 exhibition, Giedion asked, “Are there counterparts of the Crystal Palace among the paintings of the period – any paintings, that is, which give ‘no idea of the actual size or distance involved,’ and where ‘all materiality blends into the atmosphere’? There are none.”¹⁵⁵ The romanticism implicit in Giedion’s evocation was again consciously to evoke the sublime spatiality of an engineered work. Yet it was also uncanny echo of other exiles, Karl Marx and Friedrich Engels, who, when writing *The Communist Manifesto* in 1848 and trying to

¹⁵³ Giedion, *Space, Time and Architecture: The Growth of a New Tradition*, 244, 247.

¹⁵⁴ *Ibid.*, 247.

¹⁵⁵ *Ibid.*, 252. Giedion quoted Lothar Bucher, who spent ten years in exile in England after organising a tax revolt movement while serving as member of the National Assembly in Berlin. Originally close to leading socialists, Bucher eventually returned to Germany and became a trusted aide of Chancellor Otto von Bismark.

describe the ceaseless “revolutionising of production” and consequent “uninterrupted disturbance of all social conditions”, prophetically declared: “All that is solid melts into air”.¹⁵⁶ For Marx and Engels, this was to be the “sober” realisation of the “real conditions of life”. Sobriety came by recognising the materialisation of social and space relations; if this was a demystification of “production”, then what of architectures resulting from industrialised means but effecting, as Giedion felt, “to dematerialize landscape and dissolve it into infinity”?¹⁵⁷ The answer lay in believing that, somehow, under certain conditions, industrialisation brought about a *re*-enchantment of the social world.¹⁵⁸ This was precisely Walter Benjamin’s consideration of Fourier’s *Phalantère* – that underneath processes of systemic rationalisation lay a new “dream world” of mass culture.¹⁵⁹ Hence Giedion’s elevation of the Crystal Palace to “the world of dreams” achieved “through the agency of transparent glass and iron structural member”;¹⁶⁰ hence Banham’s projection of Man the Producer to a ludic realm by virtue of its “incomprehensibly endless-seeming structure of rusting steel tetrahedral”; hence Lindsay’s pleased conjunction of the “prismatic” and the “rudimentary”.

¹⁵⁶ Karl Marx and Friedrich Engels, “The Communist Manifesto” (1848), in Robert C. Tucker, ed., *The Marx-Engels Reader* (New York: W.W. Norton and Co., 1972). “All that is solid melts into air,” Marx and Engels proclaimed, “all that is holy is profaned, and man is at last compelled to face with sober senses, his real conditions of life, and his relations with his kind.”

¹⁵⁷ Giedion, *Space, Time and Architecture: The Growth of a New Tradition*, 252.

¹⁵⁸ Susan Buck-Morss, *The Dialectics of Seeing: Walter Benjamin and the Arcades Project* (Cambridge MA: The MIT Press, 1989), 252-252.

¹⁵⁹ *Ibid.*, 254, 255.

¹⁶⁰ Giedion, *Space, Time and Architecture: The Growth of a New Tradition*, 252.

In these almost hallucinatory readings was refusal to see Man the Producer as a pavilion – that is, as an institution in which the relations between individuals (visitors) and technologies (displays) were normalised. Yet it was also to believe that, in the endless exercise of modernity and its most consequent architecture, socially transformative experience could, in the end, only be achieved by the ongoing refinement of seemingly light, flexible, and sufficiently massive architectural technics. It was hardly surprising that such a fleeting utopia was found, if at all, in a “world” existing for just six, short months.

Chapter 5: Housing the World, 1

Little boxes on the hillside

Little boxes made of ticky-tacky

Little boxes on the hillside

Little boxes all the same.

Malvina Reynolds, "Little Boxes" (1962)

From the beginning, Expo 67 was imagined to be a social experiment. Its early ideal had been mass housing as a modernising force in the city. The van Ginkel's Man in the City took as paradigm the Berlin Interbau exhibition completed only a few years before their first theories on the world's fair. Housing would, it was hoped, serve as the conduit through which Canada could engage international modern architecture by showcasing experiments collected from around the world. With the inevitable rejection of Man in the City by political expediency, the strategy became to conceive some kind of "mega-pavilion" inside which, as delineated in the Man in the Polar Regions study, the "world" could be organised. Despite their scalar and, indeed, programmatic differences, both proposals had a common purpose: as the Montebello conferees had decreed, to produce architecture communicating senses of global fraternity and technological progress. As opposed to narrow self-interest, architecture at Expo 67 was, above all, meant to transmit an idea of a universal "good". As such, size mattered: whether housing exhibit or theme pavilion, any resulting project needed to be sufficiently massive and to engender new forms of social life.

The residual but polemical effect of these twinned tendencies would appear in Habitat 67. Realised by the young Montreal architect Moshe Safdie, this "housing exhibit" consecrated simultaneously the van Ginkels' earliest ambitions for the fair as well as the Montebello declaration that "modern man" must "impose on the world of 1967 new

concepts of community life”. First projected in autumn 1963, Habitat was realised against the cultural backdrop of pressing debates on suburbanisation and urban renewal, concerns central to Man in the City and at the root of Safdie’s intellectual formation. It faced among the most pressing tasks of any world’s fair: to resituate “man” *in* “his world” by rearranging the social and technological demands of domestic life in the modern city. As such, it became among the most celebrated works at Expo 67.

Habitat 67 was intended as a theme pavilion. Yet it would be one without displays in the conventional sense; instead, it was to become a “live” demonstration of living in the city, offering the public an immediate functional value – as housing and as a *permanent* addition to the Montreal cityscape – that rested on defining the thematic of “man” by the long-term need for shelter but a newer, late modern need for forms of *flexibility*, for “change and growth” in Team 10 phrasing, in everyday life. Discovering a novel architectural technics was crucial to this demand. Safdie based his project on the prefabrication of a standard dwelling unit that, when combined with others, gave rise to a multi-storey terraced complex. In Safdie’s parlance, which carefully borrowed from contemporaneous sources, this was a “cluster” geometry: an “additive” process of combining units for “growth and change” would ensure that the “identity” of the individual familial dwelling was as important as an overall massing. Later, the Expo 67 authorities would, at Safdie’s suggestion, consciously present Habitat as incomplete. Elaborated as a special “construction exhibition” emphasising its erection by “assembly line” processes, Habitat 67 was seen as emerging from first principles: a novel spatial conception of housing, created instantaneously in an on-site

factory, and realised by a patron (namely, the State) outside the norms of the marketplace. The CCWE became, therefore, deeply invested in promoting Safdie's design by describing it as the most important "prototype" arising at the world's fair. Habitat was advanced as avatar of emerging tendencies toward "cellular construction" for which Expo 67 was, in turn, upheld as proving ground.

As prototype, Safdie's building was to be a model worthy of imitation. While this fulfilled the civilising mission of a world's fair, it also revealed a unique interpretation of visionary tendencies in modern architecture. Surely unbeknownst to most fairgoers, Habitat 67 was consciously imagined, both by its creator and its critics, as actualising some of the most radical aspirations of the 1960s. Safdie's thinking owed to a uniquely influential source: Daniel van Ginkel, under whom Safdie developed his final-year design thesis at McGill University in 1961. The resulting "High Density Modular Housing Systems" project was informed by his mentor's immersion in the foundational debates of Team 10.¹ When invited by van Ginkel first to work on the Expo 67 master plan, Safdie insistently conceptualised (and then promoted) Habitat specifically in terms of his student project and the constellation of precedents that informed it.² The CCWE would, in turn, absorb

¹ In his retrospective account of "Megacity Montreal", which included discussion of Safdie's student work in relation to Habitat 67, Reyner Banham insisted that "it is helpful to be able to see Mega-Montreal of the mid-sixties as a complete historical phenomenon, inclusive enough in its ramifications to cover, among other things, architectural education at McGill". See: Banham, *Megastructure: Urban Futures of the Recent Past* (New York: Harper & Row, 1976), 105.

² After graduating from McGill, Safdie joined Daniel and Blanche van Ginkel's office. In 1962, he left the van Ginkels to work for Louis Kahn. He stayed for approximately a year and contributed to the design of the Indian Institute of Management in Ahmedabad. The invitation to return to Montreal came directly from van Ginkel:

Safdie's discourse as its own, championing the uses of prefabrication and techniques of industrialised building as panacea to the problems of the North American city – thus commensurate to the socio-technical ambitions of the fair itself.

Barely two years separated Safdie's graduation from McGill and his initial work on Habitat 67. In this remarkably brief period, Habitat emerged as a uniquely personal synthesis of contemporary architecture discourse and social commentary. It followed the transformation of a student thesis into a general theory on housing that, in turn, became an ideal plan for the future North American city. At every stage, Safdie gave prognostic value to keywords (largely appropriated from architectural sources, especially Team 10) as fixing both the social and technical ethos of Habitat 67. This would have two kinds of discursive effects: first, the deliberate use of Safdie's terminology by the CCWE to promote architecture – writ large as a housing exhibit – as the ultimate cultural signifier of the world's fair; second, the re-integration of Habitat 67 within currents of visionary architecture in the 1960s.

A TRIP

At one point I wanted to go to India to supervise the college construction. Kahn wanted me to go too, and then he changed his mind. That was the breaking point.... I had learned what I had to learn and had become restless. I suppose the restlessness was rooted in vanity, but also in impatience – an urge to come closer to the realization of my ideas.

Then, out of the clear blue sky, Sandy van Ginkel showed up in Philadelphia. Montreal had just been chosen as the site of the 1967 major international exhibition... [and] van Ginkel was to be the deputy responsible for physical planning. Would I come and work with them on the master plan?

I told Sandy I had some conditions: I should be able to take some time off to work on the housing system; I should be able to develop it within Expo; I needed ten thousand dollars to live on. He wrote back accepting. We packed up with two weeks' notice and went back to Montreal. That was August 1963.

See: Safdie, *Beyond Habitat* (Cambridge MA: The MIT Press, 1970), 62-63.

The intellectual underpinnings of Habitat 67 lay in Safdie's early evaluation of mass housing in the North American city and, in particular, in his typological reading of suburban development and urban renewal. It led directly to the design for his student thesis – a work immediately circulating in architecture culture and, in turn, forming the basis of his approach to Habitat 67.

Safdie's research on housing was initiated under the auspices of the Central Housing and Mortgage Corporation (CMHC). Created in 1945 as a Crown corporation to administer the 1944 National Housing Act, thus to run the housing policy of the Canadian government, CMHC became the machinery of postwar housing, starting first with mortgage financing and later acquiring expertise in community planning, architecture, and social welfare.³ Following his fifth and penultimate year of architecture studies at McGill, Safdie joined a group of Canadian students on a five-week travelling scholarship granted by CMHC. Visiting projects in major North American cities, mainly American ones, with a broad range of urban and suburban examples, Safdie saw firsthand new approaches to both middle class and social housing, from Mies van der Rohe's Lafayette Park housing complex

³ Albert Rose, *Canadian Housing Policies 1935-1980* (Toronto: Butterworths, 1980), 19-20, 24, 29. The core principle of the National Housing Act (NHA) of 1944 was mortgage financing of home ownership. The Canadian government provided 25 percent of the capital amount of an NHA mortgage at low interest rates, namely 3 percent. The direct form of subsidy immediately reshaped the postwar urban realm, not least with mass suburbanisation. With the swift rise in homeownership, it became apparent that the stimulating of home ownership could no longer be supported by government revenues. As a result, the 1954 NHA permitted chartered banks to enter the mortgage field. CMHC was established by an act of parliament and report to a minister but are seen largely free from ceaseless government intervention. In the immediate postwar decades, crown corporations were crucial to the provision of goods and services – transportation, resources development, or the arts – that private enterprise may not have undertaken.

in Detroit to Cabrini Green in Chicago (fig. 5.1).⁴ The prefabrication of suburban homes – whether Levittown or the Eichler homes near San Francisco – were read alongside examples of historic city fabric (Georgetown, in Washington D.C., was especially impressive). Slum clearance schemes, a government administered undertaking critical to defining urban design as a discipline, shaped the itinerary.

Safdie’s culminating report, *Housing in North America – 1960*, outlined preoccupations that would define his coming thesis work at McGill. He divided his ideas in two broad themes. In “The Forces at Work”, Safdie looked at financial and economic considerations as well as government legislation such as zoning, which culminated in ruminations on “The Building Industry”, “Technology”, and the role of “The Designer”.⁵ This triangulation became a plea for industrialised building. While “The Manufacturer” was in a position to “produce larger and larger components resulting in an integrated piece of construction”, he noted that despite the existence of “the ‘big-time’ operator” – “the very large builders (Levitt)... even own lumber forests” – most “possibilities become chaos”: “a prefabricated wall system that could give Levittown order is concealed behind wooden arches, cornices, and entablatures.”⁶ “It was very tragic visiting, as Fuller puts it, ‘The

⁴ Safdie’s complete itinerary appears in his *Housing in North America – 1960, Report Submitted to the Central Mortgage and Housing Corporation* (Montreal: McGill University, 1960), 41-44. In addition to visiting housing projects, Safdie and his fellow students met with and interviewed architects, planners, builders, and other intellectuals involved with housing; a list appears in Safdie’s report.

⁵ A very brief third section of the report was given to “Observations on CMHC”.

⁶ Safdie, *Housing in North America – 1960, Report Submitted to the Central Mortgage and Housing Corporation*, 18. To the roles of “The Builder” and “The Manufacturer”, Safdie added “Organized Labour”, which he blamed for opposing “any innovation that reduced man hours in residential construction.” “Mass production and prefabrication,” Safdie contended, “have had short periods of attention but every time a forward step is

industry that industry missed’”, Safdie admitted.⁷ Yet two examples stood out: first, Levittown, which despite having “conventional” materials and details was notable because “*the process* itself was modified”; second, Fertighause, an Austrian project financed by the Marshall Plan that Safdie discovered when meeting the Chicago bankers behind the scheme.⁸

made, Organized Labour puts its full pressure to suppress it” (19). Safdie’s indication of “process” at Levittown may have been the recognition that William Levitt had erected standard, detached houses (in different styles) at regular intervals along straight roads by dividing the construction process into 26 steps with materials supplied from a central warehouse. Levitt claimed to build a new house every fifteen minutes. Levittown came to play an important role in architectural discourse in the late 1960s, particularly following the sociologist Herbert Gans’s influential study *The Levittowners: Ways of Life and Politics in a New Suburban Community* (New York: Vintage Books, 1967), which would shape Robert Venturi and Denise Scott-Brown’s “Learning from Levittown” architecture design studio given at Yale University in 1970.

⁷ Safdie, *Housing in North America – 1960, Report Submitted to the Central Mortgage and Housing Corporation*, 21. “It is unfortunate that in travelling through seven North American cities in the year 1960 we only saw two examples of partial industrialization of the building process in residential work, and no example that reflected our technological advances in material and process of the last decades. Visiting sites under construction only proved the statements on the pathetic way in which houses are put together. Even rapid examination showed how many man hours could be saved, how quality could be improved.”

⁸ Safdie singled out one William K. Wittausch, the Vice President of the First Federal Saving Bank of Chicago, as a “lender” committed to “forward looking” projects but also someone who “outlines programmes for new schemes”. These included a prototype town house development in Chicago (that Safdie sketched and included in his report) of “L-shaped houses forming an enclosed court the size of which varies with the number of bedrooms.” Safdie tellingly declared, “Urban renewal has made it possible to experiment with this revived form of housing.” See: Safdie, *Housing in North America – 1960, Report Submitted to the Central Mortgage and Housing Corporation*, 4, 31-32. By the mid-1960s, Wittausch became a member of Housing Research at the Stanford Research Institute in Pasadena, California, where he wrote *Housing as a Consumer Product: An Emerging Industry* (1966). In August 1966, Wittausch and Safdie appeared separately at the American Institute of Planners’ conference on “Optimum Environment with Man as the Measure”, held in Portland, Oregon. Safdie gave an address on Habitat 67 at the conference, where he also encountered for the first time Christopher Alexander: “It was an unforgettable event; each of us had heard of the other and we were pleased to meet. That was the beginning of an intensive exchange, one which has been of significance to the development of my own thought and work.” Safdie noted: “There is an affinity between” Alexander’s “*patterns*”, as developed in his *Notes on the Synthesis of Form* (1964), “and the terms structures, as evolved in our discussions in Philadelphia”, by which he meant the ideas developed by him and Anne Tyng while working for Louis Kahn, and which contributed fundamentally to the early thinking on Habitat 67. See: Safdie, *Beyond Habitat*, 154-155. For the Portland conference, see: William R. Ewald, Jr., ed., *Environment for Man: The Next Fifty Years* (Bloomington: Indiana University Press, 1967). A year after the Portland conference, Safdie and Alexander jointly presented a paper at the 1967 Aspen Design Conference; see: Moshe Safdie and Christopher Alexander, “Complete or Incomplete?”, in Reyner Banham, ed., *The Aspen Papers: Twenty Years of Design Theory from the International Design Conference in Aspen* (London: Pall Mall Press, 1974), 191-196.

At Fertighause, a “one-metre module was adopted, and standard exterior partitions, interior partitions, roof trusses, and all storage furniture were developed” along with a “standard plumbing and electrical network”; taken by the separation of the house into components, Safdie believed the project would offer savings in construction time, unit cost and, importantly, “flexibility in plan arrangements within the given module”.⁹ “This will become even more critical”, predicted Safdie, “when the building industry starts to resemble the mass-production industries.”¹⁰ While describing issues of fabrication, assembly, and field erection, Safdie outlined a second preoccupation: “Forms of Housing”, which indicated what kinds of architectural types and, importantly, social ideals could be inspired by these processes. A “return to the city” – already instigated by “urban renewal” – could, he argued, revivify the question of “housing”. Safdie admiringly described and sketched several notable achievements, such as Hyde Park in Chicago, with its combination of town houses by Harry Weese and high rises by I.M Pei – projects that outwardly exhibited little on the ethic of mass production but otherwise fell within an increasingly familiar aesthetic of urban renewal.

Yet Safdie’s most important lessons were learned elsewhere – suburbia. Even if the “large portion of the population has provided sociologist wit material for their studies”, the suburbs offered Safdie important concepts in spatial and formal organisation (to say nothing of the particular advances in prefabrication he had discovered there). As opposed to the

⁹ Safdie, *Housing in North America – 1960, Report Submitted to the Central Mortgage and Housing Corporation*, 22.

¹⁰ *Ibid.*, 24. Safdie quickly added that “most single family residential work is not architect designed”.

“prevailing pattern” of such developments, Safdie sought unique “projects that deviated from this pattern”, especially those that considered “the amenities of the unit itself, its relationship to the immediate surroundings, and to the entire development.”¹¹ In particular, he celebrated Clarence Stein and Henry Wright’s Chatham Village, a Pittsburgh garden suburb completed in 1936, which “still not been surpassed as a statement *towards an environment*. The greatness of Chatham is that its form generates from a strong social idea, in which the planner has set the way of life of the occupants.”¹² Followers of the garden city movement and members of the, Stein and Wright were, in the appraisal of Lewis Mumford, their ally and fellow member of the Regional Planning Association of America, the preeminent prewar – in other words, New Deal – “architects and planners in the United States who approached architecture most consciously from the social side”.¹³ Safdie found in Chatham a similar nexus: the need for “form”, which owed to “social idea”, was to produce the concept of “group”. Chatham “forces its inhabitant to live as a group because once out of their doorsteps they share everything”.¹⁴ “It is the group that has identity”, Safdie concluded. “It is an entire village that lives as a horizontal ‘Unité’.”¹⁵ The invocation of Le Corbusier’s

¹¹ Ibid., 25. Safdie saw the typical suburban layouts from the air: “The lesson of an airplane trip: There is no better place to appreciate form and extent of Suburbia in cities than flying over one.”

¹² Ibid., 25-26; emphasis added. Safdie perhaps unwittingly replaced Le Corbusier’s famed maxim *vers une architecture* with the rubric of “environment”.

¹³ Lewis Mumford, *Roots of Contemporary American Architecture* (New York: Grove Press, 1959), 26.

¹⁴ Safdie, *Housing in North America – 1960, Report Submitted to the Central Mortgage and Housing Corporation*, 26. A “similar situation” in “another successful development” in Deep River, Ontario, had detached units “grouped around a common green which they all share.”

¹⁵ Ibid.

paradigmatic Unité d'Habitation, first completed in Marseilles in 1952, surely inspired belief in a genuine “social condenser”, a notion central to the imaginary of the modernist avant-gardes, in which a fraternal order was to be developed within a single structure integrating private dwellings (of a repeating type) with any number of communal services.

The antithesis of the North American suburb offered Safdie an entirely different kind of cultural image to incorporate in his vision of the “group”. This owed, above all, to a belief in *privacy* as a social norm. Safdie concluded that families were “moving to suburbia because there they found essentials to daily life which the city did not offer.”¹⁶ These “essentials” were, in short order, “the obvious factors of fresh air and cleanliness” but also that “their bungalows offer them relative privacy” as well as gardens.¹⁷ The individual house thus afforded a private realm both indoors and out-of-doors. Safdie accordingly imagined conjoining “enclosed intimate common ground and the secluded private garden” – an effort that could yield “a group of close houses” that, in turn, would introduce a sense of “variety” in “distinguishing one group from the other.”¹⁸ The argument rested on his opposition to a

¹⁶ Moshe Safdie, “A Case for City Living”, in *Habitat* (Ottawa: November-December 1961): 4. While Safdie’s article collected the lessons of his CMHC tour, it also presented his thesis project as panacea for future urban housing. Safdie later recalled: “I found two things going on in the United States and Canada: high-rise apartment construction, which seemed not to work for families, and suburbia, which also seemed not to work, though it offered amenities that people generally preferred when they had a choice.” See: Safdie, *Beyond Habitat*, 52.

¹⁷ Safdie, “A Case for City Living”, *Habitat*, 4. Safdie noted that the “bungalow” also gave its inhabitants “a confused sense of identity.” He added: “It seems that the private outdoors are essential to the American family. This demand is an expression of their way of life and should not be ignored. Yet this privacy should not replace the community but complement it” (27).

¹⁸ Safdie, *Housing in North America – 1960, Report Submitted to the Central Mortgage and Housing Corporation*, 27.

report by the Royal Architectural Institute of Canada that had recommended a “variety” of house styles to counter “homogeneity” in suburban development. “What is needed”, Safdie countered, “is a variety of people who would generate a need for a variety of accommodation, which in turn will generate different unit types with different form which could combine into an environment.”¹⁹ In other words, the conceptual viability of “group” was based on linking a social unit – the afore-mentioned ideal of the “family” – to an effective housing unit that could give rise to a new kind of city.

A THESIS

Safdie submitted his CMHC report just before initiating his sixth-year graduating thesis project at McGill. He turned, unsurprisingly, to the question of housing.²⁰ The resulting work, defended in the spring of 1961, bore the somewhat cumbersome but decidedly didactic title “A Case for City Living: A Study of Three Urban High Density Modular Housing Systems for Community Development”. Safdie based the work on the conclusions

¹⁹ Ibid., 27-28. Again, the question of “variety” followed Safdie’s sense of suburban houses: “...most North Americans do get a single-family house, with few variations; the lot size is 60 feet by 100 feet, the site is rather less spectacular, and the floor area of the dwelling slightly more than one thousand square feet. Everything is done to preserve the ‘Casa Loma’ image. A space of ten to twelve feet is left between houses so that they are free-standing on their estates. Superficial ornament is applied so that each house is ‘different’ and has a ‘custom-built’ look. All this at the expense of privacy both indoors and outdoors....” See: Moshe Safdie, “Fallacies, Nostalgia and Reality”, *Habitat* (Ottawa: July-August 1961): 2.

²⁰ Safdie had been exposed to housing problems in his penultimate year of architecture studies, when, under the guidance of Douglas Shadbolt, he designed a public housing project for Vancouver. Safdie recalled Shadbolt’s introduction to “the problems of mass production and about the industrializing of the building industry”; see: Safdie, *Beyond Habitat*, 52. Shadbolt became one of Safdie’s thesis advisors and later, on Safdie’s recommendation, consulted on the unrealised “Man in the Community” exhibition in Habitat 67. Shadbolt also joined the CCWE Advisory Committee on Architecture.

of his North American travels – that is, whether one could “combine” the potentially incommensurable valences of “privacy” and “group” into a “common” structure that had “identity” but was equally marked by formal “variety”. The keywords overlapped with contemporaneous discourses in architecture culture in which Safdie saw his project as participating. In fact, he would carefully synthesise his CMHC research as the theoretical framework of his thesis when it began appearing in both avant-garde and professional architecture journals soon after his graduation.²¹ This remarkable circulation of Safdie’s ideas became a decisive prelude to the coming commission for Expo 67.

Safdie’s thesis was a plea for the city. “As our civilization becomes more urban”, he argued, “one of the pressing requirements is for high density habitat.”²² North American suburbs were marked by “the sociological effect of separation of the dwelling, work, recreation and culture” and, alarmingly, the “city centre – the nucleus of our cultural activities – is in the process of disintegration.” Invoking the edicts of functionalist town planning enshrined in *The Athens Charter*, the appraisal was partly a critique of modernist

²¹ Shortly after his graduation, Safdie published a trio of articles about housing in the CMHC journal *Habitat*. While based on his North American study trip, these were not travelogues but more theoretical, if not polemical, statements on housing in general. It is likely that he wrote them while preparing his thesis and serve as explanatory texts of his design intent. See: Safdie, “Fallacies, Nostalgia and Reality”, in *Habitat* (Ottawa: CMHC, July-August 1961); “A Case for City Living” in *Habitat* (Ottawa, November-December 1961), and “The Master Plan: Growth, Change, and Repetition” in *Habitat* (Ottawa, May-June 1962). Very soon after graduating from McGill, Safdie admitted that the “travels in the USA and Canada... under the auspices of the CMHC grant for the study of housing, have clearly demonstrated the need to imagine new forms of residential types of higher density and dedicated to family life, and situated in the heart of the city.” See Moshe Safdie, “Un Nouvel Aspect d’Habitat Urbain: Étude de trios formules d’habitation à haute densité”, *Architecture-Bâtiment-Construction* (July 1961): 32, translation by author.

²² Safdie, “A Case for City Living”, *Habitat*, 2. Safdie’s argument was based on demographic projections: “The population of this continent is expected to be more than doubled by the year 2,000. In Canada this rate will be exceeded and through natural increase and immigration, the population in the same period should rise to 40,000,000.”

urbanism.²³ Yet what may well have connected suburban development and functionalist town planning was, to Safdie, a shared interest in serialised production, especially the use of standardised elements. Nevertheless, Safdie argued against any resulting repetitive urban organisation, whether Levittown or the “park city” associated with Le Corbusier.²⁴ Thus reading across suburb and city, Safdie extrapolated key design criteria:

- 1 – To offer a certain variety of housing types, suitable for bachelor as well as multi-family uses, and that respond specifically to their needs and ways of living.
- 2 – To establish a community structure, hierarchically organised by groups, each with its own well-defined personality.
- 3 – To lend at the same time to the overall ensemble, despite its variety of housing types, a unity through constant massing
- 4 – To separate pedestrian and vehicular circulation, each adapting to a desired scale and place²⁵

Here were potentially countervailing agendas: one the one hand, a programme attuned to different “needs and ways of living” that could still be reduced to “well-definable” – and “hierarchically organised” – “groups”; on the other hand, a plan to design a building that, despite being composed of “a variety of housing types”, necessarily exhibited a “constant massing”.

²³ While CIAM town planning principles circulated widely in prewar architecture culture, *The Athens Charter* was only published as an edited version by Le Corbusier in 1943. See: Le Corbusier, *The Athens Charter* (1943; New York: Grossman Publishers, 1973).

²⁴ Safdie was also indebted to the “park city”. When rendering the clustered forms of his thesis project, he drew perspectives – taken from the verdant expanse of a “man-made park” that “interpenetrates the constructed spaces” – redolent of Le Corbusier’s famous view of Ville Contemporaine. Safdie’s sketches gave contour to the kinds of precedent with which he saw himself in dialogue. See: Safdie, *A Case for City Living*, final thesis presentation boards (1961), n.p., Box 58/90/1, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal.

²⁵ Safdie, “Un Nouvel Aspect d’Habitat Urbain: Étude de trios formules d’habitation à haute densité”, 32, translation by author.

How, then, to accommodate the ever-shifting patterns of society – familial growth, demographic change, urban expansion – in an architectural work? Safdie’s approach lay in his thesis title:

Three separate urban systems were evolved, each with its distinct formal, social and structural qualities applicable to sites of varying topography and size. They are systems since they cease to be buildings. The study has shown that we cannot continue to think in terms of buildings, rather in terms of large-scale three-dimensional “subdivision” of urban space.²⁶

The stated “problem” behind Systems A, B, and C was “to establish a repetitive modular element” that “when combined results in several combinations and permutations of dwelling types” (fig. 5.2). System A consisted of a skeleton frame rising from 10 to 30 storeys with “prefabricated ‘box’ elements” set inside and arranged in a “repetitive spiral stack” around a shaft containing services such as plumbing, heating, and electricity. One to four “boxes”, each measuring 8 x 16 x 32 feet, were combined into eighteen different dwelling types; the pin-wheel formation provided a garden for every house.²⁷ The units would be “prefabricated on the ground (poured in metal forms and completely finished)” and then “lifted into position hydraulically in a manner similar to ‘lift-slab’ technique.”²⁸ System B was differentiated by the use of load-bearing concrete walls and slabs “forming an egg-crate type space frame rising up to twenty-four storeys high.”²⁹ Seven dwelling types were offered,

²⁶ Safdie, “A Case for City Living”, *Habitat*, 5. The “study” in question was, of course, the thesis project.

²⁷ *Ibid.*

²⁸ Safdie, “A Case for City Living”, *Habitat*, 5.

²⁹ *Ibid.*, 8.

most two-storeys high, with walls set back to allow for both private and public gardens. System C was “primarily ‘walk-up’ accommodations” with provision to rise to twelve storeys. Poured-in-place or precast “box elements” were “grouped one on top of the other so that the resultant force is within the middle third and hence in equilibrium.”³⁰ This arrangement favoured symmetrical layouts; still, the “basic cluster” was to be “combined with others in a variety of ways” to form “linear or space enclosing groups” (fig. 5.3).³¹ While each system had a unique overall massing, Safdie made clear that fundamental idea lay in defining the characteristics of the “box”.

Safdie’s concept of “city living” was thus derived from a single repeating idea. In presentation photographs, Safdie conspicuously juxtaposed his Systems models against unfinished skyscrapers rising in Montreal’s nascent downtown core, which had only recently become irrevocably redefined by high-rise construction (fig. 5.4).³² The self-conscious correspondence between the incomplete slabs and frames and the “open” massing of his three systems unambiguously indicated the ambition to generate “a continuous cellular structure of the various functions which must be able to grow, to be added to, to expand within each cell.”³³ The biologic-organic metaphor, which Safdie would repeatedly echo when

³⁰ Ibid., 9.

³¹ Ibid.

³² Other photographs showed the models of the three Systems registered against Mont Royal, the inescapable parkland backdrop of Montreal.

³³ Safdie, “The Master Plan: Growth, Change and Repetition”, *Habitat*, 3. The “continuous cellular structure” was a part of any number of “minor entities” that, taken together, formed “an urban complex of great unity”. Among other buildings, Safdie contrasted his “systems” against I.M. Pei’s recently-completed landmark Place Ville Marie skyscraper.

translating his thesis into Habitat 67, suggested a built form without visual end or hierarchy. At the same time, the planned limitation of the dwelling unit assumed a design method based on fixing social and technical norms. This latter condition rested on a lesson learnt from what Safdie had called a “horizontal Unité” (as discovered in Chatham Village) – that is, the need to articulate the basic “dwelling unit” as the means by which to valorise the status of the individual.

In fact, as Safdie negotiated between unit and building, between domestic space and the city, the legacy of the Unité d’Habitation grew paramount. In a series of important conceptual sketches organised under the heading “Towards a Module”, Safdie reproduced Le Corbusier’s interlocking apartment type but with rotated levels (fig. 5.5). Safdie was indebted to, if not outright haunted by, Le Corbusier’s famed image of a hand holding a “*cellule normalisée et standardisée*” and inserting it directly into a structural frame.³⁴ Le Corbusier had called it the “‘Bottle’ and ‘Bottlerack’” method.³⁵ Safdie’s “modular housing

³⁴ Safdie recalled: “An early drawing by Le Corbusier shows a frame and a hand putting a box into it and there are many recent studies of space frames with plug-in units”, by which Safdie likely meant the Plug-in City project Archigram, among others. He continued: “It’s the obvious, simple solution: put up a frame and plug things into it. It was the first thing I thought of doing in my thesis. It’s also the obvious solution to mass producing, because structure is separated from the shell of the house. You can consider the optimum structure separately and develop geometry for it, and then you can consider the optimum house.” In terms of the eventual realisation of Habitat 67, however, this system was “redundant” because the “frame” required “triangulation” to make it stiff, yet the “units would give that stiffening in themselves if they were part of the structure”. Thus, the units of Habitat were, as in the System B of his thesis, load-bearing. See: Safdie: *Beyond Habitat*, 78-79. Safdie’s exposure to Le Corbusier stemmed from several sources. As a student, he likely saw an exhibition on Le Corbusier held McGill University in December 1959 (and organised by André Blouin, a French expatriate architect who, importantly, had worked for Auguste Perret in 1945). Safdie later admitted always recalling “some moments in the years when I was a student, when I first saw Le Corbusier’s early books and his 1920 sketches of apartment buildings with gardens”; see: Safdie, *Beyond Habitat*, 144.

³⁵ Le Corbusier, “The Bottle”, in *Oeuvre Complète 1946-52* (1953; Zurich: Verlag für Architektur Artemis, 1995), 186. Le Corbusier’s description of this “*cellule normalisée et standardisée*” offered a model for Safdie’s

systems” had much in common with the approach, not least in a clear articulation of unit and frame (fig. 5.6). Nevertheless in “criticism of the Unité”, Safdie concluded, “it must be said that the dwellings tend to be tubes, *that identity is sacrificed*, and that the ‘rue interieure’ is not a ‘rue’ but a glorified corridor.”³⁶ A Case for City Living differed, therefore, from the Unité in one important respect: the concept of “community development” was not necessarily tied to realising “a complete entity in itself” – that is, hiding the repeating cell within a larger whole (with the implied sense of monasticism); rather, it rested on providing a plastic form that outwardly exhibited the living units – thus expressing the individuality, the *identity*, of the inhabitants.

Still, Le Corbusier served as interlocutor and foil. Through him, Safdie would continuously reappraise (and justify) his own design choices. In a curious historical twist, Le Corbusier had actually described the Unité as a “vertical garden city”.³⁷ Earlier, while defining the Ville Radiuese – and following his proclamation, “To Live! (To Breathe)” – Le

thesis project: “The apartment at Marseilles is a complete entity in itself completely unconcerned with the ground or with foundations. It can be placed in the middle of a building which has a skeleton of reinforced concrete. This has led to the terms “Bottle” and “Bottlerack” for this construction which was applied at the Unité d’Habitation at Marseilles. Some day the components of the bottles will be made entirely in the workshops, and will be assembled on the site, each apartment complete, being hoisted into position one at a time.”

³⁶ Safdie, “A Case for City Living”, *Habitat*, 3, emphasis added. Safdie decided that “In Le Corbusier’s later work, as realized in the Unité d’Habitation, we find many of the early ideas” – likely the two-storey dwelling unit with a “*jardin suspendu*” first formulated for the Immeubles Villas apartments of 1922, or the 14 square-metre “biological unit” designed for the *Ville Radiuese* in the early 1930s – “either abandoned or sacrificed.”

³⁷ Le Corbusier, *Looking at City Planning*, trans. of *Maniere de Penser l’Urbanisme* (1946) by Eleanor Levieux (New York: Grossman Publishers, 1971), 48. As Kenneth Frampton notes, Le Corbusier “was in categorical opposition to the horizontal, low-rise Anglo-Saxon garden city commonly adopted elsewhere for expansion on the urban periphery”. See: Frampton, *Le Corbusier* (London: Thames and Hudson, 2001), 156. Nevertheless, Le Corbusier adopted aspects of garden city planning in his master plan for Chandigarh.

Corbusier had declared: “Suburbs must be eliminated and nature brought back into the cities themselves.”³⁸ The idea drew on the twelve-storey dwelling blocks for the Ville Contemporaine of 1922; its “cellular or ‘honeycomb’ system” showed repeating units with “hanging gardens” and open-air mezzanines that afforded intimate communion with the outdoors.³⁹ Safdie was beholden to the plan. In a sketchbook prepared to frame the basic ideas (including precedents) guiding his thesis, he carefully redrew Le Corbusier’s view from a “*jardin suspendu*” in a typical Immeuble Villa apartment inside the Ville Contemporaine (fig. 5.7).⁴⁰ Le Corbusier’s sketch expressed his eventual conclusion that “Architecture, city planning, our happiness, the state of our consciousness, the equilibrium of our individual lives, the rhythm of our collective duties are all governed by the *24-hour cycle of the sun*.”⁴¹ Safdie made his case along similar lines. In the pin-wheeling arrangement of System A, the “sun penetrates through the structure to dwellings on the north side”; “each dwelling has its own private outdoor garden, which is two storeys high and opens through to the air and sun”.⁴² Similarly in System B, “four dwellings on each level share one communal roofed

³⁸ Le Corbusier, *The Radiant City*, trans. of *La Ville Radieuse* (1935) by Pamela Knight (London: Faber, 1967), 104.

³⁹ Le Corbusier, *The City of Tomorrow*, trans. of *Urbanisme* (1924) by Frederick Etchells (Cambridge MA: The MIT Press, 1971), 224-225.

⁴⁰ Safdie signed his sketch “M.S. (after L.C.)”. Safdie’s concepts were developed in the many sketchbooks he kept during his student thesis. The sketchbooks were organised as a running commentary with his advisors, including Daniel van Ginkel, that recorded the architectural precedents and design theories that he was either appropriating or challenging.

⁴¹ Le Corbusier, *The Radiant City*, 104. Le Corbusier consistently imagined views of a verdant expanse as seen from a balcony, mezzanine, or through a *fenêtre en longueur* (one of his important “5 Points of a New Architecture” of 1926; the remaining “points” were: *pilotis*, *toit-jardin*, *plan libre*, and *façade libre*).

⁴² Safdie, “A Case for City Living”, *Habitat*, 7.

garden (in addition and separate from the private ones)".⁴³ In a sense, the descriptions followed a long-standing quest for salubrity as necessary to modern life. The discourse had defined CIAM functionalism and continued to inform postwar urban renewal – namely, slum clearance – schemes. Despite having firsthand knowledge of such efforts under the auspices of CMHC, Safdie reaction to the *existing* city never adopted the terms of combating overcrowding, disease, or social chaos. He did not see the city in the same apocalyptic terms that had animated the modern movement. Instead, he remained committed to reconceiving the needs of a postwar and newly prosperous middle class.

In trying to define the concept of the “working unit”, Safdie turned not only to the technical and spatial experiment of the Unité but also to Le Corbusier’s attempt at imagining an ideal social paradigm in architecture. For Le Corbusier this stemmed from his admiration of the nineteenth-century utopian socialist Charles Fourier’s *phalanstère* and the spontaneous fraternal order imagined arising inside this massive building for 1,600 inhabitants.⁴⁴ The Unité was similarly to serve as a kind of city-in-miniature with the provision of a two internal “streets” lined with shopping, a nursery school, and a roof deck housing a

⁴³ Ibid. System C was not described in terms of public and private outdoor space. It was designed more from the point of view of providing “‘walk-up’ accommodation”, which Safdie had identified as important during his CMHC travels.

⁴⁴ Le Corbusier unequivocally declared: “And yet great city planners have gone before, but they wielded ideas, not pencils – Balzac, Fourier, Considérant, Proudhon...” See: Le Corbusier, *Looking at City Planning*, 2. Neither Fourier nor Le Corbusier had advocated the abolition of private property. Safdie shared this view, especially given his appreciation of suburbia; at the same time, he argued for statist intervention in housing. Safdie’s clear articulation of each “housing unit” in his drawings indicated a commitment to maintaining the norms of domestic private property. For a detailed discussion of the impact of Fourier’s ideas on Le Corbusier, see: Peter Serenyi, “Le Corbusier, Fourier, and the Monastery of Ema” (1967), in *Le Corbusier in Perspective* (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1975), 103-116.

gymnasium, a paddling pool for infants, and an *al fresco* theatre space. Safdie also envisaged his Systems animated by “a network of public gardens” as well as “schools and nurseries” on the roofs while “shops and other facilities” would spread around the base.⁴⁵ Safdie’s sympathetic echo of Le Corbusier’s expression of collectivisation likely stemmed from a personal source – his deep philosophical debt to the Israeli kibbutz system in which he had been immersed when young: “an open-ended, civilized”, and “much more humane interpretation of Marxism”, Safdie recalled, and decidedly “not bureaucratic socialism”.⁴⁶

The desire for some form of co-operative society underpinned his thesis programme:

In the past, man has always organised into social groups with a communal structure. This can no longer be disregarded as it was in recent years, when one is dealing with a large concentration of people sharing many facilities. Groups must be formed – the family; a group of families forms a working unit; several units form a

⁴⁵ Safdie, “A Case for City Living”, *Habitat*, 7.

⁴⁶ Safdie, *Beyond Habitat*, 50. The kibbutz movements, which arose mainly in the 1920s, were largely secular, agricultural settlements based on co-ownership; in this, they reflected the anarcho-communitarian ideas of Peter Kropotkin, especially the notion that decentralised communities required certain infrastructural bases, such as the distribution of electricity. Soon after completing Habitat 67, Safdie recalled: “the ideal of us as children was when we were 18, we would leave home and after the Army would start our own kibbutz so that the kibbutz is constantly our social goal as a way of life... all my social thinking was in terms of that kind of a life.” See: Moshe Safdie, “First Reel, Last Portion”, Interview Transcript (February 24, 1968): 18-19, Box PF22, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal. Safdie was, in fact, aware of Israeli efforts in mass housing. When providing the CCWE with a list of ten projects similar to Habitat, he included three works from Israel that outwardly shared his “pyramid-shaped” preoccupations, including Leopold Gerstel’s Ziggurat urban housing experiment of 1963. See: “Examples of Residential Design Projects Having a Character Similar to that of Habitat ’67” (September 24, 1964): 1-2, Canadian Corporation for the World Exhibition Fonds, RG71, Vol. 445, Library and Archives Canada, Ottawa.

Safdie otherwise remained cool toward inherited ideas of architectural utopias. He saw something like Le Corbusier’s Ville Radieuse as “objectionable” since “it was conceived as a city built in one day”; moreover, “we are terrified by the great ‘utopian’ plans of our time” because “we refuse in western culture to accept the taste of one man on an urban scale.” Safdie resisted any planning where space relations were fixed *a priori* – in other words, any design that did not account for “predetermining change in an existing environment”, which “implies the need for flexibility.” See: Safdie, “The Master Plan: Growth, Change and Repetition”, *Habitat*, 3-4.

community; communities form urban clusters. Every level of social organization must be a physical phenomenon; it must have identity.⁴⁷

Safdie's rediscovery of a need for "communal structure" in the 1960s was, notwithstanding his *kibbutzim* sympathies, necessarily tempered by his acute awareness of public and private life in North America.⁴⁸ He faced, therefore, the problem of how to balance the concept of a "working unit" between its signification of a hermetically-sealed entity and its basis as a more "open" social structure. If "every level of social organization" was to be "a physical phenomenon", then "one standard repetitive mass-produced element" could, in principle, lead from housing a family to a society, from the dwelling to the city.

While "change", "growth", and "flexibility" derived from notions on "choice", thereby establishing a social ideal when approaching the built environment, Safdie also tied his concepts to a more technical base. He believed that a manufactured dwelling unit could result from the rationalising capacities of industry to retool as needs and demands (or, as he put it, "values and means") continuously changed. "Projects should attempt to solve the aesthetic problems that result through standardization of constructional elements", he asserted. While Safdie did not develop his thesis by providing specific details of plant or assembly – soon crucial to Habitat 67 – he did offer a schematic outline of construction in sketches that describe casting of units, installation of prefabricated components, and erection by a "lift-slab" technique (fig. 5.8). As such, when unencumbered by matters of programme,

⁴⁷ Safdie, "Fallacies, Nostalgia and Reality", in *Habitat*, 7.

⁴⁸ In summarising the early conclusions of his thesis, Safdie noted that System A affords "extreme privacy" while Systems B and C granted "privacy". See: Safdie, "Development" Sketchbook P (1960), Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal.

this was really a hypothesis on building as *process*. Safdie thus calibrated his polemic on “growth” to a specific style of drawing: axonometric projection. Every dwelling type as well as the “basic repetitive grouping” of each System resulted from a box “superimposed” in a series of configurations always drawn on a 30° axis. The use of axonometric allowed A Case for City Living to be seen in close-up: the geometric emphasis – that is, an *objective* view of the world, with precision of measurement and perspectival disambiguation – was to confer the appearance of technical expertise. This followed in cleverly framed and cropped photographs of architectural models, with compositions often reproducing the orthographic view.⁴⁹ In both cases, drawing and photograph, the axonometric allowed reading outward from a box, its combinations, and the actual occupation of the city.⁵⁰ The careful photographic juxtaposition of models against the Montreal skyline served to situate A Case for City Living within a realistic and desirable setting.

The images also pointed to a peculiarly utopian aspect of the three Systems. This was, above all, to fix the future (a social paradigm) in the terms of the present (by way of existing building technologies). It depended upon leveraging known means of production (again, industrialised building) to enable novel forms of social organisation and well-being.

⁴⁹ Safdie’s considerable effort at cropping photographs to shape another quasi-axonometric view was a way to suggest the “unheroic” aspect of his project – the photographs appeared largely without the perspectival vastness common to architectural representation. As the architectural Robin Evans notes, “while perspective may still be lauded as the great opener of Western eyes, orthographic projection is relegated to the status of a technical matter: technical drawing; limited vision.” See: Evans, “Architectural Projection”, in *Architecture & its Image* (Montreal: Canadian Centre for Architecture, 1989), 24.

⁵⁰ Addressing “a hypothetical site with Montreal characteristics”, Systems A, B, and C used the density of Westmont, a wealthy town immediately adjacent to Montreal, to define an ideal “sector of 30,000 inhabitants”; see: Safdie, *A Case for City Living*, final thesis presentation boards, n.p.

Thus, the quest for “flexibility” was tied not only to the necessary limits of “standardization” but also to the need “to reject neighbourhoods in favour of an integrated complex ‘all-use’ urban texture.”⁵¹ Here, Safdie’s preferred source was Yona Friedman, whose “L’Architecture Spatiale” was, he believed, “marked by a penetrating analysis of the issues, the design and fabrication of the unit dwelling, its relation to the overall structure which, in turn, relates to its magnitude and the provisions of servicing and circulation” (fig. 5.9).⁵² Begun in the late 1950s, Friedman’s *Ville spatiale* proposed “tripling the housing density of the city centre” by “applying the technique of superposition” – writ large in a mammoth space frame floating over the existing city where “new housing, industry, and agriculture will be added” by filling “empty spaces in this grid” with “cells”.⁵³ Still, to Safdie, Friedman’s “gigantic enveloping structure of an urban size into which we insert dwelling, shops, etc., at will, poses technical problems to which we do not yet have solutions.”⁵⁴ In other words, the vision was somehow unconvincing: it was not bound by the constraints of extant technology. Safdie’s deliberate

⁵¹ Safdie, “The Master Plan: Growth, Change and Repetition”, *Habitat*, 4.

⁵² Safdie, “A Case for City Living”, *Habitat*, 3.

⁵³ Yona Friedman, “Paris Spatial: A Suggestion” (1961), in Martin van Schaik and Otakar Mácel, eds., *Exit Utopia: Architectural Provocations 1956-76* (Munich: Prestel, 2005), 19-28. Friedman repeatedly insisted on “conserving as much of today’s city as possible.” He took exception to the precedent of Le Corbusier’s “plan for Paris” that “envisaged the reorganisation of the centre of Paris alone, whereas the problem today extends to the whole city.” Friedman’s proposal was only a part of a broader vision of “mobile city planning” initiated in 1958, after which he began drawing aerial cities hovering over any number of settings, whether Paris, New York, or Algiers. Friedman initiated GEAM – Groupe d’Etudes d’Architecture Mobile – whose founding manifesto demanded: “Reform of property rights in building land and air space with a view to achieving easier interchange. Introduction of a system of stratified utilization of air space by the inhabitants.” See: GEAM, “Programme for a Mobile Architecture (1960), in Ulrich Conrads, ed., *Programs and Manifestoes of 20th-century Architecture* (Cambridge MA: The MIT Press, 1971), 167-168.

⁵⁴ Safdie, “The Master Plan: Growth, Change and Repetition”, in *Habitat*, 4.

use of axonometric drawing for the housing units was, therefore, meant to offer a sense of constructional plausibility. In turn, sectional perspectives looked deep into multiple apartment interiors. The resulting fourteen dwelling types “combined to result in great variety” and produced the “urban cluster” of System A, a “sector of 5000 inhabitants” (fig. 5.10).⁵⁵ The translation between “unit” and “cluster” served to express the belief that a deliberate winnowing of resources could, in 1961, lead to “the privilege of choice – repetition is voluntary act.”⁵⁶ Even as the freedom of “choice” could grow from the constraint of “repetition”, Safdie’s approach implied a view of technology, whether mechanical or informational or spatial, in which the object – the “unit”, the “cell”, the “box” – was necessarily valued in excess of its inherent functional properties. The dwelling unit itself was to signify not only Habitat 67, but the larger culture of industrialised building it was believed to symbolise.

KEYWORDS

From “unit” to “group”, from “repetition” to “variety” to “cluster” – Safdie’s terms were to imbricate his architectural project by social, spatial, and technological significance. Forming the initial theoretical base of his thinking on housing in the modern city, these ideas would soon inform his entire approach to Habitat 67. In turn, the very same concepts would be

⁵⁵ Safdie, “A Case for City Living”, *Habitat*, 5.

⁵⁶ Safdie, “The Master Plan: Growth, Change and Repetition”, in *Habitat*, 7.

appropriated by the CCWE when promoting Habitat as a “prototype” with extraordinary significance for architecture culture.

While emerging from A Case for City Living, Safdie’s keywords were hardly *sui generis*. The sources were surely plentiful, not least prevailing discourses in architectural journals, to which Safdie was finely attuned.⁵⁷ Yet Safdie’s polemic benefited from a uniquely intimate and fruitful engagement with his thesis advisor, Daniel van Ginkel.⁵⁸ Van Ginkel’s role in initiating the emergence of Team 10 out of CIAM centred on replacing modernist dogma on the “functional city” with a more phenomenological experience of “community”. Between the late 1950s and early 1960s, Safdie immersed himself in Team 10 thought. His eventual elaboration of A Case for City Living as the ur-project of Expo 67 “housing exhibit” would rest on the careful refinement of concepts such as “group” and “cluster” – and, most importantly, “habitat”.

⁵⁷ A keen observer of architectural magazines as a student, Safdie had published the study “Changing Editorial Policy in American Architectural Periodicals, 1890-1940” in *Journal of the Royal Architectural Institute of Canada* (August 1959).

⁵⁸ While Safdie’s official advisors were John Bland and Douglas Shadbolt, both professors in the McGill School of Architecture, he chose Daniel van Ginkel as an external advisor. Judging from the records of conversations in Safdie’s sketchbooks, it is clear that van Ginkel became the main intellectual interlocutor. Safdie noted: “Sandy van Ginkel has been very important in my development. I first saw him in a lecture he gave at McGill when I was in fifth year. (He had taught there previously.) In his lecture he talked about many of the experiences in Europe, about his work with Aldo van Eyck his partner in Holland, about CIAM (Congrès International d’Architecture Moderne). When thesis time arrived in sixth year Doug Shadbolt, as my teacher, was my immediate critic, but I asked permission to have van Ginkel as a critic as well. Even though he was no longer teaching at the school, he agreed to do it. Once a week I would go to him with my sketch book and we would talk and discuss the sketches. He was an inspiring critic. It was through him that I became familiar with European thought, and with the ideas of CIAM and the people around it”. See: Safdie, *Beyond Habitat*, 54-55. Bland has written that Safdie selected van Ginkel, who had previously taught at McGill in the late 1950s, as his advisor. See: John Bland, “Moshe Safdie: A Profile”, in Irena Zantoksa Murray, ed., *Moshe Safdie: Buildings and Projects, 1967-1992* (McGill-Queens University Press, 1996), 14.

The fundamental correspondence between Team 10 debate and Safdie's programme lay in an expanded definition of "habitat". Van Ginkel had been instrumental to the 1954 "Statement on Habitat" (also known as the "Doorn Manifesto") that ushered the emergence of Team 10 from CIAM, and his engagement with Dutch discourse would especially inform Safdie's predilections and precedents. The 1953 CIAM congress had been dedicated to defining "La Charte de l'Habitat". Among the exemplary work presented was that of ATBAT-Afrique, which explored ways of reorganising patterns of traditional dwelling as a basis of deriving modern architectural form. Later, van Ginkel's friend and onetime colleague Aldo van Eyck had advanced his "aesthetics of number", a view on housing with "group" and "cell" linked in a "configurative discipline" in which the multiplication of similar elements would not disappear in processes of repetition but gain greater individual significance while simultaneously building up a larger whole: "a single complex system, polyphonal, multirhythmic, kaleidoscopic and yet perpetually and everywhere comprehensible".⁵⁹ The influential first work was van Eyck's Amsterdam Orphanage of 1960. By the mid-1950s, there was already suggestion of the extraordinary prognostic (if cryptic) value given by van Eyck and others to associative spatial and social terms that, in turn, came forcefully to shape discourses on "habitat". While open to interpretation, the question of "number" typically stood to define how an appreciable unit could give meaning to an individual building unit as well as become aggregated into a more complex urban form.

⁵⁹ Aldo Van Eyck, "Steps toward a Configurative Discipline" (1962), in Joan Ockman, ed., *Architecture Culture 1943-1968* (New York: Columbia Books on Architecture and Rizzoli, 1993), 348-360.

This approach came together forcefully in the September 1959 number of *Forum*, the architectural journal newly under the joint editorship of Team 10 members Jaap Bakema and Aldo van Eyck. Titled “The Story of another Idea” by Van Eyck, the special issue was timed to coincide with the final CIAM meeting held in Otterlo in September 1959.⁶⁰ The cover showed pin-wheeling terms and phrases collected from nascent Team 10 debate (fig. 5.11):

cluster
change and growth
à mi-chemin [Half-way (in relation to other cultures)]
imagination versus common-sense
appreciated unit
la plus grande réalité du seuil [the philosophy of the doorstep]
l'espace corridor [against the *spatial corridor* between functionalist blocks]
stad als interieur van de gemeenschap [the city as “interior” of the community]
identity
het ogenblik van core [core]
hierarchy of human association
mobility
l'habitat pour le plus grand nombre [habitat for the largest section of the population]
harmony in motion
aspect of ascending dimensions
identifying devices
gedifferentieerde wooneenheid [differentiated dwelling unit]

⁶⁰ Enlarged copies of the *Forum* issue were hung throughout the Otterlo meeting. The congress was chronicled by the Canadian architect Oscar Newman in *CIAM '59 in Otterlo* (Stuttgart: Karl Kramer, 1961). Blanche Lemco van Ginkel noted that Newman was not present at Otterlo and that the meeting was “scandalously misrepresented” in his book partly due to poor tape recordings; see: Eric Mumford, *The CIAM Discourse on Urbanism* (Cambridge MA: The MIT Press, 2000), 338, n.225. Safdie eventually invited Newman to serve, along with Douglas Shadbolt (Safdie’s professor at McGill), as consultant on the “storyline” of the Man in the Community theme section, which was originally to be set within the first version of Habitat 67. Soon after submitting his report to the Expo 67 committee, Newman penned an important early (and not necessarily complimentary) appraisal of Habitat 67; see: Newman, “Habitat '67: A Critique”, *Canadian Architect* (October 1964): 37-46.

visual group⁶¹

The terms reflected van Eyck's idiosyncratic view vis-à-vis Team 10, especially in the search for sources corresponding to his anti-functionalism. In defining "The Story of another Idea", van Eyck juxtaposed photographs from Africa (taken from *Life* magazine and the Magnum agency) and images of Dogon settlements in Mali (which he had seen the previous winter) with, first, the influential Lijnbaan pedestrian mall newly built by Van den Broek and Bakema in Rotterdam and, second, examples of new "structuralist" tendencies in Dutch architecture that used identical prefabricated units to suggest both centrality and dispersal as well as order and flexibility (fig. 5.12).⁶² Van Eyck's fascination for Dogon architecture had precedent in travels with van Ginkel and the Dutch anthropologist Herman Haan to villages in the Algerian Sahara in 1952.⁶³ He believed archaic cultures retained universal values of

⁶¹ For a translation of the *Forum* cover, see: Arnulf Lüchinger, *Structuralism in Architecture and Urban Planning* (Stuttgart: Karl Krämer, 1981), 10-11.

⁶² Maristella Casciato, "'Forum': Architecture and Culture in the Early 1960s", *Casabella* 606 (1993): 69; Alan Colquhoun, *Modern Architecture* (Oxford: Oxford University Press, 2000), 222.

⁶³ Mumford, *The CIAM Discourse on Urbanism*, 338, n. 228. Van Eyck first described these trips in *Forum* 1 (January 1953). While teaching at Washington University in St Louis in 1961-1962, he published the "Architecture of the Dogon" in *Architectural Forum* (September 1961). Van Eyck recalled: "I had come upon Marcel Griuale's account of the Dogon in *Minotaure* (mission Dakar-Djibouti 1931-1933) during the war. The illustrations I knew by heart"; see: Van Eyck, "A Miracle of Moderation", in Charles Jencks and George Baird, eds., *Meaning in Architecture* (New York: George Braziller, 1969), 173-213. Van Eyck's impressions were shaped by the ethnologists and physicians Paul Parin and Fritz Morgenthaler, who he met when visiting the Dogon. *Minotaure, revue artistique et littéraire* was an important Surrealist magazine; its article on the Dogon appeared in June 1933. Herman Haan's view on indigenous dwellings appeared (accompanied his wife Hansje Haan's photographs) in "Life in the Desert", *Forum* 1 (1960): 8-15. An English version of Haan's text was included in the published account of the Otterlo meeting; see: Newman, *CIAM '59 in Otterlo*, 150-156. For an examination of van Eyck's and Haan's shared project, see: Karin Jaschke, *Mythical Journeys: Ethnography, Archaeology, and the Attraction of Tribal Cultures in the Work of Aldo van Eyck and Herman Haan*, PhD Dissertation, Princeton University (Ann Arbor: ProQuest/UMI Dissertations Publishing, 2012). Safdie heard of van Eyck's travels directly from van Ginkel: "When I worked for Sandy we would sometimes sit after hours, late at night, with him telling me of his experiences with van Eyck, or his trip to the Sahara, or the CIAM meetings. I felt much devotion and loyalty to him." See: Safdie, *Beyond Habitat*, 55.

balancing individuality and collectivity suggestive of a “culture of determined relationships” that would better characterise twentieth-century consciousness of avant-gardism and science (fig. 5.13).⁶⁴ Van Eyck saw in vernacular architectures a way of working outward from a basic signifying element while achieving an overall form that did not appear to be predetermined. This brought with it notions on serialisation or prefabrication. The attempt was to reinvigorate modern architecture via the “abstract” aesthetic of “primitive” cultures. Above all, the turn to the vernacular rested on an *interpretive* method that could suggest new ways of organising social space.

Safdie discovered van Eyck’s discourse through van Ginkel. Team 10 concerns, especially the Dutch line, appeared in the repeated invocations of “group”, “cluster”, and “identity” during tutorials between master and pupil. Thus, when first publicly circulating ideas on *A Case for City Living*, Safdie hewed closely to van Eyck:

Any use of an additive cellular urban structure, whether in a linear or other pattern will require a more imaginative approach to the problem of REPETITION. This is an aspect of the relation of one urban sector to another. Even more complex is repetition as an aspect of the design of the sector itself. We must overcome the menace of quantity, now that we are faced with habitat for the masses – *the aesthetics of numbers... must be discovered.*⁶⁵

Safdie’s open – but unattributed – p invocation of van Eyck’s concepts, including “aesthetics of numbers”, appeared in a precocious theoretical statement on “The Master Plan” in the

⁶⁴ Casciato, “Forum’: Architecture and Culture in the Early 1960s”, 69; Hans van Dijk, “Forum: The Story of another Idea, 1953-63”, in Dirk van den Heuvel and Max Risselada, eds., *Team 10 1953-81: In Search of a Utopia of the Present* (Rotterdam: NAI Publishers, 2005), 83.

⁶⁵ Safdie, “The Master Plan: Growth, Change and Repetition”, *Habitat*, 4; emphasis added.

CMHC journal *Habitat*, published immediately upon his graduation from McGill. The dialectic between “addition” and “repetition” would, when given architectural form, resolve problems of “identity” in modern urban life – a notion explained by Safdie in three accompanying illustrations: first, “Tradition”, seen in a sketch of what appeared to be a North African oasis settlement and representing “growth through slow evolution; repetition through necessity”; second, an axonometric of units from *A Case for City Living*, showing a “variety of dwelling types through the repetition of one element”; and, third, a plan of a housing complex by the Amsterdam architect Piet Blom indicating a “variety of spaces through repetition of a group of dwellings” (fig. 5.14).⁶⁶ Read together, the three illustrations defined Safdie’s idealised urban form: again, “a habitat for the masses” composed of repeated elements that gave a seemingly “unplanned” organisation of space. Importantly, *A Case for City Living* began to be presented without any reference to being a student project.

Thoughts on “repetition” indicated a way forward for contemporary architecture. “Volumes have been written on space and structure in contemporary architecture”, Safdie declared, indirectly dismissing Siegfried Giedion’s canonical *Space, Time and Architecture*, “but repetition which is the challenging aspect of modern architecture is forgotten. Historical examples of repetition are numerous and are found in most vernaculars; the mud domes of a North African village or tiled roofs of Italy”.⁶⁷ In the invocation of roofscapes,

⁶⁶ Ibid., 5.

⁶⁷ Ibid., 7. In his thesis sketchbooks, Safdie referred to the “Italian hill town” as a preferred model over the “park tower”. Nevertheless, Safdie recognised the “major problem” of “light and air in this climate” and asked

which marked the style of at least two of the three illustrations accompanying Safdie's article, was evidence, however schematic, of the kind of "growth" and "repetition" desirable in an urban work. This was in keeping with van Eyck's deeply personal but polemical call for designing "*Vers une 'casbah' organisée*" that concluded "The Story of another Idea" (fig. 5.15). Stemming from an abstraction of vernacular forms, van Eyck's plea applied specifically to the geometric organisation of space, a paradigm for his Amsterdam Orphanage of 1960 (the year Safdie began his thesis). In trying to synthesise a series of invented binaries – "part-whole", "unity-diversity", "individual-collective" – that were otherwise separated into a "meaningless absolute", van Eyck wished "to conceive of architecture urbanistically and of urbanism architecturally"; thus, the "idea" behind "this home for children" was "to persuade it to become both 'house' and 'city'".⁶⁸ The notion was formalised in the small domed units resting on a visible grid of beams and columns. Likened to "houses", the elements were grouped together and arrayed in a shifting "open" pattern above corridors that were to function as internal "streets".⁶⁹ Despite the programmatic complexity of the

if his open-air stacking "is ok in terms of the Mediterranean, is it ok in terms of Canada?" See: Safdie, "Development" Sketchbook P, 16, 36. Safdie took exception to received interpretations of Giedion. The consideration of "space-time in architecture" was, to Safdie, no longer based on a "spatial interest resulting from a moving point of view"; rather, it was "four-dimensional", where a "plan must grow with time, must change and transform as values and means evolve". In a sense, he rejected an "experiential" model of design. See: Safdie, "The Master Plan: Growth, Change and Repetition", *Habitat*, 3.

⁶⁸ Aldo van Eyck, "The Medicine of Reciprocity", in *Forum* 6-7 (April-May 1960-61): 237. On his idea to understand "architecture urbanistically and urbanism architecturally", van Eyck noted parenthetically (and humorously): "this makes sensible nonsense of both terms".

⁶⁹ Vincent Ligtelijn, *Aldo van Eyck: Works* (Basel: Birkhauser, 1999), 37-38.

orphanage, the roof work – the dome signifying the “house” in the “city” – was redolent of the “organised casbah” apparently found by van Eyck in indigenous architecture.

Safdie’s interest in a repetitive structure delineating different spaces was made clear in his wilful collapsing together of Piet Blom’s site plan, the oasis settlement, and his System A dwelling types. The project by Blom, van Eyck’s favourite student, was instrumental to A Case for City Living.⁷⁰ Blom’s housing estate showed individual dwellings linked in continuous but meandering lines that spread to imply the boundaries of any number of open or partially enclosed public spaces.⁷¹ The suggestion was of a quasi-anarchic social paradigm expressed in the “open” geometries of the plan.⁷² In a McGill thesis sketchbook, Safdie had

⁷⁰ For Aldo van Eyck’s influence on Piet Blom, see: Francis Strauven, *Aldo van Eyck: The Shape of Relativity* (Amsterdam: Architecture & Natura, 1998), 332ff. Van Eyck showed his Amsterdam Orphanage alongside Blom’s project during the 1959 CIAM meeting at Otterlo. Blom went on to design the Kasbah housing estate in Hengelo, Holland, in 1973. Safdie also retained the “casbah” as an key principle: writing after the completion of Habitat 67, he set the “steel and glass apartment building” – a bugbear since the days of his CMHC scholarship travels and which he had associated with Mies van der Rohe’s Lakeshore Drive Apartments in Chicago – against the “opposite extreme” of “the casbah” that “corresponds with people’s desire for identity and a notion of the scale of the community and their place within it.” See: Safdie, *Beyond Habitat*, 45.

⁷¹ Van Eyck included Blom’s project as a penultimate image before closing “The Story of another Idea” with photographs of archaic architectures representing a “*casbah’ organisée*”. Several months after resigning from Expo 67, Daniel van Ginkel provided an expanded definition of a “*casbah organisée*”: “Although the first association with ‘casbah’ may be the tightness of clustered units, in reality it is much more than that. It is the total environment for both the child and the adult” – a description echoing van Eyck’s characterisation of the new village of Nagele, which he and Van Ginkel had worked on in the mid-1950s – “incorporating the daily activities of all citizens, the honky-tonk as well as the culture, squalor as well as grace. The *casbah organisée* finds some of its realization in plans like Hook and Cumbernault [sic]” – a reference to Hook New Town, an unrealised plan by architects the London County Council Architects’ Department, and Cumbernault Town Centre in Scotland, an important and much-celebrated “megastructure” designed by Geoffrey Copcutt in the early 1960s and built over the subsequent decade. See: van Ginkel, “Credo”, *Canadian Architect* (July 1964): 46.

⁷² Blom’s motto for his project was “Let the cities be inhabited like villages”. Blom’s ideology owed to his upbringing in a working class district of Amsterdam, which shaped his views on urbanism and subsequent distaste for functionalist planning; see: Strauven, *Aldo van Eyck: The Shape of Relativity*, 332-333. Strauven also notes that Aldo van Eyck took Blom to see Jaap Bakema’s Pendrecht projects, thus introducing him to the schools designed by van Eyck and van Ginkel; see: Francis Strauven, *Piet Blom* (Amersfoort, Netherlands: Jaap Hengeveld Publications, 2007).

reproduced Blom's project exactly as it appeared in *Forum* (fig. 5.16).⁷³ The drawings were accompanied by notes from a tutorial with van Ginkel that, unsurprisingly, "again discussed" the "problem" of "identity":

Identity: identity of the dwelling but also of the larger group + further groups:

The visual group

The cluster

Furthermore the relationship of these was discussed: The problem: to achieve a complex grouping but which has unity.

To have a group made of a unit with identity which combines to form a greater unity⁷⁴

Emphasising three key concepts appearing on the cover of "The Story of another Idea", Safdie added a sketch that purposely retraced the forms of Dogon settlements as found in van Eyck's highly formalised photographs of cliffside dwellings and granaries and repeatedly published in *Forum*.⁷⁵ While owing a considerable debt to van Eyck's view on the vernacular as a source for revivifying postwar architecture, Safdie's approach would differ in a crucial respect. Terms such as "group" or "cluster" ceased to betray any kind of anthropological or ethnological bias typical of van Eyck and others; instead, lessons on the vernacular were distilled almost purely for their formal value. This was evident in the opening presentation panel of his thesis, in which A Case for City Living was divided into four themes: "The

⁷³ As Safdie may have learned from van Ginkel, who could translate Dutch, Blom's project as presented in *Forum* bore the caption: "the cities will inhabited like villages".

⁷⁴ Moshe Safdie, "Development" Sketchbook P, page 20, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal.

⁷⁵ Van Eyck's photographs emphasised the formal qualities of African architecture, with buildings depicted as abstract objects and where people were largely absent. See: Zeynep Çelik, "The Ordinary and the Third World at CIAM IX", in Risselada and van der Heuvel, eds., *Team 10, 1953-81: in Search of a Utopia of the Present*, 279.

Family”, “Community Structure”, “Living Environment”, and “the City” (fig. 5.17). The panel followed the organisational aims of the CIAM *grille* – the graphic device created in 1947 to compare urban designs according to the four functions – but it was coded in the rhetorical suggestions of Team 10: “The family unit must have identity”; “A sense of location must be created”; “A hierarchy of groups and their identity”. Moreover, unlike the CIAM and Team 10 *grilles*, Safdie never attempted to present any kinds of “as found” conditions. He made no use of photographs of everyday life in the city (at best, he used aerial views of Montreal to juxtapose better his modular “Systems”).⁷⁶ His presentation centred on a set of abstract diagrams outlining ideal social structures around or by which a new city could grow. Families would coalesce in a “Primary Group” (“so that voluntary social relationships can take place”) that with others formed a “Community”, which, following a similar process of addition, yielded a “Cluster” that, when multiplied, finally grew into a “Sector”; the new community was always to grow proximate to the existing “Core” (or downtown). As such, Safdie’s presentation board was not necessarily analytical: it did not offer evidence that A

⁷⁶ If anything, then the Team 10 “cultural” turn enabled the group to recuperate the CIAM *grille* as a preferred method of presentation, but now animated by reinterpreting images culled from everyday life. The expansion of explicatory classes beyond the “four functions” was seen at the ninth CIAM congress held at Aix-en-Provence in July 1953, when nascent Team 10 ideas appeared in, for example, the GAMMA grid on *bidonvilles* in Casablanca or the Smithsons’s Urban Re-Identification Grid that turned to street life in London’s East End as embodying a “house-street relationship”. (The Smithsons’ images of children playing in working-class neighbourhoods were borrowed from the photographer Nigel Henderson, a fellow member of the Independent Group.) While CIAM *grilles* had also incorporated images of everyday life, this often kept with a “scientific” view on the amelioration of existing conditions rather than using them as sources of design. The metaphorical gaps in Team 10’s keyword-ideograms allowed members to exploit, in different ways, the *grilles* as both analytical tools and as prophetic statements on design methods. On the CIAM *grille*, see: Enrico Chapel, “Représenter la ‘Ville Fonctionnelle’: Chiffres, Figurations, et Stratégies d’Exposition dans le CIAM IV”, in *Cahiers de la recherche architecturale et urbaine* (May 2001); Nader Vossoughian, “Mapping the Modern City: Otto Neurath, the International Congress of Modern Architecture (CIAM), and the Politics of Information Design”, *Design Issues* (Summer 2006): 48-65.

Case for City Living was made on the basis of actual faults or inequities in the existing city (say, Montreal); rather, it was prescriptive: the reduction to quasi-Venn diagrams as grounds for form was a kind of pretence of statistical veracity, with a small amount of demographic information (namely population growth, an interest stemming from Safdie's CMHC research) meant to substantiate programmatic and functional needs. The abstraction of an entire social and architectural system into a set of circles conjoined by radial vectors suggested a weird preclusion of the immediate, existent world.

In giving prognostic value to a constellation of terms – *group* and *identity*, *unit* and *cluster* – Safdie inherited from Team 10 a way to render social schema, however real or invented, as architectural forms. This was the justificatory role of his introductory thesis presentation panel. It was hardly surprising that the very same board announced Safdie's project in the pages of *Forum* one year after his graduation. Contextualised by a reprint of his essays "Fallacies, Nostalgia and Reality" and "A Case for City Living" – serving as theoretical statements, having been shorn of the original corresponding images – the layout relied on drawings and models showing the project in total isolation. The thesis now dovetailed with discourses and styles from which it had borrowed so much.

MEMORANDA

When, in October 1963, Safdie first began proposing a housing project while working on the Expo 67 master plan, he sent a memorandum to the CCWE that synthesised the lessons of his student thesis (though never mentioned as such) as the social and technical basis of

what would become Habitat 67. Safdie recognised the potential of realising a new type of architectural form in the *tabula rasa* of a world's fair. Moreover, he understood the necessarily didactic function – and corresponding cultural capital – of including mass housing within a spectacle such as a world's fair. “Habitat 67/Permanent Housing Exhibit”, as he titled his memorandum, would be “an opportunity to provide a meaningful demonstration of solutions to urban housing”; initially “used to house Exhibitors’ personnel” the project would eventually “become an integral part of the City of Montreal”, providing “a high density, urban development, thus dealing with the most pressing housing problems of today.”⁷⁷ Drawing on the possibilities for “growth” and “change” established in *A Case for City Living*, Habitat 67 “should be able to expand with need after 1967.” This expansion was no longer registered by the ideal realm of three “Systems”; rather, it was to be actualised by real population shifts in Montreal itself.

Only three years since his CMHC travels, Safdie found himself facing the possibility of shaping ideas on the contemporary North American city. The “most pressing housing problems of today” gleaned during the CMHC sojourn were quantised in the 1961 Census of Canada, which noted that almost 70 percent of Canadian now lived in cities.⁷⁸ Yet many critics were, at the start of the new decade, questioning whether any real impetus had come

⁷⁷ Safdie, “Habitat 67/Permanent Housing Exhibit”, 1.

⁷⁸ Rose, *Canadian Housing Policies 1935-1980*, 44. The exact figure was 69.7 percent; by 1971, the proportion would increase to 76.1 percent. As the CMHC Economic Research Department noted, the census would have important “results” that “deal specifically with housing”. At the broadest level, “the improvement in the quality of housing stock is, of course, the result of the high volume of residential construction in the postwar period” – a trend that augured well for Safdie’s ambitions. See: Frances T. Chambers, “Housing and the 1961 Census”, *Habitat* (Ottawa, January-February 1963), 25.

from amendments to the National Housing Acts of 1949 and 1956, the latter introducing the term “urban redevelopment” *in lieu* of slum clearance; others noted “weakness in our housing forecasts for 1955-1980”, suggesting the impossibility of an open economic-technological future (notwithstanding the presumed expansion of a welfare state).⁷⁹ (Indeed, the federal-provincial public housing programme had produced only 12,000 units.⁸⁰) At the same time, changes in Canadian policy – with the 1964 National Housing Act including “urban renewal” as an official category – found municipalities and cities envisioning *planning* as necessarily ongoing process and facet of civic life. As a 1959 report noted, “Urban renewal’ ... is not only a social instrument for relieving poor housing conditions but also an essential element of city growth; it should be as natural a part of the city’s normal function as a paving programme.”⁸¹ As such, Safdie began turning to agencies such as CMHC during the realisation of Habitat 67, especially when calling for the superior credit of the state as the basis of urban housing. By the mid-1950s, CMHC had shifted from its initial mandate of housing returning war veterans to actively initiating both single-family home ownership and urban renewal schemes – conditions in which A Case for City Living was imagined as

⁷⁹ R. T. Adamson, “The Weakness in Our Housing Forecasts for 1955-1980”, *Habitat* (Ottawa, January-February 1959): 21. Adamson was the chief economist and later executive director of CMHC.

⁸⁰ H. Peter Oberlander and Arthur L. Fallick, *Housing a Nation: The Evolution of Canadian Housing Policy* (Vancouver: The University of British Columbia Centre for Human Settlements, 1992), 56; Rose, *Canadian Housing Policies 1935-1980*, 213.

⁸¹ “Canadian Planners Look at Urban Renewal”, *Habitat* (Ottawa, November-December 1963): 23; Oberlander and Fallick, *Housing a Nation: The Evolution of Canadian Housing Policy*, 57.

participating.⁸² Still, when designing the housing units in *A Case for City Living*, Safdie had argued, “Is it not too generous – NOT if we compare it to ‘House Plans CMHC 1958’”.⁸³ CMHC had popularised single-family home ownership throughout Canada. Its annual publication *Small House Designs* compiled architects’ drawings for purchase by builders and prospective home owners.⁸⁴ The choices ranged from bungalows to split-levels to two-storey houses (fig. 5.18). Despite the increasing inclusion of a few reliably “modern” architects, the magazine *Canadian Architect* only saw an “abominable hodgepodge of small houses” without consideration of a “building-unit system which would allow each family to assemble its own house on a small lot – tailored to the existing site conditions and to the family’s needs and future growth”.⁸⁵ The assessment jibed perfectly with Safdie’s ambitions and the publication of his thesis along with new theoretical statements in *Habitat*, the CMHC journal, brought his ideas squarely within purview of the Canadian planning intelligentsia. Indeed, along with *Forum* and *Habitat*, Safdie had managed to circulate his thesis in *Architecture-Bâtiment-*

⁸² While Safdie recognised the nexus of architecture culture and policy-making in “urban renewal”, he likely had other interest in CMHC and was keenly aware of its ties to the Division of Building Research (DBR) of the National Research Council in Ottawa. Founded in 1947, a few months after the formation of CMHC, the DBR provided technical research to CMHC. By the mid-1960s, it was fully engaged with issues of prefabrication and industrialised building systems that paralleled efforts in the construction of Habitat 67. Safdie turned to DBR studies when defining early concepts on Habitat 67; see: Safdie, “Why not Utopia?”, in *Proceedings: Symposium on Changing Concepts of Human Habitations* (Roorkee, India: Nem Chand & Bros, 1966), 10.

⁸³ Moshe Safdie, *Sketchbook S* (1960): 49, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal.

⁸⁴ *Small House Designs* (Central Mortgage and Housing Corporation, 1958), 1. The *Small House Designs* catalogue, published annually by CMHC, was presaged by *Choosing a House Design* (1956) and *Principles of Small House Design* (1957). Plans that sold well were kept in subsequent catalogues.

⁸⁵ Quoted in Ioana Teodorescu, “Big Ideas, Small Houses”, *Canadian Architect* (May 2009): 58-59.

Construction (A-B-C), the main French-language architecture journal in Quebec (fig. 5.19).⁸⁶

It was a remarkable penetration of his ideas in local, national, and international architecture culture, and in sources targeted to professional and policy-making audiences.

Safdie followed, somewhat obliquely, the van Ginkels' early mandate to base the world's fair specifically on a housing exhibition that, in turn, would spur development in the heart of the existing city. As part of their Man in the City project, the van Ginkels had proposed an "International Housing Section" as a "live housing demonstration" that "would constitute an exhibition of the best in contemporary housing", a project they favourably likened to the Berlin Interbau.⁸⁷ Safdie similarly imagined that the "housing requirements generated by the event of Expo 67 offer an opportunity to provide meaningful demonstration of solutions to urban housing"; consequently Habitat 67 "will be used to house Exhibitors' personnel, after which the development would become an integral part of the City of Montreal."⁸⁸ Yet writing over a year after the van Ginkels' initial formulation, Safdie differed with their concept: "Gathering a group of architects of various countries to design individual buildings (Berlin Interbau)" produced "results" that "have not been successful. A number of fine buildings put together at random cannot be a meaningful

⁸⁶ *Habitat* first appeared in 1958. By the early 1960, the journal had become not only a vehicle to communicate CMHC policy but an important exchange on both Canadian urban renewal schemes and trends in international (but not always Western) urban design.

⁸⁷ "Draft Report on Montreal World's Fair" (July 1962): 2, Box 27-A21, Folder 11, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

⁸⁸ Safdie, "Habitat 67/Permanent Housing Exhibit", 1.

urban achievement.”⁸⁹ A Case for City Living was predicated on countering the fragmentary urbanism of the “tower-in-the-park”. As such, Safdie argued for locating Habitat 67 on “Point St. Charles-Mackay Pier”, the harbour front site promoted by the Port of Montreal many months earlier (when confronting the van Ginkels’ aim for a world’s fair as first enabling slum clearance in nearby districts). For Safdie, the islands were always a foregone conclusion; thus, his preferred site was both “a natural extension of the Exhibition” and “a nucleus for an extension of the city towards the river”.⁹⁰ Set between city and fair, the housing exhibition was to draw on the respectively quotidian and ideal dimensions of each. Nevertheless, Safdie recognised that his project needed to be an enclave set apart from the exigencies of the city, thus better to suggest a reinvention of the modern environment and to frame an ideal vision of mass society. The coming call by the CCWE to see Safdie’s project as “prototype” could only function, as a kind of propaganda, in this kind of space.

Still, the model of Interbau rankled. His wariness of the Berlin model signalled a worry that the Expo 67 housing exhibition could, for example, be produced by many competing architects – and echo, perhaps, of the van Ginkels’ earliest fears of architects designing separate national pavilions.⁹¹ Instead of different buildings, no matter how exemplary, A Case for City Living provided a rationale for a typical prefabricated “unit”

⁸⁹ Ibid., 3-4.

⁹⁰ Ibid., 2.

⁹¹ Safdie resisted attempts to open the housing project to other architects, including a proposal by the Cement Companies of Canada (otherwise an important early patron on Habitat 67) for an international design competition: “Quite apart from my obsession and conviction about Habitat I was sure that any big, vague, international competition would lead nowhere. I felt what I had put down on paper had a validity that gave it the right to come into existence.” See: Safdie, *Beyond Habitat*, 81.

suiting to many applications. Safdie thus promoted the idea of “gathering a team of architects to design a *total integrated complex*.”⁹² The “General Approach” would be one where

The entire sector will be an *integrated three-dimensional whole* in which housing is in the external “membrane” overlooking the river and city and with maximum contacts with sun and light, fresh air and the view. This, in turn, encloses spaces which are used as auxiliary spaces, commercial and otherwise, and parking and storage. The interior spaces are “market-like” areas of enormous scale. During the Exhibition, they are the major display area. The membrane of housing and offices is transparent in its nature allowing light, sun and air into the interior public spaces. This is complemented by large openings oriented for maximum benefit of cooling summer breezes....

The entire urban complex is designed so as to create its own micro climate in each season.⁹³

The “integrated three-dimensional whole” owed to the core argument of *A Case for City Living*: to prove the viability of using industrialised building techniques for creating a city *in toto*. Nevertheless, while trying to define a “three-dimensional whole”, Safdie made a crucial change to his conception of form. The shift lay in the mention of a “membrane” (composed “of housing and offices”) and appeared in a second sketch appended to his CCWE memorandum. Unlike the distinct patterns of earlier “systems”, the new drawing, labelled “Schematic Plan-Housing Exhibit”, showed three pairs of massive inclined triangular planes, each forming a half-pyramid shell with two opposing faces composed of stacked rectangular elements identified as “housing” and “access” (fig. 5.20). Under the coupled planes were terraces for “exhibition/commercial” while outside was the vague suggestion of a “park”. The plan was deliberately calibrated to the fair: the complex rested alongside a river flowing

⁹² Safdie, “Habitat 67/Permanent Housing Exhibit”, 2-3, emphasis added.

⁹³ *Ibid.*, 3, emphasis added.

east-west with the housing facing southward, an arrangement that followed precisely the orientation of Mackay Pier.

In placing this remarkable pyramidal scheme within the mandate of Expo 67, Safdie turned, once again, to his published work. Unsurprisingly, like the sketch quietly appropriated from *A Case for City Living*, the Schematic Plan was, in a slightly different form, already in circulation. Safdie had concluded “The Master Plan: Growth, Change and Repetition”, the final of his three articles penned for the CMHC journal *Habitat*, with “a basic idea for the city plan which can be interpreted into formal terms in various ways.” The corresponding illustrations – which followed immediately the juxtaposition of the oasis settlement, Piet Blom’s housing project, and Safdie’s *A Case for City Living* unit types – showed a scattering of “detached units” aggregating into “taller structures” and eventually piling up into a “large pyramid”, with “dwellings set on three sides and the fourth side open for light and air”, “parking, shops, schools and other communal facilities” in the “central space”, and “inclined circulation” in “the four major ribs” (fig. 5.21).⁹⁴ The diagrams could well have been misinterpreted as championing a kind of spontaneous or *ad hoc* settlement, and Safdie argued that “the plan in which time and growth are basic dimensions cannot be a formal statement since definition of exact building form is not possible at the outset.”⁹⁵ While denying any *a priori* formal intent, Safdie posited a “basic plan diagram” that “would set the programme”, thus showing a series of pyramids connected to an “employment-

⁹⁴ Safdie, “The Master Plan: Growth, Change and Repetition”, 6.

⁹⁵ *Ibid.*, 7.

production-consumption spine”: “as the spine expands new sectors appear.”⁹⁶ This fixed line of commerce and industry was really the appearance of a public terrain along (or around) which the presumably more “flexible” and private parts of the plan – namely the housing – could forever “grow”. At the scale of the world’s fair, the “spine” would hold the entire “exhibition”.

To the reader, not least the Expo authorities familiar with Safdie’s still short career, the unnamed and unspecified pyramidal plan may well have seemed utterly mystifying. Yet, as in so many of Safdie’s propositions, the idea stemmed from a specific personal source: an unrealised master plan for Meadowvale, a new town in Ontario, which Safdie had helped to advance while working with the van Ginkels soon after his graduation. The van Ginkels saw Meadowvale as embodying a “definite system of growth”; part of their resulting plan bore resemblance to Nagele, a new village designed by van Eyck as member of the Amsterdam CIAM ‘de 8’ group in the early 1950s, which eschewed traditional settlement patterns in favour of an open centre (including three school built by van Eyck and van Ginkel) with residential units united in a complex, non-repetitive composition.⁹⁷ Safdie’s Meadowvale drawings were, however, of an entirely different order. Working closely with van Ginkel for

⁹⁶ Ibid.

⁹⁷ Max Risselada, “Nagele Grid, 1956”, in van den Heuval and Risselada, eds., *Team 10 1953-81: In Search of a Utopia of the Present*, 58; Francis Strauven, “The Shaping of Number in Architecture and Town Planning”, in van den Heuval and Risselada, eds., *Team 10 1953-81: In Search of a Utopia of the Present*, 297. As Strauven notes, the Nagele plan was a small-scale demonstration of van Eyck’s concept of “the aesthetics of number”. Van Eyck presented the Nagele *grille* at the tenth CIAM meeting in Dubrovnik in 1956.

four months, Safdie attempted to discover how a “core” could “grow”.⁹⁸ He borrowed heavily from Kenzo Tange’s “civic axis” for the Tokyo Bay plan of 1960, with its “radial structure” of traffic feeding into a “linear structure”; the proposition aimed at “rejecting the closed organization of the centripetal pattern in favour of an open organization which makes possible a development along a linear pattern”.⁹⁹ He especially turned to Tange’s residential sectors in which massive parabolic terrace blocks were mirrored to enclose a huge interior space for public functions (fig. 5.22).¹⁰⁰ These were linked by streets connected perpendicularly to the “civic axis”, thereby creating “subcentres” that became “regional centres of consumption”.¹⁰¹ It was precisely what Safdie envisioned in his idea of an expandable “spine”. Extrapolating from Tange, Safdie’s triangular *parti* grew from tracing the increasing height and density of functions along the Meadowvale spine. Inspired by Tange, Safdie proposed a cross-section in which stacked banks of housing covered common areas for “school”, “community”, “shops”, and “parking”. An individual pyramid, comprising 700 dwellings, became a “neighbourhood” joining other ones when connected to the continuous spine (fig. 5.23). The notion of an “additive” structure now followed the

⁹⁸ Safdie’s proposal for Meadowvale can be seen as a parallel exercise to the actual planning work by the van Ginkels. His approach follows closely that of his thesis: all concepts are developed in one large-format sketchbook with written notes of conversations between him and van Ginkel. The sketches are dated from August to December 1961.

⁹⁹ Kenzo Tange, “A Plan for Tokyo, 1960” (1961), in Udo Kultermann, *Kenzo Tange, Architecture and Urban Design 1946-1969* (New York: Praeger, 1970): 123.

¹⁰⁰ The style of Tange’s residential blocks grew out of his World Health Organization Headquarters and Boston Bay projects undertaken with students at MIT in 1959.

¹⁰¹ Tange, “A Plan for Tokyo, 1960”, 123.

new and preferred idea that “Hierarchy is a Pyramid”. “Autocracy” remained, as ever, the tower block.

The origins of Habitat 67 as a “total integrated complex” – or, “integrated three-dimensional whole” – lay in what could be described as Safdie’s growing preoccupation with regional planning. While Safdie’s thesis project had focused on the use of a building system to delineate a carefully planned “community”, the aim behind the world’s fair housing exhibit was to realise a complete “city”. Indeed, Safdie’s work on the Expo 67 transportation systems was tied to an obsession with extending the exhibition far beyond the fairgrounds and into the city itself. This informed the Schematic Plan: with “membranes” of housing covering the world’s fair thematic exhibitions areas, the resulting total complex “could be conceived as a sector of the city” in itself.¹⁰² The pyramids were, then, to be much more than the typical pavilion. In this sense, Habitat would keep with the early and polemical mandate of Expo 67 – that is, to create an entire exhibition, thereby announcing its universalising mission within one massive building.

MAN VERSUS THE CITY

Safdie returned to Montreal in late August 1963 to work on the Expo 67 master plan. He had spent the previous year in Louis Kahn’s office but left on van Ginkel’s promise that he could turn his McGill thesis into a project for the world’s fair. Joining the young architects assembled by van Ginkel, Safdie was immediately charged with four “tasks”: first,

¹⁰² Safdie, “Habitat 67/Permanent Housing Exhibit”, 4.

“Exhibition Site Planning” and, specifically, “design studies of the thematic area”; second, “Thematic Development”, which was “concerned with spelling out the implications of the thematic ideas in terms of physical planning and design”; third, the thematic development of “Man in the City”, a reintroduction of the van Ginkels’ very first expression on Expo 67; and, fourth, “Housing – Man in the City”, an “investigation of the possibility of making a housing exhibit which could remain as a permanent structure after the Fair while being integrated with the MAN IN THE CITY aspect of the theme.”¹⁰³ The work program directly set the still abstract quality of the “theme” in terms of the actualities of “physical planning”, which, in turn, was given a specific programmatic and typological valence – a “housing exhibit” mediating, on the one hand, the space of a world’s fair that promised an entirely novel way to situate “man” in the “world”, and, on the other hand, Montreal itself, which served as necessary foil to the new “permanent structure” proposed for ameliorating of the status of “man” in the ‘city’.

Given his former student’s work, van Ginkel hardly saw Safdie’s assignments in isolation. Rather, the four “tasks” were cross-referenced and shared overlapping deadlines to be completed by mid-October. Above all, the telescoping from *theme* to *thematic area*, from *Man in the City* to *housing exhibit*, and from the temporary world’s fair to a “permanent structure” meant that, notwithstanding the islands site, van Ginkel still held some hope for shaping space relations between exposition and city. While the horizon of expectation for

¹⁰³ H.P. Daniel van Ginkel, “Planning and Design Work Program No. 3” (September 19, 1963): 7, 9, 13, 20, 26, Box 39-1999-05, Folder 02, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

the proposed “housing exhibit” was necessarily delimited by the Expo 67 master plan, the boundary was an ideal constraint, reinforcing the belief that only a supra-national entity like a world’s fair could imaginatively re-order civic space.

The actual application of A Case for City Living to Expo 67 depended on an additional but crucial specification. Despite the technological aesthetic of his thesis, Safdie had never identified the structural (or consequently financial) basis of how his “systems” were to “grow”. Van Ginkel may well have recognised this shortcoming. Thus, right around the time Safdie began working on the Expo master plan, van Ginkel met with the Committee of Cement Companies to assess their interest in participating in the world’s fair. The members of this Canadian industry sought “to put in place a scheme as big as Expo 67 itself”.¹⁰⁴ The consortium was represented by the Montreal architect Jean-Louis Lalonde. Lalonde had, in fact, contributed to the seminal PQAA retreat. On behalf of the cement companies, he was charged with establishing “the general outline of a project” – in other words, a work of architecture – “that the Committee would sponsor for Expo.”¹⁰⁵ Notwithstanding assumptions on the typical needs of industrial concerns, Lalonde would, in fact, come to articulate the context of the proposed work in surprisingly polemical terms.

¹⁰⁴ “Habitat 67”, *Architecture-Bâtiment-Construction* (December, 1963): 48, translation by author. The “proposition” was forwarded “in the name of all the cement companies of Canada by the presidents of the four enterprises established in Quebec.”

¹⁰⁵ Jean-Louis Lalonde, “Preparation of a preliminary study for the Committee’s participation in the Canadian World Exhibition, Montreal 1967” (September 5, 1963): n.p., Box PF11, File 58/100/PF4/13, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal; van Ginkel, “Planning and Design Work Program No. 3”, 9. Lalonde was already serving as a professional liaison to Safdie and Adele Naudé’s work on transforming the “theme” into a master plan.

The industrial-technical bases represented by the Committee unambiguously denoted certain kinds of architectural propositions. Safdie's early invocation of prefabricated "cells", the received examples of van Eyck (whose reinterpretation of vernacular forms occurred via the plasticity of concrete), and the ethos of "brutalism" marking architecture culture in the early 1960s, may well have coloured the engagement of the cement companies.¹⁰⁶ *Architecture-Bâtiment-Construction* observed: "The significant rise of the cement industry in these last few years anticipates the manifold and intensive application of this material for the diverse structures of the Exhibition."¹⁰⁷ The cement companies – as patrons – were seen as the best of modern industrial enterprises, with research applied to the realm of design. As both a technique – prefabrication – and an aesthetic, concrete was synonymous new Canadian architecture, notably John Andrews's Scarborough College (1965), Arthur Erickson's Simon Fraser University (1965), or the ARCOP's Place Bonaventure (1968).¹⁰⁸ These large-scale works, often photographed as hermetic containers, were seen, especially when published internationally, as withstanding an inhospitable climate as well as engendering new kinds of social life inside their heroic forms. This drew, in a

¹⁰⁶ It is difficult to know whether van Ginkel invited the Cement Companies or was solicited by them.

¹⁰⁷ "Habitat 67", *Architecture-Bâtiment-Construction*, 48, translation by author.

¹⁰⁸ For ways in which concrete was being discussed by leading Canadian architects see, for example: Raymond Affleck, "A Need for More Hands", *Canadian Architect* (September 1966), which describes the building of Place Bonaventure, a much noted megastructure; and Melvin Charney "Concrete, A Material, A System, and an Environment", *Architecture Canada* (June 1968). In the mid-1960s, Charney advanced the design of schools in terms of concrete "systems"; see his articles "Learning Environments", *Architecture Canada* (March 1968), "Les possibilites de la construction en beton prefabrique dans la conception nouvelle des ecoles", *Architecture-Bâtiment-Construction* (March 1967), and "Ecole primaire Cure Grenier, Notre-Dame des Laurentides", *Architecture-Bâtiment-Construction* (November 1967).

sense, on a prewar legacy of finding in Canada, in the New World, engineered structures – namely concrete grain elevators, as seen in Walter Gropius’s in *Deutsche Werkbund Jahrbuch* (devoted to “Die Kunst in Industrie und Handel”) of 1913, Bruno Taut’s *Modern Architecture* of 1929, or Le Corbusier’s *Vers une architecture* (and the polemic on an “engineer’s aesthetic”) of 1923 – as avatars of modernism.

Despite his mandate, Lalonde refrained from tying the Committee’s industrial interests to a specific technics. He proposed only a programmatic orientation, albeit one to which the cement companies saw themselves perfectly suited. After meetings with van Ginkel, Lalonde noted that the housing exhibit, as one of the “main aspects” of “Terre des Hommes”, will deal with “‘The City’ in its broadest sense: civilisation, the result of man’s control and organization of his environment”; thus “the urbanization of our world, and consequently the urban scene, will occupy a major part of the exhibits.”¹⁰⁹ The ultimate medium of this broad humanistic claim would be “an *experimental residential development*”: “Ideally, about 2,000 dwellings should be aimed at to obtain a large enough population to justify a complete organization including schools, commercial centre (retail), recreational and sport centre, churches, etc.” – an aspiration that extended the typical function of a pavilion

¹⁰⁹ Lalonde, “Preparation of a preliminary study for the Committee’s participation in the Canadian World Exhibition, Montreal 1967”, n.p. Early in their deliberations, Daniel van Ginkel and Michel Chevalier had identified “The City” as one of the key “exhibit subjects” of Expo 67: it “gives an opportunity to present aspects of civilization and culture, as ‘La Cité’; for this purpose, the City can present cultures of all ages, and all parts of the world.”

from a site of display to a place of living.¹¹⁰ Given that “the total cost of such an enterprise would be in the order of 40 million dollars”, it “would be possible... to establish the total skeleton of this project and build for Expo just enough dwellings to present a realistic picture of the total thing, plus the necessary amenities required right at the outset.”¹¹¹ In other words, under the imprimatur of the world’s fair, any partial realisation of the housing exhibit could still be seen as fully-functional, especially given its actual distance from (but also its symbolic dependence upon) the existing city. Incompletion was not an issue. As outlined by Safdie in *A Case for City Living*, it was the suggestion of an “open” building “system”, and not necessarily the full realisation of a city all at once, that pointed the way forward.

URBANISM

The link between the CCWE and the Cement Companies brought industry within the cultural ambit of the world’s fair. At first glance, this may have seemed to contradict the earliest principles laid down by the van Ginkels and others – namely, to eschew nationalist-corporatist interests and symbols. Yet the role of the cement companies in the housing exhibit was of a different order: the proposed nexus would demonstrate (as an exhibit) how society (and the corresponding figure of “man”) could quite literally be constructed.

“Habitat 67 is not a dream of the future”, the CCWE insisted; rather, “by taking advantage

¹¹⁰ Ibid. Safdie almost immediately revised Lalonde’s projection: “Approximately 1,200 housing units would fulfill the Corporation’s obligations to I.B.E. and be of sufficient size to form an impressive exhibition piece of housing and all related facilities”; see: Safdie, “Habitat 67/Permanent Housing Exhibit”, 1.

¹¹¹ Lalonde, “Preparation of a preliminary study for the Committee’s participation in the Canadian World Exhibition, Montreal 1967”, n.p.

of modern technology” it will “provide a stimulus for recognition and analysis of the critical problems facing the 20th century city.”¹¹² This was not a call for total urban renewal. “Cities are the cultural repositories of man” announced the CCWE, *pace* Safdie. “They are the containers of its history.”¹¹³ In other words, the *existing* city had recognisable institutions, processes, and spaces that could be leveraged (hence the notion of completing the housing with schools and churches) while being simultaneously reorganised. The resulting operation would be both *technological* – the use of “mass production” for creating housing units (with the lingering desire to create “systems”) – and *social* – based, first, on the continued domestic demand for “variety and selection” in the “choice of dwelling”, which stemmed from the “basic needs” of “differing life-patterns of families and individuals”, and, second, on the civic needs for “easy and convenient access to places of business, shops, playgrounds, and places of cultural activity”.¹¹⁴ Nevertheless, Lalonde declared, “The City has evolved from the Middle Ages without integrating the new elements that were added to its original content.”¹¹⁵ This gap between a received historic urban pattern and a host of modern types needed resolution.

¹¹² Canadian Corporation for the 1967 World Exhibition Press Service, “Prelude to Habitat 67: The City and its Malcontents” (no date), Canadian Corporation for the World Exhibition Fonds, RG71, Vol. 445, Library and Archives Canada, Ottawa. While this document was issued by the Press Service, it likely stemmed from Safdie (as conclusions drawn from his CMHC travel report and articles published in *Habitat*) and published in late 1963 or early 1964.

¹¹³ *Ibid.*

¹¹⁴ *Ibid.* While “choice of dwelling” remained tied to the needs of privacy as well as familial “growth” in the suburbs, there was a more alarming concern: “Suburban communities tend to be drab, artificial, boring and transitory. They have given to a high incidence of alcoholism among suburban housewives.”

¹¹⁵ Lalonde, “Preparation of a preliminary study for the Committee’s participation in the Canadian World Exhibition, Montreal 1967”, n.p.

Required, then, was a “project” that will “provide an organized environment where man will find the advantages of nature (what he is now looking for in the suburbs)” and “where all the elements (habitation, circulation, parking, services, amenities) would be *integrated* in a *three-dimensional whole*.”¹¹⁶ Here, the city itself was believed to be ordered anew within a single work that could only be realised within the progressive mandate – that is, *extra-civic* and *supra-national* – of a world’s fair.

The agendas of the cement Companies and the CCWE dovetailed, however temporarily, in early September 1963, when van Ginkel seconded Lalonde as consultant to Safdie. Over the next month, the two architects began studying how to link the “tasks” of “thematic development” and “Housing – Man in the City”.¹¹⁷ The pressing issue became what a “three-dimensional whole” looked like.

This still fairly abstract architectural form was to reflect existing realities. The “nature of the project” was an “urban residential area corresponding to present day knowledge and requirements.”¹¹⁸ This, Lalonde emphasised, would be “THE STUDY OF AN URBAN RESIDENTIAL SECTOR BASED ON THE MOST ADVANCED THINKING, RESEARCH AND TECHNIQUES AVAILABLE ON THE

¹¹⁶ Ibid.

¹¹⁷ Van Ginkel, “Planning and Design Work Program No. 3”, 26. Safdie noted that “the Association of Cement Industries... initiated the project as early as 1963” and “it has always proposed to participate and indeed it initiated Habitat ’67, the construction of a model community”; see: Safdie, “Theme Exhibit Man and the City, Habitat 67 and Labyrinth (N.F.B.) and Their Relationship” (December 12, 1963): 1-2, Box PF12, Folder 5/100/PF5/25, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal.

¹¹⁸ Lalonde, “Preparation of a preliminary study for the Committee’s participation in the Canadian World Exhibition, Montreal 1967”, n.p.

INTERNATIONAL SCENE”.¹¹⁹ Safdie added: “The project will be a high density, urban development, thus dealing with the most pressing housing problems of to-day”.¹²⁰ In petitioning contemporary “knowledge”, “advanced thinking”, and “research and techniques” toward ameliorating current “problems”, Safdie and Lalonde sought to obviate specific kinds of precedents. The original purpose of Man in the City as the prime mover of a future exhibition was, of course, an “International Housing Section” that “would constitute an exhibition of the best in contemporary housing” and had been modelled on the Interbau.¹²¹ In clarifying the aims of the fair a year after the van Ginkels’ initial formulation, Lalonde joined Safdie in disagreeing agree with these received ideals:

On two occasions in the last 40 years experimental housing developments were built in Germany, with the contribution of famous architects from many nations. But, as a result of such varied contribution by individual “stars”, these developments contributed little to an organized urban scheme, however interesting the individual buildings might have been architecturally.¹²²

Posed against free-standing objects of the 1927 Weissenhofsiedlung Exhibition in Stuttgart or the 1957 Interbau in Berlin was the 1967 Montreal exhibition – or, really, the actual “urban complex itself”, which constituted the “major subject” of Expo 67, with “the

¹¹⁹ Jean-Louis Lalonde, “Habitat 67: A Proposal to the Canadian World Exhibition Corporation by the Committee of Canadian Cement Companies for Expo 67” (October 1963): 3, Box PF3, Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal.

¹²⁰ Safdie, “Habitat 67/Permanent Housing Exhibit”, 1.

¹²¹ “Draft Report on Montreal World’s Fair”, 2. Van Ginkel later noted that the University Street site, which was not coincidentally part of their plan for Place Victoria (a new urban development in Montreal), avoided the “mistake of ‘Interbau’” because it was “within the fabric of the city”. See: van Ginkel, “Credo”, *Canadian Architect* (July 1964): 52.

¹²² Lalonde, “Preparation of a preliminary study for the Committee’s participation in the Canadian World Exhibition, Montreal 1967”, n.p.

HABITAT OF MAN” as its “main element”.¹²³ Here was – in Lalonde’s critical titling – “Habitat 67”: “a meaningful demonstration of new concepts in urban housing”, which “without trying to be futuristic, would still be indicative of things to come; it would bring in focus the technical and sociological problems confronting our cities today, and would propose a solution based on methods at the experimental stage.”¹²⁴ Despite the potential for the Cement Companies to offer specific “technical” – read: experimental – “solutions”, Lalonde refrained from lobbying for their particular expertise. He made little suggestion on specific formal, technical, or structural solutions for Habitat, save for characterising it as a “gigantic super-structure” that could “provide a desirable framework for urban living today”.¹²⁵ Yet prior to actually naming Habitat 67, Lalonde had indicated that the proposed “experimental area for the Expo” would, in fact, be “defined as a conclusion” to “a number of case studies pertinent to the subject of the City in general, and to the residential sectors in particular”; these examples were to appear “in appendix” in the formal proposal to the

¹²³ Ibid.

¹²⁴ Lalonde, “Habitat 67: A Proposal to the Canadian World Exhibition Corporation by the Committee of Canadian Cement Companies for Expo 67”, 4. Safdie admitted that the name “Habitat” was “Jean-Louis Lalonde’s idea. It said the same thing in both languages, French and English”. It was also “the name of the CMHC magazine that first published my thesis in Canada with which it was identified.” See: Safdie, *Beyond Habitat*, 73. Safdie was, of course, familiar with the use of “habitat” in Team 10 discourse and had used the term in his CMHC travel scholarship report: the report “is written from the architect’s point of view as he endeavours to create ‘habitat.’ I use this word with its full meaning, not just a so-called ‘residential environment’ but the whole living being of man.” See: Safdie, *Housing in North America – 1960, Report submitted to the Central Mortgage and Housing Corporation*, v. Coincidentally, in the very same month as Lalonde’s proposal to the CCWE, the French architecture magazine *Architecture d’Aujourd’hui* published an issue devoted to “Habitat”, with a cover showing the Earth composed of human figures drawn as standing together to form the continents.

¹²⁵ Lalonde, “Habitat 67: A Proposal to the Canadian World Exhibition Corporation by the Committee of Canadian Cement Companies for Expo 67”, 6.

CCWE by the cement companies.¹²⁶ Habitat 67 would, it seemed, be conditioned (in its aesthetics, social mission, and technological constraints) from the start by received modernist practices and types. This was not only to suggest sources of inspiration; it was also, especially in Safdie's view, to introduce Habitat 67 into contemporary architecture discourse.

When it came time to announce Habitat 67 to the CCWE, Lalonde provided only two of the promised appendices to his proposal. Read together, the choices were curious. The first was a brief excerpt from the émigré Finnish architect Eliel Saarinen's *The City: Its Growth, Its Decay, Its Future*, a 1943 treatise on the future of town planning. The second comprised selections from "Vers un urbanisme spatial", a text by Alexandre Persitz, editor-in-chief of *L'Architecture d'Aujourd'hui*, published just a few months before Lalonde's report.¹²⁷ Saarinen's was a somewhat paranoid assessment of the modern city, explained through contrasting diagrams of "healthy" and "disintegrating" cell tissue, one evoking an ideal "organic order" evinced in medieval town planning and the other indicating the appearance of "diseased" elements in the contemporary urban core, notably slums; his panacea – his admitted "key-word" – was "organic decentralization", a "rehabilitation process" for "overgrown cities" by "dispersion of the present compactness into concentrated units, such as centers, suburbs, satellite townships, and like community units; and furthermore it must aim at the organization of these units into 'functional concentrations of

¹²⁶ Lalonde, "Preparation of a preliminary study for the Committee's participation in the Canadian World Exhibition, Montreal 1967", n.p.

¹²⁷ Persitz later reviewed Expo 67; see: "Propos sur Montréal 67", *L'Architecture d'Aujourd'hui* 135 (December 1967-January 1968).

related activities.”¹²⁸ Persitz’s gave a synopsis of contemporary “tendencies” opposed to functionalist urbanism while offering new ways to organise city space; among the more notable were “Cluster and Casbah” types. Lalonde gave no reason for the inclusion of Saarinen and Persitz, even in light of their presumable ideological differences. In fact, he abridged the texts so to suggest shared concerns: when read together, they appeared as an initial but polemical programmatic statement on Habitat 67 itself. Above all, the common idea was, in terms of the Saarinen excerpt, that unlike the “urban development” of “today”, which has “mostly been dealing with matters of practical and technical nature”, the medieval city had “resulted in expressive design and coherent order”.¹²⁹ Lalonde thus quoted Persitz: in medieval cities “One does not stroll around volumes standing in space, but finds oneself inside this *large scale architectural complex that is the city itself*.”¹³⁰ In order to actualise this lapsed formal and spatial idea of an “integrated whole” – Lalonde’s description of Habitat 67 – the appendix quoted Saarinen’s insistence “that the city’s improvement and further

¹²⁸ Eliel Saarinen, *The City: Its Growth, Its Decay, Its Future* (New York: Reinhold Publishing Corporation, 1943), 10, 16, 20, 23, 46, 49, 151, 200. Along with his “cellular” diagrams, Saarinen provided numerous conventional figure-ground plans of historical cities.

¹²⁹ Eliel Saarinen quoted in Lalonde, “Habitat 67: A Proposal to the Canadian World Exhibition Corporation by the Committee of Canadian Cement Companies for Expo 67”, 12.

¹³⁰ Alexandre Persitz quoted in Lalonde, “Habitat 67: A Proposal to the Canadian World Exhibition Corporation by the Committee of Canadian Cement Companies for Expo 67”, 14, emphasis added. Lalonde excerpted Persitz’s article “Vers un urbanisme spatial” originally published in *L’Architecture d’Aujourd’hui* 101 (May 1962). The opposition between medieval towns and modern cities corresponded to longstanding discourses on the loss of *community* with the rise of *society*. Lalonde argued: “When the rate of evolution of the socio-political organization was accelerated man gradually lost control over his surroundings; and with the advent of the machine age, the economical structure of society changed so rapidly that the established pattern becomes obsolete. This is best seen in the chaos of the modern city where man is subordinated to the requirements of the machine which has become the main factor in determining the environment” (5).

development must be started with the problems of homes and their environments”.¹³¹

Programme and type were, therefore, married and given a sphere of operation: Habitat 67, as housing, would function not only at the scale of the city but, more importantly, internalise aspects of urban social life within a singularly new and massive “architectural complex”.

Given the stated aim to offer “case studies”, it was perhaps odd that Lalonde refrained from presenting the excerpted texts with corresponding images. This was all the more strange given Lalonde’s claim that the selected texts were “representative of present thinking” on the question of achieving “a total integration of the various elements of the urban complex into a coherent spatial arrangement” (something tied, again, to “the towns of the Middle Ages”) – Saarinen and Persitz “tend to show” that “the future of the city of lies in the integration of all its components into an organized three-dimensional ‘form order’.”¹³² Lalonde borrowed heavily from this notion, arguing against the “supposedly ideal theories” of “two-dimensional” modernist “town-planning”; opposing this kind of urbanism – emblematised by the given examples of Chandigarh and Brasilia – were theories “town-design and town-building” as “physical arrangements” in “three-dimensions”.¹³³ This took from Saarinen’s belief that “the town of the Middle Ages did not develop from a stylistically preconceived and fixed plan form, but from a three-dimensionally visualized picture of that

¹³¹ Eliel Saarinen quoted in Lalonde, “Habitat 67: A Proposal to the Canadian World Exhibition Corporation by the Committee of Canadian Cement Companies for Expo 67”, 12.

¹³² Lalonde, “Habitat 67: A Proposal to the Canadian World Exhibition Corporation by the Committee of Canadian Cement Companies for Expo 67”, 7.

¹³³ Ibid., 6. Lalonde’s descriptions followed almost verbatim Saarinen’s *The City: Its Growth, Its Decay, Its Future* (1943): 7ff.

particular organism it represented.”¹³⁴ Lalonde deliberately excerpted Persitz to conclude similarly that “modern town planning has failed, at least... under primary rules more or less derived from the Charte d’Athènes”: opposed to the legacy of functionalism, “a few isolated architects in various countries” were “converging on a certain number of definable tendencies” expressed in “a tightening of the urban ‘texture’ in such a way that the notion of ‘building’ will practically disappear and be replaced by a new entity which would be, in its whole, the urban site itself.”¹³⁵ Without any corresponding image to make readers think otherwise, Persitz’s “entity” served to evoke what Habitat 67 could be, both formally and spatially. Indeed, as *au courant* readers of the Cement Companies proposal were surely aware, Persitz’s title indicated exactly the kind of “tendency” – “the total creation of a genuine artificial urban ‘landscape’” – he (or, rather, Lalonde) was after: the “urbanisme spatiale” of Yona Friedman. The original version of Persitz’s article, published in *L’Architecture d’Aujourd’hui*, culminated in illustrations of Friedman’s “three-dimensional structure inside which are freely disposed housing elements, etc.” and Eckhard Schulze-Fielitz’s theoretical project for a “cité spatiale” as well as a cable-suspended tent construction for an exhibition hall. Both Friedman and Schulze-Fielitz were members of the Groupe d’Etude d’Architecture Mobile (GEAM) and proposed enormous elevated space frames – “town-creating spatial units” – as means for renewing urban life far above existing cities and

¹³⁴ Saarinen, *The City: Its Growth, Its Decay, Its Future*, 49.

¹³⁵ Persitz quoted in Lalonde, “Habitat 67: A Proposal to the Canadian World Exhibition Corporation by the Committee of Canadian Cement Companies for Expo 67”, 13, 16.

landscapes.¹³⁶ Seen together by Persitz, the projects “made it easy to imagine applying these ideas to a rough outline of the future three-dimensional city”.¹³⁷ To these, Persitz added works by the Japanese Metabolists Kenzo Tange and Arata Isozaki (fig. 5.24). In all, it was precisely the constellation of influence admitted by Safdie.

If Lalonde’s two appendices were to set the terms of the still unresolved dialectic between the limits of the existing city and the production of “experimental methods” in design and construction, then it remained just how some kind of synthesis could give rise to a world’s fair pavilion. This was to be Safdie’s domain. When presenting his very first memorandum on design intent to the CCWE, he hewed closely to Lalonde:

The project will be a high-density, urban development, thus dealing with the most pressing housing problems of to-day. Such an approach demands the integration of housing, service, commercial, schools, etc... into one *three dimensional entity*. The dwelling units will be considered as “single family houses” piled up on top of each other, each with its own garden and entrances off streets in the air. This approach reflects the most advanced projects in this field.¹³⁸

It was an intriguing but veiled account of A Case for City Living. Given Lalonde’s failure to provide any visual sources for Habitat 67, it was hardly surprising that Safdie accompanied his memorandum with an image selected from his McGill thesis: a view of System A, but quite unlike any of his student work; instead of idealised “systems”, there suddenly appeared

¹³⁶ GEAM (Groupe d’Etude d’Architecture Mobile), “Program for a Mobile Architecture” (1960), in Ulrich Conrads, ed., *Programs and Manifestoes of 20th-century Architecture* (Cambridge MA: The MIT Press, 1971), 168. GEAM was in close contact with the architect Frei Otto, whose “hanging cities” likely presaged Schulze-Fielitz’s tent structures. Otto realised a cabled roof construction for the 1963 Hamburg International Horticultural Exhibition; it was precursor to his tensile roof structure for the German pavilion at Expo 67.

¹³⁷ Persitz, “Vers un urbanisme spatial”, 98-99, translation by author. Persitz immediately published Schulze-Fielitz’s “cité spatiale” in the following issue of *L’Architecture d’Aujourd’hui* (June 1962).

¹³⁸ Safdie, “Habitat 67/Permanent Housing Exhibit”, 1, emphasis added.

a completely occupied city, full of people, cars, and vegetation.¹³⁹ The sketch was, in fact, a careful tracing from photograph of his models as published in *Architecture-Bâtiment-Construction*, the leading architecture journal in Quebec. The image, never attributed to the thesis project, now served only to give contour to the “integration of housing, service commercial, schools, etc” with “dwelling units... considered as ‘single family houses’ piled on top of each other, each with its own garden and entrances off streets in the air”. This “approach”, Safdie unduly declared, “reflects the most advanced projects in this field”.¹⁴⁰ As much as he focused on justifying his housing project, Safdie had also begun carefully positioning his work among – even ahead of – what he believed were commensurate avant-garde intentions in contemporary architecture

Safdie’s sketch suggested the major concerns of the Expo 67 housing exhibit. It gave it further definition to Friedman’s “urbanisme spatiale” – in a sense, it made it suitable (or palatable) to the aims of a world’s fair, with Safdie’s echoing his student thesis and insisting that “dwelling units will be considered as ‘single family houses’”, commensurate to the tastes (and desires) of fairgoers representing the very people turning to the suburbs in hope of finding those amenities – individuality, nature – now missing in the metropolis. Moreover, the closely cropped sketch also indicated a plausible constructability. The structure was not

¹³⁹ Safdie came to admit that, around the time of his memorandum, “I was thinking singularly in terms of my thesis and had for several weeks been working on its application to the site of Mackay Pier.” He consequently acknowledged a previous stab at self-promotion: “It was 1962 and the planning of the New York World’s Fair was well underway. One day I decided this would be the place to build my thesis; I clipped it from the pages of *Forum*, made a specific sketch showing how to build half-a-dozen houses as a pavilion, and sent it to the Portland Cement Institute in Chicago with a long letter explaining that this could be built for a limited cost as a great exhibit. They never acknowledged receipt of it.” See: Safdie, *Beyond Habitat*, 73, 59.

¹⁴⁰ Safdie, “Habitat 67/Permanent Housing Exhibit”, 1.

unlike scaffolding or some demountable systems suited to a temporary pavilion. Indeed, the very idea of construction seemed pressing, not least given the possible backing by an industrial concern and by the fact that no funds had been allotted by the CCWE to what was still an entirely speculative idea. Above all, the initial “skeleton”, as Lalonde’s described it, was, he and Safdie repeatedly insisted, to be “conceived as a sector of the city” in itself.¹⁴¹ Consequently, as “an *experimental residential development*”, Habitat “would act as a laboratory for testing some of the present day thinking on living in urban areas”.¹⁴² This had been partially suggested in *A Case for City Living*, at least in the outward aesthetic of the novel structural system. The world’s fair “experiment” required, however, additional criteria. The van Ginkels’ had always hoped to have “each nation... buy space or erect a structure” within unified “functional sections”.¹⁴³ The “intention” of Lalonde’s proposal continued this ambition: it would be “mandatory... to interest other groups in participating in the elaboration of the total project”, for which they will “study individual problems... required for a comprehensive scheme.”¹⁴⁴ Under the “membrane” of housing – that is, inside the pyramid – numerous public institutions were to be built by various nations. In this “live demonstration”, “one country would take the school, another the medical clinic, a third the

¹⁴¹ Ibid., 4.

¹⁴² Lalonde, “Preparation of a preliminary study for the Committee’s participation in the Canadian World Exhibition, Montreal 1967”, n.p., emphasis added.

¹⁴³ Daniel van Ginkel, Blanche van Ginkel, et al., “1967 Montreal World’s Fair” (October 29, 1962): 3, Box 39-1990-02, Folder 005, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

¹⁴⁴ Lalonde, “Preparation of a preliminary study for the Committee’s participation in the Canadian World Exhibition, Montreal 1967”, n.p., emphasis added.

theatre, all as *permanent* buildings.”¹⁴⁵ The ensemble would be rendered complete by “temporary residents”, namely “the foreign technicians working on the many national exhibits”.¹⁴⁶ By gathering international cultural and scientific agencies, the housing exhibit was to become a nucleus for global interdisciplinary exchange via modern architecture.

With *housing* as *theme*, the very idea of a temporary pavilion – the singular demand of the Bureau International des Expositions when commissioning a world’s fair – was quickly diminished. The “permanent” need for Habitat 67 was tied to its “experimental” or, indeed, diagnostic, function – that is, to communicate how mass housing could normalise space relations between peoples and institutions, thereby serving as a public “good”. This had been crucial to the command issued by the Montebello Conference: to “examine the behaviour of man in his environment”, especially as “man” could “impose on the world of 1967 new concepts of community life”.¹⁴⁷ It led to Safdie’s demand for “a team of architects to design a *total integrated complex*”.¹⁴⁸ While this surely reaffirmed the earliest ambition of the CCWE designers to house the fair within a singularly massive pavilion, it was equally an

¹⁴⁵ Safdie, *Beyond Habitat*, 74. As part of the plan to have local participants develop “schools, churches, recreational centres, etc.” within Man and the City, Lalonde noted meetings with Montreal Catholic School Commission and the office of Paul Gérin-Lajoie, the provincial Minister of Youth (and soon the Minister of Education); see: Lalonde, “Preparation of a preliminary study for the Committee’s participation in the Canadian World Exhibition, Montreal 1967”, n.p.

¹⁴⁶ Lalonde, “Preparation of a preliminary study for the Committee’s participation in the Canadian World Exhibition, Montreal 1967”, n.p.

¹⁴⁷ “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, Report of the Montebello Conference (May 1963): 1, Box 39-1990-07, Folder 001, Gilles Gagnon Archive, Canadian Centre for Architecture, Montreal. The question of human “imposition” on the material and social world indicated the prophetic (and prognostic) value assigned to the Expo 67 theme.

¹⁴⁸ Safdie, “Habitat 67/Permanent Housing Exhibit”, 2-3, emphasis added.

appeal for a greater fraternal project, one in which world architectural production would be parsed amongst the most representative artistic, cultural, or scientific institutions of participating nations; together, they provided, as a future report on the pavilion insisted, the “Universal Requirements for ‘Community’”, conditions “necessary for the *transmission* of communities’ skills and cultural heritage”, “for the *reproduction* of community members”, and “for the *integration* and association of members of the ‘community’.”¹⁴⁹ These “universal requirements” differed from the “unique circumstances of each civilisation” – broadly understood as “Historical” – such as “ethical and moral values” or “religious and political structure”.¹⁵⁰ In this early conceptual phase, then, Habitat 67 was presumed liberated from the typical function of pavilion – that is, to present things in stasis or to be a summation of human history; rather, the very notion of housing, with its sense of diurnal life, presumed a place in a constant state of flux. Hence the intention to build only a portion of the pavilion for Expo 67 – any completion using an “additive” architecture rested on identifying future needs arising from engaging the existing city, circa 1967.

Habitat 67 was believed to be imbued with the total consequence of a city itself. Its inhabitants would be the fair employees; its citizens would be the crowds and pleasure-seekers thronging the pavilion itself. This was in marked contrast to earlier exhibitions, which had sought to explain, often dramatically, the city of the future in miniature – a vision

¹⁴⁹ Oscar Newman, “Preliminary Study into the Form, Content and Implementation of the Theme Exhibit ‘Man and Community’” (February 1964): 5, emphasis added, private collection of Steven Staples, Toronto.

¹⁵⁰ Ibid. 5.

fantastically rendered in the moving “bird’s eye” view of *City of 1960*, a massive diorama of a metropolis of skyscrapers and superhighways conceived by Norman Bel Geddes for the Futurama exhibit at the 1939 New York World’s Fair (fig. 5.25). Futurama, and exhibits like it, posited ideal scenarios of the future, one in which peoples and technologies had achieved a kind of spatial and social equilibrium. Habitat could not, however, be the projection of a settled state simply because it had to contend with the transformation of Montreal itself. Architects, bureaucrats, planners, and politicians had already aspired to make Montreal a city of 5,000,000 people by the year 2000 – an operation tied to the infrastructural planning of Expo 67, which helped accelerate the creation of massive new networks such as the new Metro system (opened in 1966) and the burgeoning *autoroutes* criss-crossing the city.¹⁵¹ Against this millennial ambition, Habitat was assuredly modest.

Yet Safdie’s insistence on placing Habitat 67 along Mackay Pier, on landfall opposite the fairground islands, was to ensure that it outlived the fair. The housing exhibit “should be able to expand with need after 1967” and become “an integral part of the City of Montreal.”¹⁵² In fact, among the fundamental principles outlined at the Montebello Conference was an insistence on “the City skyline as a backdrop”, which “has all the

¹⁵¹ Contemporaneous accounts linked the infrastructural development of Montreal to the impetus of Expo 67. See: Charles Lazaeus, “Influx of Visitors: World’s Fair here Likely to Affect Automobile Planning” *The Montreal Star* (December 7, 1962): 25; Brian Upton, “World’s Fair Will Spur Quebec Road Program”, *The Montreal Star* (December 13, 1962): 61.

¹⁵² Safdie, “Habitat 67/Permanent Housing Exhibit”, 1, 4.

identification value necessary” and therefore “no artificial symbol would be as original and magnificent.”¹⁵³ The statement stood to guard against bombast and monumentality.

Several months before Montebello, Safdie had closed his Meadowvale sketchbook with a drawing of megastructural import. From a massive “system” of inverted chevron frames were hanging tension cables supporting countless floor plates (fig. 5.26).¹⁵⁴ Recalling perhaps Tange’s Tokyo Bay proposal, the design advanced an extreme version of the pyramidal solutions being developed throughout the sketchbook. While Safdie’s drawings were typically diagrammatic, the new view showed something different: the Montreal skyline. The sketch, redolent of the most visionary works of the era, revealed how Habitat 67 was to be seen as mediating city and fair. In its infancy, Habitat 67, a “Permanent Housing Exhibit” devoted to “Man in the City”, was to be nothing less than a work of urbanism. All that remained was exactly *how* it could be built.

¹⁵³ “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, 3. The document synthesised the aims of the Montebello conference and prepared by its chairman, Lucien Piché, the Vice-Rector of the Université de Montréal.

¹⁵⁴ Moshe Safdie, Sketchbook R (1960), Moshe Safdie Archive, Canadian Architecture Collection, McGill University, Montreal. In keeping with his ideas from *A Case for City Living*, Safdie noted: “because it is a tension system and because each vertical tower must be ‘balanced’ – the system is a ‘whole’ unity.”

Chapter 6: Housing the World, 2

*I'm buried deep in mass production
You're not nothing new
Iggy Pop, "Mass Production" (1977)*

When the Expo 67 master plan was approved by the Canadian government on December 20, 1963, Habitat 67 automatically became an official part of the world's fair. As a "prototype", it followed a lineage of modern housing exhibitions – the urgency of reform (or the paternal capitalism) promoted in William Lever's Port Sunlight completed in 1914; the modernist polemic on salubrity (and internationalism) advanced in Mies van der Rohe's organisation of the Stuttgart Weissenhofseidling in 1927; the vision on mass society (or the postwar triumphalism) seen in the van Ginkels' preferred example of the Berlin Interbau of 1957 – used to promote new visions of social life and urban space. In each instance, housing promised modernisation. In the extended modernist imaginary, in the possible recuperation of some avant-garde sentiment, the original declaration on Weissenhof may well have been echoed by Safdie fifty years later:

We live in an age of reorientation. In politics and in economics, new paths must be sought if we are to answer the challenges of the present day....

As it is in general, so it is in the specialised field of home building....

Equally important for the reorganisation of housing is the transformation of the technical basis of building through the use of new constructional systems and new materials....

A systematic approach to the New Home, and all associated organisational, spatial, constructional, technical and hygienic problems, is the basis of the planned Werkbund exhibition....

This exhibition... will address itself to the broad masses of our people. It is probably the first building and housing exhibition to be based on a productive principle: it wastes no money on useless exhibition buildings but makes its own

contribution, through building of the Weissenhofsiedlung, to the amelioration of the housing crisis and thus serves the public interest.¹

In defining its enclave, the Weissenhofsiedlung was set in opposition to the *divertissement* world's fairs and the "waste" of competition pavilions. Indeed, when considering real or manufactured "crisis", twentieth-century expositions had typically shown spectacular visions on the future city or retreated to fantasies of the "home of tomorrow". This was, of course, their function: to prognosticate the future, thus to naturalise the public to advanced technology.

Like the exemplary modernist works at Stuttgart, designed by Le Corbusier, Walter Gropius, Mies van der Rohe, among others, Habitat 67 was meant to be seen "live". In contrast to its surroundings, it would offer an alternative to an existing social life. As such, the direct experience of industrially-built dwellings (with prefabricated components) offering a salubrious environment was aimed at authenticating the moral imperative of the world's fair itself. Unlike the Weissenhofseidling or Interbau, the social context of Expo 67 was only the world's fair itself – an entirely artificial and ephemeral environment. Yet it was this *exceptional* status that lent Habitat 67 its authority: in articles, communiqués, and speeches, Moshe Safdie and the Canadian Corporation for the World Exhibition (CCWE) consistently linked the prototypical status of the housing exhibit to the fact that Expo 67 granted, as a cultural body, a superior form of credit: only under a financial arrangement outside of the marketplace could an "experiment" in housing be erected, displayed, and

¹ Peter Bruckmann, Mies van der Rohe, and Gustaf Stotz, "The Home: Werkbund Exhibition Stuttgart 1927" (December 1926), in Karin Kirsch, *The Weissenhofsiedlung: Experimental Housing Built for the Deutscher Werkbund, Stuttgart, 1927* (New York: Rizzoli, 1989), 195-196.

consumed. This was, in part, its properly utopian vocation – namely, somehow to fix the future in the terms of the present.

Yet just how the housing exhibit would be financed – thus built – remained uncertain. Moshe Safdie had, in the company of Jean-Louis Lalonde, the architect liaison to the Committee of Cement Companies, approached the Central Housing and Mortgage Corporation (CMHC) for further assistance. Safdie’s 1959 CMHC student travelling scholarship brought him in the ambit of Canadian housing policy, which, with the 1964 National Housing Act, began confronting the demands of “urban renewal”.² While committed in principle to Safdie’s project, CMHC balked at funding; instead, it directed Safdie to Community Development Consultants, Toronto-based developers who had realised Flemingdon Park, a housing project much hailed in Canadian architecture circles. The developers agreed to participate in preparing a feasibility study tackling all aspects of the project, from design and construction methods to cost estimates and the marketability of the scheme. The report was sponsored by the Committee of Canadian Cement Companies and submitted to the CCWE by late February 1964.

The feasibility study was coded throughout in Safdie’s terminology. It was largely boilerplate, repeating ideas taken from his student thesis and already advanced in the CMHC journal *Habitat*. Nevertheless, the study was decisive for one remarkable reason: it brought

² CMHC grappled fitfully with urban renewal. When considering the 1964 National Housing Act, the CMHC Advisory Committee, which made policy recommendations, suggested basing urban renewal on helping the poor – for example, via 100 percent loan guarantees or creating local non-profit agencies to alleviate the burden of federally funded social housing. The ideas were ultimately rejected by the CMHC board, which was seen as tied to corporate interests. See: John C. Bacher, *Keeping to the Marketplace: The Evolution of Canadian Housing Policy* (Montreal and Kingston ON: McGill-Queen’s University Press, 1993), 213-214.

to bear the constraints of structural and financial analysis, out of which the earliest polemic of “growth and change” would shift from the social need of “Man in the City” to the technological desire for a “system” of industrialised building. Habitat 67 was to be *permanent*, outliving Expo 67 and spurring Montreal’s growth.³ As such, and in the short-lived spaces of a world’s fair, the actual *construction* was to take on the demands of *spectacle*.

BOXES

Following Daniel van Ginkel’s resignation as chief planner along with the official approval of Habitat 67, Safdie established an office at the behest of the CCWE, which required all pavilions to be designed by independent architects. The first detailed elaboration of Habitat 67, quickly advanced in early 1964, found his student thesis project reimagined as in massive pyramidal forms. Rarely forgetting Kenzo Tange’s Tokyo Bay plan, drawing on Team 10 concepts, and returning to his studies for the van Ginkels’ Meadowvale new town, Safdie presented an enormous sloping “membrane” of terraced “houses” (fig. 6.1). Drawings and models showed “rhomboid planes inclined at 60° to the horizontal” sheltering public areas below, including an exhibition of “Man and the City” in which different nations were to build the social infrastructure (schools, clinics) supporting Habitat 67. Huge A-frame “edge

³ As much as the early designs of Habitat 67 were always “dependent... on the downtown core, on other interdependent development”, the project was also to be the “nucleus” of something far greater: a “program for dispersal”, providing “for the integration of the urban meeting place and the open country; for agriculture and industry”, and “supported by an evolving system of communications and transportation which unite a region into an urban entity”. See: Moshe Safdie, Stewart Andrews et al., “Combined Report Covering the Schematic Design, Development and Economical Aspects of the Proposed Permanent Housing Exhibit Habitat 67” (February 21, 1964): n.p., Box PF3, Moshe Safdie Archive, Canadian Architecture Collection, McGill University.

members” enclosing elevator tubes connected to “streets” giving access to the rhythmically arranged units, each with its own garden (fig. 6.2). Two phases – one 22-storey, the other 12-storey – were to be built along Mackay Pier.⁴ The scheme was to house 5,000 inhabitants in 1,000 dwellings (a clear reflection of the nuclear family as the measure of postwar Canadian society). While “dependent... on the downtown core, on other interdependent development”, the project was really the “nucleus” of something far greater: a “program for dispersal”, providing “for the integration of the urban meeting place and the open country; for agriculture and industry”, and “supported by an evolving system of communications and transportation which unite a region into an urban entity”.⁵ Safdie’s project – a heroic *avant-propos* to a world’s fair still without architecture – quickly circulated in international magazines, its forms read in sympathy with nascent discourses on megastructures. Its eventual realisation (as an entirely different structure) would be measured against these initial efforts.

As he undertook the first feasibility study on Habitat 67, while remaining committed to achieving an utterly unique urban form, Safdie’s ambition was necessarily tempered by a new and increasing preoccupation. Still concerned by themes on “growth”, he turned his attention to the actual fabrication of dwelling units. A Case for City Living had necessitated the need “to establish a repetitive modular element”, that correspondingly demanded some form of mass production. Now, in February 1964, as Safdie worked alongside real estate

⁴ The 22-storey scheme included a hotel with a similar pyramidal massing.

⁵ Safdie, Andrews et al., “Combined Report Covering the Schematic Design, Development and Economical Aspects of the Proposed Permanent Housing Exhibit Habitat 67”, n.p.

developers on the first feasibility study, the idea of serialised industrial production became increasingly pressing: “The economics to be gained by standardization – reduced labour costs, efficient use of materials – have architectural implications.” Habitat 67 consequently “attempts to provide an entire range of dwellings using mass-produced units. It strives for long range economics by minimizing manual labour in production.”⁶ While the theory owed to Safdie, the technical focus came from the consulting engineer, August Komendant. Safdie had encountered Komendant while working for Louis Kahn. Among other works, Komendant contributed the innovative Vierendel truss system used by Kahn at the Salk Institute for Biological Studies, then under construction in La Jolla, California. Safdie invited the engineer to work on Habitat given its “structurally demanding” design that necessitated “expert structural consultation”.⁷ Komendant immediately made three crucial decisions: first, “the individual housing units should be manufactured as precast concrete mass products”; second, the units “are jointed together and to the bridging streets by a simple tensioning procedure” using “threaded bars”, thus making the units load bearing; third, “the housing units would be pre-fabricated at a location adjacent to the construction site, transported to the site on rubber tired low-bed trailers, lifted into position by crane and

⁶ Ibid, n.p.

⁷ Moshe Safdie, Letter to August Komendant (January 7, 1964): 1, Box PF11, Folder 58/100/PF4/13, Moshe Safdie Archive, Canadian Architecture Collection, McGill University. Safdie did not solicit other structural engineers. Komendant worked only in a consulting capacity, with drawings prepared by the Montreal firm Monti, Lefebvre, Lavoie, Nadon and Associates.

post-tensioned together to form a rigid unit.”⁸ While Komendant addressed the viability of construction, his remarks suggested an increasingly important aspect of Habitat 67: in the popular, public display of constructability, the building process would be as important as the finished form itself, perhaps even more so.

The very ethos of Expo 67 was bound to the promotion of Habitat 67 as a *prototype*. As the CMHC president put it, the project “should be bold and imaginative, creating a construction which should lead to progressive steps toward the development of new ideas in the field of the residential building industry.”⁹ With even more emphasis, Robert Shaw, the Deputy Commissioner of the CCWE, considered Habitat to be “a meaningful symbol... the first such symbol since the Eiffel tower taught the world how to design and build sky scrapers in 1889.”¹⁰ Regardless of Shaw’s historical inaccuracy, if some elevated cultural status was actually granted by the didactic function of an innovative structural system, then this was further ensured by the promise of capital outlay existing outside marketplace demands.

“Habitat 67 is a prototype”, the Expo 67 Press Service would later announce, “and

⁸Safdie, Andrews et al., “Combined Report Covering the Schematic Design, Development and Economical Aspects of the Proposed Permanent Housing Exhibit Habitat 67”, n.p. Komendant insisted on the use of concrete over competing interests on steel or aluminium, especially since that metals requires “all the way moment connections, rather heavy sections (torsion) and columns (under each street) to transmit the vertical loads directly to the foundations.” See: Komendant, Letter to Moshe Safdie (April 11, 1964): 1, Box PF11, Folder 58/100/PF4/6, Moshe Safdie Archive, Canadian Architecture Collection, McGill University.

⁹ Stewart Bates quoted in A.A. Peters, “Economic Aspects” (October 2, 1964): 1, Box PF9, Folder 58/100/PF3/2, Moshe Safdie Archive, Canadian Architecture Collection, McGill University. Bates was President of CMHC.

¹⁰ R. F. Shaw, Letter to the Hon. Mitchell Sharp, Minister of Trade and Commerce (September 16, 1964): 1, Box PF9, Folder 58/100/PF3/2, Moshe Safdie Archive, Canadian Architecture Collection, McGill University. Shaw echoed the breathless assessment of *Time* magazine (June 19, 1964): “They call it ‘the soul, the genius’ of the Fair, and suggest that, as symbols go, it will make the Eiffel Tower seem a collection of girders leading up to a hot-dog stand.”

consequently the cost... is appreciably higher than once the system of fabrication is perfected".¹¹ The architects within the CCWE had similarly decided:

It has been suggested that an investment over and above the economic value of the Habitat 67 is unjustified when compared to directly subsidized low cost housing. The aims of two such projects are diametrically opposed....

Habitat 67 represents an experiment in housing. An experiment by its nature cannot justify financial support on the same terms as a proven answer to a specific problem as in the case of subsidized low cost housing. The potential benefits to be gained from the realization of Habitat are so far reaching as to be impossible to assess in terms of dollars. Any gain from subsidizing low cost housing is immediate in terms of social assistance but never produces a financial return.

Therefore,

Habitat 67 is conceived with basically three aims:

- a) to meet the challenge of urban housing in our expanding cities
- b) to research new construction methods and techniques for benefit to the entire building industry
- c) to demonstrate the catalytic ability of a new solution such as Habitat to revitalize the environment and influence urban development.¹²

Notwithstanding the argument for its "catalytic ability", the concept of Habitat had begun to shift largely along the lines of the latter two "aims": "Irrespective of the result of the Habitat social experiment", the CCWE concluded, "the construction industry will draw immense benefit from research into the new building methods and techniques explored."¹³

¹¹ Expo 67 Press Service, "Habitat Project Gets Green Light" (April 8, 1965): 2, Box PF9, Folder 58/100/PF3/16, Moshe Safdie Archive, Canadian Architecture Collection, McGill University.

¹² A.A. Peters, "Economic Aspects", 1. Peters's report was included as part of a package delivered to the Canadian Government in mid-October 1964, following a presentation by Safdie to Mitchell Sharp, who, as Minister of Trade and Commerce, was in charge of Expo 67.

¹³ Ibid. To Safdie, the housing project was nothing less than a "laboratory for building techniques" that enabled "the manufacturing and construction industry to explore new methods." The impression appeared shared by concrete industries around the world; see, for example: Silvano Raffo Pani, "Habitat 67 all Esposizione Universale di Montreal", *L'Industria Italiana del Cemento* (October 1967); "Habitat 67 – Hacia el

In a sense, this kept with a much longer march through the late nineteenth and twentieth centuries toward addressing the “housing question” by solving its technical means of production ahead of actual realisation.¹⁴ Indeed, the correspondence between industrial manufacture and housing stemmed from the need to design interchangeable parts – a precept of Fordism that had influenced the Modern Movement and had latent significance in Safdie’s ceaseless call throughout the 1960s: “We must adopt the manufacturing methods of automobiles, aircraft and appliances to building”.¹⁵ By doing so, it would be “possible to recover monies spent on research through the resultant opening of future markets.”¹⁶

Habitat 67 was no longer to be only a project of social engineering, regardless of the “hard”

Desarrollo de un Sistema Constructivo”, *Revista Instituto Mexicana del Cemento y del Concreto* (May 1967); “Habitat 67”, *Concrete Quarterly* (Cement and Concrete Association, London, July 1966). The Prestressed Concrete Institute, based in Chicago, would, as part of 1967 PCI Awards, grant “full recognition to Habitat 67 for its tremendous importance as a research experiment”; see: “Winners 1967 PCI Awards”, *Journal of the Prestressed Concrete Institute* (August 1967): 66-75.

¹⁴ If an indictment of the modern city lay in Friedrich Engels’s tirade against insalubrity (as witnessed in Manchester), then a certain solution was soon found in theories of management – whether of workers or materials – espoused by the likes of F.W. Taylor and Henry Ford. Technocratic control, the theory went, could supersede the divisiveness of politics and usher an age of mass production remedying even the most calamitous conditions of urban blight. This contributed to even more futuristic ideals, with a sense of technoscience as spurring utopia – notably captured in Thorstein Veblen’s idea of a “Soviet of Technicians”. Different tangents of the modern movement would be seduced by the ambitions of Taylorism. Le Corbusier responded favourably to Taylor’s vision of “Scientific Management” as panacea to reconstruction in France following the First World War; see: Mary McLeod, “Architecture or Revolution’: Taylorism, Technocracy, and Social Change”, *Art Journal* Vol. 43, No. 2 (Summer 1983): 132-147.

¹⁵ Moshe Safdie, “Why not Utopia?”, in *Proceedings: Symposium on Changing Concepts of Human Habitations* (Roorkee, India: Nem Chand & Bros, 1966): 10. A Canadian reprint of Safdie’s article changed the use of “adopt”: “We must *adapt* the manufacturing methods of automobiles, aircraft and appliances to building”; see: Safdie, “Why not Utopia? Part 2: Proposals and Requirements”, *Habitat* (Ottawa, September-December 1966): 7. In championing the production of the Habitat units in an on-site precasting plant, Safdie claimed: “You can make houses like you make refrigerators, and bring them off the assembly line at the rate of 10 a day”; see: Safdie, *Habitat* (Montreal: Tundra Books, 1967), 46.

¹⁶ Safdie, “Why not Utopia? Part 2: Proposals and Requirements”, 7.

data of demographics, settlement patterns, and metropolitan growth that it was ostensibly designed to address; rather, the quality of an “engineered” building itself, and its process of fabrication as a universalising principle, was now deemed as granting lasting societal value.

The privileged status of “experiment” or “research” and the consequent design of a “prototype” suggested a potential cleavage between the socio-technical project symbolised by Habitat 67 and the prevailing market conditions determining its realisation. By the mid-1960s, the Canadian government noted three impending and interrelated phenomena: the nation faced “an acute housing need”; “there has been a definite trend toward apartment living in Canada, which has been the chief market for industrialised building” elsewhere; and “North America is the only continent in the world where industrialised building has not been used to any extent yet”.¹⁷ These observations were the context of the *Report of the Canadian Technical Mission on Prefabricated Concrete Components in Industrialized Building in Europe* commissioned by the Materials Branch of the Department of Industry, a government ministry, in September 1966; in noted: “industrialised building in Canada for the housing market will have to be developed” by “a group that will have the ability to acquire land, develop it, and finance production facilities, and take care of subsequent erection and completion of buildings, along much the same lines as the conventional builders

¹⁷ P. Eugène Marchand, *Report of the Canadian Technical Mission on Prefabricated Concrete Components in Industrialized Building in Europe, September 2-22, 1966* (Ottawa: Materials Branch, Department of Industry, 1966), 26-27. The Canadian Department of Industry became deeply invested in exploring the rise of industrialised and how it could affect building practices in Canada. Marchand’s report was followed by two related studies: D.G. Laplante, *Report of the Canadian Technical Mission on Prefabricated Steel Components in Industrialized Building in Europe, June 1967* (Ottawa: Materials Branch, Department of Industry, 1967) and John A. Dawson, *Report of the Canadian Technical Mission on Prefabricated Structural Ceramics in Industrialized Building in Europe, May 20-June 8, 1966* (Ottawa: Materials Branch, Department of Industry, 1969).

and developers are doing now.”¹⁸ Expo 67 was precisely this kind of agency, a kind of para-governmental body that could both ensure proper zoning of land and raise adequate public awareness before building sufficient numbers of housing units. Yet the total cost of Habitat – based on “careful scrutiny of new construction methods and materials which will provide a substantial contribution to the housing market of the future”¹⁹ – was, with the tabling of the feasibility study, projected at \$42 million, with a \$22 million market value set by rents targeted to an “upper and middle income group”, thereby resulting in a \$20,000,000 million shortfall. To Safdie, this premium – which enabled the “new techniques” – “must be paid in the first application”.²⁰ In other words, *research* and *design* were to be ensured outside and ahead of any economic self-interest. “All of these costs will not be incurred after the method is applied in the future and perfected”, Safdie insisted while maintaining a typically prophetic tenor: “To build economically is a social and political aspect of our time”.²¹ The CCWE thus began trying to interest private industry “to participate in” – that is, to finance – “Habitat 67 for the purpose of developing new methods of construction and building

¹⁸ Marchand, *Report of the Canadian Technical Mission on Prefabricated Concrete Components in Industrialized Building in Europe, September 2-22, 1966*, 26-27.

¹⁹ Safdie, Andrews et al., “Combined Report Covering the Schematic Design, Development and Economical Aspects of the Proposed Permanent Housing Exhibit Habitat 67”, n.p.

²⁰ Moshe Safdie, “Revolution in Housing”, Lecture given at University of Western Ontario (January 16, 1965): 11, Box PF20, Folder 58/100/PF12/1, Moshe Safdie Archive, Canadian Architecture Collection, McGill University.

²¹ Ibid; Safdie, Andrews et al., “Combined Report Covering the Schematic Design, Development and Economical Aspects of the Proposed Permanent Housing Exhibit Habitat 67”, n.p. The demand – “to build economically” – was repeated *verbatim* but without attribution in several early appraisals by architectural magazines, notably *Architectural Design* (December 1964) and the *Architectural Association Journal* (July-August 1965).

materials.” The approach stemmed specifically from federal law granting corporations (pursuing legitimate “research”) a 150 percent tax deduction (in other words, a subsidy) for technical innovation. For Habitat, this was hopefully the provision of tooling-up and plant facilities.²² Consequently, in late May 1964, Safdie gave a slideshow to heads of industrial concerns meeting on Ile Sainte-Hélène and claimed: “We have evolved a mass production method in which assembly line techniques now commonly used in the aircraft or automobile industry are applied to construction generally, and to housing specifically. Habitat offers a setting for the Canadian building industry to exercise its ingenuity and skill.”²³ No mention was made of exactly which industries could participate on specific aspects of the project, but as newspapers quickly put it after Safdie’s pitch: “For Habitat 67 – so far – no takers.”²⁴ The Canadian government – the majority stakeholder in the fair – took a similar position. Several months after the CCWE presentation to industry, Safdie, backed by the Expo authorities, delivered a speech to the minister in charge of Expo 67 and claimed that the

²² Safdie’s belief in the state sponsorship of architectural “research” grew out of his CMHC-sponsored student travel, after which he concluded that “it is felt by many in the building industry that the initiative must come from governments who must set up a series of pilot projects and studies (by universities) that would be picked up by the industry.” In the Canadian context, “it would be advisable if the various ‘atelier’” in CMHC “undertook experimental projects periodically.” See: Safdie, *Housing in North America – 1960*, Report submitted to the Central Mortgage and Housing Corporation (1960), 22, 37.

²³ “Presentation of Habitat 67 by Mr Moshe Safdie, Commissioned Architect of the Building, to Member Attending Symposium at St Helen’s Island, May 29, 1964”, Canadian Corporation for the World Exhibition Fonds, RG71, Vol. 445, Library and Archives Canada, Ottawa. According to local reports, the event was “a sneak preview of a unique model community” for “some 200 leading Canadian businessmen”. See: Hans Grottke, “Model Community Previewed”, *The Montreal Gazette* (May 30, 1964).

²⁴ Lee Belland, “Expo’s ‘Hanging’ apartments, costly exhibits”, *Toronto Daily Star* (June 2, 1964). The article stated that Habitat “is not considered in the private sector but officials would like to see it built by private effort.”

“excess costs” of the pyramid scheme were “due to the proto-type nature of project.”²⁵ Two months later, the government categorically refused to allow financing by a tax deduction for research, worried that this would set an unacceptable precedent enabling builders to claim exemptions from things like building codes; instead, it offered a total package of \$11.5 million dollars.²⁶ The new budget resulted in crucial changes to Habitat 67: a greatly diminished version of the project, the elimination of the Man in the City exhibition (it would soon have its own theme pavilion designed by Arthur Erickson), and the fact that the CCWE would not only undertake construction but own outright the project. In late 1964, only six months before the foreseen driving of foundation piles, and facing new budgetary limits, Habitat 67 began to be entirely rethought.

Obligated drastically to reduce the project, Safdie redesigned Habitat between November 1964 and April 1965. This became the scheme as realised (fig. 6.3). Two important changes ensued: a repositioning on the site and, far more significantly, an entirely

²⁵ Moshe Safdie, “Habitat 67 Introduction” (September 5, 1964), Box PF9, Folder 58/100/PF3/2, Moshe Safdie Archive, Canadian Architecture Collection, McGill University. Safdie argued for covering construction costs by “donations from industry”, the “classification of the project as research”, and “various forms of depreciation”. Among the important mentions of Habitat 67 as “prototype” was a letter by Robert Shaw, Deputy Commissioner of Expo 67, to Mitchell Sharp, the Canadian Minister of Trade and Commerce and the government appointee in charge of the fair. Shaw accounted for the “excess costs” of Habitat “over economic value” due to “the fact that this is a prototype”; written one day after Safdie’s presentation to Sharp and other ministers, Shaw’s letter reproduced the architect’s reasons. See: R. F. Shaw, Letter to the Hon. Mitchell Sharp (September 16, 1964): 3, Box PF9, Folder 58/100/PF3/2, Moshe Safdie Archive, Canadian Architecture Collection, McGill University.

²⁶ Safdie, *Beyond Habitat*, 88-90. Safdie recounts that a handful of large industrial concerns were interested in financing the original version of Habitat 67 but only if they could exploit a formula similar to that for underwriting ship-building in Canada, which allowed corporations to build ships, sell them on the international market, and claim the difference as a tax write-off. The Government ultimately decided not to make an exemption for Habitat on these terms.

new form. Tellingly, the Expo authorities would now call it “Habitat 67 – Phase 1”.²⁷ The winnowing mandate was to be compensated by a future completion.

Safdie shifted the entire ensemble to the tip of Mackay Pier. Views were afforded over the St Lawrence River or towards the city skyline. Instead of the sheltered “meeting place” of the first proposal, Habitat now rested on a continuous raised podium for unimpeded pedestrian circulation and open to the elements. Underneath this “public space” was an entirely separate level for service roads and parking facilities.²⁸ This followed a long-held modernist belief: that *circulation* – here premised on the elevated “horizontal street” – could both liberate people from machines – literally, by lifting them above world – and unite them in the experience of a newly ordered city. The first efforts on the master plan by Safdie, Adèle Naudé, and others were couched in this logic. Nevertheless, this was the final obviation of Man in the City – the fairgoer was no longer promised the experience of a full “integration” of social and technical systems, whether schools or transit lines, inside the pavilion-cum-city.

The winnowing of budget brought a shrinking of architecture. Gone were the inclined rhomboid “membranes” and the A-frame supports. Instead, 354 precast concrete modular units, each measuring 17½ by 38½ by 10 feet (roughly a 1:2:4 proportion) and

²⁷ As a critique following the opening of Expo 67 noted, the revised Habitat plan “has been named Phase 1 of what is hoped to be a total involvement of building and planning in a modern society.” See: Hans Elte, “Habitat 67: The Critical Eye 2”, *Canadian Architect* (October 1967): 36.

²⁸ Safdie continued referring to the pedestrian podium as a “public space” well after Expo 67 – even when photographs showed very little evidence of fledgling social life. See: Moshe Safdie, *For Everyone a Garden* (Cambridge MA: The MIT Press, 1974): 70-71.

weighing 70 to 90 tons, were arranged to produce a twelve-storey structure with fifteen different house types of one- to four-bedrooms, comprising 158 dwellings, some on multiple levels (fig. 6.4). Three vertical cores contained elevators stopping every four floors at a horizontal “pedestrian street” giving access to residences as well as carrying mechanical services. Like Komendant’s first scheme, the new project was also a “three-dimensional space structure”. The units were load-bearing, connected to one another by bolting and post-tensioning; a portion of the loads was transferred to the horizontal streets, which were in effect ten-foot high girders, and down along the vertical cores. All elements – the cores, walkways, and units – were to be precast. The placement of the vertical post-tension cables at midpoint and slightly inboard of the end of the exterior walls of each unit enabled their stacking at right angles (fig. 6.5).²⁹ The resulting cantilever provided a roof garden above the adjacent apartment. The units were organised symmetrically about the vertical cores, resulting in ziggurat profiles. Yet viewed obliquely, as most visitors finally saw it, Habitat 67 would exhibit a crenulated, almost haphazard massing, redolent of the vernacular types admired by Safdie. Here were, it was hoped, the ultimate aesthetics and technics of the sought-after “cluster” geometry.

ECONOMIES

²⁹ To allow stacked boxes, all bearing points were provided with steel plates and neoprene pads. The concrete units were cast with lower and upper beams.

The construction drawings for Habitat 67 were completed by April 1965. “Habitat Project Gets Green Light”, the Expo Press Service declared, marking the completion of almost 250 architectural working drawings.³⁰ The CCWE made the call for tender.

While Habitat 67 was substantially reduced, the CCWE promised that there was room to grow. Its Press Service announced: “Habitat – Phase 1 forms but a portion of the originally conceived development. Not all the community facilities provided for in the original concept will be built by 1967, but it is planned that these would be added as Mackay Pier is developed in the future.”³¹ Among Safdie’s early successes was convincing the City of Montreal to rezone Mackay Pier from industrial to residential and commercial use, a manoeuver tied to the belief that the housing would continue to expand along with new and growing services. Even during construction, Safdie would carry on designing social programmes for the future complex, including a commercial centre located at the southern edge of the site “to become a link with future Habitats.”³² Extending the pedestrian podium,

³⁰ Expo 67 Press Service, “Habitat Project Gets Green Light” (April 8, 1965), 2. “There were two hundred and fifty architectural working drawings in the final set”, Safdie would note, and “at least an equal number of structural, mechanical, and electrical construction drawings; thousands of shop drawings; innumerable design sketches and studies.” See: Safdie, *Beyond Habitat*, 97. Safdie’s associated architects were the Montreal firm David, Barott, Boulva.

The tendering process for Habitat 67 was unique. Complete working drawings were not given to contractors. Instead, Safdie’s team relied on general drawings and specifications that “outlined in broad terms the requirements of the design and called for proposals which were to be technically developed in collaboration with the design team. A budget was established on the basis of conventional equipment and industry was encouraged to participate in the cost of development of new products.” After sending the project to bid, Safdie felt assured that “Habitat 67 is proving to be a research project”. See: Safdie, “Habitat 67”, *Habitat* (Ottawa, September-December 1965): 4-5.

³¹ Expo 67 Press Service, “Expo 67 to Build Habitat” (April 8, 1965): n.p., Box PF9, Folder 58/100/PF3/16, Moshe Safdie Archive, Canadian Architecture Collection, McGill University.

³² Safdie, *For Everyone a Garden*, 82.

the centre was composed of units similar to the housing modules “making it possible to construct it with the output of the Habitat factory”.³³) Stacked in like fashion but only up to two storeys, and with modified roofs that appeared to open while lifting a glazed canopy that served as the shop façade, the overall impression was that of a *zouk* (fig. 6.6). Unlike the heavier masses of the Habitat housing cells, with their punched openings, the commercial centre gave the impression of a lightweight system – an effect accentuated by the controlled thinness of the cardboard and acrylic models. The scheme remained unrealised. After Expo, Habitat was given a convenience store in the garage.

For the CCWE, the very look of Habitat 67 conferred cultural value. Meeting in late autumn 1965, the Expo 67 Advisory Committee on Architecture “unanimously agreed” that “the project Habitat should be better explained to the public and that an elaborated presentation should be prepared in order that the said project be fully understood in depth.” The CCWE Public Relations branch started to enlist the committee architects to act as “Friends of Expo” and to deliver a stock speech, accompanied by slides, in “every nook and cranny in Canada” and “major American centres” to “get EXPO’s message across”.³⁴ Habitat would be promoted as “probably the most ambitious single exhibit in the whole exhibition” – a status resting on the belief that “new building techniques may be developed from the

³³ Ibid. The idea of manufacturing the commercial centre in the on-site factory underscored Safdie’s belief in mass production, especially given its two typical constraints: first, components must be utilisable for buildings with different functions – hence Safdie’s idea that the basic unit could be modified for the proposed commercial centre; second, components must serve various purposes – for example, as both wall and roof.

³⁴ Patrick MacAdam, Canadian Corporation for the 1967 World Exhibition Public Relations Branch, Letter to John C. Parkin, Chairman, Advisory Committee on Architecture (June 15, 1966), Box 18-97-009, John Parkin Archive, Canadian Centre for Architecture, Montreal.

construction of this complex and lead to the saving of manpower in the future.”³⁵ Technics now began to take on a properly social vocation: on the one hand, the forming of popular taste, within the spectacle of a world’s fair, for industrialised building; on the other hand, a long-term project for reshaping industrial relations in capitalist society. This also had aesthetic contour: soon after the completion of the original Habitat pyramidal scheme, the CCWE had begun anticipating the lasting cultural value of Expo 67 in the appearance of “Cellular Construction”. As announced in *Expo Digest*, its public bulletin:

According to Edouard Fiset, Expo 67’s chief architect, the World Exhibition will be an opportunity to present a “new direction” to the architects of the world.

The new departure being used at Expo is “cellular” construction instead of mass construction of the past.

For example, the building that will house Expo displays will be flexible because cellular design allows expansion or reduction as the need presents itself.

There’s Habitat 67. It will be built on a relatively small area; elements will be superimposed to form a pyramid.

“This way of building, be the addition of new cells, will have repercussions throughout the whole world,” explains Mr. Fiset.³⁶

While suggesting an architectural *zeitgeist* at the world’s fair, the “cellular” demand allowed Safdie and the CCWE to see his work in more comparative and global terms. At the behest of the CCWE, as well as in his increasingly celebrated role as author of the coming housing “prototype”, Safdie began to elaborate theories on “cellular construction”. Even before the actual construction of Habitat 67, Safdie visited the Soviet Union to observe advances in large-scale prefabricated housing. In December 1965, at the invitation of the National

³⁵ “Basic Expo Speech” (May 10, 1966), Box 18-97-009, John Parkin Archive, Canadian Centre for Architecture, Montreal.

³⁶ “‘Cellular’ Construction”, *Expo Digest*, Vol. 1, No. 20 (November 18, 1964): 1-2.

Building Research Council Institute of India, he travelled to the northern Indian city of Roorkee and attended a symposium on *Changing Concepts of Human Habitations*.³⁷ Notwithstanding the conference title, and despite his work, Safdie spoke little on the question of housing. Instead, he began to elaborate a theory on design that sought, above all, to eliminate what he dismissed as the “arbitrary” in built form – a view that underpinned the entire social and technological project for Habitat.

Ostensibly in India to present Habitat 67, Safdie devoted the bulk of his paper to a more theoretical definition of the dwelling unit, or “cell” or “box”. He spoke to a largely Indian audience with a smattering of international attendees.³⁸ Safdie titled his paper “Why Not Utopia”, a place and concept he described vaguely but sentimentally in an associated

³⁷ A leading Montreal newspaper reported: “the brilliant, creative design of Habitat caught the imagination of foreigners everywhere, especially in countries with serious over-population problems.... Some countries are not willing to wait until Habitat has been built, tried and proven before investigating the concept it embodies. In December 1965, at the invitation of the Indian government” Safdie went to Roorkee “to present a paper on his project.... ‘They’re interested in having me come back to do a prototype of Habitat adapted to Indian conditions once we are finished at Expo,’ he said.” See: “Habitat Plan Evokes Controversy”, *The Montreal Star* (May 29, 1966): 32.

Soon described his Soviet Union trip in an interview soon after completing Habitat 67; see: Safdie, “Last Part of Second Session”, Interview Transcript (March 6, 1968): 18-19, Box PF22, Moshe Safdie Archive, Canadian Architecture Collection, McGill University. Later he remarked: “We may dislike what the Russians are building in Moscow, but it’s foolish simply to dismiss it all, as professional critics do; these suburbs are, in fact, a realistic expression of what our present system for building housing is able to produce”; see: Safdie, *For Everyone a Garden*, 3. Safdie’s experience was not exclusive: the Canadian building industry was aware of Soviet advances in prefabricated concrete construction in the 1960s. For example, when the trade journal *Canadian Pit and Quarterly* featured the early construction stages of Habitat 67, it reminded its readers in a prefatory note: “In the April and May issues of CPQ we described the assembly-line methods used to build apartments from precast concrete units in Russia. At the same time our Canadian building industry started the construction of an apartment project, which can be justly called the most advanced application of precast components in the world: ‘Habitat 67’.” See: “Habitat 67, the Ultimate in Precast Concrete Construction”, *Canadian Pit and Quarterly* (July 1966): 32.

³⁸ Among the notable international attendees was the town planner Constantin Doxiadis, whose notion on “ekistics” as the “science of human settlements” was gaining currency in the 1960s. Safdie had cribbed Doxiadis’s diagrams on “growth” when first publishing his student thesis; see: Safdie, “The Master Plan: Growth, Change, and Repetition”, *Habitat* (Ottawa, May-June, 1962): 4.

view of “The Meeting Place” as sketched for the original Habitat project: “a city which allows man to enjoy all the extremes, from open space and wilderness to the intense enclosure and urbanity of the market and the meeting place; from the privacy of and seclusion of his house to the excitement and intercourse of the public place”.³⁹ Despite the suggestion of a talk on urbanism, Safdie turned instead to defining “Modular Housing Systems”:

In the past, we have been concerned with the design of “independent units” whether in rural or urban construction.... Our problem today is the grouping of elements, wholly or partially dependent on each other. The process of design must change to accommodate this. The design of dependent elements in groups is the design of building systems, the organization of units in groups in which the relationship to each other is as significant as the design of the unit itself.⁴⁰

Safdie presented diagrams of various “clusters” designed “to absorb light”, “to shade each other”, “to absorb breezes”, and finally to “create a micro-climate” – the latter effectively a city – produced “in such a way that each [unit] finds its best place within the three dimensional whole” (fig. 6.7).⁴¹ The sketches illustrated what he importantly termed “fitness of form”: “The keyword for the architect today is not freedom but dependency”; the architect should, therefore, strive “to reduce the arbitrariness of the building form in

³⁹ Safdie, “Why not Utopia? Part 2: Proposals and Requirements”, 2. Safdie also reiterated previous statements on demographic and urban growth in Canada, described his ideas about “Growth and Change in the Master Plan”, and decided that the only viable solution for modern urbanism was to plan comprehensively at the scale of the region – in short, his ongoing claims for “integration”.

⁴⁰ Safdie, “Why not Utopia?”, 6.

⁴¹ Ibid., 7, 8. Safdie continued to use these diagrams well after their initial formulation; they appeared, for example, on the cover of the Quebec architecture journal *Architecture Concept* (October 1974).

fulfilling its function as perfectly as possible”.⁴² Whether showing his Indian hosts A Case for City Living, the first pyramidal plans of the housing exhibit, or the ultimate design for Habitat 67, Safdie’s plans, sections, and model photographs served to emphasise the “organization of units”.

Against this architectural work, Safdie juxtaposed images from an entirely different realm. Taken from the natural sciences, they showed, among other things, a Nautilus shell, an oak leaf, and the links of a molecular chain (fig. 6.8). To Safdie, the figures spoke of “gnomic” or “additive” growth. Safdie had previously used “gnomic growth” to characterise the urban patterns of 1962 competition project for Tel Aviv that he had designed with the architect Anne Tyng while they worked in Louis Kahn’s office. Tyng had been instrumental to an especially experimental phase in Kahn’s output during the 1950s, introducing him to Buckminster Fuller’s geodesics and other experimental structures, and decisively shaping the remarkable City Tower, a proposed city hall included in Kahn’s unrealised Philadelphia civic centre designs.⁴³ The tower was a triangulated strut frame of precast and pre-stressed concrete, with a plan shaped as three combined hexagons and each level shifted so that no two adjacent floors aligned. Under Tyng’s influence, Safdie was introduced “to a book she called her bible” – the zoologist D’Arcy Wentworth Thompson’s book *On Growth and Form*, originally published in 1917 but subsequently issued as a revised edition in 1942, thus influencing postwar architectural circles. “I consumed it”, Safdie admitted. “It was through

⁴² Safdie, “Why not Utopia?”, 9.

⁴³ Tyng’s thinking on experimental structures led, for example, to the tetrahedral concrete floor slabs of Kahn’s Yale Art Gallery of 1953.

D’Arcy Thompson that I started understanding the nature of form.”⁴⁴ Attempting “to invoke the aid of the physical and mathematical sciences” to the study of natural history, Thompson’s contribution lay in the correlation of biological forms and mechanical phenomena.⁴⁵ In describing the shapes of living organisms by the physical forces that act upon them, he made unique contributions to the study of topology. While considering the outward appearance of “organic Form”, he also looked into the deepest structure of things to note the formations and symmetries exhibited in cells and crystals at the molecular level (a task likely aided by the use of the electron microscope in the 1930s).⁴⁶ Written with literary acumen, *On Growth and Form* was more a treatise than a book of empirically verifiable truths (“for indeed it is ‘all preface’ from beginning to end”, he admitted prefatorily). Above all, he aimed to marry “descriptive” and “analytical” approaches to the “Comparison of Related Forms”, a task undertaken by including drawings, diagrams, and photographs – in short, a *visual* if not outright aesthetic explication of formal transformations that made the work all the more palatable to architectural tastes (fig. 6.9).⁴⁷ Indeed, the appropriation of

⁴⁴ Safdie, *Beyond Habitat*, 145.

⁴⁵ D’Arcy Wentworth Thompson, *On Growth and Form* (New York: The Macmillan Company, 1942), 2.

⁴⁶ Thompson’s sense of a decidedly “modern” view of the penetration into things was appeared in his addition of stroboscopic photographs of milk splashes by Harold E. Edgerton of MIT to the 1942 edition of *On Growth and Form*.

⁴⁷ Thompson, *On Growth and Form*, 1026. The need for bio-structural analogies, as borrowed by postwar architects from Thompson, had long been part of the modernist imagination. As Robert Maxwell notes of England during the rise of the modern movement: “For the generation of young architects that were taking part in this search” – that is, the search for “hybrids”, of culture and technology, or of the “new and the old” – “after the first world war there was one source that seemed utterly convincing: the book by D’Arcy Thompson, *On Growth and Form*, of 1917. Leslie Martin, former head of the Architecture School of Cambridge University, told me that this book was viewed as gospel in his group – the group that went on to publish *Circle* in 1937.” See: Maxwell, *Sweet Disorder and the Carefully Careless: Theory and Criticism in Architecture* (New York:

Thompson in aesthetic discourse was assured by the notable exhibition *Growth and Form*, which opened in July 1951 at the Institute of Contemporary Art in London. Organised and designed by the artist Richard Hamilton, soon to become a member of the Independent Group, the show presented photographs, models, and films of non-art objects: enlarged x-rays of the human body, images of animal and insect musculature and tissue, models of tensile structures, all arranged as elements floating in a thin lattice frame as well as projected on the walls (fig. 6.10).⁴⁸ “The great charm” of the exhibition, *The Architectural Review*

Princeton Architectural Press, 1993), 291-292. *Circle*, an important compendium of European avant-garde practices for British readers, concluded with an image of the *Victoria regia* water lily cleverly juxtaposed with the radiating concrete structure of the architect Matté Trucco’s Fiat factory of 1923. Earlier, Joseph Paxton had apparently based the structural design of the Crystal Palace on the form of the *Victoria regia*, for which he had designed a hothouse in Chatsworth, completed in 1850.

The aesthetic dimension of Thompson’s work was central to his biological investigations. The lessons of aesthetic experience as a method to examine the matter of natural things decisively influenced Thompson’s work and, later, the Theoretical Biology Club founded at Cambridge University in the 1930s, and which included Conrad Waddington and Lancelot Law Whyte as members. Both men contributed to the postwar culture of interfaces between art and science. Just as these scientists took from aesthetics in the late-nineteenth and early-twentieth centuries, the postwar appreciation of Thompson and others reversed the trend, with architects turning to the visualisation of scientific examples as holding fundamental truths on design. See: Donna Haraway, *Crystals, Fabrics, and Fields: Metaphors of Organicism in Twentieth-Century Developmental Biology* (New Haven and London: Yale University Press, 1976). Whyte edited *Aspects of Form: a Symposium on Form and Nature*, a 1951 book that united artists and scientists on considerations of bio-mechanical aesthetics. Whyte’s book influenced Safdie: “In the world of dual thinking where good opposes evil, we tended to think of design concepts also in terms of dualities: uniformity versus randomness, rigidity versus looseness, regular versus irregular. But these dualities contradict all natural organisms and systems. They are, as Lancelot Whyte put it, in contradiction with unitary thinking. In the world of unitary thinking, we can think of the design of an object or organism simultaneously in terms of repetition and variation, system and variety, standardisation and rhythm, conformity and identity.” See: Safdie, “On from Habitat”, *Design* 226 (October 1967): 45.

⁴⁸ The idea of the exhibition was originally floated by Hamilton, the photographer Nigel Henderson, and the artist Eduardo Paolozzi. All were original members of the Independent Group, which dedicated itself to introducing ideas of mass culture (through, for example, “as found” objects) to modernism. Hamilton admitted discovering *On Growth and Form* through Henderson. Significantly, Hamilton recalled: “Sigfried Giedion’s *Mechanization Takes Command* became a primary source book immediately after its publication in 1948. It was particularly significant for me in that it complemented *On Growth and Form*, which deals with the natural world in just the wide-ranging manner of Giedion’s perception of technological form and process.” See: Richard Hamilton, *Collected Words 1953-1982* (London: Thames and Hudson, 1982), 10-12. At the opening of *Growth and Form*, which coincided with the convening of the eighth CIAM congress just north of London in the suburban village of Hoddesdon on July 7-14, 1951, Le Corbusier declared: “The authors of this

noted, “was that the eye might enjoy itself without having to call in the intellect to help it make qualitative judgements”.⁴⁹ Coincidentally in the very same year as *Growth and Form*, the artist Gyorgy Kepes, whose discourse on “pattern seeing” was influencing architects in the 1960s, had organised *The New Landscape*, an exhibition of scientific photography held at MIT, where he was based. Kepes’s display was not unlike that by Hamilton, with magnified images of natural phenomena mounted on grid made of extremely fine struts so as to appear hovering thus removed from any context. The effect was to immerse the visitor within this “landscape”, thereby amplifying the visual experience of objects that were to serve as gestalt entities for designers.

While Hamilton’s *Growth and Form* bore the telling subtitle “The Development of Natural Shapes and Structures”, it was through the book *Aspects of Form: a Symposium on Form and Nature*, which appeared immediately after the exhibition, that the “qualitative” lessons of Thompson began penetrating art and architecture. Edited by Lancelot Law Whyte, a Scottish financier, engineer, and commentator on science, *Aspects of Form* resulted from a colloquium held in September 1951, two months after *Growth and Form* closed. It brought together mainly scientists (including biologists, crystallographers, and geneticists) but also the Gestalt psychologist Rudolf Arnheim and the art historian E.H. Gombrich to explore the “different aspects of *spatial form*, including both *external form* or visible shape,

exhibition are people who have observed, who are sensitive and who are poets.... The exhibition has moved me very deeply, for I found in it a unity of thought which gave me great pleasure.” See: Le Corbusier, Speech given at the opening of *Growth and Form* (July 3, 1951), in David Robbins, ed., *The Independent Group: Postwar Britain and the Aesthetics of Plenty* (Cambridge MA: The MIT Press, 1990), 17.

⁴⁹ “Exhibitions”, *The Architectural Review* (October 1951): 273.

and *internal form* or structure, as well as *transformation*".⁵⁰ "Our theme", Whyte emphasised, "is thus the *realisation of unity of spatial form in the complex processes of physics, biology, psychology, and art.*"⁵¹ Tyng acquired a copy of *Aspects of Form* as soon as it was available in the United States in the early 1950s.⁵² Given Safdie's introduction to Thompson's ideas by Tyng, he likely discovered Whyte through her as well. Safdie admired

⁵⁰ Arnheim became one of Kepes's many interlocutors on *The New Landscape*. For the influence of Gestalt psychology on Kepes, see: Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge MA: The MIT Press, 2003), 51-52. Kepes's search for an aesthetic correspondence between art and science appeared in his artistic work. As Phillip Ritterbush observes, "Gyorgy Kepes is well known for his attempts to reproduce organic form by manipulating the emulsion of photographic plates" – efforts early published in *Arts & Architecture* (August 1946, July 1948, and August 1948). See: Ritterbush, *The Art of Organic Forms* (Washington D.C.: Smithsonian Institution Press, 1968), 74-75. Kepes's "pattern-seeing" found parallels in remarks made by Herbert Read, the director of the Institute of Contemporary Arts, where *Growth and Form* was installed. Read noted "the revelation that perception itself is essentially a pattern-selecting and pattern-making function (a Gestalt formation)", thus bringing "works of art and natural phenomena on to an identical plane of inquiry." See: Read, "Preface", Lancelet Law Whyte, ed., *Aspects of Form: A Symposium on Form in Nature and Art* (New York: Pellegrini & Cudahy, 1951), n.p. Read's emphasis on perception was symptomatic of postwar culture: as Adrian Forty notes, in the "post-1945 era, interest in 'order' has shifted to the psychology of perception, to the study of human perception as the key to order in the world of artefacts" – for example, the basis of Kepes's MIT colleague Kevin Lynch's "analysis of the order of cities", which strongly marked thinking on the Expo 67 master plan, "was not the cities themselves, but the perceptual apparatus through which people knew them." See: Forty, *Words and Buildings: A Vocabulary of Modern Architecture* (London: Thames & Hudson, 2000), 241.

⁵¹ Whyte, "Introduction", *Aspects of Form: A Symposium on Form in Nature and Art*, 2. Among the contributors to *Aspects of Form* were the scientists Conrad Waddington and Joseph Needham, both of whom were Whyte's colleagues in the Theoretical Biology Club formed at Cambridge University in the 1930s. As Reinhold Martin observes, Kepes had met Waddington and Needham in London in the 1930s and was deeply influenced by their theories. Moreover, both Sigfried Giedion and Walter Gropius would, when corresponding with Kepes about his project, refer to Whyte's *Aspects of Form* as an important source. Kepes eventually included statements by Giedion and Gropius in his book *The New Landscape in Art and Science* (1956). See: Martin, *The Organizational Complex: Architecture, Media, and Corporate Space*, 70-71. Waddington later became a kind of futurologist. In his last book *The Man-Made Future* (London: Palgrave Macmillan, 1978), he prognosticated on "Population", "Food", the "Controlling Nature of Man", along with other themes including a chapter on "Urbanisation" that concluded in a brief overview of "Specialised Cities" and listed Habitat 67 under the heading "Super Beehive Cities" (the other example was Paolo Soleri's Arcosanti in Arizona). The other "specialised cities" were "Cities with Climate Control" (including Montreal's "underground city") and "Ocean Cities" (illustrated by Kenzo Tange's Tokyo Bay project of 1960). Waddington accompanied the description of Habitat 67 with his own photograph.

⁵² Sarah Goldhagen, *Louis Kahn's Situated Modernism* (New Haven and London: Yale University Press, 2001): 234n27.

the diverse collection of contributors to *Aspects of Form*. Marked by Whyte's approach, Safdie would, well after the completion of Habitat, continue to call for the recognition of "a certain unity in nature and in human energy": in the coming "era of greater integration of human thought", the "concept of the artist – the man who... makes objects of art for others – must become much less important in our life. Our furniture, our cars, made so that they are more meaningful in our lives, will become our art."⁵³ To this unification of art and life, via machined consumer objects, Safdie may well have added "building", which was, by the time of the Roorkee paper, his preferred euphemism for "architecture".⁵⁴ Later, like many others in the 1960s, he would replace both terms by *environment*.

Safdie was deeply indebted to Thompson when using bio-organic imagery as a conceptual apparatus for architectural form. He tied examples culled from the natural world (in the vein of Thompson) to a larger social need for "Economy", the achievement of which, in buildings, was "a moral obligation of our time":

Economy is achieved by using the most readily available material to enclose the most space, and using the least labour, i.e. process. The exploration of the efficient form means the exploration of those geometries which most readily achieve structural stability with the least material, and those systems of "space packing", or the subdivision of space which most efficiently serves the requirements we are providing.

⁵³ Safdie, *Beyond Habitat*, 171-172. When describing Whyte's thought, Safdie wrote: "For the first time since the Renaissance, and probably under the influence of Eastern thinking, we are coming to believe that there isn't a dual world of so-called science and so-called art and humanities.... In his *Aspects of Form*, twelve different people, an astronomer, a chemist, and a physicist among them, talk about form in their own disciplines, and discover there is a unity to it all."

⁵⁴ Schools of architecture, Safdie argued, "do not communicate to the student that he is first and foremost a builder and that in the realization of building he is dependent on a team"; consequently, "we must reorganize the education of the 'environmental designer'". See: Safdie, "Why not Utopia?", 11. Safdie's description was symptomatic of the 1960s, when architecture schools were often rechristened – for example the College of Environmental Design at Berkeley, renamed in 1959.

The wing of a vulture is made up of a three-dimensional network of thin bone giving maximum strength with minimum material; the beehive cell gives the maximum storage space for the minimum wax. In the construction of the environment, we must explore the geometries, the systems of construction which achieve the most with the least.⁵⁵

Safdie borrowed openly from Thompson, who had illustrated *On Growth and Form* with images of a honeycomb and the metacarpal bone of a vulture's wing. Thompson thought the vulture's wing bone akin to a Warren truss (in which parallel horizontal chords were connected only by diagonal bracing members).⁵⁶ While obviously sympathetic to this suggestion of "systems of construction", Safdie was not only interested in the qualities of lightweight construction *per se* but sought a way to produce buildings exhibiting the very "economy" of space and material suggested by Thompson's examples. Safdie's invocation of "systems of 'space packing'" thus drew on a further source in *On Growth and Form*: an

⁵⁵ Safdie, "Why not Utopia?", 9. While providing a largely technical reading of "economy" at Roorkee, Safdie began, likely with the authority granted by completing Habitat, to describe the concept in slightly more humanistic terms: "The architect cannot live out of the political reality of his time. For the first time in history, we accept that everyone has the right to economic and social privileges – not only in our own community, but universally. To the architect, this means that Economy is a moral obligation!" See: Safdie, "Habitat 67" (September-December 1967), 6.

⁵⁶ Thompson found the vulture's metacarpal bone superior to the Warren truss: "In all the mechanical side of anatomy nothing can be more beautiful than the construction of a vulture's metacarpal bone.... The engineer sees in it a perfect Warren truss, just such a one as is often used for a main rib in an aeroplane. Not only so, but the bone is better than the truss; for the engineer has to be content to set his V-shaped struts all in one place, while in the bone they are put, with obvious inimitable advantage, in a three-dimensional configuration." See: Thompson, *On Growth and Form* (New York: The Macmillan Company, 1942), 981. In his contribution to *Aspects of Form*, the biologist Conrad Waddington, Whyte's colleague in the Theoretical Biology Club at Cambridge University during the 1930s, juxtaposed Thompson's photograph of the vulture wing with a drawing of the radiolarian *Aulonia Hexagona* (which had been beautifully drawn by the German biologist and philosopher Ernst Haeckel, whose book *Kunstformen der Natur* appeared between 1899 and 1904 and, with its visual emphasis on symmetry and organisation in natural forms, became a source for space frames enthusiasts). Louis Kahn kept a slide of Waddington's paired images in his personal collection. The impact of Thompson's imagery on postwar discourses on lightweight construction, particularly space frames, was evinced in Anne Tyng's work. For a discussion of these exchanges, as well as a reproduction of Kahn's slide, see: Goldhagen, *Louis Kahn's Situated Modernism*, 68ff.

illustration of a “14-hedra” that, Thompson argued, demonstrably revealed the idea of “close-packing”: “by means of an assemblage of these fourteen-sided figures... space is filled and homogenously partitioned – into equal, similar and similarly situated cells – with an economy of surface in relation to volume”.⁵⁷ Safdie responded to Thompson in presenting Urban System 1965, a hypothetical housing project made of interlocking hexagonal units (fig. 6.11). Close-packing is, typically, the elimination of air between adjacent solid bodies; the Urban System exhibited this in its polyhedral forms. The extended corollary of “economy” here meant a consistent reduction of means – the “geometry has been modified to achieve a more efficient transmission of stresses”; the “proportions have been modified to achieve a more efficient organization of dwelling with very limited circulation space”; the “exterior surface has been reduced” – to arrive at “a more complex module of a basic shell”.⁵⁸ Safdie tied this, in turn, to what he called “The Structure of Numbers”: “In nature a single element combined within an order results in a variety of hundreds of permutations and combinations” – a view illustrated by the unit combinations of A Case for City Living that indicated, once again, “variety within a single building system”.⁵⁹ In architectural terms, this

⁵⁷ Thompson, *On Growth and Form*, 551. Thompson’s description was also taken up by Anne Tyng, who wrote in 1965: “From a comprehension of the geometries of close-packing may be developed forms which are most effective in creating spaciousness where populations are dense” (a synthetic description of Safdie’s future interests by the mid-1960s). See: Anne Tyng, quoted in David B. Brownlee and David G. DeLong, *Louis I. Kahn: In the Realm of Architecture* (New York: Rizzoli, 1991), 61. As Brownlee and DeLong note, Tyng made her remarks while applying for a grant to complete a book tentatively titled *Anatomy of Form*.

⁵⁸ Safdie, “Why not Utopia?”, 15.

⁵⁹ *Ibid.*, 10. The discourse on “the structure of numbers” echoed Aldo van Eyck’s own concept of “aesthetics of numbers”. Safdie both followed and departed from van Eyck. On the one hand, the “structure of numbers” expressed, as Safdie explained in terms of the Habitat unit combinations, the rule of “nature” where “a single element combined within an order results in a variety of hundreds of permutations and combinations”. On the

meant maintaining an evident reciprocity between part and whole in the overall composition.

The conceptual conjunction of part and whole underpinned Safdie's entire approach to Habitat 67. While Whyte had called for "unity" in "spatial form", as discovered across artistic and scientific disciplines, he had also explained that "recent Western culture, say 1910 to date" – in other words, modernism – was irrefutably marked by a "concern with *elementals*" – that is, "basic particles, the protein or organisms", and even "geometrical elements in art and architecture"; this breaking down of wholes (via visualised correspondences between art and biology in efforts such as *The New Landscape and Growth and Form*) was now to be accompanied by "a *universal process of ordering*" resulting from an inevitable but healthy "*clash* between contrasted forms".⁶⁰ As much as this suggested a sense of aesthetics, the very idea of "contrast" implied the evolutionary rhetoric of *improvement*.

other hand, the "structure of numbers" is "not limited to the combination of a single repetitive element" – in other words, not in terms of van Eyck's Amsterdam Orphanage – but "to the combination of several different elements of different size which are related to each other through geometric order."

⁶⁰ Lancelot Law Whyte, "From Primitive Disorder to Twentieth-Century Visual Images", in Reyner Banham, ed., *The Aspen Papers: Twenty Years of Design Theory from the International Design Conference in Aspen* (London: Pall Mall Press, 1974), 60-61. Whyte delivered his talk at the 1959 Aspen Design Conference, which took the theme "Communication: The Image Speaks". At the 1967 Aspen Design Conference, Safdie addressed the concept of "order" in a joint presentation with the architectural theorist Christopher Alexander. Prefatorily invoking Whyte's "unitary thinking", Safdie set out to challenge the conference agenda: "Irritated by the conference's theme, 'Order and Disorder,' which was inspired by Ben Shahn's call for the value of disorder, we decided to analyze some basic psychic structures, those usually associated with disorder – identity, the need for variety, and how an individual can affect his own dwelling, the need for change." Safdie presented a "6-module component system" made of seemingly platonic solids: a cube and "five accessories" to be "selected by the tenants"; the cube would represent "stability" ("to satisfy requirements of sunlight, distribution of services", and so on) while "the five components can be placed to produce hundreds of different houses that have truly different spatial character and are capable of adaptation and change by individuals". See: Moshe Safdie and Christopher Alexander, "Complete or Incomplete?", in Banham, ed., *The Aspen Papers: Twenty Years of Design Theory from the International Design Conference in Aspen*, 191-196; Safdie, *Beyond*, 150-151.

As such, the bio-mechanical model could suggest an idea on *process*, bringing it closer to a view on industrialised building. The translation of naturalistic processes was, therefore, to offer a total theory of design *and* construction.

The question remained whether Habitat 67 stood as a polemic on the technics of the dwelling unit itself or on the overall functionality of the housing complex as a work of urbanism. Safdie preferred not to consider these “design concepts... in terms of dualities”; instead, the architect should “think of the design of an object or organism” – in other words, the “modular unit” devised for the various Habitat schemes – “simultaneously in terms of repetition and variation, system and variety, standardisation and rhythm, conformity and identity”. The approach, he admitted, followed the “unitary thinking” of Lancelot Law Whyte.⁶¹ As opposed to the quest for ideality – namely, perfected outward appearance – “if science”, and by extension *architecture*, “is to advance”, Whyte believed, “it must discover how the ordering of parts gives form to the whole, in organisms for example.”⁶² At Roorkee, Safdie put it in architectural terms: “*The definition of structure is the arrangement of all parts of the whole.* It is this definition that we must satisfy in our building form”.⁶³ The condition was, he believed, imminent as Habitat 67 broke ground. Thus when speaking to the journal

⁶¹ Safdie, “On from Habitat”, 45. Safdie’s appreciation of Whyte’s “unitary thinking” lay in his reading of *Aspects of Form*. In the introduction to *Aspects of Form*, Whyte declared that the opposition between “atoms” and “forms” had produced two sets of ideas – “atomism-material analysis-quantitative precision” versus “form-unity-symmetry” (which led in part to “the old mechanism-vitalism quarrel”) – that may, in fact, “be complementary rather than antagonistic”. See: Whyte, “Introduction”, *Aspects of Form: A Symposium on Form in Nature and Art*, 2, 3.

⁶² Whyte, “Introduction”, *Aspects of Form: A Symposium on Form in Nature and Art*, 3.

⁶³ Safdie, “Why not Utopia?”, 9, emphasis added.

Progressive Architecture, which examined “The Architect’s Habitat”, “The Owner’s Habitat”, “The Contractor’s Habitat”, and “Everyman’s Habitat” during construction along Mackay Pier, Safdie insisted that his project was not “an offshoot of functionalism”: “Function is not an adequate word to describe this sense of structure. I believe morphology – the science of evolution of form in nature – is more descriptive.”⁶⁴ Illustrating an article titled “Building a City with King Kong Blocks”, photographs emphasised almost exclusively the plant fabrication of precast dwelling units and their mechanised placement in the overall complex (fig. 6.12). It was, the CCWE claimed, the use of “mass production methods” to create housing on an “assembly line”.⁶⁵ Yet as an architectural analogy, *morphology*, the branch of biology that deals with the relationships between the form and structure of living things, implied a theory of building that departed from the limitations of serialised production. D’Arcy Thompson and others had purposely distinguished *morphology* from *anatomy* in trying to elucidate the processes governing form rather than determining the functions of the various components of organisms.⁶⁶ Duly inspired, Safdie told *Progressive Architecture* that if the architect starts “imitating the morphological process that evolves in nature”, then he will “automatically stop looking at buildings as single entities”; instead, he “would have to think

⁶⁴ “Building a City with King Kong Blocks”, *Progressive Architecture* (October 1966): 226, 231. The assessment of Habitat 67 was part of a special issue on the question “Concrete: Where Do We Go from Here?” that included “Komendant on Concrete”; while the engineer discussed Habitat, the article only included images of his collaborations with Louis Kahn.

⁶⁵ Canadian Corporation for the 1967 World Exhibition, *Habitat 67* (Ottawa: the Queen’s Printer, 1967): n.p.

⁶⁶ Ritterbush, *The Art of Organic Forms*, 7.

of cities as systems, as building systems.”⁶⁷ Given the article layout, readers may well have accepted the common understanding of “building systems” as sets of dimensionally related components, largely factory made, and fitting together in various ways on site. Indeed, Safdie’s work from *A Case for City Living* to *Habitat 67* had rested on a similar view of production. Yet “system” offered something greater. Allied to the prognostic value of “morphology”, the turn to “system” allowed Safdie to imagine bringing into contact two vastly different scales of design: the prefabrication of building components and the design of cities.

EXHIBITING CONSTRUCTION

As a theme pavilion, *Habitat 67* was meant to help visitors understand and believe in the future. Unlike other pavilions, *Habitat* presented no hands-on displays, whether diminutive or magnified, by which “man” could experience new forms of culture and science. Instead, *Habitat* offered a novel architectural technics – this would be the tangible mode of its popularisation. The self-enclosed, prefabricated dwelling unit was to be appreciated in the public mind as encapsulating imminent norms of domestic life, while the overall complex signalled, given the promise of its post-Expo expansion, the pending form of the modern city. As the very first schematic report on *Habitat 67* declared in early 1964: while “World’s Exhibitions are events in which we pause and take stock”, their “justification” lies “in accelerating both physical and intellectual aspirations of our time”; thus, “The enormous

⁶⁷ “Building a City with King Kong Blocks”, 231.

investment of a World Exhibition can be justified if it has reduced the time lapse between the time of conceiving an idea and its realization.”⁶⁸ Taking stock of present realities was, in fact, predicated on “accelerating”, thus approximating, a curative future. In architectural terms, this meant a form based on using – and in terms of a spectacle, *testing* – current technologies for solving future social needs. If the Canadian population was assumed to more than double, reaching 40,000,000 by the end of the century (so the Habitat 67 report predicted), then it “means the equivalent construction of a complete new city of 70,000 inhabitants each and every month to the year 2,000.”⁶⁹ Thus the housing exhibition as the answer to a looming millennial crisis: “In building and exhibiting this unique project,” the Expo Press Service pronounced, “Expo 67 is attempting to solve some of the most pressing problems of construction and urban growth which today face Canada and other nations.”⁷⁰ Armed with demographic evidence, Expo 67 promoted its own version of a “home of tomorrow” – a concept crucial to the propagation of modern housing before an expectant public, whether Buckminster Fuller’s “Dymaxion House” (a name dreamt up by an advertising man at Marshall Field’s department store in Chicago, where the house debuted in 1929) or George Keck’s “House of Tomorrow” and “Crystal House” (respectively displayed at the 1933 and 1934 Century of Progress Exposition in Chicago) or Alison and Peter Smithson’s “House of the Future” (promoted by the *Daily Mail* newspaper for its 1956 Ideal

⁶⁸ Safdie, Andrews, et al., *Combined Report Covering the Schematic Design, Development and Economical Aspects of the Proposed Permanent Housing Exhibit Habitat 67*, n.p.

⁶⁹ *Ibid.*, n.p.

⁷⁰ Expo Press Service, “Expo 67 to Build Habitat” (April 8, 1965): n.p.

Home Exhibition in London), to list only those with appropriately suggestive names and launched in conveniently consumerist settings.⁷¹ Yet unlike these singular efforts, which in at least the first two instances presented detailed advances in prefabrication but otherwise responded to typical conventions of land ownership, Habitat 67 was to embody “both physical and intellectual aspirations” of its era not only by championing an ideal home (in terms of fashioning public taste) but by presenting how it was actually made – or, really, how it could be made again and again.

The first housing unit was cast on February 18, 1966. It was hoisted into place on April 7, 1966; the last unit was lifted on February 28, 1967. The entire structure of “Habitat 67 – Phase 1” was erected in ten months, twenty-one days.

While Habitat 67 appeared, at first glance, to arise on a conventional building site, its actual *chantier* was, in fact, nearby – in a custom-built factory for fabricating all concrete components of the housing complex. As 1,121 foundation piles began to be driven, a 55,000 square-foot precasting plant was built by the concrete subcontractors, Francon Ltd of Montreal, on the promontory of Mackay Pier and just adjacent to Safdie’s project. Within the plant (itself made of precast concrete T-sections) were four steel moulds with hinged walls, each capable of producing one housing unit every 48 hours. Preassembled rebar cages as well as adjustable steel panels were lowered inside each mould, allowing variable wall

⁷¹ To help popularise a technological future, George Keck’s Crystal House was exhibited with Buckminster Fuller’s Dymaxion Car parked in front – both could be seen for the combined admission of ten cents. Indeed, it was at the Century of Progress Exposition (which presented a section called “Home and Industrial Arts”) that the term *prefabrication* came to substitute *mass production* in general discussions of housing. See: Brian Horrigan, “The Home of Tomorrow, 1927-1945”, in Joseph J. Corn, ed., *Imaging Tomorrow: History, Technology, and the American Future* (Cambridge MA: The MIT Press, 1986), 145.

thicknesses of five or twelve inches. Concrete was delivered by ready-mix trucks and pumped into the forms. The housing units were cast in two stages: first, the floor and perimeter beams; second, the walls poured in three lifts, with block-out panels at window and door locations. The mould was covered and steam cured. A 100-ton rubber-tired straddle gantry then raised each box out of its formwork and transported it to the stockyard where it was sandblasted, after which crews post-tensioned and grouted the steel rods within the beams and walls (fig. 6.13). Moved to a finishing area, the unit received all components, fixtures, and finishes, including preassembled kitchens and a pre-moulded reinforced fibreglass bathroom – a highly publicised feature designed by Safdie in co-ordination with Fiberglas Canada Ltd, and habitually described by him as exemplifying “one of the technically new parts of the Habitat interior”: its “virtue [is] that it is a continuous surface. Instead of having hundreds of pieces to put together, with a multitude of joints, all you have to do is make the connections” (fig. 6.14).⁷² Far more important than the smooth finished surface, which imparted a longstanding modernist aesthetic-technical belief in salubrity, was the fact that the bathroom as a whole indicated the sort of modularity Safdie required if his “system” was to work as an “assembly-line”.

From here, the Habitat housing unit made the most spectacular part of its journey.

The gantry brought the precast box within reach of a stiff-leg mobile derrick crane. This

⁷² Safdie, *Habitat*, 22-23. The fibreglass bathrooms had another “virtue”: as the CCWE noted in a construction progress report, the bid for the bathroom contract by Fiberglas Ltd was above the cash allowance; consequently, the company made up this difference by presenting its “revolutionary design” that “will be marketed... on a commercial basis”, thus keeping with the mandate “to promote new applications of materials and techniques within the main structure” of Habitat. See: CCWE Architectural Branch, “Habitat 67 – Phase 1” (November 1966), Box 39-1990-05-027, Fonds Gilles Gagnon, Canadian Centre for Architecture.

behemoth, constructed by Dominion Bridge Company of Montreal, the storied builders of Canadian infrastructure since the nineteenth century, stood on 80-foot high stilts set 70-feet by 70-feet apart, its boom reaching 200 feet (fig. 6.15). The crane hoisted the unit out of the plant yard, rolled over the site on a rail track (mounted on the foundation beams or slab footings of Habitat itself, thus to resist the massive erection loads), and lowered each box into its designated place. In extraordinary photographs issued by the CCWE and circulating worldwide in architecture and building industry journals alike, closely cropped perspectives of the dwelling unit and the derrick crane advanced the argument that these elements were effectively symbiotic. The trussed jib and boom of the crane, almost dematerialised when seen against the sky, imparted a sense of weightlessness to the box itself. The housing unit appeared spectacularly hanging in midair, hovering above the St Lawrence River and the staggered silhouette of Habitat, and seemingly weightless – quite literally, a floating signifier of “cellular construction”.

The symbolic conjunction of unit and crane rested, however, upon a deliberate omission. The only way the derrick crane could actually set many of the concrete boxes in place was, in fact, with the aid of a 130-ton crawler crane.⁷³ Yet in its most significant and detailed promotional publication for Habitat 67, in which the phases of Safdie’s designs were recounted alongside coverage of the casting and erecting procedures as well as an extensive portfolio of how the “houses” were to be finished according to taste, the CCWE neither mentioned the second crane nor showed it in photographs documenting the construction.

⁷³ The derrick crane had a capacity to lift 70 tons to 120 feet; some concrete units weighed up to 90 tons.

Architecture and trade journals followed in their oversight.⁷⁴ Construction appeared to be effortless.

This purposeful exclusion was really the working of a powerful modernist imaginary: that is, to render architectural construction as fully automated. Contemporaneous tendencies were envisioning entirely machined cities, most famously the Archigram group's Plug-in City proposal of 1964, in which cranes continuously moved capsule dwellings among massive inverted ziggurat complexes, cylindrical towers, and diagonal lattice structures, thereby shaping what its designer Peter Cook called "a replacement city".⁷⁵ Habitat 67 was not as bold a statement (nor did its architect share Archigram's science-fiction enthusiasms); but the acute views of derrick crane and dwelling unit expressed an

⁷⁴ For example, *Interbuild*, a magazine issued by Prefabrication Publications in London, mentioned only the derrick crane – this in spite of a detailed discussion of Safdie's project in a section devoted to "system building". See: "Montreal's pièce de résistance", *Interbuild* (February 1967). Only a few observers resisted being similarly seduced. Among them was Alexander Pike, an indefatigable chronicler of building systems in *Architectural Design* throughout the 1960s, who included a photograph showing the derrick crane lifting a dwelling unit with the assistance of the crawler crane: "Despite the publicity given to the design of special lifting equipment considered as an essential feature of the scheme, no impression of consistency of purpose is given by this illustration of the main crane receiving a rather makeshift assistance from an auxiliary in the hoisting of a box unit". See: Pike, "Habitat '67", *Architectural Design* (March 1967): 119. Pike credited the photograph to *Concrete Quarterly*, which had published it in its July-September 1966 issue and included a caption that noted the special function of the derrick crane but completely ignored the obvious presence of the roller crane. David Jacobs, a *New York Times* critic reporting on Habitat while living there with his family, also perspicaciously noted: "...very soon after our arrival my wife and I decided that corners had been cut during the construction of the interior in order to keep the ever-rising costs down; that second crane had to be compensated for somehow." Jacobs's view of Habitat was otherwise favourable. See: David Jacobs, "What It's Like to Live in an Experiment", *The New York Times* (June 4, 1967).

⁷⁵ Peter Cook, *Experimental Architecture* (New York: Universe Books, 1970), 129. In 1968, Archigram member Ron Herron produced his "Oasis" collage, in which Habitat was placed alongside fragments of works by Denys Lasdun, Mies van der Rohe, Kenzo Tange – these presumably already outmoded forms were juxtaposed against an open lattice frame with "plug-in" modules, the resulting impression being that future architecture would be one of open frames and interchangeable units. Habitat 67 was not, of course, a "plug-in" solution. Safdie's choice of concrete was based on creating a composite "three-dimensional" form to avoid what he believed was structural redundancy of plug-in projects. Safdie's apparent neglect of steel structures opened his project to criticism.

especially heroic vision of construction, one emphasising Safdie's claim that "no work is done in the air beyond simple connections" (fig. 6.16).⁷⁶ The notion was echoed by the CCWE when presenting a close-up image of the unit being lowered into place while dangling from cable stays: "A five-man rigging crew can lift a box into place and secure it in one and a half hours".⁷⁷ While the "factory" replaced the need of formwork, the "in the air" production supplanted the demand for falsework (scaffolding) typical of construction. In both cases, notions on "building a building" characteristic of poured concrete construction was believed to be replaced by the seemingly seamless casting, erecting, and joining of parts along an apparently frictionless path from shop floor to crane to site.

The rhetoric of minimal assembly was a neat summation of typical theories of industrialised building. This had as its essential features the mechanisation of labour (Safdie's insistence that all "work could be done on the ground", thereby eliminating the customary practice of workers arriving on site to ply their respective trades), a smooth continuity and evenness of output (the creation of dwelling units in "assembly-line" fashion), and mass production (the infinite capacity of the on-site factory).⁷⁸ As Safdie argued just prior to the opening of Habitat 67 – thus at a moment of justifying a construction process that remained, for now, extremely expensive (in other words, without having reached an economy of scale):

⁷⁶ The "simple connections" were the bolting, spot welding, or post-tensioning necessary to achieving the overall "three-dimensional structure". Safdie, *Habitat*, 46.

⁷⁷ Canadian Corporation for the World Exhibition, *Habitat 67*, n.p.

⁷⁸ Safdie, *Habitat*, 46, 50.

Just compare the typical construction site to a typical factory of a manufactured product... Never does one see idleness in a factory of this kind. Never does one see work being torn out because it has not provided for other components, or because it has not fitted the given tolerances. In contrast, the typical construction site is swarmed with idle men: riggers waiting for a piece to be installed; workers carrying equipment and materials for installation through the multi-storey structure; workers ripping out work to provide for other trades; plumbers interfering with carpenters or concrete men; components being modified because they do not fit within the structure; and hand labours being used for a multitude of construction operations, from building form work for concrete, to the fitting and bending of ducts and pipes. All this indicated waste and inefficiency.⁷⁹

Safdie's desire to advance techniques of industrialised building was tied to a fairly typical theory of work – that mechanisation would forever eliminate “waste” and idle labour.

Prefabrication was – philosophically, materially, technically – essential to this vision.⁸⁰ Yet it was Safdie's conception of a cellular system (as opposed to other types such as panel or skeletal frame techniques) that gave the impression of a “whole” presumably resulting from the complete rationalisation of a research programme, component manufacture, assembly, and marketing integrated into a single process.⁸¹ Thus the suggestive imagery of the crane and concrete unit: with everything produced “on the ground”, it became only a matter of joining the boxes in space. Indeed, the contractors Francon Ltd had employed a detailed

⁷⁹ Moshe Safdie, “Habitat 67 – Towards the Development of a Building System”, *Journal of the Prestressed Concrete Institute Journal* (February 1967): 62.

⁸⁰ Despite being a “wet” material, concrete took on properties of “dry” construction through prefabrication: to be presumably lightweight, thus suited to installation by limited labour power.

⁸¹ By the 1960s, architects had come to define “industrialised building” by an expanded scope of tasks, especially in distinction to what many perceived as the limitations of “prefabrication”. Safdie similarly noted: “Industrialized building does not necessarily mean pre-fabrication. It is the organizational re-structuring of an industry in which raw material manufacturing, component manufacturing, design, research, development, assembly, and marketing are integrated into a single process within a co-ordinated organization.” See: Safdie, “Industrialized Buildings”, *Architecture Canada* (November 1968): 36.

plastic model of the crane and the housing complex to “help crews visualise assembly order for 2,798 pieces” – an approach recalling Safdie’s eschewal of conventional drawn elevations in favour of schedules showing axonometric diagrams of various sequences for stacking units (fig. 6.17).⁸² (In the resulting obviation of the supremacy of the façade, the aesthetic “modernity” of Habitat 67 lay in the reversibility of front and back.⁸³) The dimensionally accurate fabricated dwelling unit and the precisely calibrated movements of the crane were thus together imagined producing the effects of “economy” desired by Safdie’s pursuit of “space packing” as a method of architectural design.

If, as the CCWE repeatedly insisted, Habitat 67 was only in its infancy, then displaying the actual means and methods of its future completion were surely as important as the partially realised work itself. Building industry journals believed that the “\$2-million, custom-built production plant at the end of Mackay Pier represents the most outstanding construction development to be seen on site at present”.⁸⁴ Despite its “growing pains”, the

⁸² Walter Rooke, “Habitat Pioneers in Design and Methods to Produce Assembly-line Housing”, *Heavy Construction News* (April 22, 1966): 14. The final structural drawings included an Erection Schedule, which actually showed the derrick crane and where the units would be placed as it moved along its guide rails. For Safdie, the mechanisation of the building industry promised a change in architect’s use of drawings: “During the construction of Habitat, for example, we had several hundred working drawings and several thousand shop drawings – a drawing for every piece. Ideally, mechanisation would mean that you would make a few drawings of basic components. A series of cards would specify which of these components should come together, and in what manner. In such a system, you would be working from a few cards instead of hundreds of thousands of drawings.” See: Safdie, *Habitat* (1967), 50-51. The idea was predicated on the use of computer punch-cards; in theory, the contraction of on-site construction labour was tied to the future rise of computerised scheduling, which Safdie had witnessed in the highly publicised “critical path method” used by the CCWE Construction Branch to co-ordinate the building of Expo 67.

⁸³ Yve-Alain Bois, “Metamorphosis of Axonometry”, *Daidalos* 1 (1981): 57.

⁸⁴ Walter Rooke, “Habitat Pioneers in Design and Methods to Produce Assembly-line Housing”, in *Heavy Construction News* (April 22, 1966): 10. Not all views were as celebratory. When discussing the “exotic structures” at Expo 67, the British weekly *Engineering* reservedly noted: “Certainly the most talked-about Expo

Francon Plant “is still the most exciting development in building going on today”, stated another.⁸⁵ “Habitat Pioneers in Design and Methods to Produce Assembly-line Housing”, promised *Heavy Construction News*; “Habitat 67’s Housing Blocks Build a Better Environment”, decided *Engineering News-Record*; “Building a City with King Kong Blocks”, observed *Progressive Architecture*. The declarations united the specialised tasks of fabricating a “block” and the gigantic ambitions of building of a “city” along a single line of action.

The laudatory projections – all written in 1966, well before the completion of Habitat – coincided with the ambitions of the CCWE. In late 1965, the CCWE Advisory Committee on Architecture “unanimously resolved” to ensure that “if possible, the tooling costs of this project be not lost and therefore, that the project is regarded by the Corporation and presented to the public as pilot project” – again, as *prototype* – and “the first step of a continuing housing development on Mackay Pier”.⁸⁶ At the very same moment, Safdie similarly declared when presenting his project in the pages of the CMHC journal *Habitat*:

It was decided that in spite of the fact that amortizing all the equipment over 160 dwellings would result in extremely high unit costs, the construction system would

structure is the conglomeration of precast concrete ‘boxes’ rejoicing in the name Habitat 67. Many regard this daring concept as the prototype of a new way of solving the housing problem suffered by many nations. *Engineering* is less optimistic, but regards Habitat as probably the most ambitious single project at Expo. The revolutionary ideas incorporated are bound to yield useful information, especially with regard to concrete precasting techniques and planning.” See: “Expo 67: the Exotic Structures”, in *Engineering* (London, 13 January 1967): 63.

⁸⁵ “Habitat 67, the Ultimate in Precast Concrete Construction”, 37.

⁸⁶ “Extract of a Resolution and Recommendation Adopted at the 7th and 8th Meeting of the Advisory Committee on Architecture Held on November 19, 20, 1965 and March 22, 23, 1966, Respectively” (November 19-20, 1965): 2, Box PK-290, Fonds John Parkin, Canadian Centre for Architecture. The ambition to complete Habitat 67 was set early: “Ultimately, Habitat 67 may extend along Cité du Havre” – as Mackay Pier was also known – “to house five thousand people providing shops, schools, and integrating the many cultural facilities provided by Expo”; see: Peters, “Economic Aspects”, 1.

be demonstrated with the hope that such equipment could be used after the exhibition.... The decision arrived at was that within the context of a World Exhibition and within the context of an experimental housing project, it was more important to suggest the methods and techniques and potential of mass production rather than to achieve low unit costs....⁸⁷

Already anticipating accusations of exorbitant costs despite the project's ultimately reduced size ("the Committee is aware of public criticism of aspects of the project, particularly with regard to high capital costs"), the goal was now to insist that if the project was to stand as a polemic for the rationalisation of building, then it be popularised by its means of production.⁸⁸ The advising architects thus motioned:

THAT the concrete plant and crane be left intact but not necessarily kept in operation during Expo and that it be treated as an exhibit, provided this is consistent with their future usefulness to complete the project and that it will result in an ultimate saving in cost.

THAT adequate funds be provided for, and work started immediately by the consulting architect on an exhibition which will illustrate the final development and document the complete rationale behind the project which will justify the original capital cost, on the one hand, and make a case for Habitat as one solution to the urban environment, on the other.

⁸⁷ Safdie, "Habitat 67" (September-December 1965), 4. Safdie added: "it was consequently decided to treat all these components as highly sophisticated industrialized products, even when unit costs could only eventually be reduced by increasing quantities to 1,000, 5,000 or even 10,000 units."

⁸⁸ The CCWE was sensitive to cost implications: "Since Habitat is a prototype, it is expected that the cost of producing individual units will be higher in Phase I than later, when fabrication and construction techniques are developed further". See: Expo 67 Information Services, "Drawing Board Dream Will Be Built" (April 12, 1965), Safdie Archive Box PF20, Folder 58/100/PF12/1. The exorbitant cost of Habitat was fodder for magazines such as *Canadian Builder*, which by the mid-1960s was deeply vested in covering all aspects of industrialised building. In a special issue on "1967-2067, the Next 100 Years in Building", aimed to coincide with the celebrations of the Canadian Centennial and published the same month as the opening of Expo 67, the magazine dismissed Habitat 67 given its high costs, limited scope, and financing (without consideration for future profit) by the government: "It has been variously reported that the Habitat system has produced apartment units at costs up to \$200,000 a unit whereas the average apartment unit of today costs in the region of \$12,000." See: "Habitat 67 – an Expensive Gimmick or a Serious Plan for Mass-produced Housing?", *Canadian Builder* (April 1967): 65.

THAT as many housing units be put on display in addition to this exhibition to demonstrate the variety and scope of the project and to facilitate the maximum public appreciation of the project.⁸⁹

Was, then, Habitat 67 to be a measure of its tools and machines or seen as an idealised environment? On the one hand, the Advisory Committee on Architecture was keen to display the construction objects as centrepiece. The existence of the factory reinforced a belief in the plausibility of construction. To exhibit the prefabrication plant was to avow the inevitable completion of Habitat. On the other hand, as Advisory Committee members realised, when meeting soon after the precasting plant produced its first unit, the CCWE was more guarded: “The Corporation has been cautioned against leaving anything on the Site which could be construed as indicating that construction is not complete.”⁹⁰ There was cosmetic worry: in a sense, making public the remarkable apparatus of construction contravened the typically manicured scapes – of pavilions, of politics – of world’s fairs. No matter how polemical, the production-cum-exhibition of an *unfinished* work would possibly disturb perceptions of the fairgrounds as a perfected urban realm.

⁸⁹ “Extract of a Resolution and Recommendation Adopted at the 7th and 8th Meeting of the Advisory Committee on Architecture Held on November 19, 20, 1965 and March 22, 23, 1966, Respectively” (November 19-20, 1965): 3, Box PK-290, Fonds John Parkin, Canadian Centre for Architecture. The Committee added: “funds be provided for a complete documentation of the project in all its stages... in the form of a publication for sale” – resulting in the CCWE publication *Habitat 67* (Ottawa: The Queen’s Printer, 1967) – and insisted, perhaps wishfully: “THAT the Corporation take steps to obtain the guarantees to provide for the continuity of management, financing and construction, to complete the project after the close of Expo 67, and to exploit this presently publicly owned unique middle-class housing project as a case study to further a full spectrum of research in the fields of the social sciences, community planning, and urban design.”

⁹⁰ “Extract of a Resolution and Recommendation Adopted at the 7th and 8th Meeting of the Advisory Committee on Architecture Held on November 19, 20, 1965 and March 22, 23, 1966, Respectively”, 4.

Safdie responded immediately. He reminded Edward Churchill, a retired colonel and indefatigable Director of the Expo 67 Department of Installations (whose reputation rested on having built airfields in North Africa during the Second World War), that “it has always been stated that the Corporation would encourage that the balance of MacKay Pier be developed in a way compatible with Habitat 67” and “it was hoped that the know-how and equipment which have been designed and constructed for the project could be made available to the interested developers who may be able to extend the project on a commercial basis.”⁹¹ The public monies would bear fruit as the “pilot project” was made more real by private means. Safdie concluded:

We therefore recommend that the CCWE encourage the keeping of the plant and its equipment intact during the period of the Exhibition. The plant and equipment could be used as an exhibit and/or as storage. It would be essential that the casting beds and moulds remain intact. Furthermore, the CCWE may be able to interest the contractor to participate in such an exhibit within the plant.⁹²

⁹¹ Moshe Safdie, “Post Expo Considerations for Habitat and MacKay Pier”, letter to Col. E. Churchill (March 31, 1966): 1, Box PF19, Folder 58/191/PF15/20, Moshe Safdie Archive, Canadian Architecture Collection, McGill University. Later, in a confidential memorandum discussing the post-Expo disposal of Habitat and Mackay Pier, Safdie suggested that “proposals” by developers “should be done in the spring of 1967” thereby allowing “a successful developer” to “negotiate with Habitat contractors for the use of existing equipment should they choose to extend Habitat-type development in their proposal.” See: Moshe Safdie, “Considerations in the Disposal of Habitat 67 and Mackay Pier” (November 22, 1966): 2, Box PF19, Folder 58/191/PF15/20, Moshe Safdie Archive, Canadian Architecture Collection, McGill University.

⁹² Safdie, “Post Expo Considerations for Habitat and MacKay Pier”, letter to Col. E. Churchill, 2. Using the plant as a storage site kept with the demands of industrialised building. Among the difficulties of industrialisation is the question of “surplus”. Industrialisation is typically a long-term undertaking: a product is manufactured and stored without knowing when and where it is to be used; moreover, it can be stockpiled in response to changes in the marketplace. This was entirely impossible in an undertaking such as Habitat: because it was to be built as a demonstration project, its components were not yet commodities *per se*. By turning the factory into storage, the idea rested on giving the impression of stockpiling for use immediately after the world’s fair.

Once erected, the plant could restart production as soon as the fair closed; moreover, it could also stand as another “prototype”, one marketable to realising other Habitats elsewhere.⁹³ Everything was to remain ready in anticipation of eventual completion.

The notion of a proper Habitat 67 Construction Exhibit was thus mooted. By the opening day of Expo 67, it was thought essential to the fairgoer’s experience. Shown in Safdie’s construction drawings as a “Visitor Circulation Site Plan”, the “recommended route” through Habitat started precisely where construction yard met housing complex: the CCWE hoped that visitors would approach Habitat having walked along the axis of the “assembly line” before arriving at the North Cluster, where the interiors of units were left unfinished owing to the federal government’s sudden reluctance for continued financing. Notwithstanding its earlier worries, the CCWE now maintained that this portion was “purposely left incomplete to demonstrate the design and construction techniques peculiar to Habitat.”⁹⁴ The Deputy Commissioner of Expo 67, Robert Shaw, had aimed to keep the precasting plant in place as part of the overall exhibit. The CCWE management insisted that it be removed before the fair’s opening. Shaw desperately pressed Safdie and other

⁹³ A comprehensive study of Expo 67 building materials and techniques noted that among the three types of “innovation” achieved at Habitat 67 was its “structure”, or the components that “demonstrate the potential of load bearing, three dimensional, precast elements for multi-storey use”; these elements were “commercially available” in “present or adapted form from Francon Ltd” without “further research and development required before marketing in Canada”. See: I. Kalin, *Expo 67: Survey of Building Materials, Systems and Techniques used at the Universal and International Exhibition of 1967* (Ottawa: Materials Branch, Department of Industry, Trade and Commerce: The Queen’s Printer, 1969).

⁹⁴ Expo 67 Press Service, “Expo’s Forgotten Exhibit” (July 13, 1967): 2, Box PF7, Folder 58/100/PF1/1, Moshe Safdie Archive, Canadian Architecture Collection, McGill University. In certain circles, credit for the construction exhibition was given to the irrepressible Montreal mayor Jean Drapeau, who, when visiting the building site in the company of officials worrying over an incomplete project, claimed being fascinated by the process and suggested that fairgoers would be equally taken by it: “As the mayor says: ‘We decided to announce that Habitat 67 had been left voluntarily unfinished so that the visitors could see how it was built.’” See: Brian McKenna and Susan Purcell, *Drapeau* (Toronto/Vancouver: Clark, Irwin & Company Limited, 1980): 155.

consultants to fund some sort of construction exhibit. Francon Ltd provided its rolling gantry lift along with three additional concrete boxes revealing “wall, ceiling and floor construction; the heating and cooling systems, insulation, and portion of the mechanical core, stripped away to show how cables and pipes are arranged.”⁹⁵ The Dominion Bridge Company left the derrick crane on site. A presentation on “the original concept of Habitat and similar ‘multi-unit dwellings’ in a planned community, designed by Moshe Safdie” was mounted inside four of the unfinished North Cluster units.⁹⁶ Audio tapes of “post-mortem meetings”, during which Safdie and his consultants evaluated lessons learnt at Habitat, were played inside one of the units “so that people could come in and listen to discussions about the structure” while nearby “several students answered questions from the thousands of people who visited the exhibit every day.”⁹⁷ The exhibit was sponsored by over twenty-five

⁹⁵ Expo 67 Press Service, “Expo’s Forgotten Exhibit”, 3.

⁹⁶ Ibid.

⁹⁷ Safdie, *Beyond Habitat*, 132-133. The “post-mortem meetings” were, in fact, study seminars organised by Safdie in late March 1967, when he joined the contractors and consulting engineers to evaluate experiences gained during design and construction. In outlining the proposed meetings, Safdie wrote: “The purpose of the seminars is to discuss the following: ‘If you were to do this project again, what would you change in order to achieve greater economy, ease of construction or speed of construction?’” See: Safdie, “Habitat Study Seminars” (February 24, 1967): 1, Box PF19, Folder 58/191/PF15/20, Moshe Safdie Archive, Canadian Architecture Collection, McGill University; Moshe Safdie; “Habitat: a Post-Mortem”, *Journal of the Royal Institute of British Architects* (November 1967): 492-494. Safdie’s consulting engineer August Komendant also published a detailed post-construction assessment; see: Komendant, “Post-Mortem on Habitat”, *Progressive Architecture* (March 1968): 138-147. The students helping direct visitors to the Habitat exhibition distributed a “Public Opinion Survey” that asked fairgoers whether they would raise their children in Habitat, if they felt there was adequate privacy, and what they thought of the facilities. The survey additionally requested each respondent’s requisite vital statistics, such as age, sex, income, and whether or not he or she presently owned or rented a house and where it was in terms of population and the type of city, suburb, or countryside. See: “Habitat 67 – Public Opinion Survey”, Box PF19, Folder 58/191/PF15/20, Moshe Safdie Archive, Canadian Architecture Collection, McGill University.

suppliers of materials and labour to Habitat.⁹⁸ Despite the absence of a functioning factory, the line leading from display units, to hoisting machines, to the unfinished cluster, and finally to the built – and now partially occupied – complex made plausible the idea that the second phase of most vaunted project at Expo 67 was, indeed, imminent.

The Construction Exhibition valorised the most durable of all postwar consumer symbols, even in the age of cars and televisions – the single-family house. “The houses which form Habitat ’67 provide their occupants with a means of preserving their identity within an urban community”, the CCWE announced, echoing Safdie’s original quest to balance the valences of public and private life unfolding in city and suburb.⁹⁹ Promotional sketches showed a single dwelling with its own garden terrace, where a family relaxed amidst unmistakably contemporary furnishings (fig. 6.18).

The quest of “preserving” the future inhabitant’s “identity” presupposed a quality of taste-making. As Habitat 67 neared completion, Safdie had sought to organise international designers to provide ideas on finishing the North Cluster units.¹⁰⁰ Yet under pressure from

⁹⁸ With the contractors Anglin-Norcross and Francon Ltd as well as the Dominion Bridge Company, the contributors included: Frigidaire Products of Canada, makers of the prefabricated kitchen units; companies such as Metropolitan Drywall Limited, Polar Air Conditioning Company Ltd, the Singer Plumbing and Heating Company, and the Canadian Asbestos Company; David, Barott, Boulva, Safdie’s associated architects; the consulting engineers Monti, Lavoie, Nadon and Associates; and Safdie. See: “Sponsors of the Construction Exhibit”, Box PF19, Folder 58/191/PF15/28, Moshe Safdie Archive, Canadian Architecture Collection, McGill University. To a casual observer, the extensive list of sponsors may well have suggested that Habitat 67 did not achieve Safdie’s desire for a totally industrialised process – that is, one built without the impact of different building trades.

⁹⁹ Canadian Corporation for the 1967 World Exhibition, *Habitat 67*, n.p.

¹⁰⁰ Safdie recalled: “From the beginning I was aware that when we’d get to furnish the exhibit units I would run into problems, the thing being furnished in a way which I felt was not up to the project. And so, in negotiating the contract with Expo I insisted on a clause that says that I had the design authority over the furnishing of all the areas in the building which were open to the public, not the individual houses which were rented but the

the Canadian Home Furnishings trade group, and seeking to emphasise that Habitat was a uniquely Canadian contribution to the fair, the CCWE invited the women's magazine *Chatelaine* to co-ordinate the designs of the unfinished unit interiors. The result was a hodgepodge of twenty-six "Display Houses" in the North Cluster, decorated in "Bachelor House – Eskimo Motif", "French Provincial and Wrought Iron", "Modern with Steel and Glass", or the "'Circa 75' Home Entertainment of the Future", among others.¹⁰¹ The remarkable variety of styles stacked atop one another may well have approximated the predilections of an actual community.¹⁰² While insisting that for "both house plans and room sizes we met current Canadian standards of middle-class families", Safdie was aghast at the *Chatelaine* contribution. He found the choices of furniture both uninspired and dreary.¹⁰³ In solidarity with Safdie, the Advisory Committee on Architecture had demanded the furnishings "show as broad a range of living activities as possible, by including areas such as studios and children's room and should include displays such as quality Canadian toys";

public areas". See: Safdie, "Session of March 22, 1968", Interview Transcript: 64, Box PF22, Moshe Safdie Archive, Canadian Architecture Collection, McGill University.

¹⁰¹ After much wrangling with the CCWE, Safdie managed to be put in charge of inviting some designers to furnish the display units. Safdie's recollection of what he dismissively called the "Chatelaine Affair" appears in *Beyond Habitat*, 135-141.

¹⁰² Despite his utter disdain for the *Chatelaine* commission, Safdie admitted that "the ideal would be real tenants doing their own places rather than having them 'decorated'." His opposition stemmed from what he perceived as opting for mediocrity when faced with a unique opportunity to showcase design innovation. See: Safdie, *Beyond Habitat*, 140-141

¹⁰³ Safdie, *Habitat* (1967), 20. On the apparent preference for modern styles over the eclectic *Chatelaine* furnishings, Safdie noted: "The reaction when people came to Habitat was really at the end very rewarding, because the average man knew the difference to the point since there were credits at the entrances saying who designed it, you'd get people walking into a unit saying Oh its another Chatelaine, let's not look at that and would go out and these were lay people. This really proved something." See: Safdie, "Session of March 22, 1968", Interview Transcript, 72.

this emphasis on the tangible qualities of quotidian life would translate into thinking of the rooms as “stage settings”, where “the visitor can walk through and sit in the various rooms. Roping off display areas is not considered satisfactory”.¹⁰⁴ Instead, the *Chatelaine* units were explained by an official Expo 67 hostess stationed inside each unit, guiding visitors along a prescribed path marked by ropes.

Even if many of the installed styles were retrograde, the popular narrative became one of discovering a genuinely *modern* domestic environment. While the magazine *Canadian Builder* elsewhere dismissed Safdie’s attempt at industrialised building as a “gimmick”, it otherwise swooned over the Habitat interiors: “As the Expo visitor enters the door these stark units suddenly transform into bright, ultra-modern individual homes”, with their “look-of-tomorrow” prefabricated kitchens and bathrooms.¹⁰⁵ In a promotional booklet, the CCWE featured house plans with corresponding images of only those units having the most up-to-date furniture, often Canadian-made and similar to Danish teak furniture being imported for a middle-class market (fig. 6.19). Many of the CCWE’s photographs of the interiors – including a room with furnishings by Herman Miller – were reprinted in magazines worldwide. Views of the prefabricated kitchen and bathroom – both “custom designed

¹⁰⁴ “Habitat Furnishing”, Meeting of the Montreal Sub-Committee of the Advisory Committee on Architecture (September 16, 1966): 2, Box PK-290, Fonds John Parkin, Canadian Centre for Architecture. An appendix to the meeting minutes noted that the CCWE had established a Habitat Furnishing Committee that “assumed the responsibility of furnishing 26 units in approximately seven furniture styles” – a mandate the Advisory Committee on Architecture found distasteful.

¹⁰⁵ “Habitat 67 – an Expensive Gimmick or a Serious Plan for Mass-produced Housing?”, 65.

‘showpieces’”, the CCWE asserted – received special attention.¹⁰⁶ Each stood as proof of renewed faith in a kind of a functionalism, stemming from an ethos of *existenzminimum*, in which the chores of domestic life were seen as thoroughly reorganised (eliminating drudgery with an incipient Taylorism) by way of improved and industrially made interiors.¹⁰⁷ If the Construction Exhibition had focused on the more heroic aspect of Habitat 67 – that is, imparting the impression of an effortless mechanism for building “boxes” as the beginnings of a radically new urban form – then the tour through its interiors served to reinforce that here were “houses” like any other.

CRITIQUE

The argument for Habitat 67 as avatar of late modern life rested on social and technological norms, namely the nuclear family and prefabrication. “It would not be correct to say Habitat presupposes a new way of living, a new urban society”, opined *Canadian Architect*; “it is, or could be with the addition of its missing community or communal components, very much in tune with the life of our times.”¹⁰⁸ Nevertheless, as advanced under the cultural imprimatur of a world’s fair and financed by government, Habitat 67 was presumably freed from the nettlesome constraints of the marketplace. This privileged status – and an immediate useful value as permanent housing – led to deeply divided criticism.

¹⁰⁶ Canadian Corporation for the World Exhibition, *Habitat 67*, n.p.

¹⁰⁷ The salutary example was Grette Schütte-Lihotzky’s “existenzminimum kitchen” designed for the German modernist Ernst May’s housing estates built in Frankfurt in the late 1920s.

¹⁰⁸ James A. Murray, “Habitat 67: The Critical Eye 1”, *Canadian Architect* (October 1967): 36.

There was little doubt that Habitat 67 was audacious. The editor of the *Journal of the Prestressed Concrete Institute* described it as “at once a research project, a mock-up prototype – and an exciting structure of the future that is certain to be a significant architectural milestone.”¹⁰⁹ When discussing the “exotic structures” at Expo 67, the British weekly *Engineering* wrote that it “regards Habitat as probably the most ambitious single project Expo” and the “revolutionary ideas incorporated are bound to yield useful information, especially with regard to concrete precasting techniques and planning”; nevertheless, it was “less optimistic” than those who “regard this daring concept as the prototype of a new way of solving the housing problem suffered by many nations.”¹¹⁰ Conversely, the editor of *Canadian Architect* unambiguously noted, in an issue devoted to Habitat just before the close of Expo 67: “Significantly executed attempts to rethink the design phenomenon of dwelling densely could be counted on the fingers of one hand – Marseilles’ Unité d’Habitation, Sheffield’s Park Hill, possibly Stockholm’s Taby Nasbydal or Philadelphia’s Mill Creek – and still leave over a forefinger to point to Moshe Safdie’s Habitat.”¹¹¹ Even as they suggested a complete departure from technical, if not social, norms, the appraisals pointed precisely to where criticism (whether national or international)

¹⁰⁹ “Editorial”, *Journal of the Prestressed Concrete Institute* (February 1967): 61. Several months later, Habitat 67 was among the winners of the Institute’s Annual Awards.

¹¹⁰ “Expo 67: the Exotic Structures”, in *Engineering* (London, 13 January 1967): 63.

¹¹¹ Murray, “Habitat 67: The Critical Eye 1”, 35. The special issue included Hans Elte, “Habitat 67: The Critical Eye 2”; “Habitat: Some Lessons”, a detailed technical evaluation; and Safdie’s article “The Anatomy of a Building System”. Murray remarked in passing: “Habitat is a phenomenon most heartening in a nation unmarked by housing innovation since the disappearance of the wigwam, a nation, moreover, which (last in the western world) reluctantly accepted a minute government responsibility for social housing.”

would be most divided: as soon the fair opened, critics swiftly and repeatedly began to ask whether Habitat 67 could actually transcend its didactic function as prototype.

The question was pressing, not least with Safdie and the CCWE assiduously showcasing Habitat alongside its means of production. As panacea for both urban overcrowding and suburban decentralisation, Habitat offered a powerful vision of the beneficial use of technology. “But now there is Habitat – an accomplished fact”, declared *Architectural Forum* when, in light of Safdie’s project, it explained how “the notion of building with boxes is recognized as a realistic alternative”: “And suddenly, the idea” – that is, “to assemble multistory structures by piling prefabricated boxes upon prefabricated boxes” – “is no longer a pipe dream.”¹¹² The concept of “piling prefabricated boxes” implied that the aesthetic, social, and technological programmes of Habitat were commensurate to the maximising tendencies symbolised by its precasting factory. Safdie had assumed this when translating D’Arcy Thompson’s notion of “close packing” as a way to realise both a genuine social and technical “economy” (Safdie’s preferred term) through design.¹¹³ Yet for the

¹¹² “Habitat and After”, *Architectural Forum* (May 1967). The special feature on prefabrication was divided in three parts: “Experimenting with Boxes”, which looked specifically at Habitat; “Planning with Boxes”, which studied the “growing sophistication” of prefabricated “box” construction; and “Building with Boxes”, which examined the actual building of a pharmaceutical plant with shipping containers. For a discussion on the circulation and polemical use of images of Habitat 67 in the 1960s, see: Hubert Beringer, “La médiatisation d’Habitat 67 et le mythe de la fin de l’architecture moderne”, in Jean-Yves Andrieux and Fabienne Chevallier, eds., *La réception de l’architecture du mouvement moderne: Image, usage, heritage* (Saint-Etienne: Publications de l’Université de Saint-Etienne, 2005), 323-328.

¹¹³ Upon completing Habitat 67 and returning to his concept of “Economy” (interpreted through D’Arcy Thompson’s “morphology”) as “a moral obligation of our time”, Safdie stated: “I would translate the political reality of our time to a statement that economy is moral obligation to the builder and designer today... in fact it’s Le Corbusier and [Buckminster] Fuller who are the first generation that lived with that political reality and if economy is a moral obligation then technology is a political necessity because it’s the only way of providing more for more people or providing solutions which are applicable to all people, at least certain minimum solutions applicable to all people. I’m not suggesting in any way that means everybody should have the same

Canadian Architect critics, Habitat hardly fulfilled this promise, having been always compromised by “*Formverlangen*, that is the desire for form, a form which could create an image, and it is astonishing to note what frantic technological efforts had to be made to cling to that image.... One is left with the conviction that the preponderant emphasis on form failed to put prefabrication of apartment units on a rational basis and so sharpen the techniques needed to produce mass housing”.¹¹⁴ Moreover, “doubling or tripling its 12-storey heights (if technically possible) would leave the density unaffected if the basic cross-section of the complex continues to recognize Habitat’s primary objective – a terraced garden for each dwelling unit stacked up the sloping pyramid of its cross-sectional geometry”.¹¹⁵ The accusation – of aestheticising the effects of serialised production, or the surrender of “technique” to “image” – further suggested that the dwelling unit (the “cell” from which Safdie believed his project would “grow”) could never meet the demands of urban density, something Habitat was otherwise publicised as achieving. Thus, *Canadian Architect* noted, while Habitat may have appeared “to any visitor” as “an apartment block of unusual interest” it was finally nothing more than “an assembly of penthouses”.¹¹⁶ The charge was not directed against the capaciousness of the dwelling. Indeed, the “contribution” of Habitat

environment or that everything as to be even.” See: Safdie, “Session of April 17, 1968”, Interview Transcript, 23, Box PF22, Moshe Safdie Archive, Canadian Architecture Collection, McGill University.

¹¹⁴ Hans Elte, “Habitat 67: The Critical Eye 2”, *Canadian Architect* (October 1967): 37.

¹¹⁵ Murray, “Habitat 67: The Critical Eye 1”, 35.

¹¹⁶ Elte, “Habitat 67: The Critical Eye 2”, 36.

was certainly “a more humanistic attitude towards resident-oriented mass dwellings”.¹¹⁷

Instead, the criticism suggested that the Habitat “house” was, as a new type of urban dwelling, still inadequate to its task of actualising the needs of the city.

This was both a social and an economic critique. The indictment of “penthouses” implied that Habitat 67 was, for now, limited exclusively to a certain class of occupants – despite its promoted assembly-line construction, critics believed that the housing project did little to achieve a genuine “economy” of construction. The final cost was \$22,195,920; or, as *Canadian Architect* further noted, echoing many similar observations, a unit cost of “approximately \$140,000; the cost of 8 rowhouses.”¹¹⁸ The CCWE had, of course, consistently reminded that the outlay for the housing exhibit was far higher than once its fabrication system became perfected, and Safdie had early maintained that the Habitat “components” were treated as “highly sophisticated industrialized products, even when unit costs could only eventually be reduced by increasing quantities to 1,000, 5,000 or even 10,000 units.”¹¹⁹ Nevertheless, repeated comparisons between the Habitat dwelling unit and existing housing types – affordably made by conventional construction methods, as many critics insisted on noting – implied that the impossibly high expenditure for tooling and

¹¹⁷ Ibid.

¹¹⁸ Ibid., 38.

¹¹⁹ Expo 67 Press Service, “Habitat Project Gets Green Light”, 2; Safdie, “Habitat 67” (September-December 1965): 4. The argument on achieving economies of scale in materials was assumed related to the refinement of labour practices. Safdie later claimed that construction was only at “10 per cent efficiency”: “We were kept at this low efficiency because we had to train workers for every job. Every operation on the project was totally new to them, and inevitably it required time for them to adapt. Because labour is half the cost of a building, this made considerable difference in the cost of Habitat.” See: Moshe Safdie quoted in Robert Fulford, *This Was Expo* (Toronto: McClelland and Stewart, 1968): 114.

plant, combined with the low densities resulting from aesthetic proclivities, necessarily resulted in a work without broad social applicability.¹²⁰ On this, Safdie equivocated. In the first Schematic Report for Habitat, the development consultants had assumed that rents would be targeted to an “upper and middle income group” – a necessity for underwriting “Phase 1” (the “prototype”). Safdie later adopted this line when considering the post-Expo disposal of Habitat, recommending that a “Trust Company be given the project for disposal on a Condominium basis” and in “establishing the purchase price of the units consideration should be given to the fact that Habitat should be lived in by middle income (or upper middle income) families, preferably with children.”¹²¹ Yet when first promoting his design in 1965, he had been unsure about the socio-economic target:

What kind of housing is Habitat? Is it low, middle, or high-income housing? Habitat is a building method to provide housing for everyone. As an urban form, it must accommodate the entire range of income groups. To isolate it and consider it as a form catering to one of the groups only would be to imply its lack of universality.¹²²

¹²⁰ Symptomatic of the criticism levelled against Habitat 67 as somehow proving the need for industrialised building was an article by Bernard P. Spring, Director of the Research Centre for Urban and Environmental Planning in the School of Architecture at Princeton University. Spring insisted: “it is claimed that the industrialized production methods used could produce competitively priced apartments if there were enough of a market. This is a very ancient and tired argument by the proponents of industrialized housing that should not have the power to fool anyone. But it does.... If there were a contest between a prefabricator and a good conventional builder, I would bet that the conventional builder would turn in lower costs. In that case the conventional builder would profit from the economies of scale without having to bear the costs of retraining labor and management, or of setting up new transportation, distribution, and financing systems.” See: Spring, “Is There a Habitat in Your Future?”, *Journal of the American Institute of Planners* (November 1967): 418.

¹²¹ Moshe Safdie, “Considerations in the Disposal of Habitat 67 and Mackay Pier” (November 22, 1966): 1, Box PF19, Folder 58/191/PF15/20, Moshe Safdie Archive, Canadian Architecture Collection, McGill University. When preparing his memorandum Safdie knew that condominiums were not yet legal in Quebec.

¹²² Safdie, “Habitat 67” (September-December 1965), 6. The socio-economic status of Habitat had been questioned right from the start. Oscar Newman, who had helped develop the Man in the City theme at Safdie’s invitation, and who had chronicled the Team 10 meeting Otterlo in 1959, penned an early appraisal of the first Habitat scheme in October 1964. Newman’s critique presented passages from the Habitat 67

Maintaining that “low-cost housing” has “to do more with the financing of housing than with its construction”, Safdie claimed that the only way to “provide the most housing to all people” (“for less labor and less material”) was “by the introduction of new methods of construction”. Moreover, while “there is no question that it would be cheaper to use the construction method of Habitat by building vertical towers along double loaded corridors” and that “there is also no question that higher densities than Habitat have been constructed”, the imperative was to “offer to the family, to the public, at least some of the amenities” – the conventions of suburbia informing Safdie since *A Case for City Living* – “which they have at present.”¹²³ In other words, Habitat encapsulated desires already prevalent in society.

Moreover, given its very form, it “sets a standard” (a *social* one) and “introduces a method of construction which will make that standard possible.”¹²⁴ Moreover, “if it is the economist’s

Feasibility Study of February 1964, after which he offered a point-by-point rebuttal. In singling out the claim “To build economically is a social and political aspect of our time”, Newman retorted that the excessive per unit costs, the unrealistically low price of land, the low promised return on equity for developers, and the foreseen high rents, all made the project utterly unrealistic, thus adding: “The housing picture for the upper classes looks very rosy indeed.” See: Oscar Newman, “Habitat 67: A Critique”, *Canadian Architect* (October 1964): 43. The paradigm of a “prototype”, as developed by Safdie and the CCWE, was to inoculate Habitat 67 against precisely this kind of criticism.

¹²³ Safdie noted that “Stuyvesant Town in New York has a density 50% higher than that of Habitat 67.” While recognising that Habitat achieved lower densities than typical urban types, he had also positioned Habitat in categorical opposition to suburban patterns of land use – a view he illustrated repeatedly in an oft-published “density comparison” diagram that juxtaposed Habitat with a plan of Levittown; see: Safdie, “Habitat 67” (September-December 1965), 13. With the opening of Expo 67, Safdie was further emboldened to see his prototype as a total replacement to suburban living. Speaking to a Vancouver audience in early May 1967, he predicted that in ten years the single-family house will no longer be the predominant form of housing. See: “Suburbia’s on the Way Out Says Expo Habitat Designer”, *Vancouver Sun* (12 May 1967): 34.

¹²⁴ Moshe Safdie, “Habitat 67” (September-December 1965), 6. Safdie further qualified his new “standard”: “It cannot be evaluated within the short range implications of the first construction program of 160 dwelling units.”

responsibility to establish some of these standards, it is the architect who must give the image the physical interpretation".¹²⁵ The "method" was the refinements achieved by industrialised building; but it was only the architect's privileged compositional acuity (notwithstanding the ensuing critique of *Formverlangen*) that could make mass production a redemptive force, thereby actualising an "image" of society – precisely what the Expo 67 mandate sought to approximate or, really, to foretell.

The production of units, cells, boxes, or, indeed, "houses" was now meant to be the paramount achievement of Habitat. *Arts & Architecture*, the magazine most associated with promoting the Case Study House programme (which ran from 1945 to 1966 and aimed to establish the modern, often prefabricated, home as the preeminent type for middle-class America), passingly dismissed Expo 67 as "an expensive display of conceptual poverty, a \$300-million frug, a middle-aged archidelic freak-out": "World's Fairs tend to stew the architect in his own juices"; nevertheless, Habitat 67, it concluded, "is one of a few projects indicating an attempt to spend millions responsibly."¹²⁶ The demand of *responsibility* was not explained by a detailed analysis of Habitat; rather, it was deliberately constructed around the inclusion of Habitat in an issue specifically devoted to industrialised building, with Safdie's project shown alongside examples such as Herbert Ohl's prefabricated systems advanced at the Hochschule für Gestaltung in Ulm, Ezra Ehrenkrantz's celebrated Schools Construction Systems Development (SCSD) project in California, advances in "pods" and

¹²⁵ Moshe Safdie, "Habitat 67" (September-December 1965), 6.

¹²⁶ "Habitat 67", *Arts & Architecture* (April 1967): 11.

“space-frames” (shown by juxtaposing Alexander Graham Bell’s tetrahedral kites of 1907 with the aluminium pyramidal geodetic structure of the Gyrotron funhouse at Expo 67), the space frames pioneer Konrad Wachsmann’s polemic on “Research: The Mother of Invention”, and CIAM architect Knud Lonberg-Holm’s article “Architecture in the Industrial Age” (an unpublished piece of 1929 that was, as an editorial aside noted, originally rejected by *Architectural Record* for being too controversial). Suggesting an alternative trajectory in modernism premised on the ideal of mass production, a contextualising polemic was given in the architecture critic Allen Temko’s introductory essay, “Building the Great Society: The Challenge to the Construction Industry” by. A self-professed “radical who would like to see sweeping changes in our environment”, Temko drew on key contemporary cultural concepts – “our ‘open’ society” and the “New Frontier” – to argue that only the experimental methods of industrialised building could activate the socio-cultural programmes commensurate to the “Great Society” (the set of domestic programmes enacted by President Lyndon B. Johnson to eliminate, among other things, poverty and racial injustice in the United States).¹²⁷ Suggesting simultaneously the technological sublime of the Space Race (John F. Kennedy’s “New Frontier”) as well as the philosopher Karl Popper’s

¹²⁷ Allen Temko, “Building the Great Society: The Challenge to the Construction Industry”, *Arts & Architecture* (April 1967): 8-9. Temko’s credential as a West Coast “radical” had been *bona fide* since his inclusion as Roland Major in Jack Kerouac’s novel *On the Road* of 1957. Temko and Kerouac were friends as undergraduates at Columbia University. Temko first published *Building the Great Society: the Challenge to the Construction Industry* as a “working paper” for the Center for Planning & Development Research at the University of California, Berkeley, in 1966; it was prepared for the symposium *America’s Private Construction Industry and the Future American City*, held in Los Angeles in January 1966.

influential postwar critique of historicism (his anti-Hegelianism), Temko's prognostication on architectural advance served to describe a possibly new state in human affairs:

Only now, as the Age of Communications, Services, and Automation succeeds the earlier period of mechanization, is the new society commencing to hit its full stride. Although it may eventually enter a "post-historic" stage, in which its complex dynamics will be stabilized, it presently is in an exhilarating state of flux; its material demands are still apparently limitless; its cultural requirements, including the need for amenities of every conceivable kind, have not been clearly articulated.¹²⁸

Echoing what in other circles would soon be described as post-industrial society, Temko perceived a phase in which conflicts of "history" – the dialectic of, say, class struggle, or the uneven access to knowledge or natural resources – could be realigned – and "stabilized" – through architecture itself; hence, the efficiencies promised by industrialised building would invent entirely new forms for the necessary reorganisation of social institutions. His preferred example was Ehrenkrantz's SCSD, which he singled out for two reasons: first, the engineer Robertson Ward's design of a lightweight, folding steel truss system for Inland Steel used in the SCSD schools; second, that this new challenge for architecture "may come from market competitors" but, in fact, demanded a "different kind of push, much stronger" that could "come from the nation's intellectual leadership" (fig. 6.20).¹²⁹ It was an appeal to an enlightened technocratic class – a situation already facing Safdie when contacted by the newly created United States Department of Housing and Urban Development (HUD). HUD invited Safdie to consider ways in which Habitat 67 could, even before its completion,

¹²⁸ Ibid., 9.

¹²⁹ Ibid., 10. SCSD was undertaken by the Educational Facilities Laboratory at Stanford University and sponsored by the Ford Foundation.

be used for Operation Breakthrough, a newly initiated programme for providing housing to lower income families by the large-scale use of industrialised building.¹³⁰ The ambition was not unlike the hopes for Habitat 67: “HUD officials believed that publicity form a large-scale demonstration of industrialized housing construction methods could be a catalyst in helping reduce or eliminate the complex housing industry problems”.¹³¹ This aligned

¹³⁰ In June 1967, Safdie met with members of the United States Department of Housing and Urban Development to discuss a “Proposed Experimental Project for Washington, D.C.”. The “main objective” was “to demonstrate the use of new building technology and design in the construction of housing for low-income families”, specifically by “adapting the general concept of prefabricating complete dwelling units as conceived by Mr. Moshe Safdie for Habitat”. In establishing the project goals, the Office of Urban Technology and Research at HUD asked “what assessments both technically and in terms of tenants and visitors reaction to Habitat were being undertaken.” Upon being told by Safdie about the Habitat survey, the Office replied that it was “extremely anxious to more about the responses which you received from your questionnaire.” Safdie had, by this point, designed the HUD “modular system” project in collaboration with Conrad Engineers (with whom he would work on the aborted Habitat Puerto Rico). While the HUD project was never realised, Safdie described it as “the first opportunity to change and modify the system after our Habitat post-mortems”, and concluded that it set the standards for financing and design of “Operation Breakthrough”. See: Safdie, “Proposed Experimental Project for Washington, D.C.”, Meeting Minutes (June 20, 1967): n.p., Box PF19, Folder 58/191/PF15/28, Moshe Safdie Archive, Canadian Architecture Collection, McGill University; Safdie, Letter to S.A. Gitterman, Central Mortgage and Housing Corporation (August 11, 1967), Box PF19, Folder 58/191/PF15/20, Canadian Architecture Collection; Safdie, Letter to James R. Simpson, Department of Housing and Urban Development (November 6, 1967), Box PF19, Folder 58/191/PF15/20, Canadian Architecture Collection; James R. Simpson, Letter to Moshe Safdie (November 15, 1967), Box PF19, Folder 58/191/PF15/20, Canadian Architecture Collection; and Safdie, *Beyond Habitat* (Cambridge MA: The MIT Press, 1970): 181-186.

¹³¹ United States General Accounting Office, *Operation Breakthrough – Lessons Learned about Demonstrating New Technology*, Report to the Congress by the Comptroller General of the United States (November 2, 1976), 6. As the Comptroller General noted in hindsight, Operation Breakthrough was stymied by traditional labour practices, building codes, and land assembly problems; it “did not prove the marketability of most of its sponsored housing construction methods, but it did support some useful changes in the building industry” (n.p.). The Demonstration Cities and Metropolitan Development Act of 1966 authorised HUD to undertake Operation Breakthrough. The ambition was not unlike what was hoped for Habitat 67: “HUD officials believed that publicity form a large-scale demonstration of industrialized housing construction methods could be a catalyst in helping reduce or eliminate the complex housing industry problems” (6). HUD was elevated to a cabinet agency in 1965, the very year of the Great Society programme that, in one of its very first announcements, during President Lyndon B. Johnson’s commencement address at the University of Michigan on May 22, 1964, took urban renewal as a core aspect of the “War on Poverty”: “Our society will never be great until our cities are great. Today the frontier of imagination and innovation is inside those cities and not beyond their borders.” See: Johnson, quoted in Christopher Klemek, *The Transatlantic Collapse of Urban Renewal: Postwar Urbanism for New York to Berlin* (Chicago: The University of Chicago Press, 2011), 2.

perfectly with the kind of total programme sought by Safdie: a triad between the precision of the assembly line, the imagination of the architect (to conceive of “combinations and permutation... within a repetitive construction”), and the authority of an ideal commissioning agency (“a complete small-scale government” – here, a world’s fair – that “could integrate the design and manufacture of thousands of different elements... and improve them through research”).¹³² Critics similarly acknowledged the authority of Expo 67 as uniquely suited to steering Habitat. As *Canadian Architect* observed:

Complex social purpose, standardized construction techniques, soaring building and site costs, fragmented patterns of land ownership, systems of finance, the organization of the development industry, conservative public acceptability, zoning and building codification, the very form of cities: all these factors constrain the normal processes of multiple housing design and result in predictable and universal stereotypes of slab and tower undifferentiated from Murmansk to Montreal....

Without Expo 67, Habitat would not exist except as a paper thesis among a goodly company of technical and social acrobatics.... Without Expo neither private development nor public purpose could have achieved this extraordinary statement of habitation.”¹³³

Robin Boyd, the Australian architect and contributing editor to *Architectural Record*, similarly insisted that Habitat “manages to convince as a little scrap of tomorrow”; since “this was the object of the exercise as an Expo exhibit, almost any price paid in practical building discomfort and economies was prejustified.”¹³⁴ *The Architectural Review* likewise argued that

¹³² Safdie, “Why not Utopia?”, 15.

¹³³ Murray, “Habitat 67: The Critical Eye 1”, 35.

¹³⁴ Robin Boyd, “Habitat’s Cluster”, *Architectural Forum* (May 1967): 39. Boyd’s article appeared in a special issue on “Habitat and After”, which looked at advances in prefabrication and industrialised building. He was a well-known critic during the 1960s, and had been a visiting professor at MIT in 1956-1957. Boyd prepared the monograph *Kenzo Tange* (New York: George Braziller, 1962), thus allowing him to compare Safdie’s work to Tange’s Tokyo Bay and Boston Harbour projects.

despite “the cost” of each Habitat house as built” (which “puts them in the luxury class”), the very purpose “of an exhibition is to make experiments that would not be economically justified in other contexts”; thus, “a lot will be learnt” from Habitat, “including the lessons about how to improve the planning and construction system it employs.”¹³⁵ In a “post-mortem” published in *Progressive Architecture*, Safdie’s consulting engineer August Komendant described flaws in design, fabrication, and construction, but otherwise concluded that “Habitat, as built, proves that it could be realized only within the framework of Expo 67 because the funds were available”, although it “could have been built in its own right within reasonable time and economical limits if there had been a single executive authority completely in charge of all phases of the project. This authority would need up-to-date technical knowledge and be well experienced in construction and mass-production methods.”¹³⁶ The vacuum of the world’s fair – as an institution set apart from the typical demands of capital – was presumed necessary not only to initiating Habitat 67 – as “prototype” – but for suggesting some kind of technocratic agency – for example, HUD – capable of organising the built environment. As much an argument on the economic base of society, the idea of an enlightened use of technology by statist enterprise was, in terms of architecture culture, also to confront a category of the *avant-garde* – namely, “paper thesis” statements on contemporary megastructures as forms of critique, thus seen as standing outside everyday life by virtue of “technical and social acrobatics” positing an alternative,

¹³⁵ “Habitat” and “Theme and Permanent Buildings”, *The Architectural Review* (August 1967): 143, 136.

¹³⁶ Komendant, “Post-Mortem on Habitat”, 147.

largely improbable, reality. Key works informing Safdie, and influencing the early Expo 67 master plans, belonged to these visions, in which an aestheticisation of technology inevitably masked any differentiation between utopian and pragmatic aspects; the most extreme examples offered a world in which social life would be in constant, irrational agitation with economics, government and industrial production sequestered in a state of automated perfection.¹³⁷ While not unsympathetic to such sentiments, Safdie offered a prognosis on society ushered by an enlightened liberal state – ideally operating outside the short-term goals of politics – as the agent of social reform via architecture. The “framework” offered by Komendant was, then, an ultimate vision on organising *design* and *machines* to produce environments free of unevenness and irregularity – thus, commensurate to the world’s fair thematic of a post-corporatist and post-nationalist “world”, with the housing exhibition representing, however artificially, the kind of “post-historic” *zeitgeist* projected by Temko and others.

SYSTEMS

Appraisals of Habitat 67 located it between its relative success as a factory-made building and its potential as a new form of the modern city. In 1965, Safdie still assumed that “we must await completion of the project before discussing and evaluating its social implications”.¹³⁸

¹³⁷ Alan Colquhoun, *Modern Architecture* (Oxford: Oxford University Press, 2000), 228-229.

¹³⁸ Safdie, “Habitat 67” (September-December, 1965), 6.

By early 1967, as Habitat stood almost finished – and believed to be only the first of future phases – he concluded:

In the construction of an environment, the problem presented by mass production is how to achieve a variety of spaces required in the make-up of the city; how to achieve a variety of house types; how to achieve a variety in the patterns and groupings of the elements of the city to avoid monotony, without sacrificing the prerequisites of repetitive use of similar elements.”¹³⁹

Of these three “problems”, Safdie saw Habitat treating the latter two: the creation of a “single standardized three-dimensional precast component” and its use “as the repetitive modular construction element”.¹⁴⁰ The project – as architecture, as ethos – was now “Habitat 67 – Towards the Development of a Building System”.¹⁴¹ Safdie’s invocation of *standardisation*, *prefabrication*, and *repetition* closely followed discussions on “building systems” rife in architecture culture by the mid-1960s. Building systems referred to an array of components and the rules for putting them together; as such, commodities like housing – which demanded economies of scale for growing populations and urban needs – could be renewed at an increasing pace.¹⁴² At the close of Expo 67, Safdie asserted: “A building system is not only a means to end; it is a form of organisation.” “Systems”, he added, “are a way of approaching the environment” – housing, a world’s fair, the city – “as a total, complex organism, of discovering an order which, once established, would preserve those

¹³⁹ Safdie, “Habitat 67 – Towards the Development of Building System”, 60. This was also the title of a paper Safdie delivered at a Prestressed Concrete Institute Convention in Houston

¹⁴⁰ *Ibid.*, 60-61.

¹⁴¹ *Ibid.*, 62.

¹⁴² Barry Russell, *Building Systems, Industrialization, and Architecture* (London and New York: Wiley, 1981): 647ff.

aspects of the environment which we consider essential.”¹⁴³ The argument was not simply on the rationalisation of construction, a deeply held principle of the Modern Movement, but to see design as a stemming from the interrelatedness of things – hence the belief in biological models like D’Arcy Thompson’s “holism”.¹⁴⁴ Natural systems – such as molecular cells – were especially attractive given that these were processes embodied in physical containers and actual forms; in other words, they were analogous to building elements. By “imitating the morphological process” found in nature, architects would, Safdie believed, “automatically stop looking at buildings as single entities”; instead, they “would have to think of cities as systems, as building systems.”¹⁴⁵ This shared with modernist functionalism a belief in achieving an organic unity of culture; where it differed was in challenging idealist diagrams of space – nature versus technology – by aesthetic, social, and technological categories in which all aspects were inextricably bound to one another.

“Building system” referred not only to the celebrated assembly-line construction of Habitat but invoked ascendant ideas of *systems building* in architecture and *systems theory* in the postwar human sciences. Both regarded design as a *process* accepting “input” from any number of sources, whether public taste, terms of financing, or technological innovation. Developed by Austrian biologist Ludwig von Bertalanffy, “General Systems Theory” offering

¹⁴³ Safdie, “On from Habitat”, 45.

¹⁴⁴ Francis Ferguson, *Architecture, Cities and the Systems Approach* (New York: George Braziller, 1975): 40ff. Ideas of holism or homeostasis in biology assumed an organism regulated by internal conditions so as to preserve a permanent state of equilibrium (thus a self-regulating system).

¹⁴⁵ “Building a City with King Kong Blocks”, 231.

a “theory of organisation” applicable to any number of social, economic, or technological questions.¹⁴⁶ Increasingly popular in the 1960s (with a particularly rapt American audience, not least given the application to war gaming scenarios being developed for the war in Vietnam), systems theory was the application of the principle of biological self-regulation to machines and society. The view was common to the rising science of cybernetics, which sought in the principle of “feedback” a way of maintaining things in equilibrium thereby forever increasing their “performance”.¹⁴⁷ Broadly applied to the social realm, systems analysis was believed to offer a long-term “good” achieved by calculation and measurement (and as opposed to, say, politics, which sought only short-term success). The construction of “wholes” – social systems, economic models, machines, or architectural works – rested on maintaining a continuous flow of information (or user input). With Habitat nearing completion, Safdie offered that a “building system is not only a means to an end” but it is a “form of organisation”; systems thinking could thus lead to an “order” that, once established,

¹⁴⁶ Ludwig von Bertalanffy, “General Systems Theory: A Critical Review”, in *General Systems, Yearbook of the Society for the Advancement of General Systems Research* 7(1962), 1-20.

¹⁴⁷ Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (1950; New York: Avon Books, 1967). “Systems” also tied to broader considerations on “management” – whether applied to abstractions such as the economy or the actual conditioning of people and the husbandry of resources. For Safdie, this kind of organisational “feedback” was also a way to reconsider approaches to design: “The relationship of the architect, who is designing the assembled complex; the industrial engineer who is designing the product itself; the contractor who assembles them, must be transformed into a single organization. This organization would develop systems of building, manufacturing all parts, undertaking basic research, marketing on an international scale. We have, then, two levels of design. The design of the building system evolving new vernacular to satisfy our building requirements, and its application to a specific area.” See: Safdie, “Why not Utopia?”, 11

The rising managerial aspect of systems thinking in the early 1960s marked the “bright young men” of the Kennedy administration, who propagated the Vietnam War through techniques of “role playing” or “war gaming” (also called “scenario planning”), which followed earlier “operational research” during the World War Two. The establishment of “think tanks” such as the RAND Corporation was tied to military planning; during the Vietnam War, members of RAND worked for Robert McNamara at the Department of Defense, where systems thinking flourished.

would preserve these “aspects of the environment” an architect considered “essential”.¹⁴⁸ In principle, the creation of “order” grew from the introduction of a self-regulating element into the way large buildings and, by extension, cities were conceived. For Safdie, this component had always been the “dwelling unit” that, fixed by constraints of mass production, could serve as the basis of an ever-expanding environment.

Safdie’s view on systems owed to his earlier immersion in the Dutch line of Team 10. Under Aldo van Eyck, the Dutch “structuralist” tendency was marked by a search for forms that could change with time while retaining their coherence and “meaning”.¹⁴⁹ Van Eyck’s Amsterdam Orphanage, which had so influenced Safdie as a student, epitomised structuralist precepts of using repeating – and prefabricated – modular cells to create clusters signifying both “house” and “city” in continuum. This condition of being “both/and”, in van Eyck’s phraseology, informed Safdie’s sense of “systems” that emerged from a set of “synonyms” he gave to “the word structure” (which, in turn, followed from understanding “morphological process”): “integration, articulation, concatenation, organisation, arrangement, system, organism, scheme, and complex. Each of these words must form the broadest programmatic base in our design of the urban texture.”¹⁵⁰ Semantically, this approximated the increasingly

¹⁴⁸ Safdie, “On from Habitat”, 45.

¹⁴⁹ Colquhoun, *Modern Architecture*, 222; Wim van Heuval, *Structuralism in Dutch Architecture* (Rotterdam: 010 Publishers, 1992), 15.

¹⁵⁰ Moshe Safdie, “Why not Utopia? Part 2: Proposals and Requirements”, 6. Lancelot Law Whyte, whose theories influenced Safdie, had written: “The word ‘form’ has many meanings, such as shape, configuration, structure, pattern, organisation, and system of relations.... Common to the idea of form, configuration, pattern, and structure is the notion of ordered complexity, a multiplicity which is governed by some unifying principle.” See: Whyte, “Introduction”, *Aspects of Form: A Symposium on Form in Nature and Art*, 2. In a similar vein, Gyorgy Kepes also provided an expanded sense of “structure”. When discussing what he called the

popular “method” of analysis, ascendant in linguistics and the social sciences, known as Structuralism, which sought the existence of elementary signifying forms (from myth to grammar) out of which variety (cultures and languages) was generated. In this, structuralism would share with systems theory the desire to find in the natural sciences models (really, analogies) expressing both the dynamic transformation and the conservation of any given totality (a “whole”). When contemporaneously defining structuralism as “a system of transformations”, the Swiss psychologist and philosopher Jean Piaget crucially noted that von Bertalanffy derived his General Systems Theory from earlier ground-breaking attempts “to introduce an explicitly structuralist perspective into biology” – proof of the Austrian biologist’s “organicism”; he added: “it can be maintained that in the morphological transformations which D’Arcy Thompson studied more than a generation ago *life is geometrizing*.”¹⁵¹ Von Bertalanffy’s approach rested on introducing the principles of

“modulation of signals”, Kepes argued that “the key techniques of our civilization are instrumentation based on the transformation of patterns into their structural analogues through modulation of signals” – as produced, for instance, by the oscilloscope. Kepes concluded: “Structure emerges as the key to our knowledge and control of our world – structure more than *quantitative measure* and more than relation between cause and effect.” Kepes contextualised his definition with a footnoted reference to Whyte’s books *The Next Development of Man* (Mentor Books, 1950) and *The Unitary Principle in Physics and Biology* (Henry Holt and Co., 1949). See: Kepes, *The New Landscape in Art and Science* (Chicago: Paul Theobald and Co., 1956), 173.

¹⁵¹ Jean Piaget, *Structuralism* (1968; New York Harper Colophon Books, 1970), 5, 46-47, 114; emphasis added. Donna Haraway observes that Piaget, a Swiss psychologist, “felt that Ludwig von Bertalanffy, inspired by the work of Gestalt configurations” – for example, the aesthetic analogies for biological form derived by D’Arcy Thompson and others – “was the first biologist seriously to explore the requirements of a structuralist organicism, which led to his ‘general systems theory.’” See: Haraway, *Crystals, Fabrics, and Fields: Metaphors of Organicism in Twentieth-Century Developmental Biology* (New Haven: Yale University Press, 1976), 61-63. Piaget referred expressly to Thompson’s *On Growth and Form*, which, he noted, “influenced Lévi-Strauss’ earlier thought.” The anthropologist Claude Lévi-Strauss saw social life as a system in which all aspects are linked with one another. Aldo van Eyck spoke purposely from the theoretical world of Structuralism and, given his own preoccupations with “primitive” cultures, was likely well versed in the theories of Lévi-Strauss. Arnulf Lüchinger notes that while van Eyck may well have absorbed Lévi-Strauss, younger architects such as Herman Hertzberger turned to linguistic models of structuralism: “Parallel to the concept of LANGUE ET

mechanics to biology (namely that biological laws must be expressed in physical-chemical terms).¹⁵² His organicism was rooted in Romantic conceptions on how the outward expression of any organism could express its internal organising principles. Indeed, Goethe was among the first to use “morphology” (among Safdie’s preferred expressions) following studies in anatomy, botany, and mineralogy that revealed to him certain common patterns – “the laws of transformation” – underlying the modifications – that is, the shape and structure – of natural forms.¹⁵³ He considered science not simply as the quantitative ordering of things (that is, as taxonomy) but as an attempt to understand human experience. In short, biological principles were appropriate to describing technology, society, and aesthetics. Thus, “geometrising”: Goethe’s inheritance, extended through discourses on structuralism and systems, lay, for postwar architecture culture, in seeing *form* – a conjoined social and aesthetic concern – not as static but as dynamic and open to change.

Seemingly technocratic, *system* was also to suggest a more archaic view on architecture. Safdie remarked:

PAROLE (language and speech), Hertzberger “developed his own ideas on the topical subject of co-determination in housing: parole of the occupants”; see: Lüchinger, *Structuralism in Architecture and Urban Planning* (Stuttgart: Karl Krämer, 1981),19.

¹⁵² Haraway, *Crystals, Fabrics, and Fields: Metaphors of Organicism in Twentieth-Century Developmental Biology*, 26-27.

¹⁵³ Ritterbush, *The Art of Organic Forms*, 7. Donna Haraway also observes that the Romantic view on “form” embodied “all the relations of the organism and expresses the whole and its internal organizing principles” – which related to Goethe’s early aesthetic conceptualisation of “morphology” – and became “essentially the starting point for modern biology, not in the sense that the poets provided acceptable biological explanations of laws (which they surely did not), but in the sense that the artists and biologist face a common problem: creation of novelty and fundamental appreciation of the nature of organic form.” See: Haraway, *Crystals, Fabrics, and Fields: Metaphors of Organicism in Twentieth-Century Developmental Biology*, 39ff.

People visiting Habitat were reminded of a Mediterranean village. That association was not rooted in formalism; it is generic in nature. The typical Aegean hill villages, the Arab hill towns, or the Indian pueblos are true building systems. They consist of a vocabulary of repetitive components – for example, the Arab village with its cubical room, dome, vault, and court.¹⁵⁴

Critics had, indeed, described Habitat as “reminiscent of villages not far from Moshe Safdie’s birthplace of Haifa”; that it “tried to capture something of the spontaneity of those villages and towns which have grown spontaneously in countries around the Mediterranean”; or that here was a “communal housing project that is half Indian pueblo in appearance, but is possibly the shape of the future.”¹⁵⁵ While acknowledging the formal comparisons, Safdie insisted that “vernacular architecture” was akin to a “building system” because it followed “the development of repetitive elements capable of combination and growth” over time.¹⁵⁶ He thus claimed that “the vernacular of Habitat is not a dome or an adobe roof, but the standardized units themselves.”¹⁵⁷ The CCWE and Safdie always intended the precast box to forge a metabolic relation between visitor – the future inhabitant – and a dwelling unit. Now, the prefabricated cell did something more: it situated Habitat “in the tradition of spontaneous self-made environments, the beginnings of contemporary vernacular”.¹⁵⁸ On

¹⁵⁴ Safdie, *Beyond Habitat*, 118.

¹⁵⁵ Boyd, “Habitat’s Cluster”, 39; Hans Elte, “Habitat 67: The Critical Eye 2”, 37; “Habitat 67’s Housing Blocks Build a Better Environment”, in *Engineering News-Record* (June 16, 1966): 84.

¹⁵⁶ Safdie, “Why not Utopia?”, 6.

¹⁵⁷ Safdie, *Habitat* (1967), 8. Safdie’s idea of a “vernacular” as a “system” was likely inherited from Christopher Alexander, another preferred source. In his *Notes on the Synthesis of Form* (1964), Alexander described “unselfconscious” vernacular architecture as “self-organising”.

¹⁵⁸ Safdie, *Beyond Habitat*, 118. To Safdie, Habitat 67 was “much more a vernacular system, a reaction against the idea of individually-designed buildings on individual lots”. He thus turned to the “vernacular” to oppose

the one hand, the *vernacular* was adopted as a way to popularise ideas on prefabrication and industrial building. On the other hand, while industrialisation broadly marked a dichotomy between traditional and modern society, Safdie's dovetailing of *structure* and *vernacular* was to suggest a renewal of human agency vis-à-vis the built environment. As Safdie began repeatedly to state, almost as a post-rationalisation, when Habitat 67 opened to visitors:

I should say that people want their own identity to start with, they want to feel that they can shape their own personal environment, they can change it, modify it, they can choose it to start with, that it's not imposed on them and they like to feel that it has certain differentiation from others that it's not the same as everybody else because they are not the same as other people in fact the Utopian statement could be that houses and dwellings should be as different to each other as one human face and personality to the other, this is the idea and any system which imposes dwellings which are all identical on people they generally react to it. I think this is true of most societies; there are very few societies where conformity of the individual to the overall group is so strong that he does not have the need for identification. In fact, there are certain societies where the identification isn't to the individual but it may be to the immediate group like the Indian pueblo, the need to identify was probably more directed to the whole tribe".¹⁵⁹

Returning to Safdie's earliest worries on the city versus the suburb, it remained unclear whether his social paradigm was meant to err on side of the communal or the individual. If the equation between spontaneity, auto-construction, vernacular, and standardisation was a re-evaluation of Aldo van Eyck's "organised casbah", then it was without the Dutch architect's nostalgic sense of "community" – despite analogy to vernacular construction, the paradigm of "open" structures offered techniques toward a built world largely unimpeded by

"the tradition of what I would call the architect-designed building", which was inherited from "the Renaissance idea of an architect designing a building" (9-10).

¹⁵⁹ Moshe Safdie, "Session of April 7 and 8", Interview Transcript, 3-4, Box PF22, Moshe Safdie Archive, Canadian Architecture Collection, McGill University .

any *a priori* cultural codes.¹⁶⁰ As users draw on the rationalising capacities of industrialised building in the form of the prefabricated cell, they were, in theory, offered the means to alter their own environment – and, therefore, their patterns of behaviour; this was the paradigm at its most anarchic. Still, the dovetailing of “systems” and “structure” was part and parcel of a broader tendency to substitute a new kind of “organicist” project – via models of wholeness and self-regulation – for the oppositional frameworks of modernism, whether in terms of the conflicts of history or, indeed, the functionalist (or mechanistic) ordering of space in which absolute values, like nature or technology, were clearly and consistently juxtaposed; this was the basis of Temko’s turn to industrialised building as commensurate to a “post-historic” phase in human civilisation.¹⁶¹ Here, the aspiration for “systems” of self-building – predicated on the promise of unremitting mass production – jibed with emerging tendencies

¹⁶⁰ Safdie, “On from Habitat”, *Design* 226 (London, October 1967); Safdie, “Variety within Repetition”, *Architecture Canada* (November 1968): 49; Safdie, *Beyond Habitat*, 150-151.

¹⁶¹ In terms of a critique of functionalism, Donna Haraway explains that *gestalt* (epitomised in modern architecture by Le Corbusier’s “engineer’s aesthetic”) was seen by structuralists as neglecting history. In architecture culture, this was an opposition between functionalism (atomistic) and structuralism or systems (ways of seeing the relatedness of things). See: Haraway, *Crystals, Fabrics, and Fields: Metaphors of Organicism in Twentieth-Century Developmental Biology*, 62; Lüchinger, *Structuralism in Architecture and Urban Planning*, 40.

Temko’s “post-historic” society was contemporaneous with similar projections on “the year 2000”. Symptomatic was the important “2000+” issue of *Architectural Design*, released in February 1967 and edited by John McHale, erstwhile acolyte of Buckminster Fuller, in which architecture was eclipsed by the “New Symbiosis” of cybernetics and the rise of the “Communications Revolution”. The summer 1967 issue of *Daedalus*, the Journal of the American Society of Arts and Letters, published the findings of The Commission on the Year 2000 led by the sociologist Daniel Bell, who very soon became the polemicist of “post-industrial society”. Safdie was not unaffected by this futurology and would appear at the 1969 annual convention of the Californian Council of the American Institute of Architects, which looked towards “2000” with presentations on “Nature 2000”, “Students 2000”, “Population 2000”, “Earth 2000”, “Technology 2000”, “Oceans 2000”, and, of course, “Habitat 2000”. Millenarianism had coloured Expo 67 as ushering a host of civic improvement following official pronouncements (never fulfilled) on Montreal becoming a city of five million people by the year 2000. Indeed, the City Planning Department would, in 1967, produce its film *Horizon 2000*, a remarkable audio-visual evocation – through the use of split-screens – of a multivolume report on the future of Montreal.

to describe the world as an “information society”, a “leisure society”, an “affluent society”, and, notably, a “post-industrial society”.¹⁶² In each formulation, primacy was accorded to “knowledge” and techno-science in the belief that social groups – and their built environments – could be constructed and managed in some equilibrium with no one level “in control”. This was surely a utopian ambition. Yet if Habitat 67 was symbolic of the kind of social and spatial expansion presumed by “systems”, then it inevitably pointed to a coming crisis. The role of the “user” in creating what Safdie had called a “contemporary vernacular” was premised on an open technological future. With the fallout from urban renewal schemes throughout North America and an ensuing global financial crisis by the early 1970s, “users” may have come to wonder whether their spaces were really meant to be *conceived*, to be forever built anew; or, should these have quite simply been *appropriated*, as found in the existing conditions of the traditional city.

Habitat 67 was finally an argument on technological innovation as the basis for social change. Seemingly evolved outside the normal processes of history – namely, in the ideal space of a world’s fair – Habitat projected a belief in technics as the means for achieving a “perfect” society in the near future. This technological utopia was not simply to culminate in the introduction of new tools and machines (which had, of course, been the ultimate didactic function of world’s fairs); rather, it would be modeled on tools and machines – the

¹⁶² Just as one critic would, when considering Habitat, conclude that “our increasingly affluent society will be demanding greater choice in... high-density housing”, Safdie assumed that his project, as “prototype”, could only be achieved given the existing “economy of abundance”. See: Spring, “Is there a Habitat in Your Future”, 417; Safdie, “Habitat 67” (September-December 1965), 6.

precasting plant, the prefabricated cell – in terms of institutions, values, and culture.¹⁶³

Habitat could make credible such claims on the future in one important and novel aspect: it was built at full scale – whether as factory or “vernacular” community – and meant to be experienced “live”. As such, the housing exhibit made a crucial departure from earlier modernist narratives on the future city designed for popular consumption: it was no longer in the tradition of promoting miniaturised landscapes of the future typical of architectural contributions to world’s fairs.¹⁶⁴ Unlike these “perfected” types, Habitat appeared as a work in progress. This sense of incompleteness was always part of the spectacle. The image of vertiginously arranged cells, with one unit purposely left dangling from the crane, aimed to convince authorities of the project’s viability – not necessarily of its forms, but of its methods. Safdie had, well before the opening of Expo 67, already moved “On from Habitat” and began positing a new “system” that, while still mass-produced, could offer

¹⁶³ Howard Segal, *Technological Utopianism in American Culture* (Chicago: The University of Chicago Press, 1985), 14ff.

¹⁶⁴ David Nye, *American Technological Sublime* (Cambridge MA: The MIT Press, 1994), 215. Nye argues that corporations used world’s fairs originally to exhibit *products*, after which they started to explain *processes*, and finally turned to creating “*simulated landscapes*” (“miniaturised landscapes of the future”) – such as Norman Bel Geddes’s Futurama diorama of the “City of 1960” for the “Highways and Horizons” exhibit in the General Motors pavilion at the 1939 New York World’s Fair – as a way of marketing the future. The corresponding part to Futurama was industrial designer Henry Dreyfuss’s Democracy, a vision of the city in the year 2039. Both Futurama and Democracy were replete with skyscrapers. Another example appeared in Le Corbusier’s presentation of his plans for Paris inside his Pavillon de Temps Nouveau erected at the 1937 Paris International Exposition. In describing his “gratte-ciel cartésien”, Le Corbusier reproduced a page from *Paris Soir* (24 August 1938), which discussed the 1939 fair, Democracy, and the fact that the actual insalubrious skyscraper city of New York was simply a return to the Middle Ages. In his accompanying commentary, Le Corbusier reminded that the skyscraper was, in fact, “born in France (Salon d’automne 1922, Une Ville Contemporaine)” – an earlier instance of promoting his ideas in expositions – and that, upon “disembarking in New York in 1935, I told the American journalists: ‘The skyscrapers are too small and there are too many of them...’ It caused a scandal in the press.” See: Le Corbusier and P. Jeanneret, *Oeuvre Complète 1934-1938* (Zurich: Les Editions d’Architecture, 1995), 75; translation by author.

“produce a range of ‘true’ differentiations”.¹⁶⁵ Shown quite literally as toy-like building blocks, the idea was to promote – to any number of agencies now adopting systems building as an approach to urban design – mass production as capable of responding to the ever-changing needs of consumer society (fig. 6.21).¹⁶⁶ This was not only to present a general theory on architecture but to situate future Habitat schemes as necessarily ready for adoption by governments.

Safdie’s consequently drawings began to change. Unlike the exacting axonometrics of Habitat 67, new projects would carry a more “open” expression through ink sketches, with the entire process from fabrication to erection now actually showing people alongside machines and architecture. This was, above all, a way to domesticate “systems” in the popular imagination. Safdie had consciously cultivated a mediatic strategy of presenting three-dimensional combination of building materials as an image of architectural proliferation.¹⁶⁷ Moreover, he had, from the beginning, judiciously crafted a dramatic style of showing models in heroic isolation; indeed, architectural journals continued publishing

¹⁶⁵ Safdie, “On from Habitat”, 49.

¹⁶⁶ Before the completion of Habitat 67, Safdie began to imagine abstract design methods, not unlike games, in which users were given means to create their own environment. He modeled a Habitat “house” as a fixed element within “6-module component system”: a cube would represent “stability” (“to satisfy requirements of sunlight, distribution of services”, and so on) while “five accessories” could be “selected by the tenants” and “placed to produce hundreds of different houses” – “the cross-shaped house, the circular house, the elliptical house, the oblong house, the crystal-shaped house, the L-shaped house, the hipped-roof house” – “that have truly different spatial character and are capable of adaptation and change by individuals”. See: Safdie, “On from Habitat”, *Design* 226 (October 1967): 48-49. Safdie showed the “6-module component system” at the 1967 Aspen Design Conference, where he jointly presented with Christopher Alexander. See: Safdie and Alexander, “Complete or Incomplete?”, 191-196.

¹⁶⁷ Hubert Beringer, “An Image of Habitat 67 in 1968: They Finished It, So It Was a Failure”, *L’Image* 2 (May 1996): 181.

photographs of models of new Habitat schemes daringly projected against land or sky. Yet reports for governmental agencies consciously used the new *drawn* aesthetic to suggest the ease and ready availability of industrialised techniques that always shown just slightly above ground level, thereby offering a comfortable panorama of production while remaining technologically and ideologically persuasive. It was precisely how Safdie presented his Operation Breakthrough project to HUD (fig. 6.22). Everything could, it seemed, be made into a box.

The dream awaited one final step. It remained whether Habitat 67 could reproduce itself outside Expo 67, outside the sanction of state-issued debt. “As a building system”, Safdie had announced shortly before Expo 67 opened, “Habitat 67 attempts to provide for the present growth of existing and new urban developments.”¹⁶⁸ While trying to initiate Habitat schemes for Israel, New York, or Operation Breakthrough, Safdie received a commission to build low-cost housing for moderate-income families in Puerto Rico. Made of interlocking hexagonal units, the project was perhaps the closest approximation of what Safdie had wished to extrapolate from Montreal, distilling theories on “close packing” (still stemming from D’Arcy Thompson) but offering, he hoped, something more than the repetitive “modular system” of Habitat 67.¹⁶⁹ The project was again rendered as an almost

¹⁶⁸ Moshe Safdie, “Habitat ’67 – Towards the Development of a Building System”, *Journal of the Prestressed Concrete Institute* (Chicago, February 1967): 62.

¹⁶⁹ Moshe Safdie, “Variety within Repetition” and “Habitat Puerto Rico”, *Architecture Canada* (November 1969): 49, 51.

autonomous process of building and assembly. The sketches showed the entire “system” naturalised in the intermediate technology of a potentially underdeveloped society (fig. 6.23). A prefabrication plant was set up and production commenced. Yet the government withdrew financial support and the developer stopped construction after only 30 modules were in place (fig. 6.24). It remained whether it was a shame or poetic justice that the end of the Habitat experiment – with its ideas on Mediterranean vernaculars and Team 10 inspirations of indigenous architectures, but finally realised in Northern climes – could only have been in the jungles of the New World.

In Montreal, the North Cluster would be completed in 1974 – then, nothing. Nothing emerged along Cite du Havre. Nothing else appeared in Montreal. Nothing further grew from government patronage.

By 1970, CMHC had begun cutting public funds for housing in favour of privatisation. In the meantime, Canada continued to suburbanise. Standing apart, Habitat 67 remained a mute symbol of audacious – and unfulfilled – dreams for Montreal becoming a city of five million people by the year 2000. As the remaining Expo 67 structures slowly began decaying on the invented worlds of the twin islands, residents inside the permanent concrete boxes could only stare silently across the river or at the distant city skyline, the poles between which Man in the City was once imagined to arise anew.

Conclusion: A Nation

*Expo 67 represents, in microcosm, the contrasting worlds of the biplane and the jet liner.
Progressive Architecture (June 1967)*

*There's a tidal wave of mysticism
Surging through our jet-aged generation
Said it's all designed to take us to the sky
Funkadelic, "Better By the Pound" (1975)*

What, then, of the fair?

In short span of six months, from April 27 to October 29, 1967, 50 million people came to see the “world” re-presented, re-organised, and re-mapped. In the realm of *Terre des hommes*, nations were imagined subordinated to peoples, politics to knowledge, ideologies to themes. With the final atomising of the master plan into national pavilions, the theme pavilions, many with noteworthy architecture, would serve to display the contents of global culture: Man the Creator, a museum of fine arts; Man in the Community on the urban realm; Man the Provider, a remarkable display on agriculture; Man the Producer and Man the Explorer, which encompassed “life”, the planets and space, and, of course, the polar regions; and Habitat 67. In a brilliant stroke of marketing, visitors were issued a “passport” to enter “man and his world” (fig. 7.1). As they moved among countries and corporations, a stamp was issued for every frontier crossed – a *laissez-passer* allowing a borderless vision of a world free from strife, inequity, and violence. Even as each pavilion sat on its plot, fairgoers could, when riding the Minirail looping high above, look down and, for an instant, believe that here lay the new outlines of postwar society. Only the most perspicacious, or ironic, critics looked down and note that the outline of Frei Otto’s amazing tensile roof – “it proved that his system was eminently adaptable to any shape of plan” – suspended over the West

German pavilion actually resembled “West and East Germany”, “former areas now firmly within the domain of Poland”, and “a hunk of Czechoslovakia, in the area of the Südetenland”.¹ Elsewhere, the United States and Soviet Union (which, with 13 million visitors, would hold the attendance record), faced one another opposite a Cosmos Walk bridging the islands, replaying – now in terms of a “space race” – a previous generation’s gigantism when the USSR and Germany had similarly engaged in a battle of style at the 1937 Paris Exposition Universelle (fig. 7.2). In the Canadian precinct, the largest of the fair, individual provincial pavilions found Quebec, housed in an elegant elevated glass box, floating separately in its own moat, unmistakably adjacent to France.

Popular accounts inevitably read Expo 67 as a “city”. Here were “ideological and organisational links” appearing simultaneously in Montreal’s downtown core and the world’s fair – “links” that J.M. Richards, the longstanding editor of *The Architectural Review* and champion of the modern movement, both appreciated and simply left behind when entering Expo 67, a space “so different” from that which he just left, “free from the constricted narrow streets, from obsolescence, from machine-made noises and odours, from anonymity, and from the hard facts of daily life”. Free from the mechanisation of modern life, the turmoil of work, the psycho-social poverty of being a stranger, a trip to the islands was not, the Canadian Corporation for the World Exhibition (CCWE) insisted, an “evasion”: leaving the real city behind, the visitor was brought “face to face with Man and His Work and, he

¹ Abraham Rogatnick, “Expo 67, the Past Recaptured”, *Lotus 5* (1968): 33.

himself, participated in the spectacle in which he took delight” (fig. 7.3).² Expo 67 stood, literally across the water, as foil to the existing city, offering a space in which the productive and creative efficacies of “man” could be re-presented in ideal forms, shorn as they were from the social relations that otherwise granted value to exchanges of everyday life. The idea was described by the *Architectural Record* (in a celebratory mood marking most accounts in professional magazines): “Understandably, it confounds those who expect to see only quantitative boasts of industrial strength, military power, scientific progress, and cultural ascendance.”³ Still, there remained an inescapable fact: the nation-state. Ultimately every invitation by the Commissioner General Pierre Dupuy, the old hand diplomat brought out of retirement to run the fair, was issued to countries based on “the recognition and of the self-assertion of each of the Nations in the field of individual pavilions.”⁴ “Self-assertion” simply meant architectural *style*, whether historicist or modernist. As Abraham Rogatnick, the Canadian corresponded to the Italian journal *Lotus*, caustically noted,

The whole question of symbolism as an element as an element in architecture of the late twentieth century architecture is one that may well bear investigation. Is it not strange that a whole generation of fairly near descendants – call them grandchildren – of Wright, of Le Corbusier, of Gropius and of Mies, are unabashedly boasting of their creations in terms of moral, political, and poetic symbols? That is: expressions of and representation of something other than their most obvious functions, their most dominating structural systems and most cogent materials. Obviously, there is something about World Fair psychology which elicits, perhaps demands, this curious comportment....

² Canadian Corporation for the World Exhibition, *General Report on the 1967 World Exhibition* Vol. 3 (1969), 1263.

³ “A Brilliantly Ordered Visual World”, *Architectural Record* (July 1967).

⁴ *General Report on the 1967 World Exhibition* Vol. 3, 1268.

Is this what architecture is for? We have certainly come a long way from Dessau if serious architects can blatantly squeeze the shapes and details of their buildings into such banal ideograms.⁵

The clear association of some modern style with the nation-state was understood as a closure to the modernist project. To press the point (when dismissing Basil Spence's self-consciously "craggy" British pavilion), Rogatnick recalled the Crystal Palace and insisted that while Queen Victoria's diaries described every object inside the ferro-vitreous behemoth as upholding the glory of Empire, Joseph Paxton only defended his design by "its ease of erection and convenience as a container".⁶ Notwithstanding his muddy history, Rogatnick attempted to recuperate the ethics of some unadulterated functionalism from the aesthetics of political filiation. Yet the doctrinaire line could not accommodate a salient aspect of world's fairs: the desire of fairgoers necessarily to experience the construction of *difference*, to measure aspects of their own life world against those of others. At its most hopeful, this was to be revealed in the *themes*. At its most crude, it would be reduced to aesthetics. Had he known, Rogatnick could only have been grateful that Expo 67 never pursued Dupuy's first ambition: namely, a world's fair in which the "civilised" nations of the world – Britain, France, America, and Canada – would occupy their own compound.

Still, for other architects and critics, there was, even amidst the efflorescence of "cellular" architecture" and megastructural ambition, an exhaustion of a modern ambition to

⁵ Rogatnick, "Expo 67, the Past Recaptured", 33. Only three structures were spared Rogatnick's wrath: Buckminster Fuller's geodesic dome for the United States pavilion, Moshe Safdie's Habitat 67, and the transportation systems.

⁶ Ibid., 32.

resituate the “world” by architectural form. In Rogatnick’s asymmetrical history, the nineteenth century, the *modern*, haunted the present. Like the van Ginkels, his reading likely took from Sigfried Giedion.⁷ The thesis was, of course, the transmission of cultural ideals from one epoch to the next. Giedion’s act of recuperation had made nineteenth-century technology – and his construction of historical contexts (read: ideologies) around them – relevant to resituating present. Thus, for example, discourses on space frames. Yet the search for a genuinely new form of social organisation lay in another kind of technics, one that Giedion had suggested in his trope of “interpenetration” as the artistic and psychological expression of a collective modern consciousness. The idea of intermingling of spaces creating a new social reality had been evoked in “lyrical” parts of a “New Monumentality” animated not only by long-span structures but by the suggestion of filmic projections and the creation of truly immersive environments. The sensation of being deep inside, of being overcome, by some spatial event was crucial to Giedion’s theory of modernity (and evident in his preference for the dematerialising effects of photography). If this was still the haunting of a nineteenth-century visual imaginary – one that Giedion’s interlocutor Walter Benjamin had so precisely defined in the ambit of the panoramas (and leading up to the *expositions universelles*) – then it came, in fact, to be conjured again at Expo 67.

⁷ Rogatnick received his architecture degree from Harvard in 1953, when he would have encountered Giedion. He then immigrated to Canada and settled in Vancouver.

In the spirit reminiscent of a Hugo-ian “this will kill that”, architects would eschew the architecture of Expo 67 in favour of something altogether different: films. Not just films but, in the parlance of the era, *environments*. Over three thousand films were produced for Expo 67; approximately 65 percent of the pavilions or complexes presented moving images, many of which were technical marvels extending the flexibility of the screen and mediums of projection to heroic proportions.⁸ As much as these experimental works often required being housed in unique forms, they were immediately interpreted as architectures in themselves, often dwarfing their audiences and offering a sensory immersion that eclipsed even the most radical structures at the fair. While anticipating a future of “‘cellular’ construction”, the CCWE had also argued:

People are no longer awed by the latest model of widescreen cinema, colour television, the latest model of an electronic computer, or the fully automated plant. However, the public mind is still fascinated and may be enriched by seeing how the ever-widening range of techniques and discoveries serve Man to shape the world of tomorrow.

In other words: Universal Exhibitions must not be a static showcase for the arts, the science of technology. At all costs, any temptation to show the latest “hardware” must be resisted. The major effort should be to concentrate on subjects and modes of presentation which are likely to stir the imagination.⁹

Thus could Reyner Banham, arriving at Expo 67, becoming frustrated by the queues, and admitting disappointment in most of the architecture (especially Habitat 67), admit:

⁸ Janine Marchessault, “Multi-Screens and Future Cinema: The Labyrinth Project at Expo 67”, in Janine Marchessault and Susan Lord, eds., *Fluid Screens, Expanded Cinema* (Toronto: University of Toronto Press, 2007), 29.

⁹ Canadian Corporation for the World Exhibition, *The Theme Man and His World* (Ottawa, 1965), 14.

If Expo 67 has laid some giant eggs, it also has some resounding successes to boast, and some partial successes for further study. For instance, audio-visual communication is an area of general success.

And so it should be, since Expo is practically in the heart of McLuhan country.¹⁰

Banham singled out two examples. On the one hand was the Czechoslovak pavilion offering multiple filmic environments including one allowing audience feedback to change the storyline: here the visitor became a “participant – not as a simple dazed receptacle of respectful impressions”.¹¹ On the other hand was Labyrinth (or *Labyrinthe*), an official theme pavilion designed as a hulking, seemingly impenetrable, concrete box inside which people moved through “torturous passageways” between three chambers: in the first part, audiences stood on eight balconies on four levels to watch a two-screen film projected along the floor and at the far end of the oval space; next, after “the colorful film bombardment”, they moved into a “maze” of two-way mirrors through which they saw thousands of small lights; finally, entering the third space, a theatre arranged on three levels, they encountered *In The Labyrinth*, a ground-breaking film projected in a five-screen cruciform arrangement (fig. 7.4).¹² Produced by the National Film Board of Canada and using footage shot on location throughout the world, the films, inspired by the Greek myth of Theseus and the Minotaur, offered a narrative on the “inner struggle” of “man” to “triumph over his

¹⁰ Reyner Banham, “L’Homme à l’Expo”, *New Society* (1 June 1967): 812.

¹¹ *Ibid.*

¹² Canadian Corporation for the World Exhibition Press Service, “Labyrinth”, press release (no date): 1-4, RG53, Vol. 3, National Film Board Fonds, Library and Archives Canada, Ottawa; National Film Board of Canada Technical Operations Branch, “Labyrinthe”, Technical Bulletin Number 8 (March 1968): 1-19.

hesitations”, thereby arriving at individual self-realisation.¹³ The aim was, for the filmmakers, to construct a “ritual” or “artistic” experience creating “a state of mind”: “While other theme pavilions represented man’s conquest of his environment and his development as a provider, producer, healer, and community-oriented being, ‘Labyrinthe’ dealt with man’s conquest of himself.”¹⁴ The effect was stunning, with masses of people seemingly dwarfed by the endlessly changing images of ancient crafts and modern technologies (fig. 7.5) Banham hated it, dismissing the “melodrama” and “bottomless sentimentality of theme (if you have a low threshold of noble peasantry and black titties, avoid all the films at Expo, with exceptions I’ll mention later).”¹⁵ The criticism, typically though unfortunately phrased, followed perfectly Banham’s technological determinism, which insisted on the invention of tools or machines allowing individuals somehow to control their environments (and not be passive recipients of information) – hence his willful reading of Man the Producer in terms of Cedric Price’s Fun Palace, or his delight in the role of human interaction at the Czechoslovakian pavilion.

The refusal to engage Labyrinth left Banham outside other possibilities, noticed by many critics, of reimagining architectural space. The correspondent for *The Architectural*

¹³ *Expo 67 Memorial Album* (Thomas Nelson & Sons, 1968), 66.

¹⁴ Roman Kroitor, Colin Low, et al., quoted in Marchessault, “Multi-Screens and Future Cinema: The Labyrinth Project at Expo 67”, 40-41; National Film Board of Canada Technical Operations Branch, “Labyrinthe”, Technical Bulletin Number 8 (March 1968): 3. As Marchessault notes, Low had previously created remarkable animated films on space travel. These had greatly impressed Stanley Kubrick, who invited Low to work on the design of *2001: A Space Odyssey*. Despite meeting Kubrick several times, Low was finally too busy with Labyrinth, which took several years to make.

¹⁵ Banham, “L’Homme à l’Expo”, 811.

Review (Banham's erstwhile patron) discovered in the new kinds of "total environment" a welcome lack of architectural legibility:

Labyrinth, however, not only had a theme of its own, but it has created a new space without even the use of film. Connecting its two display spaces (there isn't an existing word to describe them) is a series of meditation galleries. They have none of the recognisable hardware of spaces; no walls, no ceiling, no views; this is true software space, in which, without any physical change, the whole atmosphere can be made terrifying, exciting or contemplative.¹⁶

Once confronted by "software space" it became "impossible to be thrilled any more by the conventional space system."¹⁷ In this vision of the technological sublime, the installation worked to highlight a new sense of simultaneity – between images, peoples, epochs – and a heightened experience of space-time; as such, synaesthetic experience could overcome human limitations and work to merge "man" with the "world" once again.¹⁸ If Banham had, like others, noted this was being done in "McLuhan country", then it was hardly surprising that Marshall McLuhan, no doubt influenced by Labyrinth, soon stated:

Multi-screen projection tends to end the story-line, as the symbolist poem ends narrative in verse. That is, multiple screens in creating simultaneous syntax eliminates the literary medium from film.¹⁹

¹⁶ Jeremy Baker, "Expo and the Future City", *The Architectural Review* (August 1967): 154. As the journal noted, Baker was "a young English architect temporarily resident in Montreal".

¹⁷ Ibid.

¹⁸ David Nye, *American Technological Sublime* (Cambridge MA: The MIT Press, 1994), 60-62; Marchessault, "Multi-Screens and Future Cinema: The Labyrinth Project at Expo 67", 32. While defining the "technological sublime" as an aspect of the imagination faltering before the immensity of machines (or their effects), thus creating moments of social communion, Nye also historicises aspects of, say, a more transcendental technicism – for example, Emerson's sense that technology, as a form of art, could re-merge people and nature.

¹⁹ Marshall McLuhan, *Counter Blast* (1969), quoted Marchessault, "Multi-Screens and Future Cinema: The Labyrinth Project at Expo 67", 46. McLuhan first produced *Counter Blast* as a small booklet in 1954. The title consciously evoked Wyndham Lewis's futurist magazine *Blast* published in 1914 and 1915. McLuhan's layout borrowed from Lewis's radical juxtaposition of words on the page and meant to amplify their sonic qualities (much in the vein of Italian Futurism).

Banham judged Labyrinth as little better than a kind of *National Geographic* sentimentalism (if not voyeurism). Indeed, its somewhat lachrymose quality was not unlike *The Family of Man*, which had so influenced early concepts on Expo 67 and its theme. In attempting to establish homologies across any number of inequalities in the world, both *In the Labyrinth* and *The Family of Man* risked accusations of fashioning a spectacular form of propaganda from banalities.²⁰ In other words, the construction of some universal humanism was perhaps the withering of personal experience. Yet it was here, when trying to find a different sense of humanism, that the latent influence of Giedion's "interpenetration" on Expo 67 was revealed: a true rekindling of experience actually came via the creation of new artistic forms adequate to the material circumstances they confronted.²¹ Giedion shared the belief with Walter Benjamin, who had read the nineteenth-century expositions as a neurasthenic dream world that simultaneously produced the technologies to be levelled against this very "phantasmagoria" or "poverty of experience" ("Glass is, in general, the enemy of secrets").²² McLuhan's evocation of symbolist poetry (also Benjamin's preferred source to announce modernism) was to situate the "multi-screen" as eclipsing not just realism but any form of

²⁰ Ben Highmore, "Phantasmagoria at Expo 67", in Rhona Richman Kenneally and Johanne Sloan, eds., *Expo 67: Not Just a Souvenir* (Toronto: University of Toronto Press, 2010), 133-134.

²¹ *Ibid.*, 130.

²² Walter Benjamin, "Experience and Poverty" (1933), in *Selected Writings: 1927-1934* (Cambridge MA: The Belknap Press of Harvard University, 1999), 732, 734; Walter Benjamin, "Paris, Capital of the Nineteenth Century" (1935), in *Reflections: Essays, Aphorisms, Autobiographical Writings* (New York: Schocken Books, 1978), 146-162.

unilateral discourse (the authority of the “story-line”, thus of political language).²³ Rather than serving industrial capitalism, *In the Labyrinth*, with its playful and bewitching power, offered technologies of vision to confront industrial propaganda (often seen elsewhere in equally immersive environments at Expo 67).²⁴ This was its fullest global import:

In the same way that the new spaces are multi-media, so they are multi-purpose. The fun life has merged into the education system, and it is perhaps the influence of Expo that the medium has suddenly developed along didactic lines. To see Montrealers queuing up to learn about public health in Tehran at 9 o'clock on a Saturday night is to realize the potential of new methods.²⁵

The frankly populist appeal was what critics may have sensed missing in the architecture of Expo 67. If there was still to be some latent project of a “new monumentality” – a vision Giedion had, after all, partially constructed vis-à-vis his experiences of the 1937 Paris Exposition and the 1939 New York World’s Fair – then it was to be discovered in the appearance of new forms of human association. (Banham had, of course, found this deep inside Man the Producer, its space frames producing a kind of “open” environment.) Just as Gyorgy Kepes’s “pattern seeing” had offered architects a way to navigate the information

²³ McLuhan was in contact with Giedion since the 1940s and embraced *Space, Time and Architecture* and *Mechanization Takes Command* as influences. Their interlocutor was Jacqueline Tyrwhitt, who had worked closely with both Giedion in CIAM and McLuhan in the Explorations group during the early 1950s (when she was teaching city planning at the University of Toronto). Tyrwhitt had encouraged Blanche Lemco van Ginkel to establish GAI, a CIAM chapter based in Philadelphia (where they were teaching at the University of Pennsylvania). See: Michael Darroch, “Bridging Urban and Media Studies: Jaqueline Tyrwhitt and the Explorations Group 1951-1957”, *Canadian Journal of Communication* Vol. 33, No. 2 (2008): 147-169; Stephen Kowal, “The Catrographatron – Between Media and Architecture: McLuhan, Giediom, Tyrwhitt, and Doxiades”, in Michael Darroch and Janine Marchessault, eds., *Cartographies of Place: Navigating the Urban* (Montreal and Kingston ON: McGill-Queen’s University Press, 2014), 77-91; Mark Wigley, “Network Fever”, *Grey Room* No. 04 (Summer 2001): 82–122.

²⁴ Highmore, “Phantasmagoria at Expo 67”, 133.

²⁵ Baker, “Expo and the Future City”, 154.

overload of the postwar world, so Labyrinth provided images – many of them – as templates for outlining shared values across cultures, thus outside the limits – quite literally the lot lines – of the many nations defining the Expo 67 master plan. Still, if Labyrinth was, as McLuhan and others suggested, a place to recuperate a newfound sense of humanism appropriate to the late twentieth century, then it only remained whether or not celebrating the nation-state, which occupied so much space at the fair, really mattered.

What, then, of the world?

Banham’s optimistic construction of a ludic environment inside Man the Producer was also a critique of Buckminster Fuller’s geodesic dome for the United States pavilion. The remarkable structure – a five-eighth dome, 200 feet tall and 250 feet wide, made of outer triangulated steel web (carrying the heavy loads) joined to interior chords arranged in a hexagonal grid supporting both an acrylic skin and motorised fan-shaped blinds opening and closing according to solar gain – was, at least for architects, the most celebrated structure at the fair (fig. 7.6). It was also the most outwardly “global” – not only in appearance, a new kind “*colisée de fer*” (recuperating the nineteenth-century expositions), but given its changing participation in negotiating the *cultural* terrain of cold war geopolitics. Fuller’s dome was commissioned by the United States Information Agency (USIA) as proof of “American Creativity”.²⁶ The idea had animated Fuller’s previous contributions to USIA exhibitions – the United States pavilion at the 1956 Jeshyn International Fair in Kabul and the 1959

²⁶ “Bucky’s Biggest Bubble”, *Architectural Forum* (June 1966): 75.

American National Exhibition in Moscow (site of the famous “kitchen debate” between Nikita Khrushchev and Richard Nixon), to say nothing of the Radomes establishing the Distant Early Warning line across the Canadian Arctic. As the magazine *Architectural Forum* insisted when anticipating Fuller’s work at Expo 67, the exhibition domes “almost invariably filled foreign spectators with awe at U.S. technical virtuosity, and with delight at U.S. esthetic sensibility.”²⁷ As much as this was to be a triumph of the arts over ideology, something also presumably to be achieved at Man and His World, Fuller saw both fields perfectly aligned in geodesics, with the lightweight structures – the Kabul project reused many times elsewhere, the Radomes ferried by military transport – demarcating a new global network of influence.²⁸ Indeed, geodesics stood for Fuller as shifting the use of scientific and technological discoveries away from destructive ends and to peaceful purposes.²⁹ Moreover, the quite literal redrawing of a geodesic globe at Expo 67 drew on Fuller’s Dymaxion Map, first presented in 1943, which sought to correct Mercator projection in the face of “blitzkrieg” or new means of air travel (especially over the Arctic). In terms of politics, the emphasis on moving *matériel* fulfilled Fuller’s obsession with countering global resource scarcity. (The idea had haunted him since the 1920s, when he began formulating the goal of

²⁷ Ibid.

²⁸ Jeffrey Lindsay, Fuller’s Canadian acolyte and designer of the Man the Producer space frame, had in fact developed an “arctic weatherbreak” that “could also be flown into other inaccessible areas, and erected very fast.” The project was designed in 1951, five years before Fuller’s Radome. While Fuller erected a prototype at the Pentagon, the real test was only possible in Canada given the ongoing postwar rationing of aluminium in the United States. See: “Geodesic Dome”, *Architectural Forum* (August 1951): 147, 150.

²⁹ Buckminster Fuller, “No More Second Hand God”, *North Carolina State College Student Publication of the School of Design* (Winter 1954): 41-47; Douglas Haskell, “The Crystal Ball”, *Architectural Forum* (June 1951): 198-200.

rationalising American society through industrial design.³⁰). The result, a triangulated unfolding of the globe meant to minimise the distortion of land masses, contributed to Fuller's studies on the close packing of spheres that allowed visualising spheres as a series of faceted planes thus their approximation in geodesic shapes.

Fuller's pavilion was a success. Architects and visitors alike were seduced by the feeling of almost floating inside a glazed realm "modulated by the skin to provide", Fuller proclaimed, "a 'Garden of Eden'".³¹ Among the most popular pavilions at the fair, the dome and its exhibitions (created by the Cambridge Seven group) charmed visitors by the informality of organisation and brilliance of installation. As people ascended a 125-foot long escalator or, in the only moment of its kind at Expo 67, actually rode the Minirail through the pavilion, there appeared a panorama of space capsules, fifty-foot high Pop Art paintings, and giant photographs of Hollywood stars, everything somehow defying gravity in a structure that quite literally seemed to be lighter than air (fig. 7.7).³² The overall impression

³⁰ Jonathan Massey, "Buckminster Fuller's Cybernetic Pastoral: the United States Pavilion at Expo 67", *The Journal of Architecture* Vol. 11, No. 4 (2006): 468-469.

³¹ "Bucky's Biggest Bubble", 77.

³² In terms of public perception, *Architectural Forum* magazine had, when praising "Bucky's Biggest Bubble" in 1966, warned "that next year, in Montreal, 'Creative America' will be on view before an international audience that knows a great deal about where the action is in U.S. art, design, science and technology. To trot out mediocrity before such people would be an insult." See: "Bucky's Biggest Bubble", *Architectural Forum* (June 1966): 78. In fact, the USIA recognised that it was in the unprecedented situation of having to contend with Americans viewing their culture on foreign soil. Indeed, federal law prohibited the USIA from influencing American public opinion. (Curiously, an early USIA study included feedback on not pandering to what was purportedly a "sense of low self-esteem" on the part of Canadians vis-à-vis the United States. See: Jack Masey and Conway Lloyd Morgan, *Cold War Confrontations: US Exhibitions and Their Role in the Cultural Cold War* (Baden, Switzerland: Lars Müller Publishers, 2008), 36-57. Americans made up 44.8% of attendees at Expo 67; see: Canadian Corporation for the World Exhibition, *General Report on the 1967 World Exhibition* Vol. 5 (1969), 2821.

was of wit and elegance. To architects celebrating the rise of immersive environments like Labyrinth, the geodesic sphere was among the few architectural works actually capturing new possibilities of space-time. Rogatnick, who otherwise dismissed almost all the buildings at Expo 67, was fulsome in praise:

The total result was a marvellously “inefficient” climate-conditioning system which should have raised the hair on the back of any self-respecting mechanical engineer, but which created an invigorating sense of airiness and freshness, light and shadow, warmth and coolness, all as much a part of the architectural experience as the lofty spaces, the physical movement and the views of the elegant structure silhouetted against the sky and earth.³³

Banham was, however, circumspect. Alone among leading critics, he would, while admiring its technics, find Fuller’s dome wanting, especially in comparison to visiting Man the Producer, where he had happily wandered unencumbered by displays or artefacts. There was something more:

But, chiefly, it is not Bucky Fuller’s original project. This was for a giant flat space-frame on legs, sheltering a public gallery with control panels on which visitors could set up coast-to-coast strategic games, population movements, natural resources, ethnic distributions, conservation programmes, on an enormous map of the US that covered the whole floor of the pavilion. That’s the sort of level great exhibitions ought to be working at nowadays.³⁴

Fuller’s first proposal had been to enact his recently designed World Game in which fairgoers were to generate strategies for improving the living conditions of all peoples. It was not, as Banham believed, to be played on a projection of the United States but with an interactive Dymaxion map. Sitting around the perimeter of a massive structure composed of Fuller’s

³³ Rogatnick, “Expo 67, the Past Recaptured”, 15.

³⁴ Banham, “L’Homme à l’Expo”, 813.

octet trusses and elevated above the map, here a dynamic display listing inventories of world resources, visitors would use computers to reorganise global data for creating “win-win” scenarios while transforming themselves into “world citizens” (fig. 7.8).³⁵ The aim was, Fuller noted, to confront “Drop Dead” scenarios of war gaming with “schemes of ‘How to Make the World Work’”.³⁶ Rejected by the USIA, not least given the sensitivity of an increasingly violent war in Vietnam, the World Game stood as a remarkable alternative to *Terre des hommes*. To the initiated few, it must surely have recalled an original architectural speculation on a world organised by ever-changing “storylines”. To others, though not to Banham, the phenomenal aspects of World Game-like environments had partially appeared in spaces like Labyrinth and the technological sublime that expressed greater global, even interplanetary, senses of *scale* overshadowing nation-state boundaries. The feeling, first encoded in the borrowings from Saint-Exupéry’s narratives on aviation, had become only more intensified since 1963 with increasingly distant views of the Earth from outer space. The Archimedean point where “man the producer” could actually move the planet was, therefore, also believed found, as one of the Labyrinth producers put it, in “the basic human need for a communal experience of vision”.³⁷ On the one hand was the utopian wish for

³⁵ “Fuller’s Initial Concept for the U.S. Pavilion at Expo 67”, *Domus* (July 1968): 3.

³⁶ Buckminster Fuller, “How It Came About” (1969), in Joachim Krausse and Claude Lichtenstein, eds., *Your Private Sky: R. Buckminster Fuller, The Art of Design Science* (Baden, Switzerland: Lars Müller Publishers, 1999), 479.

³⁷ Roman Kroitor, quoted in Gene Youngblood, *Expanded Cinema* (New York: E.P. Dutton & Co., Inc., 1970), 352. Youngblood was instrumental to initiating Fuller’s first World Game seminars. Fuller wrote the introduction to *Expanded Cinema*, a theory he favourably described as “the forward, omni-humanity educating function of man’s total communication system.”

some aesthetico-spatial experience visible to and shared among different people. On the other hand was a similarly hopeful vision of global fraternity but marked by a technocratic view on managing peoples and things (thus without differences or hierarchies), producing a kind of sovereignty also being advanced (though to different ends) by a war machine.³⁸ The supposedly liberative act of *redistribution* had already been spatialised elsewhere in concepts like “strategic hamlets”, which, as early exercises in managing the growing conflict in Vietnam, were part and parcel of the systems theory otherwise undergirding Fuller’s millenarian desires.

While at a passing glance the United States pavilion fulfilled the CCWE’s earliest hopes on “‘cellular’ construction”, this was largely a matter of form. It did little to fulfill the suggestion of “cellular” technics as expressing some greater social meaning – a link was perhaps most evident at Habitat 67 given its useful value as housing. Still, these very different works were seen as somehow complementary. *Progressive Architecture* thus grouped a host of tendencies under “Man and His Space Frame”, bringing together almost anything that appeared to be made by some form of serialised construction. The architectures were surely remarkable. Yet the compilation of what were, after all, temporary buildings only suggested a fashion for megastructures without some greater social purpose.

A more political sense of “cluster” did, in fact, appear at Expo 67. The aesthetics and technics of grouped architectural forms could, so the theory went, offer different kinds of human association (beyond the rationality of Cartesian, or modernist, space-making). The

³⁸ Felicity Scott, *Architecture or Techno-Utopia* (Cambridge MA: The MIT Press, 2007), 204.

most radical reading of “‘cellular’ construction” (at the world’s fair) assumed the rise of a very different popular expression of sovereignty – not simply as a nation-state but extending beyond it. Thus, Africa Place: here, under a series of red brick groupings topped by elegantly shaped white and yellow triangulated roofs, fifteen newly decolonised countries were grouped together to present, as the *Expo 67 Memorial Album* would put it, “one of the most distinctive developments since Expo 58 in Brussels: the emancipation of black African countries (fig. 7.9).”³⁹ Designed by the Canadian architect John Andrews, who had completed the celebrated Scarborough College megastructure outside Toronto in 1965, the pavilion allowed, or so the CCWE claimed, “for the first time, emerging African nations [to] reveal cultures, industries and plans of production” – read: modernisation – “to the world at large”.⁴⁰ Cameroon, Chad, the Democratic Republic of Congo, Gabon, Ghana, Ivory Coast, Kenya, Madagascar, Niger, Nigeria, Rwanda, Senegal, Tanzania, Togo, and Uganda showcased histories that had, on the one hand, been overshadowed by colonialism and were, on the other hand, being invented since emancipation.⁴¹ Indeed, the 1958 Brussels fair had taken the theme “A New Humanism” to project not only the peaceful use of atomic energy but, perversely, the ongoing cause of colonialism in the Belgian Congo. Now, the former British and French colonies were seen fulfilling what the van Ginkels and their architect allies

³⁹ *Expo 67 Memorial Album*, 220.

⁴⁰ “Africa Place” (no date), Series R869-0-8-E, Canadian Corporation for the 1967 World Exhibition fonds, Library and Archives Canada, Ottawa.

⁴¹ Among other recently decolonised countries, Algeria also built a pavilion. African representation was elsewhere witnessed in the Ethiopian pavilion, a colourful cone-shaped interpretation of the ceremonial umbrellas carried by priests in the ancient city of Axum.

had, in late 1962, hoped would be the influence of “smaller countries” benefitting from “cooperative participation” on the fair itself.⁴² The van Ginkels and others made the issue of decolonisation paramount – it represented a remapping different from the bi-polar world they wished to confront.

Yet in the apparently uneven development of West and East, of the colonising and colonised, the appearance of the African nations served simultaneously to stabilise and to undermine the very global networks imagined arising in *Terre des Hommes*. The early embrace of themes such as Man and the Polar Regions elevated technology and scientific discovery as a principle of cultural development, thus of modernity. Decolonisation, too, meant the instrumentalisation of technology: as much as the van Ginkels and their architect allies suggested that new nations would best uphold the ideal of grouped pavilions, they were quick to note that Ghana could, as a newly independent country, represent itself by its mineral resources.⁴³ Well before Man and His World, things like the “green revolution” were specifically championed as means for individual nations (here developing ones) to showcase their best work.⁴⁴ These aspects of modernisation – with origins in postwar

⁴² R. Affleck, Michel Chevalier, R. Lemoyne, Hazen Sise, H.P.D. and B.L. van Ginkel, “1967 Montreal World’s Fair” (October 29, 1962): 2, Series 27-A21-13, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

⁴³ Daniel van Ginkel, H. Mayerovitch, et al., “Le Thème” (Congrès de l’Association des Architectes de la Province de Québec, Janvier 1963): 7, Box 39-1990-002-35, Fonds Gilles Gagnon, Canadian Centre for Architecture, Montreal.

⁴⁴ Henry E. Strub, “World Fair – Montreal – 1967” (26 October 1962): 3, 27-A21-13, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

Western techno-science – were precisely the things once imagined as quite literally building the “plug-in” scenarios of the theme pavilions.

In a sense, the van Ginkels and others had read decolonisation, whether in Africa or elsewhere, as a way to uphold, really to invent, an ideal of Canada. This was to see Canada in similar terms, as a young, modern nation, free of colonial (British) or geopolitical (American) constraints. Yet the discourse was somehow exhausted. The appearance of decolonised nations was described in terms of historical development – of nations arriving at finished states of modernisation – that were being eclipsed by cycles of a late capitalism in which notions on the *core* and *periphery* were extended in a new “world system” obviating distinctions between “first” and “third” worlds in favour of other forms of accumulating global capital. This included cultural capital, with the identification of “new directions” in architecture arising throughout the African continent.⁴⁵ At Expo 67, the full commodification of things became apparent in the final application of “‘cellular’ construction” to those very cultures from which these aesthetics had once been extracted.

What, finally, of Canada?

Like other nations facing their empty plots on the Expo 67 master plan, Canada confronted a crisis of representation. How exactly would it show itself – as host – to the world? If this was a question of aesthetics – a concern over appropriate symbolism for a country that had enthusiastically adopted modern architecture only in the past two decades –

⁴⁵ Udo Kultermann, *New Directions in African Architecture* (New York: George Braziller, Inc., 1969).

then for the van Ginkels and the Montebello conference this was always meant to be resolved in the sphere of *theme*. Canada could resituate world's fairs through things like Man and the Polar Regions, which offered a space – hemispheres or environments as opposed to nation-states; *exploration* as a transcendent human concern – where other countries could discover common purpose. Techno-science, was, again, an ascendant concern.

When first endowed with the properties of *Terre des Hommes*, Expo 67 was imagined fulfilling Saint-Exupéry's meditation on “*la ligne*”, “the craft”, as a technological mediation of the *world* revealing a common sense of purpose across cultures. Owing in the first instance quite literally to the piloting of a machine, the French aviator-philosopher's rumination on a resulting omniscient view of the earth was extended, at the Montebello deliberations and in the van Ginkels' plans, to encompass *exploration* as an ultimate means of progressively binding peoples and technics:

Terre des Hommes – Man and His World – would be a record, an inventory of man in all his moods, extolling his accomplishments, examining his hopes and fears. To gain self-awareness, man explores his world, adapts to it, and cultivates it. As his knowledge grows, he acquires new means to modify his environment, and his behaviour subsequently changes in the context of a world in evolution. Throughout this continuing process, man reorganizes his diverse relationships with the world, history, time and place.⁴⁶

Explore, adapt, cultivate: ever-increasing senses of “self-awareness” were coded in Man and the Polar Regions, the thematic and architectural source of Expo 67, via “storylines” meant

⁴⁶ “How EXPO 67 Got Its Theme”, *The News and Eastern Townships Advocate* (April 27, 1967): 8. The Report of the Montebello Conference was here excerpted in a regional Quebec newspaper covering the first days of Expo 67.

continuously to arrange world cultures by shared beliefs in modernisation. This was, above all, to shape an ecumenical view on *progress*.

This fit the deliberate construction of a newly modernising sense of Canadian identity. Arctic development – “roads to resources” leading to “a Canada of the North” – had been promoted by a Progressive Conservative government in a spirit of *Tory Futurism*, a renovating style of power, at once restorative and modernising, advancing a utopian technicism to be enjoyed by sovereign consumers.⁴⁷ The veneration of technology (and the rise of a technocratic class) was presumed essential to social modernisation – a schema erring on one side of the British chemist and novelist C.P. Snow’s influential argument on “two cultures” that found, in the mid-1950s, a traditional literary mindset yielding to “the frontier qualities” of scientists shaping “a directing class of a new society”.⁴⁸ Extended in Canadian

⁴⁷ David Mellor, “A ‘Glorious Technicature’ in Nineteen-Fifties Britain: The Many Cultural Contexts of the Independent Group”, in David Robbins, ed., *The Independent Group: Postwar Britain and the Aesthetics of Plenty* (Cambridge MA: The MIT Press, 1990), 229. Mellor defines Tory Futurism in relation to British society marked by technological advance, social modernisation, and consumer demand in the mid-1950s: “That the styles of political power might masquerade as archaic is unarguably the case, since they were as ambivalent as that meeting of the monarchic, adventuring past and the nuclear, space-exploring future which was the essential component of the New Elizabethan mythology.”

The Roads to Resources programme was initiated by the Progressive Conservative government of Prime Minister John Diefenbaker. It aimed at providing transportation infrastructure to remote parts of Canada for facilitating access to natural resources. It was also an announcement on Canadian nationalism. First promoting his vision in 1958, Diefenbaker declared:

As far as the Arctic is concerned, how many of you here knew the pioneers in Western Canada. I saw the early days here. Here in Winnipeg in 1903, when the vast movement was taking place into the Western plains, they had imagination. There is a new imagination now. The Arctic. We intend to carry out the legislative programme of Arctic research, to develop Arctic routes, to develop those vast hidden resources the last few years have revealed. Plans to improve the St Lawrence and the Hudson Bay route. Plans to increase self-government in the Yukon and Northwest Territories. We can see one or two provinces there.

See: John Diefenbaker, Speech delivered at Civic Auditorium, Winnipeg (February 12, 1958), in J.M. Bliss, ed., *Canadian History in Documents* (Toronto: The Ryerson Press, 1966), 332-335.

⁴⁸ C.P. Snow, “The Two Cultures”, *New Statesman* (6 October 1956): 413. The “greatest enrichment the scientific culture could give us is – thought it does not originate like that – a moral one”, Snow concluded,

discourses on industrial modernisation, the scientific outlook also extended to architects working for the state and charged with projecting utterly remarkable (but finally unrealised) megastructures in the far north. These works were means to settle – really to compensate for – a seemingly inhospitable environment that underpinned longstanding and newly resurrected historical narratives, projected by southern Canadians, of being a nation of pioneers (fig. 3.9).⁴⁹ By exposing the hinterland, techno-science (and its imagery) served to propel the Conservative paradigm of the basic rootedness of culture. When considered beyond the dictates of narrow national interest, this ethos, which also coloured initial ideas on the world's fair, reflected just how Man and the Polar Regions was imagined in the terms of the first UNESCO Director General Julian Huxley's "transhumanism", an inspiration for the Expo 67 theme, and its emergence in his preferred example of the Tennessee Valley Authority, where political problems were to be transformed into technological solutions. (It was perhaps helpful that the nationalisation of hydroelectricity in Quebec appeared as backdrop to the van Ginkels' plans.) While this husbandry of cultures and landscapes – the sense of contemporary world history as a series of feedback loops reinforcing links between the arts, technology, and society inside a theme pavilion – was an appeal to pluralism,

since scientists "have nothing but contempt for those representatives of the traditional culture who use a deep insight into man's fate to obscure the social truth – or to do something prettier than obscure the truth, just to hang on to a few perks." While otherwise noting the scientists were as equally divided between conservative and left-leaning politics as other educated members of society, Snow, who had been both a researcher and a high-level civil servant, saw the scientific mind as safeguarding against political injustice. He expanded his essay in the popular and influential book *The Two Cultures and the Scientific Revolution* of 1959.

⁴⁹ Andrew Waldron, "Frobisher Bay Future: Megastructure in a Meta-Land", *Architecture and Ideas* Vol. VIII (2009): 20-35. The sense of nation-building and territorial sovereignty would find architects, working for or under contract with the Department of Public Works, projecting permanent civilian settlements in the Arctic; the first designs immediately followed the Progressive Conservative electoral victory in 1957.

experienced not only in a world's fair as popular spectacle but via a *theme* meant to assuage anxieties over a division between humanistic and scientific knowledge, it really reflected a mindset of “systems” thinking in which a host of behavioural, computational, or psychological paradigms, all tinged by cybernetic discourse, were to sharpen “expertise” on collecting and processing ever-increasing amounts of data toward practical, long-term solutions on managing environments. (Snow had, in fact, adduced: “Psycho-analysis once looked like a deep invasion, but that was a false alarm; cybernetics may turn out to be the real thing, driving down into the problems of will and cause and motive.”⁵⁰) Man the Producer and Habitat 67 had been construed in this discourse; the influence of Kepes’s “pattern seeing” on the van Ginkels’ plans was symptomatic. For architecture (as a discipline) it meant placing emphasis on controlling complex systems as opposed to necessarily privileging intuitive aesthetic judgement – a line delineating early concerns, outlined by the van Ginkels’ confrere Michel Chevalier, on the Expo 67 theme:

A more complex approach [to theme development] is now being investigated. It was pioneered in 1952, when a number of leading Americans were queried on a question equally nebulous as the “Terre des Hommes” thematic treatment as so far developed. This question was “How big should our (U.S) deterrent force be?” The method consisted of an initial series of questions which, through a rigorous system of analysis and feedback established areas of agreement and dissent, eliminated bias, and then arrived at a broad consensus of agreement. The general form of the “answer” to the question has, it appears, served as a basis of American policy in this area for the past ten years. The process was completed in a manner of weeks.⁵¹

⁵⁰ Snow, “The Two Cultures”, 414.

⁵¹ Michel Chevalier, “Thematic Development, Position Papers No. 8” (Tuesday, 23 July, 1963): 1-2, Series A21-04, Fonds van Ginkel, Canadian Centre for Architecture, Montreal.

The unnamed 1952 questionnaire was characteristic of countless studies on ensuring survival of people and industry – writ large in the designed decentralisation of cities – under the cloud of “megadeath”, a term popularised by the RAND Corporation military strategist Herman Kahn in his influential book *On Thermonuclear War* of 1960.⁵² Extrapolating from the otherwise doomsday scenarios of war gaming, Chevalier indicated how systems theory was seen as guiding the arts and culture – with both artistic content and public perception adjudicated by experts (here, architects) – toward shaping welcome senses of “consensus”. The very spaces and technologies conjured by Man and the Polar Regions brought the 1952 study to its endpoint in the rise of a “military-industrial complex” (extended in the joint Canadian and American militarisation of the Arctic). At the same time, Chevalier’s schematisation allowed the humanistic and technological spirit of, say, *exploration* to deliver a very different *cultural-industrial complex* in a world’s fair imagined as communicating an enormous theme – at times described as almost the total output of humanity – to a mass but heterogeneous audience. Such an undertaking as an extension of state capitalism was necessarily prey to the dismissive charge of fashioning a “culture industry” and its attendant “technical contrast between the few production centers and the large number of widely dispersed consumption points”.⁵³ Here, complaints were made against a widespread

⁵² Peter Galison, “War against the Center”, *Grey Room* 4 (Summer 2001): 26-28. Galison notes that urban decentralisation, as an aspect of civic defence applied to city planning, also influenced Canadian policy by the mid-1950s. Kahn’s book was most famously parodied in Stanley Kubrick’s 1964 film *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb*.

⁵³ Max Horkheimer and Theodor W. Adorno, *Dialectic of Enlightenment*, trans. by John Cumming (1944; New York: The Continuum Publishing Company, 1995): 121. Horkheimer and Adorno’s coinage of “culture

scientism, seen in *systems*, in which human needs were no longer central to technocratic governments; as W.L. Morton, the influential conservative historian responsible for the Canadian Centenary Series (a multivolume volume authoritative history of Canada begun in 1963 as a contribution to the Centennial), observed when commenting on state of universities in the mid-1960s, “only an Englishman such as Sir Charles Snow could speak of the existence of two cultures. To a North American there is only one, the scientific.”⁵⁴ Yet it was specifically in fostering a new polity of anti-elitism and pluralism – thus to ensure “agreement” in Chevalier’s terms – that the state could counter its incipient technicism in the 1960s; as a leading group of Canadian intellectuals declared, only the high arts *and* mass culture were capable of alleviating the “manufacture of dull uniformity” arising from a misguided faith of modern technology.⁵⁵ The statement, made by the Canadian Conference of the Arts following its important Seminar ’65 convened to advise the government on both the Centennial celebrations and Expo 67, was not anti-technological. Updating landmark recommendations on state support for the arts made in the early 1950s, Seminar ’65 concluded: “Until recently the arts in Canada were unable to assume their rightful place. The new technology of communications offers the means for a national expression but only

industry” rested on a trenchant critique of mass media that they saw as manipulating society into passivity, thus hallmark of totalitarian regimes.

⁵⁴ W.L. Morton “The University as It Is and Is Becoming (1966), quoted in L.B. Kuffert, *A Great Duty: Canadian Responses to Modern Life and Mass Culture, 1939-1967* (Montreal and Kingston, Ontario: McGill-Queens University Press, 2003), 133. Morton’s remarks appeared during a period of creating new universities (many with distinctly megastructural architectures) throughout Canada – a situation in which the welfare state was viewed as mediating the status of humanistic versus scientific (even vocational) education.

⁵⁵ Canadian Conference of the Arts, *Seminar ’65-’67: Report* (Montreal and Toronto, 1967).

the arts can provide the significant content by which a nation comes to know itself".⁵⁶

Tinged by McLuhan rhetoric, the view was of an artistic base and a mediatic superstructure united in technologies of mass communication – whether television or Labyrinth – that could, via a new publicly supported cultural sector, compensate for a traditional economic reliance on natural resources (now presumed inadequate to the demands of total social modernisation).⁵⁷ Perhaps in mild riposte to the expert committees tasked with defining the Expo 67 themes, the Seminar '65 delegates (some of whom had been at Montebello) insisted that "artists do more than enhance our lives. Like scientists, they illuminate and enrich it".⁵⁸

This had epochal significance: "1967, as well as marking a century of building Confederation, may well prove to be the year of its true completion; true in the sense that the modern forces of technology impel us toward a unity, and at least make it possible to share in a common heritage and a common destiny as we could never before."⁵⁹ An announcement on overcoming provincial and colonial mindsets of the past, and perhaps on countering Snow's warning of the specialisation of knowledge, the consequent lessening of outward nation-state symbols was to be compensated by the elevation of artists and scientists – along with their artefacts – as guiding popular senses of postwar modernity.

⁵⁶ Ibid.

⁵⁷ David Howard "The Transparent Empire?: Exhibition Strategy and the Cold War at Expo 67", *American, British and Canadian Studies* Vol. 5 (December 2004): <http://abcjournal.ulbsibiu.ro/David%20Howard.html>.

⁵⁸ Canadian Conference of the Arts, *Seminar '65-'67: Report*.

⁵⁹ Canadian Confederation on the Arts, Supplementary Brief to the Royal Commission on Bilingualism and Biculturalism (1965), quoted in Howard, "The Transparent Empire?: Exhibition Strategy and the Cold War at Expo 67".

While the arts and sciences were to inform questions on Canadian nationhood in the 1960s, their conjunction in discourses like *systems* was, when writ large at a world's fair, to confront greater geopolitical narratives. In their ecumenical reach, the van Ginkels and their allies, who always understood the world's fair as rooted first and foremost in architecture as a social "good", unfailingly embraced technology as a liberating force in modern life. Indeed, their 1959 proposal for a Central Mortgage and Housing Corporation design exhibition (a critical source of their considerations on Expo 67) had offered a prose poem on Canadian identity turning on the repeated refrain "Mechanization took command" – the borrowing from Sigfried Giedion's *Mechanization Takes Command* of 1948 suggested a series of historical plateaus stepping from one to the next by technological advance. Thus the van Ginkels' repeated reference to undertakings like the International Geophysical Year (IGY), which had attempted to bridge Cold War divisions by promoting scientific exchange between East and West, was not only to advance techno-science as a pacific force but to project Canada as an agent of similarly new global realignments. The hallmark IGY initiative of multinational expeditions to Antarctica – resulting in the 1961 Antarctic Treaty declaring the continent a scientific and non-military preserve – led to ideas on *exploration* as *theme* in the diagrams of *Man and the Polar Regions*, the first statement on what properly became the megastructures of *Man the Producer* and *Man the Explorer*. The architects had imagined *Man and the Polar Regions* as uniquely suited to showcasing Canada by its geography and history: as other nations began, via architecture, to join "storylines" undergirding the pavilion, Canada would be seen in terms of new global alignments guided

by the apparatus of scientific research. On the one hand, this was a reinterpretation of Canada as a “middle power”, the influential description used by the diplomat and future Prime Minister Lester B. Pearson when stressing autonomy – “national in formulation and execution, but... never be isolationist or exclusive” – in international affairs.⁶⁰ As much as the sentiment drew on Pearson’s mediation of the Suez Crisis, thus earning him a Nobel Peace Prize along with the opprobrium of London and Washington, there remained other Cold War realities and realignments including Canadian leadership in NATO.⁶¹ There was, too, the inescapable feeling of being overwhelmed by a superpower neighbour (notwithstanding being a junior partner in North American air defence) that guided a Canadian preference for multilateral relations as opposed to bilateral ones.⁶² On the other hand, a “middle” *cultural* space, to be discovered in links between science and architecture (with the Arctic as theme), was witnessed in the admired combination of UNESCO’s constituent parts, with the spirit of Huxley’s “transhumanism” also believed found in both state and corporate capitalism creating, via technological advance, a pragmatic vision of liberal society. Indeed, the Montebello Conference’s exhortation to oppose nations and

⁶⁰ Lester B. Pearson, Address to meeting of Men’s and Women’s Canadian Clubs, Halifax (April 5, 1957), in J.M. Bliss, ed., *Canadian History in Documents, 1763-1966* (Toronto: The Ryerson Press, 1966), 326.

⁶¹ The *cultural* tie to NATO was reinforced by significant European emigration to Canada in the 1950s.

⁶² Robert Bothwell, *Big Chill: Canada and the Cold War* (Toronto: Canadian Institute of International Affairs, 1998), 55-56. Canada maintained a certain distance from the United States on waging a global anti-communism crusade. To American displeasure, Canada did not join the Vietnam War. Moreover, given an ongoing trade deficit with the United States (Canada’s largest trading partner), Canadian economic policy was partly guided by opening markets abroad, including communist countries, by the late 1950s. The trade deficit was offset by a large inflow of American investment capital to Canada. The Quebec *Revolution tranquille* had, by the early 1960s, witnessed the nationalisation of industries, including hydroelectricity, often in the hands of American companies.

corporations was only a call to resist consumerism and corporatism (which the van Ginkels predicted would mar the 1964 New York world's fair), not techno-science.

The nexus of culture, science, industry, nationhood, and architecture – as informing a world exhibition along with the host nation's role – had, in fact, an origin in American cold war political theory. Despite being swiftly celebrated as an exclusively indigenous undertaking – that is, construed solely by *national* expertise – the Montebello conference was, in fact, guided by a specific “think tank” approach to shaping postwar culture and geopolitics developed at the Massachusetts Institute of Technology (MIT). Soon after the PQAA retreat and well before Montebello, the CCWE contacted John Ely Burchard, the eminent MIT architectural historian, and solicited his advice on the world's fair. Burchard's reply was swift and enthusiastic. In a detailed memorandum, he suggested considering new ways of organising thematic, international, national, trade, and entertainment zones but insisted that the abiding concern rested in achieving a “sense of place” as opposed to any arbitrarily chosen symbol.⁶³ Commending the Quebec architects' “proposal for a unified treatment dedicated to the study of the important problems of ‘one world’”, Burchard nevertheless warned: “Though the prospect of separatism in the world is gloomy, so is the prospect of over-unification.” A prescient remark on the paroxysmal debates soon engulfing the master plan, it followed Burchard's steadfast belief that *modern* architecture – a true expression of the endurance of Western society and beliefs after tragic encounters with

⁶³ John E. Burchard, “Memorandum of Suggestions Concerning Terre des Hommes Exhibition Montreal, 1967” (no date): 1-8, Fonds van Ginkel, Box. 3.02, Folder 27-A21-10, Canadian Centre for Architecture, Montreal.

Fascism and now Communism – faced the postwar consequences of responding to “humanity, our client” as opposed to any “doctrine of individualism” (or beyond any narrow functionalism).⁶⁴ In other words, architecture could restore culturally specific but universally respected values to society. This was to be the full summoning of the arts at the world’s fair.

As such, Burchard critically proposed establishing a committee of intellectuals dedicated to fashioning a theme. The recommendation led directly to the convening of Montebello.⁶⁵ Burchard’s suggestions were distributed to the conferees. For some – namely the van Ginkels’ architect allies Ray Affleck, Victor Prus, and Claude Robillard (responsible for *Terre des Hommes* as theme), all of whom had been on PQAA retreat – Burchard’s work as an architectural historian was already well known: he had recently published an important history of American architecture and was a regular contributor to architecture magazines.⁶⁶ Other intellectual links to MIT were well established via ideas – including those of Gyorgy Kepes or Kevin Lynch – emanating from its Joint Center for Urban Studies with Harvard (where key Expo 67 staff architects had studied city planning). Yet unbeknownst to the Montebello conferees, Burchard’s enthusiasm – and ideology – drew on his immersion in a highly influential project, developed by American “action intellectuals” throughout the 1950s, of reimagining geopolitical propaganda. If a key ambition of Montebello lay in

⁶⁴ John E. Burchard, “Humanity: Our Client”, *Architectural Record* (July 1951): 97.

⁶⁵ Burchard, “Memorandum of Suggestions Concerning Terre des Hommes Exhibition Montreal, 1967”, 7-8.

⁶⁶ For ways in which Burchard’s ideas were synthesised at Montebello, see: Claude Robillard, Jean-Louis Roux, Alan Jarvis, and Ray Affleck, “Report of Sub-Committee #3”, Montebello Conference (May 24, 1963): 6, Series D03.9-109-26-TD, Fonds Guy Desbarats, Canadian Centre for Architecture, Montreal.

defining a *theme* meant to eclipse nation-state hegemony (thereby reimagining a proper role for Canada), then it would be undertaken by absorbing, however unconsciously, already established theories – on *culture* as an instrument of global modernisation – fashioned for winning rhetorical battles in a global cold war. World’s fairs, as “soft” propaganda, were central to this ambition.

The post-national ecumenism espoused by the van Ginkels and at Montebello echoed exhibition strategies developed in key American intellectual circles crucial to foreign policy since the Second World War. Responding to worries over foreign perceptions of the United States as a superpower, the idea was to diminish the nation-state as a symbol while rigorously defending national interests by projecting images of modernity that, as the liberal historian Arthur Schlesinger Jr. put it, could offer views on how “to master and apply the technological revolution to human life”.⁶⁷ Schlesinger had contributed to a select committee of businessmen, media executives, labour leaders, and intellectuals charged by the United States Information Agency (USIA) with defining the ethos of the American contribution to the 1958 Brussels Universal and International Exposition, the first postwar world’s fair. Its theme was noteworthy: “A New Humanism”, meant to promote the peaceful uses of nuclear energy and better international relations (along with Belgian colonisation).⁶⁸ President

⁶⁷ Arthur Schlesinger Jr., quoted in Robert W. Rydell, “The New Day Dawns: The American Pavilion at the 1958 Brussels World’s Fair”, in *World of Fairs: The Century-of-Progress Exhibitions* (Chicago: University of Chicago Press, 1993), 196. Schlesinger full comment was on confronting the view that “Communism is the only way to master and apply the technological revolution to human life.”

⁶⁸ Rydell, “The New Day Dawns: The American Pavilion at the 1958 Brussels World’s Fair”, 193; Felicity Scott, “Encounters with *The Face of America*”, in Antoine Picon and Alessandra Ponte, eds., *Architecture and the Sciences: Exchanging Metaphors* (New York: Princeton Architectural Press, 2003), 257-258.

Dwight D. Eisenhower had, in fact, famously addressed the United Nations on December 8, 1953, one year after the first American hydrogen bomb test in the middle of the Pacific Ocean, and demanded a multi-national effort at donating a specific quantity of fissionable material for “peaceful” purposes – a theme (otherwise meant to counter Soviet “peace propaganda”) leading to the USIA *Atoms for Peace* exhibitions seen by millions worldwide from 1954 to 1958.⁶⁹ Stemming from discussions on how to present thermonuclear power to both the American public and the world, *Atoms for Peace* – travelling by truck caravan to major cities in Europe, Asia, and Africa with smaller shows sent to 217 USIA posts abroad – brilliantly showcased the peaceful applications of atomic energy in working models, colourful displays, short films, and public lectures.⁷⁰ The successful installation at the 1955 Indian Industries Fair in New Delhi displayed a full-scale mock-up of the graphite reactor in Brookhaven, New York, with sixty young multilingual Indian guides, all graduate students in physics or scientific disciplines, making comprehensible the uses of nuclear energy and technologies to audiences from a nation nervously viewed by American policymakers as a

⁶⁹ Dwight D. Eisenhower, “Atoms for Peace”, in *The Annals of America 1950-1960: Cold War in the Nuclear Age* (Chicago: Encyclopedia Britannica, 1968), 211-214; Lawrence S. Wittner, *Resisting the Bomb: A History of the World Nuclear Disarmament Movement, 1954-1970* (Stanford CA: Stanford University Press, 1993), 155-156; Paul Carter, *Another Part of the Fifties* (New York: Columbia University Press, 1983), 262-265. Eisenhower’s proposal led to the creation of the International Atomic Energy Agency.

⁷⁰ Kenneth Osgood, *Total Cold War: Eisenhower’s Secret Propaganda Battle at Home and Abroad* (Lawrence KS: University Press of Kansas, 2006), 170-178. At the same moment as *Atoms for Peace*, the United States began providing equipment and information to domestic and foreign research institutions including civilian nuclear reactors in Iran and Pakistan, while the CIA and State Department launched extensive opinion polls in foreign countries to elicit popular attitudes on nuclear weapons.

leader of an emerging Non-Aligned Movement (fig. 7.10).⁷¹ An unprecedented success, *Atoms for Peace* presented a new form of psychological warfare: no longer limited to the unilateral signal of print or broadcast propaganda (for example, *The Voice of America*), the promotion of things like the “peaceful” atom was premised on cultural exchanges of long duration, with arts and technology experienced live, at full scale, and in many languages. As such, *Atoms for Peace* participated in a greater project of fashioning *Pax Americana* through theories on modernisation – purposely engineered in academia – that saw Western, industrial, capitalist democracies, and the United States in particular, as the pinnacle of world history.⁷² The worldview, seen as meeting the challenge of “A New Humanism” at Brussels, owed to a unique institutional origin: the powerful Center for International Studies (CENIS) at the Massachusetts Institute of Technology (MIT). Building on major their contributions to military technology – including radar and the atomic bomb – during the Second World War, MIT scientists and now especially social scientists became crucial to providing information – *research* – useful to policymaking in the 1950s. Funded by the Central Intelligence Agency and the Ford Foundation, CENIS was, as team member Walt

⁷¹ Jack Masey and Conway Lloyd Morgan, *Cold War Confrontations: US Exhibitions and Their Role in the Cultural Cold War* (Baden, Switzerland: Lars Müller Publishers, 2008), 36-57. A graduate of the Yale School of Art and Architecture, Masey began his career with the United States State Department as an Exhibits Officer in New Delhi. He continued with the USIA to organise exhibitions worldwide and worked closely with architects on fashioning a technologically sophisticated view on postwar American life – epitomised by Fuller’s geodesic domes at Kabul (1956), Moscow (1959), and, of course, Montreal.

⁷² Michael E. Latham, *Modernization as Ideology: American Social Science and “Nation Building” in the Kennedy Era* (Chapel Hill NC: The University of North Carolina Press, 2000), 4.

Whitman Rostow put it, “to bring to bear academic research on issue of public policy”.⁷³ Among its key areas of research was communications studies centred on psychological and behavioural models for exploring and predicting public opinion. Rostow, an economist, political theorist, and anti-Communist, who had identified bombing targets while serving with Schlesinger in the Office of Strategic Services (precursor to the CIA) during the war, fervently argued for “interdisciplinary” studies promoting modernisation through foreign investment and development planning, thereby fostering democracy in “third world” countries. His views would crystallise in a unique commencement ceremony in June 1961: as the newly appointed deputy national security advisor, he addressed eighty military officers, wearing the uniforms of twenty different national armies at their graduation from the counter-guerrilla course run at the U.S. Army Special Warfare Center, and insisted that when facing “old societies... trying to change to gain a position in the modern world and to take advantage of the benefits of technology”, the United States and its allies had to intervene directly in “the whole creative process of modernization”.⁷⁴ In this schema, Western,

⁷³ Walt Rostow, quoted in Latham, *Modernization as Ideology: American Social Science and “Nation Building” in the Kennedy Era*, 54; James Schwoch, *Global TV: New Media and the Cold War, 1946-69* (Urbana IL: University of Illinois Press, 2009), 63.

⁷⁴ Walt W. Rostow, “Countering Guerrilla Warfare” (1961), in Franklin Mark Osanka, ed., *Modern Guerrilla Warfare: Fighting Communist Guerrilla Movements, 1941-1961* (New York: The Free Press of Glencoe, 1962), 465, 471. The “whole creative process of modernization” included not only counter-insurgency military officers but “those others who are committed to help fashion independent, modern societies”: “doctors, teachers, economic planners, agricultural experts, civil servants”. The greater arc of MIT modernisation theory was suggested in the kinds of non-military fields being targeted by organisations such as the Peace Corps. Rostow concluded his address by referring specifically to Vietnam, where counterinsurgency planning had already been spatialised in the Strategic Hamlet Program. Along with Rostow, John F. Kennedy brought members of the MIT group directly into the White House after winning the presidential election in November 1960. As senator from Massachusetts, Kennedy had approached the MIT centre for advice on policy proposals on South Asian development. In the migration from academia to government, Rostow epitomised the “action

industrial, capitalist democracies, and the United States in particular, would appear at the apex of nations because of historical development (the Communists, in only propagating guerrilla war, were, Rostow concluded, “the scavengers of the modernization process”).

From this summit, one giving an unimpeded view on human progress, the *creative* construction of *modernisation* would also be exercised through the arts.

Here lay the USIA approach to MIT. In trying to balance earlier recommendations on showcasing only *cultural* aspects of American life at Brussels, the USIA asked John Ely Burchard, MIT’s influential dean of humanities and architectural historian, to request his colleagues “to undertake the task of providing a definition of the culture and sociological impact of technology together with the most recent advances in that technology”.⁷⁵

Burchard had, in fact, been instrumental to the birth of CENIS: in 1950, the U.S. State Department approached MIT for assistance on Project Troy, an effort to combat the USSR’s effective jamming of Voice of America broadcasts; the resulting team of engineers and social scientists, led by Burchard, proposed complementing their technical investigation with an examination of the larger benefits to be achieved by communicating with Soviet citizens (while assessing the possibilities of a total campaign of information overload that was labelled “political warfare”).⁷⁶ Earlier, he had worked in the Office of Scientific Research and

intellectuals” of the Kennedy administration. See: Latham, *Modernization as Ideology: American Social Science and “Nation Building” in the Kennedy Era*, 1-2, 56-57.

⁷⁵ Letter from the United States Commissioner General for the Brussels Exhibition to John Burchard, quoted in “Progress Report on the U.S. Exhibition at the Brussels Fair”, *Interiors* 117 (September 1957): 135; Masey and Morgan, *Cold War Confrontations: US Exhibitions and Their Role in the Cultural Cold War*, 114.

⁷⁶ Latham, *Modernization as Ideology: American Social Science and “Nation Building” in the Kennedy Era*, 44.

Development under Vannevar Bush, the former MIT vice president and engineer who had presided over the spending of \$450 million on weapons research and development during the Second World War – a powerful authority granted to science that Bush envisioned, shortly before atomic bombs were dropped on Japan, as contributing to peacetime progress.⁷⁷ Now, Burchard was crucial to the purposeful comingling of the humanities, sciences, social sciences, and engineering. Thus, when responding to the USIA request for conceptualising the Brussels fair, he invited authorities from these very disciplines to a weekend retreat in April 1957 at MIT, where he, Rostow, and their CENIS colleagues Max F. Millikan (a development economist) and Ithiel de Sola Pool (a major theorist of communications research), joined USIA officials, prominent scientists, and MIT design professor Gyorgy Kepes as well as visiting instructor and architect Bernard Rudofsky, to fashion “A Society in Ferment”, a theme on American culture as arising from the advantages of advanced technologies – automation, communications, electrification, transportation – generating a life of increasing leisure.⁷⁸ Rudofsky would end up working with the Yale-trained architect Peter G. Harnden, a former U.S. Army intelligence officer who had become the chief exhibition organiser of the Marshall Plan in Germany and pioneered postwar

⁷⁷ Stuart W. Leslie, *The Cold War and American Science: The Military-Industrial-Academic Complex at MIT and Stanford* (New York: Columbia University Press, 1993), 6-7; Vannevar Bush, “As We May Think”, *The Atlantic* (July 1945). Burchard described wartime research and design at MIT in his book *Q.E.D.: M.I.T. in World War Two* (1948).

⁷⁸ Robert H. Haddow, *Pavilions of Plenty: Exhibiting American Culture Abroad in the 1950s* (Washington and London: Smithsonian Institution Press, 1997), 94ff; Scott, “Encounters with *The Face of America*”, 263; Rydell, “The New Day Dawns: The American Pavilion at the 1958 Brussels World’s Fair”, 199.

techniques on promoting the “American way of life”, on *The Face of America*, an exhibition installed inside the architect Edward Durrell Stone’s enormous cylindrical pavilion at Brussels and showcasing “man-made” artefacts ranging from household technologies to shopping streetscapes along with “loop films” capturing impressions of everyday life: “the surprise of a crack train, of Jones Beach on a crowded Sunday, of rush hour on the subway, of a San Francisco Chinese restaurant, a Pizzeria, and a Kosher shop (under the heading ‘Melting pot-au-feu’). The Grand Canyon is omitted simply because it is expected – and known.”⁷⁹ The overall impression – of showing fairgoers a United States in which anxieties about nuclear power and automation had been refashioned into a world of leisure and consumer freedom – suggested an ironic, even somewhat dystopic sense of American culture. Indeed, Rostow had, when chairing a subgroup on “American Idealism in Action” at the MIT retreat, adamantly argued that any panoramic view of the United States necessarily include “problems” such as racial desegregation that would be “underlined rather than evaded by omission”; the resulting exhibition, *The Unfinished Work*, displayed in a separate structure outside Stone’s pavilion, concentrated on “three areas: the Negro, the City and Nature” – an exercise designed, in Rostow’s words, to express “the American commitment to struggle towards its peculiar version of common Western aspirations”.⁸⁰ The deliberate

⁷⁹ “Progress Report on the U.S. Exhibition at the Brussels Fair”, *Interiors* 117, 140. See also: Greg Castillo, *Cold War on the Home Front: The Soft Power of Midcentury Design* (Minneapolis; University of Minnesota Press, 2010), xiii; Sarah Nilsen, *Projecting America, 1958: Film and Cultural Diplomacy at the Brussels World’s Fair* (Jefferson NC: McFarland & Company, Inc., 2011), 144ff.

⁸⁰ Walter Rostow, quoted in Michael L. Krenn, “‘Unfinished Business’: Segregation and U.S. Diplomacy at the 1958 World’s Fair”, *Diplomatic History* Vol. 20, No. 4 (Fall 1996): 595-596; Masey and Morgan, *Cold War Confrontations: US Exhibitions and Their Role in the Cultural Cold War*, 128-145. Rostow’s emphasis on

lessening of nation-state triumphalism accorded perfectly with the CENIS aim to shape international perceptions of the United States through programmes of “soft” cultural propaganda. The “faces” of America continued the work of the MIT intellectuals, who sought throughout the 1950s to create empirical benchmarks on overall patterns – economic organisation, political structures, and social values – of global transformation that were to be leveraged by policymakers on wining “hearts and minds” through the benevolent extension of Western technology.⁸¹ The grand paradigm was always to advance *progress*, which, in the guise of world’s fairs – that is, in the inheritance of a nineteenth-century ideal – inevitably led to visions on nation-building.

In all this, a critical link between Cold War modernisation theory and architecture culture would bear on Expo 67. Burchard’s work at CENIS was otherwise complemented by his role as an architectural historian. His appointment as the first dean of humanities and social sciences at MIT, a position meant specifically to balance technical education, stemmed from this disciplinary foundation. Among his many roles at MIT, Burchard had managed the Albert Farewell Bemis Foundation (AFBF), an institution named after its industrialist

“unfinished business” was also to counter the USSR’s accusations of “racial terror” in the American South, a retort to American complaints on Soviet repression of the 1956 Hungarian uprising. The exhibit inspired considerable backlash from many American officials and especially Southern congressmen. *The Unfinished Work* was sponsored by *Fortune* magazine and designed by its art director Leo Lionni, who had, along with Laszlo Moholy-Nagy, Gyorgy Kepes, and Herbert Bayer, previously been commissioned to create advertisements for the Container Corporation of America by its influential chairman Walter Paepcke. Before turning to MIT, the USIA had solicited advice from business leaders including Paepcke, who suggested: “The best exhibits would be American intellectuals in all fields, who could conduct seminars while the fair was in progress”; see: Rydell, “The New Day Dawns: The American Pavilion at the 1958 Brussels World’s Fair”, 196.

⁸¹ Rydell, “The New Day Dawns: The American Pavilion at the 1958 Brussels World’s Fair”, 203; Latham, *Modernization as Ideology: American Social Science and “Nation Building” in the Kennedy Era*, 3-7.

patron who had studied and promoted modular theory and the prefabrication of housing in the 1930s – an undertaking symbolising the social power of technology and free enterprise.⁸² The AFBF mission both influenced the architecture curriculum and accorded with a postwar institution promoting “rationalisation” in interdisciplinary research and government policy. Burchard came, however, to reconsider his earlier position, noting that his compilation of efforts in prefabrication during the 1930s had “serious defects” including “an inordinate interest in the engineering detail” – read: design – “of the various proposals and an inadequate interest in all other factors which might determine success or failure.”⁸³ The *mea culpa* was mitigated by a hopeful sense of balancing postwar technicism: “A study of the state of the art stands therefore at the crossroads of the applied physical and social sciences, an appropriate place for a teacher at M.I.T. to stand.”⁸⁴ Befitting a new academic dean (and leader of Project Troy), the sentiment not only suggested the mission of, say, CENIS but reflected new humanistic overtones of discourses on science and technology, including architecture, in response to the traumas of war (and now nuclear holocaust). It was, above

⁸² Avigail Sachs, “The Pedagogy of Prefabrication: Building Research at MIT in the Postwar”, in Arindum Dutta, ed., *MIT, Architecture, and the ‘Techno-Social’ Moment* (Cambridge MA: The MIT Press, 2013), 232-236. Burchard assisted Bemis on preparing *The Evolving House*, a three-volume study on industrialised housing published between 1933 and 1938.

⁸³ John E. Burchard, “Introduction”, in Burnham Kelly, *The Prefabrication of Houses: A Study by the Albert Farwell Bemis Foundation of the Prefabrication Industry in the United States* (Cambridge MA and New York: The Technology Press of the Massachusetts Institute of Technology and John Wiley and Sons Inc., 1951), vii. Kelly succeeded Burchard as director of the AFBF in 1948. The AFBF maintained an enormous archive on prefabrication in architecture; as Burchard noted, in word befitting an MIT administrator and CENIS cold warrior: “The files of the Bemis Foundation, though far from complete, were certainly among the largest in the country. The Foundation was frequently sought out by visitors, especially from abroad, who were seeking the truth about a business concerning which many half-truths or untruths were being said” (viii).

⁸⁴ *Ibid.*, ix.

all, a statement on some form of aesthetic, social, and technological synthesis for postwar society, an extension perhaps of Sigfried Giedion's "New Monumentality" in terms of a newfound capacity for symbolic communication.⁸⁵ Indeed, Burchard believed Giedion's "most durable" thesis remained "that the modern movement will attain no stature until it aims at monumental expression based on modern concepts of space."⁸⁶ The remark expressed his fear, growing throughout the 1950s and summarised in an 1960 issue of *Daedalus* on "The Visual Arts Today" specially edited by Gyorgy Kepes, of, first, an irreconcilable division between architecture and the fine arts, and, second, a generation of socially unconscious artists and architects.⁸⁷ On the one hand lay Kepes's forceful vision:

...the enormous expansion of human conflict in World War II and its consequences made so many ideas seem shallow that I was impelled, like many others, to search for values rather than tools. The social horizon, with its immense and seemingly insoluble problems, did not seem to contain the key to these values. The scientific revolution, with its menaces, benefactions, and promises, did seem to open an emotional window. Basically, I felt, the world made newly visible by science contained the essential symbols for our reconstruction of physical surroundings and for the restructuring of the world of sense, feeling, and thought within us. I was drawn to the converging contributions made by art and science, and to the distillation of the images common to our expanding inner and outer worlds.⁸⁸

⁸⁵ Reinhold Martin, "The MIT Chapel: An Interdiscursive History", in Arindum Dutta, ed., *MIT, Architecture, and the 'Techno-Social' Moment* (Cambridge MA: The MIT Press, 2013), 75-76, 95.

⁸⁶ John Burchard and Albert Bush-Brown, *The Architecture of America: A Social and Cultural History* (1961; London: Victor Gollancz Ltd, 1967), 356. Bush-Brown was an architectural historian and Burchard's colleague at MIT. Their book was originally commissioned to mark the American Institute of Architects centennial in 1957.

⁸⁷ John E. Burchard, "Alienated Affections in the Arts", *Daedalus*, Vol. 89, No. 1 (Winter 1960): 52-61.

⁸⁸ Gyorgy Kepes, "Introduction to the Issue 'The Visual Arts Today'", *Daedalus*, Vol. 89, No. 1 (Winter 1960): 5.

On the other hand was Burchard's view on countering anomie resulting from undue technological determinism in postwar architecture – “Americans have found it easy to confuse technological change with ‘progress’” – including an unreconstructed functionalism: “Thus the work of Markelius in Sweden was denounced in 1951 when Giedion published *CIAM: A New Decade of Architecture*: the new empiricism ‘under cover of “humanising” architecture leads it only to another cul-de-sac.’”⁸⁹ Against this was, again, the other preferred example of Giedion's “new monumentality”, which Burchard celebrated, also in 1951, as having restored to architecture its proper role of communicating “feeling” in a technocratic society.⁹⁰ Thus:

...in Kepes's study of visual communication, *The Language of Vision*, published in 1944... he tried to apply Gestalt psychology to optical communication. His first sentence revealed the social objectives of these visual studies: “Today we experience chaos ... our common life has lost its coherency.” His examples of new typography and paintings, his analysis of texture, focus and spatial patterns revealed an open desire to relate manifold discrete aspects of modern thought. Still in 1960 the problem of communicating ideas visually was not as near solution as it had been in the Middle Ages or the Renaissance. The old common symbols had been discarded and there were no new and common ones.⁹¹

⁸⁹ Burchard and Bush-Brown, *The Architecture of America: A Social and Cultural History*, 251, 374. Burchard was otherwise appreciative of Kepes's attempt at revealing an aesthetic unity in the arts and sciences: in *The Language of Vision* (1944), “he [Kepes] tried to apply the Gestalt psychology to optical communication. His first sentence revealed the social objectives of these visual studies: ‘Today we experience chaos... our common life has lost its coherency’” (346).

⁹⁰ Burchard, “Humanity: Our Client”, 97. Burchard quoted a passage from Giedion's *Space, Time and Architecture* (1941) on restoring “feeling” in town planning. Burchard aimed especially at restoring “history” – as means to consider “the direction of the culture as manifested by its ethics and its public policy” – in face of a growing (but worrisome) embrace of “Science”. Introducing his article, the *Architectural Record* noted that “the same swing toward ‘emotional content’ has lately appeared in critical writings of Belluschi, Mumford, Hitchcock, Eero Saarinen, Burchard and many others”; see: Emerson Goble, “Science AND Art”, *Architectural Record* (July 1951): 85.

⁹¹ Burchard and Bush-Brown, *The Architecture of America: A Social and Cultural History*, 346.

While admiring Giedion's and Kepes's "social objectives" to restore order to "chaos", Burchard adopted a more overtly spiritual, even theological, line when considering the role of contemporary architecture.⁹² Eschewing *symbols* – architecture – in favour of *values*, he argued in 1951:

Thus living religions have, regardless of their absolute values, managed to afford a transcendent communion linking every man of the culture to the fellowman of his culture and have created in this sense a sort of anonymity in which the individual was of minor consequence.⁹³

A decade later, when concluding a lengthy survey on American architecture, he continued (rhetorically using the past tense to summon present times):

The greatest architectures have risen in support of religion. It is possible that this is not essential but the important thing is that there should be a strong common belief, religious or not....

Had any building types emerged that seemed so desirable to Americans that they would lavish upon them kindred sacrifices of extra money, extra labor, extra love, such as we think were brought to the Acropolis or to Mont St. Michel? If there were no such dominant types, was the pluralistic society nonetheless reaching towards an agreement on some common values to be expressed by many architects, ordinary and extraordinary, to be accepted, even admired, by many people, not only by a few self-indoctrinating critics and connoisseurs, to be offered and accepted as a record not only of what the times *might* have been like in twentieth-century America but also of what the times were like?⁹⁴

Here lay the full import of the Montebello report. Rather than advancing through "dominant types" – again, architectures – postwar society was poised to extend itself through

⁹² Martin, "The MIT Chapel: An Interdiscursive History", 92-93.

⁹³ Burchard, "Humanity: Our Client", 95-96.

⁹⁴ Burchard and Bush-Brown, *The Architecture of America: A Social and Cultural History*, 449.

“common values” – the Expo 67 *themes* – of a new universal humanism.⁹⁵ This could, as Burchard noted in reply to the CCWE deputy commissioner C.F. Carsley, arise in the Place des Peuples proposed by the Montebello group – but it would really take root in the “theme area”, which represented a “workable and interesting” approach to translating the spirit behind “a very high-minded report” into “material which the man in the street can find entertaining as well as instructive.”⁹⁶ *Material* did not mean only displays; rather, “in a program of this sort the chances are that progress is made most rapidly by development of concrete material suggestions which can be examined and criticized” – and, “By concrete, of course, I mean actual drawings and site relations, etc., since I think the report of the Montebello conference is as concrete as a report of this kind can perhaps become.”⁹⁷

Concrete stood to suggest equally durable architectural and cultural expressions.

There was no contradiction between the spiritual and secular claims made for *Terre des Hommes*. Rather than technocracy, technology was to be valued as fulfilling the needs of intellectual curiosity, liberation from work, and entertainment; rather than sectarianism, a new spiritual sense of humanism was to be felt in themes uniting the many aspect of “man”.

⁹⁵ “Humanism” represented, to Burchard, the survival of “contemporary architecture as a new expression of the growing spirit of Western man” once threatened by “the pagan reaction of Nazism and Fascism” and now facing the “the Tartar threat of Russian absolutism, under which no new art can survive”. The corollary between Cold War victory and aesthetic triumph (or even some *avant-garde* spirit) was clear: “for it is the Western World and not the communist world which has a revolutionary character. If one doubts this on the political front he may examine it on the aesthetic front.” See: Burchard, “Humanity: Our Client”, 92.

⁹⁶ John E. Burchard, Letter to C.F. Carsley, Deputy Commissioner General, Canadian World Exhibition Corporation (June 18, 1963): 1-2, Folder 9, Series 2, D03.9-109-26-TD, Fonds Guy Desbarats, Canadian Centre for Architecture, Montreal.

⁹⁷ *Ibid.*, 2.

In the context of the host nation, it found expression in renewing a sense of Canadian identity that, on the one hand, was seen, at least in the mirror of Expo 67, as somehow uniting technology and rationalism to oppose nationalism (or isolationism) and irrationalism – a line also informing a postwar *liberal continentalism* that anticipated an increasingly shared historical horizon, whether in the hemispheres of culture or geopolitics.⁹⁸ As a leading Canadian exponent presumed in early 1950s:

These so-called “alien” American influences are not alien at all; they are just the natural forces that operate in the conditions of twentieth-century civilization....

The root cultural problem in our modern mass-democracies is this relationship between the mass culture, which is in danger of being further debased with every new invention in mass communications, and the culture of the few. The United States is facing this problem at a rather more advanced stage than we have yet reached, and the more intimately we can study the American experience the more we shall profit.⁹⁹

Yet Burchard’s appeal would, on the other hand, also resonate with a strong line of Canadian Idealism shaping ideas – and policies – on postwar culture and geopolitics, in which a “lament” for nationhood was predicted in the face of a heedless absorption of technology and

⁹⁸ Karel D. Bicha, “Five Canadian Historians and the USA: Frank Underhill, Arthur Lower, Donald Creighton, WL Morton and Kenneth McNaught”, *The American Review of Canadian Studies* 29, no. 2 (Summer, 1999): 195. Often described in pejorative terms, “continentalism” was actually viewed positively in left-wing and centre-left political circles, which included Underhill, during the first postwar decades; see: Gregory J. Inwood, *Continentalizing Canada: The Politics and Legacy of the MacDonald Royal Commission* (Toronto: University of Toronto Press, 2005), 17ff.

⁹⁹ Frank H. Underhill, “Notes on the Massey Report”, *The Canadian Forum* (August 1951): 102. Underhill, a prominent journalist, historian, and political thinker, who advocated stronger Canadian ties to the United States (not least due to his anti-monarchism), was commenting on the recently completed *Report of the Royal Commission on National Development in the Arts, Letters and Sciences*, which irrevocably reshaped cultural norms in postwar Canada. On Underhill’s liberal continentalism and acceptance of American influence on Canadian life, see: Karel D. Bicha, “Five Canadian Historians and the USA: Frank Underhill, Arthur Lower, Donald Creighton, WL Morton and Kenneth McNaught”, *The American Review of Canadian Studies* 29, no. 2 (Summer 1999): 195.

mass media.¹⁰⁰ The 1951 report of the two-year the Royal Commission on National Development in the Arts, Letters and Sciences – which would, while remaining sanguine on the pull of Americanism, effectively create the framework for entirely new national institutions promoting modern Canadian culture – had noted:

If modern nations were marshalled in the order of the importance which they assign to those things with which this inquiry is concerned, Canada would be found far from the vanguard; she would even be near the end of the procession. Some of the reasons are suggested in an earlier chapter: vast distances, a scattered population, our youth as a nation, easy dependence on a huge and generous neighbour. But while engaged in these material matters we were confronted with new problems which we share with all modern states. “Unfortunately”, says the author of one of our special studies,

“just as in the western world, we are beginning to understand how deeply our spiritual traditions need guarding, just as we are ready to divert some of our energy from technology for that purpose, our society is being challenged to defend itself against a barbaric empire which puts its faith in salvation by the machine. We are tempted to forget the spiritual necessity in the face of the more present danger.”

The tidal wave of technology can be more damaging to us than to countries with older cultural traditions possessing firmer bulwarks against these contemporary perils.¹⁰¹

¹⁰⁰ The most famous reaction against Americanism, technological advance, and continentalism appeared in the conservative historian George Grant’s influential book *Lament for a Nation* of 1965. Grant epitomised a middle generation of Canadian idealism that sought to defend political and religious *status quo* while demanding a nationalist spirit as bulwark to absorption by American technological modernity; this was, broadly speaking, a project of the political right, though one that shared little of emergent American conservatism (or neo-conservatism). See: Robert Meynell, *Canadian Idealism and the Philosophy of Freedom: C.B. Macpherson, George Grant, and Charles Taylor* (Montreal and Kingston ON: McGill-Queen’s University Press, 2011).

¹⁰¹ Royal Commission on National Development in the Arts, Letters and Sciences, *Report of the Royal Commission on National Development in the Arts, Letters and Sciences* (Ottawa: King’s Printer, 1951), 272, www.collectionscanada.gc.ca/2/5/h5-400-e.html. The concluding ambition was to establish institutions (for the arts, sciences, and education) directly through the appropriation of federal funds. Under the advice of its patrician chairman, the lawyer and diplomat (and future Governor General) Vincent Massey, the Commission, which had held official hearings and solicited suggestions from constituencies across the country, studiously avoided the word “culture” for fear of sounding “elitist”. Elitism was not just highbrow taste but at times equated to anti-Americanism – two sentiments that Massey wished to eschew. See: Claude Bissell, *The Massey Report and Canadian Culture* (Ottawa: Carleton University Information Office, 1982), 16-18.

Otherwise rarely suffering the binds of either nostalgia or chauvinism, the report's curious quotation of a noted conservative historian suggested a parallel cultural wariness of technological modernity.¹⁰² In the limits of geopolitics, the perilous idolatry of technology was seen as the province – and power – of American and Soviet hegemons (between which Canada lay wedged). To confront cold war polarities was not necessarily to choose sides; rather, it was to defy expectations of *deus ex machina* by recuperating some spirit of organic-collectivist society. In this conservative idealist paradigm of modern communitarianism, in which individualism was to be measured by assisting the traditions of a commonweal, lay a critique of *progress*, of an unswerving historical force leading to the heedless conquest of nature. The repeated refrain, no matter how maudlin, of *Terre des Hommes* was, as discourse, to overcome intellectual fears of a rift between materialist and spiritualist senses of history and mass culture. Thus Huxley's "transhumanism" or Saint-Exupéry's "*linge*": the desire to promote some sort of cultural synthesis – of renewing bonds between the arts and science, or between thought and action – surely appealed to Burchard, whose own search for "common values" – expressed as architecture – in a "pluralistic society" led him enthusiastically to endorse the Montebello report. Replying to the CCWE Deputy Commissioner General C.F. Carsley, who had sent the Montebello group's report along with Piché's letter, Burchard wrote: "I must say I think both of these are admirable and I am

¹⁰² The quoted lament for withering spiritual values in the face of technological change came, in fact, from the Royal Commission chairman Vincent Massey's nephew, the influential conservative historian George Grant. See: Bissell, *The Massey Report and Canadian Culture*, 17.

delighted that you have come out with such a statesmanlike document, which puts to shame the manoeuvres of Mr. Moses in New York.”¹⁰³ Wishing to counter the anticipated crass materialism of the 1964 New York world’s fair by the “high-minded” ideals of Expo 67, Burchard reflected: “I am glad that the Canadian committee said something that I felt I could not properly say” – doubtless as an American – “dealing with the relationship of the celebration of the centenary to the exhibition itself.”¹⁰⁴ To celebrate the founding of a modern country was to believe in the possibility of reinventing history – a status assumed in New World exceptionalism (which the MIT modernisation theorists had hoped to extend to newly decolonising societies) – with *themes* replacing politics by the arts and sciences, culture and technology.¹⁰⁵ Burchard thus saluted two results of the Montebello deliberations: first, the inclusion of his original memorandum alongside a report on the Brussels world’s fair as key sources of ideas on Expo 67; second, the specific proposal on a “theme area” devoted to “THE EARTH, HOME OF MANKIND (MYSTERES DE LA PLANETE)” with “exploration” organising all fields of human endeavour.¹⁰⁶ Burchard understood the link

¹⁰³ Burchard, Letter to C.F. Carsley, 1. Burchard acknowledged that he would be pleased to serve on a supervisory committee and urged that every effort be taken safeguard the exhibition “in the face of larger forces” (presumably political ones).

¹⁰⁴ Ibid.

¹⁰⁵ The Montebello conferees consistently described Canada in exceptional terms: “Situated as it is, historically and geographically, between Europe and the United States, it has been a land of experiment”. See: “The Theme ‘Terre des Hommes’ and Its Development at the Canadian World Exhibition in Montreal, 1967”, Montebello conference report (no date): 2, Series 39-1990-07-001, Find Gilles Gagnon, Canadian Centre for Architecture, Montreal.

¹⁰⁶ Burchard, Letter to C.F. Carsley, 1; Lucien Piché, Letter to Mr. Paul Bienvenu, Commissioner General of the Canadian World Exhibition Corporation (May 31, 1962): 2, Series 27-A21-04, Fonds van Ginkel, Canadian Centre for Architecture, Montreal; “The Theme ‘Terre des Hommes’ and Its Development at the Canadian World Exhibition in Montreal, 1967”, 4.

between *exploration* and *Canada*: the open-ended senses of science and history followed perfectly the schemes of acculturation that he and his MIT colleagues had advanced throughout the 1950s. It surely gave satisfaction that ideas on promoting the United States in 1958 were now elevated to emblematised the “world”.

At Expo 67, the construction of Canadian modernity appeared in this long discourse on world’s fairs, techno-science, the nation-state, and the cold war. Tensions between “spiritual and material aspirations” were, as both the van Ginkels and the Montebello conferees wished, to be perfectly mediated by *exploration*, a theme not only capturing the full import of “transhumanism” but granting Canada an extraordinary prognostic value – “the perfect stage for the glorification of nature”; “a highly suitable theatre for the study of man today” – on expressing multiple forms of global fraternity.¹⁰⁷ While coded in aspects of the MIT work on cultural propaganda, the Canadian ambition was not necessarily to produce an equivalent *Pax Americana*. Nevertheless, it shared the desire to present pacific scapes of modernisation: by “transcending boundaries”, “modern man” had arrived at a point where, “having learned to escape the law of universal gravitation, the abilities he has developed now impel him to attack the evils which heretofore have been part and parcel of his existence.”¹⁰⁸ These were the early hopes of early 1963. In the end, with the ceding of themes to dedicated pavilions, Canada would no longer retain the status – of reorganising *la terre des hommes* –

¹⁰⁷ “The Theme ‘Terre des Hommes’ and its Development at the Canadian World Exhibition in Montreal, 1967”, 1.

¹⁰⁸ Ibid.

first imagined by the architects and later at Montebello. Instead of mapping an alternative geography of the “world”, it would, like other countries, have to attend a nation-state interest.

Canada would, in the end, build its pavilion. Costing \$22 million, it was, with Habitat 67, the most expensive building at Expo 67. Canada had, in fact, been defined at Montebello:

In dealing with the question of Confederation, the theme of unity in diversity should be dealt with; particularly in respect to the universality of this problem. Canadian unity should be presented not as a “fait accompli”, but as a challenge and a search. This spirit of challenge and questioning, rather [than] a self-satisfied sense of achievement, should also animate the presentation of all thematic material.¹⁰⁹

The difference between 1963 and 1967 was that on February 15, 1965, Canada adopted a national flag.¹¹⁰ Still, instead of a nation, the pavilion was, much like the growth of the country, a collection of regions: the Atlantic Provinces with an unremarkable box; Quebec inside an elegant glass container floating at the edge of the complex within its own moat; Ontario underneath irregularly peaked space frame roofs of glass-fibre panels; and the Western provinces combined in an apparently suitable “organic” mound made of Douglas fir tiles and rising parabolically to enclose tall trees inside (fig. 7.11). The buildings were set around an 11.5-acre site. At its centre arose a massive 109-foot high inverted pyramid (fig.

¹⁰⁹ Ibid., 12. The idea that Canada represented a veritable “*Terre des Hommes*” was articulated by Daniel van Ginkel and others at the seminal PQAA retreat some months earlier; see: van Ginkel, H. Mayerovitch, et al., “Le Thème”, 1-13. The architects Robillard, Affleck, and Prus, all present at the PQAA meeting and sympathetic to the van Ginkels ideas, were official participants at Montebello.

¹¹⁰ The Canadian national flag was adopted on February 15, 1965. It replaced the British Union Flag, though the Canadian Red Ensign had been unofficially flown since the late nineteenth century.

7.12). Designed by the firm Ashworth, Robbie, Vaughan and Williams, the outstretched form – named Katimavik, the Inuktitut word for “meeting place” – was, as an official guidebook offered, to suggest “the constant expansion of Canada’s horizons. It reflects Canada’s devotion to the tenets of humanism.”¹¹¹ Climbing far above the fairgrounds to a platform running the perimeter of the pavilion, visitors actually turned inward to descend into the inverted apex. Along the deep sloping planes on which rested enormous reconstructions of primitive masks and mechanical instruments. Devoted to “time”, “space and distance”, “nature”, and, finally, “man”, the artefacts – a sundial or an atomic clock; a compass or a radio telescope; huge sculptures of carrot seeds or lotus blossoms; masks representing Greco-Roman, African, Japanese, or Native American cultures – stood to represent the evolutionary process of humanity (fig. 7.13). The juxtaposition of the archaic and the modernising was conceived as a reverse trajectory of history, returning Canada to some common folklore, however invented – or, as the head of the Canadian Government Committee for Expo 67 put it:

We coined terms from prefixes and suffixes of the Latin and Greek – they had the sounds of pharmaceuticals and paint, of science fiction and the carboniferous era.

Thus “Katimavik”:

¹¹¹ François Hébert, “Katimavik”, in *Widening Horizons: Katimavik and Interdependence* (Ottawa: Queen’s Printer, 1967), 3. As an official film put it, the pavilion was “an open hand towards the sky” symbolising “the Canadian people reaching for a better future”; see: Marc Beaudet, dir., *The Canadian Pavilion, Expo 67*, film (Montreal: National Film Board of Canada, 1967). Ashworth, Robbie, Vaughan and Williams emerged in the early 1960s from the office of Peter Dickinson, the important but prematurely deceased British émigré architect. For anecdotes on the Canadian pavilion, see: John Lownsbrough, *The Best Place to Be: Expo 67 and Its Time* (Toronto: Penguin Canada, 2012), 87-94.

In the right connotation, and with supporting words, it can say “gathering place for those who wish to understand the world”.¹¹²

Deep in the bowl of the upturned pyramid, each visitor, gazing at the larger-than-life forms projecting against the sky, stood to portray “the place of man in his universe”.¹¹³ If this was to be a visceral but intimate reckoning with the durability of human consciousness, ensuring the stability of “values” sought in so many philosophical sources from Saint-Exupéry to Huxley to Burchard, then it was almost inevitable that it would be countered by some mediatic pull elsewhere. Thus, under the low white “plastic pyramids” exhibition buildings spreading outward from Katimavik, the “immense Canadian display proper” ultimately appeared.¹¹⁴ In distinction to the contemplative scape above, visitors were subjected to a three-part history of the host nation now reduced to “Growth” (from “the feeling of strife-torn early times, when a farmer plowing his field had to pick up his musket in alarm as sounds of gunfire reverberated in the woods nearby” to a society “urban and industrialized, yet still dependent on the big land”), “Resources and Energy” (“Walk through a simulated coal mine”), and “Transportation and Communications” (“Elsewhere, television, the microwave, and Canadian filmmaking are on continual show”).¹¹⁵ *Terre des Hommes* was finally invoked in the mastering of the “world” by machines – an often harsh reality elevated

¹¹² H. Leslie Brown, Commissioner General for the Canadian Pavilion, quoted in Kuffert, *A Great Duty: Canadian Responses to Modern Life and Mass Culture, 1939-1967*, 231. At the time of his appointment, Brown was a career civil servant with the Canadian Department of Trade and Commerce.

¹¹³ Hébert, “Katimavik”, 13.

¹¹⁴ *Expo 67 Memorial Album*, 112.

¹¹⁵ *Ibid.*, 112-113.

to the status of myth when reconstructing Canadian history for the centennial. As visitors walked through a mock oil pipeline – or, like everywhere elsewhere at Expo 67, entered film projections, multimedia environments, and carousel theatres – the triumph of the *carboniferous* – “the conquest of our natural environment”, “the wealth that lies beneath our farms and forests”, “the Canadian forest remains inexhaustible” – became a paean to resource exploitation and economic nationalism (fig. 7.14).¹¹⁶ More than the victory of machines, the technological utopianism – evinced in the pavilion Commissioner General’s wry sense of “prefixes and suffixes”, of *uni-* or *-ion*, *poly-* or *-trope* – offered visitors (that is, Canadians) a direct view on how their late modern society was quite literally being constructed. When defining the role of arts in the Centennial celebrations, a committee of Canadian intellectuals had declared: “The cultural climate has been warmed by the many thousands of new Canadians, by the spread of higher education, and by the imminence of the age of leisure.”¹¹⁷ Despite the trope of “leisure”, and notwithstanding the new realms of *information* being communicated at Expo 67, this was not quite yet post-industrial society. In fact, the representations of a resource economy (ideally *dirigiste*) as base of an expansive welfare state – *immigration, education, leisure* – accorded with the historical actuality of Expo 67: a neo-

¹¹⁶ Beaudet, *The Canadian Pavilion, Expo 67*. Between 1955 and 1965, American domination of the Canadian economy continued to grow: 70 percent ownership of the petroleum and natural gas industry, 50 percent of mining and smelting, 40 percent of general manufacturing, and 95 percent of automobile manufacturing; see: J.A. Lower, *Canada: An Outline History* (Toronto: McGraw-Hill Ryerson Limited, 1973), 207-209. Among the most influential voices on economic nationalism was Walter Gordon, the Minister of Finance from 1963 to 1965 (when he had at times reluctantly funded Expo 67), who fervently argued for increased Canadian influence in the development and use of natural resources. See, for example, Gordon’s book *A Choice for Canada: Independence or Colonial Status* (Toronto: McClelland and Stewart, 1966).

¹¹⁷ Canadian Conference of the Arts, *Seminar '65-'67: Report* (Montreal and Toronto, 1967), 1.

Keynesian event *par excellence* – debt expenditure outside historical crisis – appearing at a unique moment of changing postwar prosperity. In the euphoria of Expo 67, or the nationwide Centennial celebrations, it seemed impossible to imagine that 1967 was actually nearing the end of an unprecedented thirty-year period of growth soon to face a series of irreversible global economic crises.

If 1967 represented something truly new, as the Canadian display of modernism and modernisation implied, then it was perhaps seen in a rising *late capitalism* shaping the systemic mechanisation and specialisation of industry and culture as well as any alignments between “first” and “third” worlds. This bought, therefore, spaces like Africa Place into regimes of modernity witnessed in, say, the implementation of “green revolutions” (or participation at world’s fairs).¹¹⁸ Indeed, Canada represented an image, especially in terms of cold war alignments, of national development – symbolised by wheat production – conceivably bridging the gap between advanced industrialised nations and newly decolonising ones.¹¹⁹ The idealisation of Canada was, in part, the endurance of a modernist paradigm in which in which absolute values, such as nature and technology, were clearly and consistently juxtaposed.¹²⁰ At the same time, technology was the means by which the continental landmass and its myths were revealed to its citizenry. Now, the last vestiges of Nature (along with the functional scapes of modernism: *dwelling, work, recreation,*

¹¹⁸ Fredric Jameson, “Periodizing the 60s”, in *The Ideologies of Theory: Essays 1971-1986* (Minneapolis: University of Minnesota Press, 1988): 205-207.

¹¹⁹ Howard, “The Transparent Empire?: Exhibition Strategy and the Cold War at Expo 67”.

¹²⁰ Alan Colquhoun, *Modern Architecture* (Oxford: Oxford University Press, 2002): 152.

circulation) were at length to be eliminated.¹²¹ The apparently liberative project of “systems” was part and parcel of this transformation. So was the cultural logic of the world’s fair.

If the modernisation of *terre des hommes* was finally the displacement of *man* and the *world* by techno-science, then the full force of domination lay just at the edge of the Canadian precinct. Here, in a slightly forested enclave surrounding a small artificial lake stood the Indians of Canada pavilion (fig. 7.15). Originally proposed by the federal Department of Indian Affairs and Northern Development, it was largely conceived and organised by First Nations peoples. The representation of an autonomous structure, of being part of but separate from Canadian society, meant confronting patterns laid down in previous international exhibitions, where aboriginal life and art was a footnote to Euro-Canadian displays on agriculture, industry, and culture.¹²² The circuit started from a reception built as a kind of longhouse. Inside were explanations on the six large cultural groups of Canadian First Nations. Visitors then entered two rooms describing life before first contact, after which they arrived at displays on “the land” and “the people”. From here a bridge led toward six elevated hexagonal chambers – always the “cellular’ construction” expected by the CCWE, to say nothing of the professed *primitivisme* of such forms in the 1960s – showing the pressing issues of modern life and surrounding a 100-foot tall steel and

¹²¹ Jameson, “Periodizing the 60s”, 206.

¹²² Ruth B. Phillips and Sherry Brydon, “Arrow of Truth’: The Indians of Canada Pavilion at Expo 67”, in Ruth B. Phillips, *Museum Pieces: Toward the Indigenization of Canadian Museums* (Montreal and Kingston ON: McGill-Queen’s University Press, 2011), 30. Only two Canadian groups appeared outside (but adjacent to) the Canada complex: the Indians of Canada pavilion and the Christian pavilion. On the latter and its remarkable audio-visual displays, see: Monika Kim Gagnon, “The Christian Pavilion at Expo 67: Notes from Charles Gagnon’s Archive”, in Kenneally and Sloan, eds., *Expo 67: Not Just a Souvenir*, 143-162.

wood tower resembling a teepee and symbolising “the future”; below it a staircase descended to a campfire and the exit.¹²³ The full entry in the *Expo 67 Official Guide* read:

The Indians of Canada Pavilion on Ile Notre-Dame adjoins the pavilions of the Atlantic Provinces and of Canada. Expo-Express provides convenient access.

In all parts of Canada, Indians have discussed and helped to shape their exhibit. Indian painters, carvers and other artists have worked to translate the concept which evolved into a form of significant expression.

Through their exhibit, the Indians of Canada speak to fellow Canadians and to the other peoples against the background of Man and his World.

Primarily the Indian people want to present the problems with which they are faced by involvement in a modern technological society, and to affirm their will to preserve the traditional moral and spiritual values of their forefathers.

This is a positive expression of Indian thought. While the Canadian Indian approaches the Expo 67 Theme in terms of himself and of his own world, the subject is a common experience of Man.¹²⁴

The possible irony of the pavilion actually resting at the extreme edge of Canada but right next to the United Nations was quietly overlooked. Between the poles of “problems” and “positive expression” lay a far more pressing message, dramatically displayed in each of the hexagons, on “the white man”, “wars, treaties and betrayals”, “religion”, “government interest and reserves”, “work life”, and “education”. Alongside brilliantly placed works by contemporary First Nations artists, visitors faced utterly unsentimental, often shocking, portrayals of aboriginal life in an ambivalent discourse on the polarities of traditional culture

¹²³ The pavilion was designed by J.W. Francis, a branch architect with Department of Indian Affairs and Northern Development. See: Phillips and Brydon, “‘Arrow of Truth’: The Indians of Canada Pavilion at Expo 67”, 33.

¹²⁴ *Expo 67 Official Guide* (Toronto: Maclean-Hunter Publishing Co. Ltd., 1967).

and modern adaptation to a “world” dominated by other “men”.¹²⁵ Indeed, mid-twentieth-century museums continued to treat aboriginal displays in terms of an “authentic” distant past.¹²⁶ This had been central to constructing modern Canadian identity: during his London exile, the German architect Gottfried Semper had received the commission to install the Canadian section of the 1851 Great Exhibition; consumed by fashioning an unifying architectural theory, which looked to primitive cultures as sources on modern ornament and tectonics, Semper collected First Nations artefacts (along with typical displays of machines and furs) and arranged them underneath a massive birch bark canoe hanging from the girders of Joseph Paxton’s Crystal Palace (fig. 7.16).¹²⁷ Now, instead of practices of connoisseurship and taxonomy perpetuating late-Victorian traditions, the long march of Euro-Canadian civilisation was met at Expo 67 by utterly different, often accusatory, accounts on culture and nationhood. While a sign hanging in the entryway generously greeted a journalist from the Canadian Broadcasting Corporation – “The Indians of Canada bid you welcome. Walk in our moccasins, the trail from our past. Live with us in the here and now. Talk with us by the fire of the days to come” – this past, present, and future was

¹²⁵ Myra Ruthdale and Jim Miller, “‘It’s Our Country’: First Nations’ Participation in the Indian Pavilion at Expo 67”, *Journal of the Canadian Historical Association* Vol. 17, no. 2 (2006): 154. The totem pole was sculpted by master carvers Tony and Harry Hunt, in the Kwakwaka’wakw tradition – atop the 65-foot-high pole was the Thunderbird, which could order lightning to strike. The longhouse (or “bighouse”) mural was painted by renowned Tseshaht First Nation artist George Clutesi, also known as Thunderbird.

¹²⁶ Phillips and Brydon, “‘Arrow of Truth’: The Indians of Canada Pavilion at Expo 67”, 39.

¹²⁷ *Dickinson’s Comprehensive Pictures of the Great Exhibition of 1851* (London: Dickinson, Brothers, Her Majesty’s Publishers, 1854): section XI. For Semper’s contributions inside the Crystal Palace, see: Mari Hvattum, “‘A complete and universal collection’: Gottfried Semper and the Great Exhibition”, in Mari Hvattum and Christian Hermansen, *Tracing Modernity: Manifestations of the Modern in Architecture and the City* (London: Routledge, 2004), 124-136.

foreshortened in “a note of unhappiness... a note of questioning” on what had amounted to a history, far longer than a centennial, of colonisation.¹²⁸ While displays optimistically balanced ancestral and modern life – photographs of trappers, fishermen, and craftspeople as well as physicians, doctors, and politicians – the polemic quickly turned. As a “Paleface” synopsis put it, not unsympathetically:

As for the efforts of the first Christian missionaries, the Indians point out: “Long before they came, we had already talked with God, whom we called the Great Spirit, after our fashion. We lived together like brothers and we saw the Spirit present in everything.”

Smiling faces of Indian children catch the visitor’s eye in the exhibit devoted to education. But they are partly ironic. Among the photographs and the children’s drawings, the handicaps facing Indian pupils are detailed. The child must begin at school by learning a foreign tongue, that is, English or French. And, generally, the white man’s style of education is an alien environment to the young Indian. With him it is the sun and the moon which regulate the passing of time. Any clock-regulated timetable is repugnant to him. The school bell startles him. The heroes of our schoolbooks have nothing in common with him.¹²⁹

The actual hanging photographs juxtaposed with short declarative texts put it in stark terms: “Dick and Jane in the storybook are strangers to an Indian boy” (fig. 7.17). A photograph showing children lining up to board a school bus could only recall the dwindling but still extant Indian Residential Schools, the federally funded but religiously administered system of forcibly placing First Nations boys and girls in boarding institutions where they were to be

¹²⁸ “Expo 67’s Indians of Canada”, *Expedition*, Canadian Broadcasting Corporation, radio broadcast (August 4, 1967), www.cbc.ca/archives/discover/programs/e/expedition/expedition-july-7-1967.html. For a description of journalistic accounts, which were typically sympathetic to the pavilion and its political message, see: Ruthdale and Miller, “‘It’s Our Country’: First Nations’ Participation in the Indian Pavilion at Expo 67”, 166ff.

¹²⁹ *Expo 67 Memorial Album*, 121.

“enfranchised” – or, “encouraged” in their “gradual civilisation”.¹³⁰ Here, again, alternative geographies – of native reservations, of residential schools – confronted an increasingly fraught scape, once dreamt as situating a new spirit of “transhumanism”, by entirely different land-use instruments meant to extend a civilising process through isolation and individuation.¹³¹ Standing between the Canadian compound and the United Nations, the Indians of Canada pavilion could only but call into question the liberal-capitalist ideology of settler culture, or the “frontier” ethic of techno-science imagined as liberating the *terre* but, here, effectively standing for the subjugation of “man”.

At their most visionary, the architectures of Expo 67 were to present how life could be newly regulated by design. Yet the confrontation of Indians of Canada pavilion could

¹³⁰ The Act to Encourage the Gradual Civilization of Indian Tribes in this Province, passed on June 10, 1857, a decade before Confederation, clearly stated the agents and doctrines of colonial administration and indoctrination:

III. The Visiting Superintendent of each Tribe of Indians, for the time being, the Missionary to such Tribe for the time being, and such other person as the Governor shall appoint from time to time for that purpose, shall be Commissioners for examining Indians, being members of such Tribe, who may desire to avail themselves of this Act, and for making due inquiries concerning them: and such Commissioners shall meet for the said purposes at such places and times as the Superintendent General of Indian affairs shall from time to time direct, and shall have full power to make such examination and inquiry: and if such Commissioners shall report in writing to the Governor that any such Indian of the male sex, and not under twenty-one years of age, is able to speak, read and write either the English or the French language readily and well, and is sufficiently advanced in the elementary branches of education and is of good moral character and free from debt, then it shall be competent to the Governor to cause notice to be given in the Official Gazette of this Province, that such Indian is enfranchised under this Act; and the provisions of the third section of the Act aforesaid, and all other enactments making any distinction between the legal rights and liabilities of Indians and those of Her Majesty's other subjects, shall cease to apply to any Indian so declared to be enfranchised, who shall no longer be deemed an Indian within the meaning thereof.

For a detailed history of the residential schools, see: Geoffrey Carr, *House of No Spirit: An Architectural History of the Indian Residential School in British Columbia*, PhD dissertation, University of British Columbia (2011), <https://circle.ubc.ca/handle/2429/34181>.

¹³¹ Geoffrey Carr, “Atopia of the Modern: Revisiting the Place of the Indian Residential School”, *English Studies in Canada* Vol. 35, No. 1 (March 2009): 117.

only show how the very same conditioning of landscapes, resources, laws, had, *by design*, produced utterly different – and necessarily accusatory – accounts on culture and nationhood outside any conventions of the Centennial or the otherwise *long durée* of European influence. While the early thematising by the van Ginkels, the Montebello conferees, and others had sympathetically read newly decolonising nations as welcome members, indeed as upholders, of the *transhumanism* of Expo 67, the reality of the fair, and the three million people visiting the Indians of Canada pavilion, unveiled, however partially, an entirely different account of homegrown colonisation – one never considered when imaging what, exactly, one hundred years of *Terre des hommes* really looked like. The very same kinds of masks appearing high above in Katimavik were, in the First Nations pavilion, a different reality of the modern nation-state. Yet staging “Indian-ness” had long been crucial to Canadian constructions of cultural authenticity. Indeed, the nature of monarchical spectacle, still crucial to Canadian life, was grounded by an invented tradition of majesty having an aboriginal aspect.¹³²

Perhaps expecting a similar romanticism, the Queen of Canada, Elizabeth II, arrived in Montreal aboard the royal yacht *Britannia* on July 3, 1967. Proceeding through the Canadian precinct, she entered the Indians of Canada pavilion at noon, halfway through her visit (fig. 7.18).¹³³ She toured it ashen faced and was seen to leave early.

¹³² Ruthdale and Miller, “‘It’s Our Country’: First Nations’ Participation in the Indian Pavilion at Expo 67”, 122. On “invented tradition” as a practice peculiar to the trappings of nations and nationalism; see: Eric Hobsbawm and Terence Ranger, eds., *The Invention of Tradition* (Cambridge UK: Cambridge University Press, 1983).

¹³³ *Programme of Arrangements for Her Majesty Queen Elizabeth II and His Royal Highness the Duke of Edinburgh at Ceremonies Commemorating the Centennial of Canada – 1967* (1967), Series MG32-B16, Fonds Lionel Chevrier, Library and Archives Canada, Ottawa.

In a remarkable sleight of hand, or an act of hubris, or innate political cunning, Montreal mayor Jean Drapeau, who had imperiously presided over the world's fair islands as a veritable annex to his city, would reopen Expo 67 in 1968. Defying the Bureau International des Expositions, which demanded that world exhibitions be dismantled upon closing, Drapeau managed to retain 46 national pavilions, many with new displays, in a permanent exhibition on "Man and His World" (fig. 7.19). The claim was economic: a boast that the new show would net \$6 million per year.¹³⁴ It was more clearly to feed Drapeau's appetite for monuments.

1968 could never be 1967. All the infrastructural upheavals – the highways, the Metro, the islands – and the territorial instruments used to build the world's fair had left a different city and social life in their wake. Drapeau had understood this perfectly. Worried that tourists were driving to the world's fair through the poorer neighbourhoods of the city, he ordered the construction of prettifying blue and white fences – the official colours of Expo 67 – to mask the poverty.¹³⁵ Graffiti soon appeared: "Visitez les Slums". Elsewhere, meatpacking industries reportedly spent \$1 million preventing abattoir odours from floating

¹³⁴ Jay Walz, "Expo 67's Sequel Will Open Today", *The New York Times* (May 17, 1968): 13. "Man and His World" continued on Ile Ste. Hélène until 1981. By this time, many of the remaining pavilions had fallen into disrepair. The resulting landscape was used by filmmaker Robert Altman as a post-apocalyptic world for his poorly received science fiction film *Quintet* of 1979. Drapeau's ambition for even grander spectacles brought the 1976 Olympic Games to Montreal; it took the City of Montreal thirty years to pay off the total cost of \$1.61 billion. In 1970, Drapeau had remarked, "the Olympics can no more have a deficit than a man can have a baby".

¹³⁵ Terrance McKenna and Susan Purcell, *Drapeau* (Toronto and Vancouver: Clarke, Irwin & Company, 1980), 150-151.

over the fairgrounds.¹³⁶ The public service was never extended to those living in Pointe-Saint-Charles, the impoverished districts once imagined by the van Ginkels as benefitting from a world's fair dedicated to urban renewal.

Drapeau's act of preservation was to believe that the civic euphoria created by an artificial, manicured, and temporary city could somehow be extended to everyday life. It was really the aestheticisation of politics, with the technological aura of Expo 67 anticipated spreading to, thus legitimising, any number of future modernising schemes for Montreal.¹³⁷ In this process of massification – of buildings, of people – Drapeau steadfastly maintained, with monomaniacal zeal, that the populace would herald any large-scale change as another welcome spectacle of modernisation.

Yet the totalising urbanism that now defined Montreal – the architecture, engineering, and infrastructure celebrated by international architects and critics when visiting Expo 67 – had forced a reconsideration of, if not outright lament for, what may have disappeared in its wake. In 1972, the Montreal Museum of Fine Arts looked back at the previous decade. In an exhibition titled *Montreal: Plus or Minus?*, curated by the architect-artist Melvin Charney, who had previously advanced *au courant* discourses on megastructures and systems in the 1960s, the museum worryingly explored the effect of unremitting development. It aimed to reveal the “fabric of Montreal” where “traces of an urban tradition” were vanishing:

¹³⁶ “How the Fair Was Planned”, *Progressive Architecture* (June 1967): 131.

¹³⁷ Walter Benjamin, “The Work of Art in the Age of Mechanical Reproduction” (1936), in Hannah Arendt, ed., *Illuminations* (New York: Schocken Books, 1968), 217-251.

There are many plans and projects which should have been included in this show, but they were not. The plans for the 1976 Olympic installations; the exact position of the Eastern extension of the Trans-Canada Expressway; the plans for the St Sulpice lands in the centre of the city; the development of office buildings at the Windsor Station site; the plans for federal offices on the site of Montreal's Chinatown. All this is kept secret, through the complicity of 'experts' who tend to remain quiet as long as they get the work....¹³⁸

Pointedly, no architectural designs were presented. Instead photographs, poems, and comic strips portrayed the "public and communal city" found "in the streets, in the parks, in the signs, in the graffiti, in the water we drink, and in the lives we lead."¹³⁹ Growing social, economic, and political conflicts led the radical poet André Major to write:

but when you've got nothing better to do
you walk along the water's edge
along the docks
and you wonder whether Montreal has a heart
even though you live in the heart of the city¹⁴⁰

Major's lines were a coda to a project once predicated on the affirmative modernist discourse of "The Heart of the City". Montrealers could only look on as neighbourhoods were destroyed for a new *autoroute* running along Montreal's continuous east-west escarpment – a site proposed by the van Ginkels many years earlier to avoid demolishing other old districts of the city (which later became the spaces of Man in the City). Suggesting a withering of social divisions (typically French versus English) given a common subjugation to the forces of modernisation, *Montréal: Plus or Minus?* described direct action in social affairs such as

¹³⁸ Melvin Charney, *Montréal: Plus or Minus?* (Montreal: Montreal Museum of Fine Arts, 1972), 16, 20.

¹³⁹ *Ibid.*, 19.

¹⁴⁰ André Major, "Au coeur de la ville", in Charney, *Montréal: Plus or Minus?*, 24.

advocacy planning. Charney's contribution was a panorama of both sides of a block on St Laurent Boulevard – the traditional fault line between Francophone and Anglophone – reminiscent of Ed Ruscha's record of the Sunset Strip in Los Angeles. Photographers captured graffiti that screamed "Taudis Français Châteaux Anglais"; "Pouvoirs Ouvriers"; "La Merde pour Elliot Trudeau". The cry from the streets was clear.

The streets had, for an instant, been charged in a very different way. On October 15, 1970, Pierre Elliot Trudeau, the prime minister of Canada, enacted the War Measures Act in response to the kidnapping of James Cross, the British trade commissioner, and Pierre Laporte, the Quebec minister of labour and immigration, by two independent cells of the Front de Libération du Québec (FLQ), a group of self-professed revolutionaries inspired by anti-colonial struggles (whether the Algerian war of independence or Che Guevara) and dedicated to Quebec *indépendance*. Since 1963, the FLQ had undertaken a bombing campaign against apparent symbols of Anglophone or capitalist authority.¹⁴¹ Now, Montreal was filled with soldiers and curfew imposed. Laporte would be executed and his body found in a car abandoned on the outskirts of Montreal; an FLQ communiqué announcing his murder derisively called him the "minister of unemployment and assimilation". On December 3, Cross was freed in exchange for the safe passage of his kidnappers to Cuba. His

¹⁴¹ The FLQ was responsible for at least 170 violent incidents, including bombings, which killed eight people and injured many more. FLQ violence typically targeted property rather than people. Nevertheless, the bombing of the Montreal Stock Exchange on February 13, 1969, left 27 people wounded. The total FLQ members involved in violence was around 100; a smaller number were active in editorial and propaganda work, while a few hundred more were ready to offer concealment and financial aid; a few thousand lent "armchair" support. See: Judy Torrance, *Public Violence in Canada* (Montreal and Kingston ON: McGill-Queen's University Press, 1986), 36ff.

release took place on Île Notre-Dame in the former Canadian pavilion, temporarily declared Cuban territory. Here, at the base of Katimavik, under “an improbable huddle of white roofs clustered together like fallen paper airplanes”, the fairgrounds of Man and His World – “a manmade island, remote from normal pursuits, impregnable to casual violence” – briefly became, once again, the focus of worldwide attention.¹⁴² Yet the internationalism of a distant world’s fair now yielded to the *séparatisme* of revolutionaries calling themselves the “*nègres blancs d’Amérique*”. The site could not have been better chosen: an island in the middle of the St Lawrence River, a part of Montreal but decidedly apart from it, perhaps always apart from it even during the heady days of Expo 67.

¹⁴² Brian Moore, *The Revolution Script* (New York: Holt, Reinhart and Winston, 1971), 248.

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Illustrations



Fig. 0.1 The heroic architecture of Expo 67



Fig. 0.2 Crowds at Expo 67



Fig. 0.3 Montreal transformed: new skyscrapers rise in 1960 (*top*); the headquarters of Hydro-Québec, the state-run hydroelectricity monopoly created as part of the Quiet Revolution, 1960 (*middle left*); I.M. Pei's Place Ville Marie of 1961 (*middle right*); Mayor Jean Drapeau announces the Radio Canada tower as part of his long-cherished plans of urban renewal, June 1966 (*bottom left*); the Turcotte Interchange, part of the massive programme of *autoroutes* crisscrossing the city by 1967 (*bottom right*)



Fig. 0.4 John Andrews, Scarborough College, Toronto, 1965: an early and celebrated instance of megastructures



Fig. 0.5 The Expo 67 islands under construction (*top*) and finally atomised by pavilions in 1967 (*bottom*)

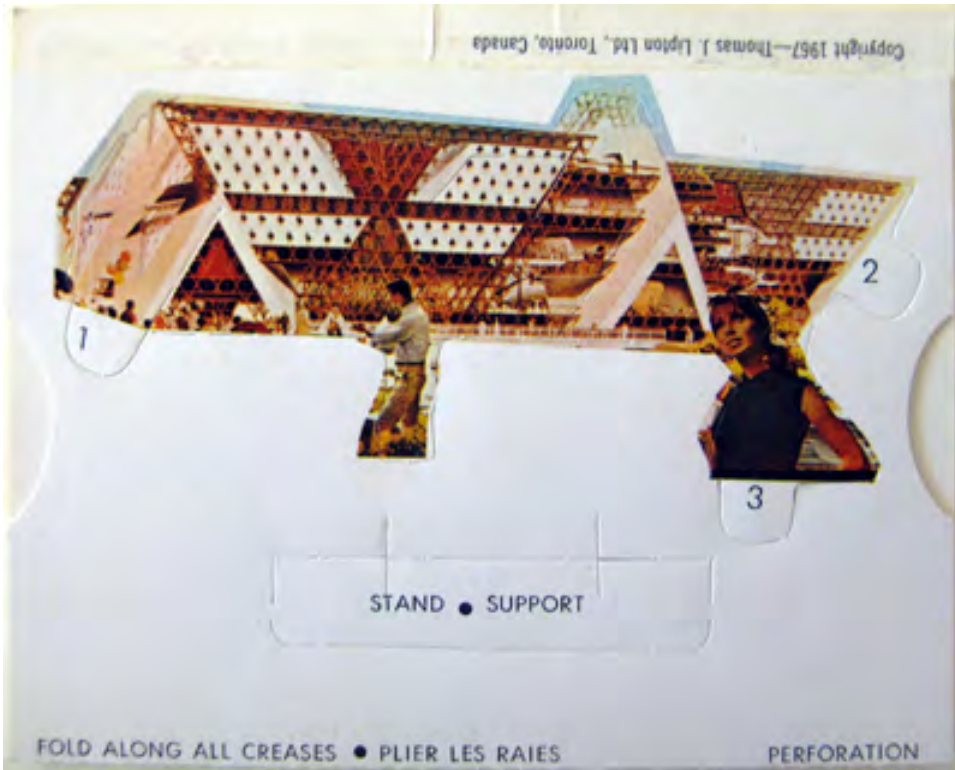


Fig 0.6 Man the Producer, an official Expo 67 theme pavilion

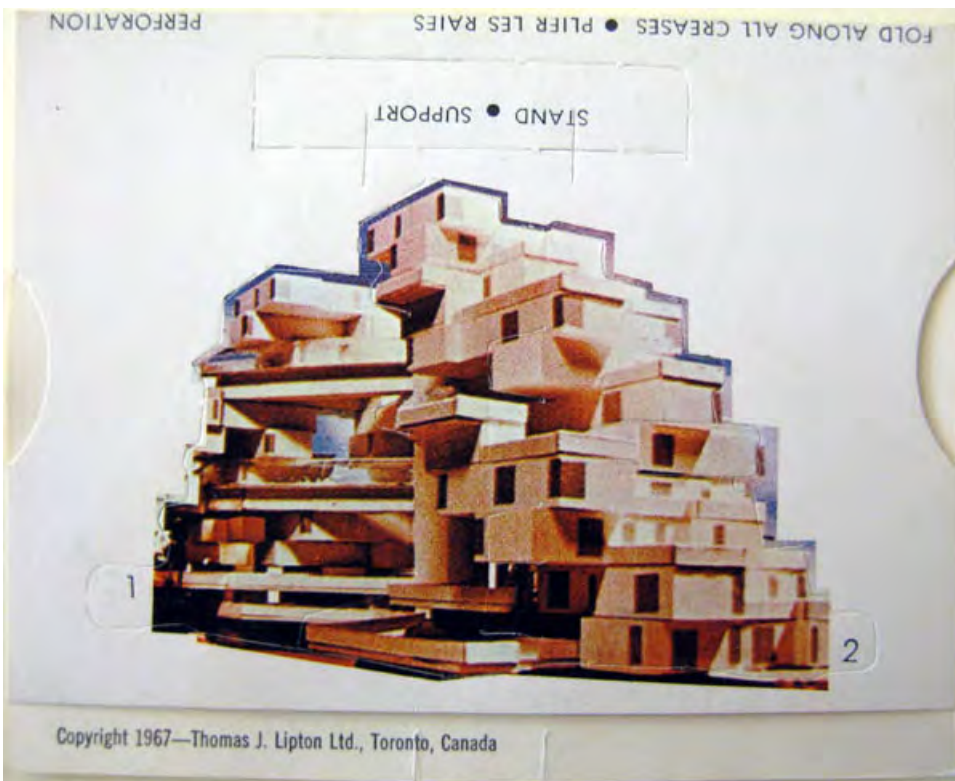


Fig. 0.7 Moshe Safdie, Habitat 67: the celebrated housing complex at Expo 67



Fig. 1.1 Van Ginkel Associates, “Man in the City” presentation model for the Canadian World Exhibition, 1962 [Courtesy Canadian Centre for Architecture, Montreal]

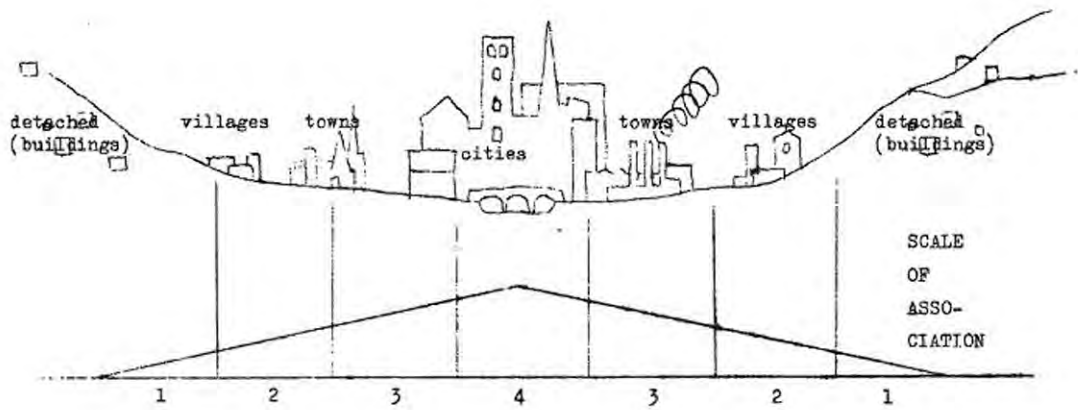


Fig. 1.2 Jaap Bakema, Aldo van Eyck, Daniel van Ginkel, Hans Hovens-Greve, Peter Smithson, and John Voelcker, “Scales of Association” added to the “Doorn Manifesto”, CIAM Meeting, January 29-31, 1954



Fig. 1.3 The “death” of CIAM, Otterlo, 1959. *Clockwise from upper left:* Peter Smithson, Alison Smithson, John Voelker, Jaap Bakema, Daniel van Ginkel, Blanche Lemco van Ginkel, Aldo van Eyck

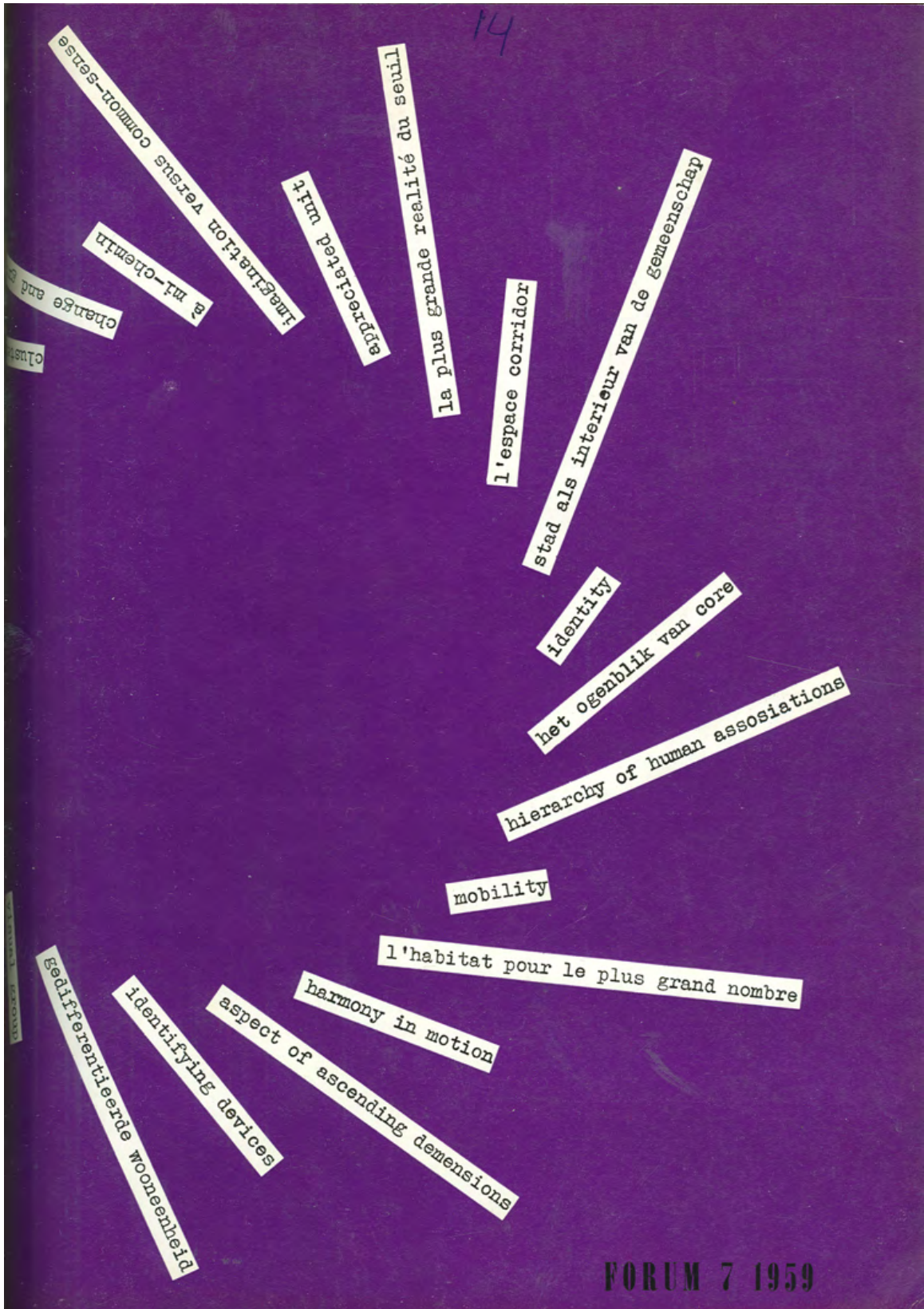


Fig. 1.4 *Forum 7* (1959): "The story of another idea", edited by Aldo van Eyck

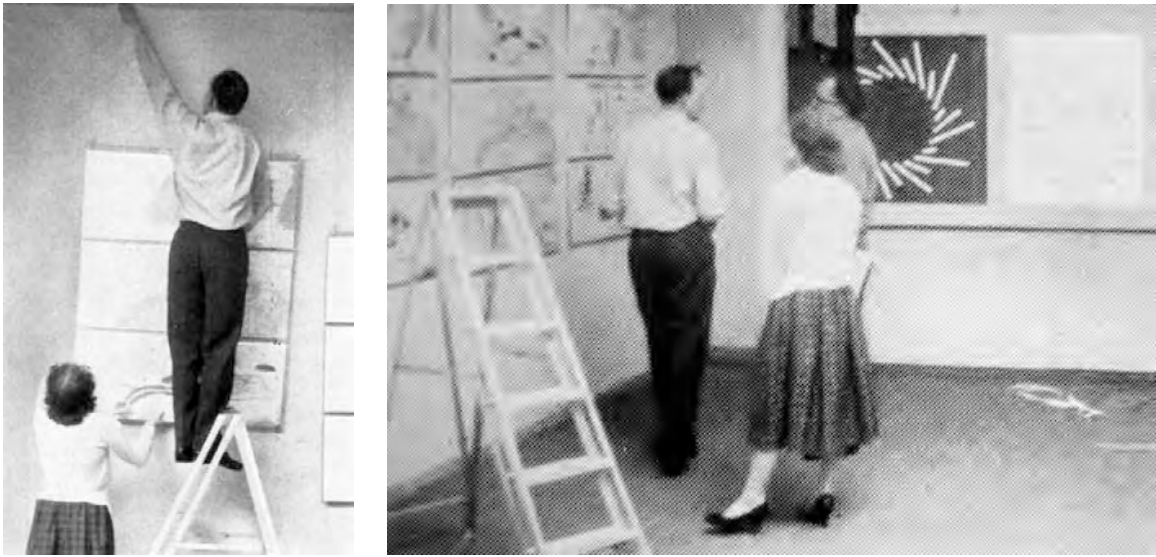


Fig. 1.5 The van Ginkels at CIAM Otterlo, 1959 (*above*); Blanche Lemco van Ginkel, Daniel van Ginkel, Aldo van Eyck, and John Voelcker at CIAM Otterlo, 1959 (*below*)

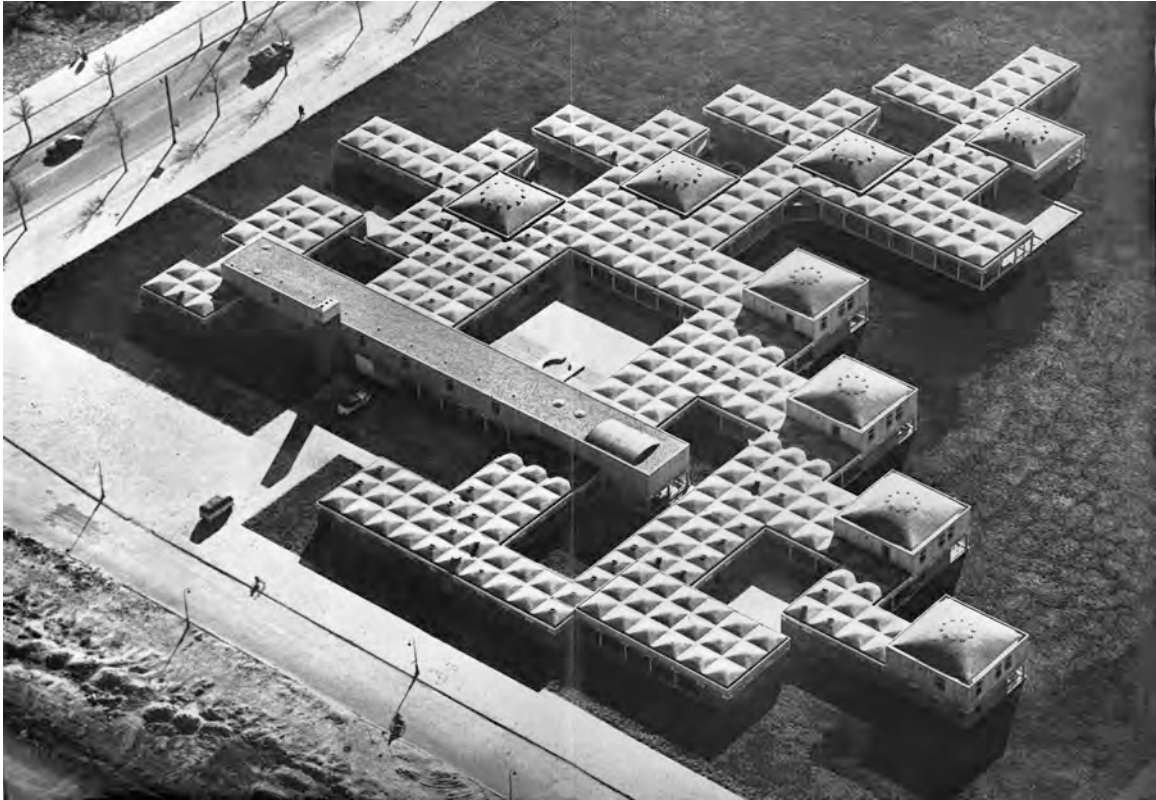


Fig. 1.6 Aldo van Eyck, Amsterdam Orphanage, 1959, as published in *Forum* 6/7 (April-May 1961)

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Fig. 1.7 “The Elevated Sidewalk: How it Will Solve City Transportation Problems”,
Scientific American (July 26, 1913)

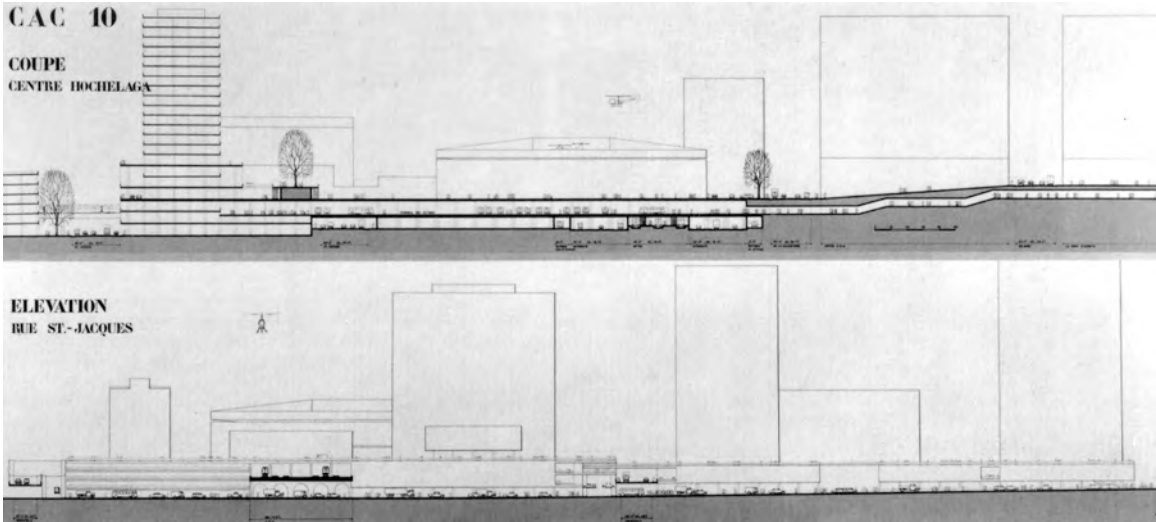
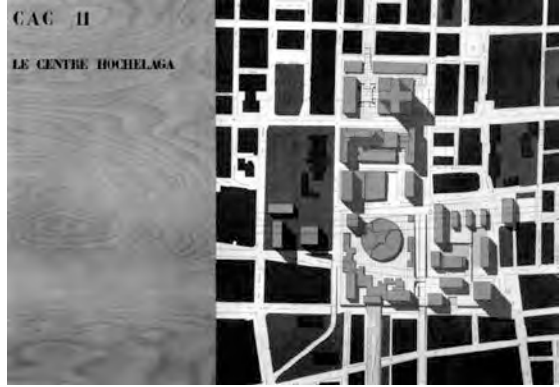
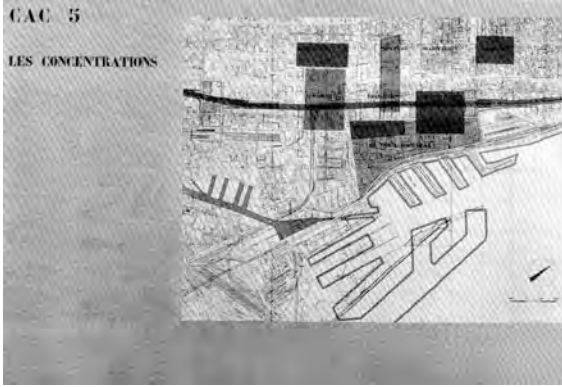
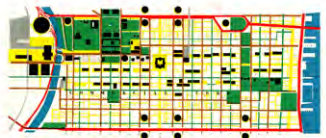


Fig. 1.8 Van Ginkel Associates, Central Area Circulation study, 1962

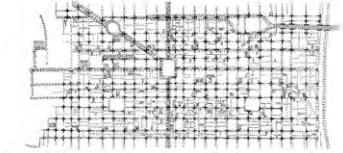


BUILDING PLAN FOR MIDTOWN PHILADELPHIA

■ Existing Buildings
■ Proposed Buildings
■ High Density Building
■ Medium Density Building
■ Low Density Building
■ Transit Station
■ Transit Line
■ Transit Stop
■ Transit Stop
■ Transit Stop
■ Transit Stop

The further government is present in parking areas both at the same time as the expansion on limited front end of the support parking to be required by the Parking Authority on New Street. Each tower would house about 1000 cars. The garage buildings in the dark areas between Market and Chestnut, Center and Walnut, are present as both to get away from the city and to provide a parking area for the Pennsylvania State University.

The Pennsylvania State University is an essential part of the program of expanding the city. The Pennsylvania State University is an essential part of the program of expanding the city. The Pennsylvania State University is an essential part of the program of expanding the city.



EXISTING MOVEMENT PATTERN

This type of drawing made fifty years ago would show that in all the movement areas, in essence, the result of movement is to be found in the through lines as part of the movement. The movement is to be found in the through lines as part of the movement. The movement is to be found in the through lines as part of the movement.



PENN CENTER

The Penn Center is an essentially large parcel of land in the middle of the city. The Pennsylvania State University is an essential part of the program of expanding the city. The Pennsylvania State University is an essential part of the program of expanding the city.



Order of movement and renewal of the city

If one moves to a building, the movement is to be found in the through lines as part of the movement. The movement is to be found in the through lines as part of the movement. The movement is to be found in the through lines as part of the movement.

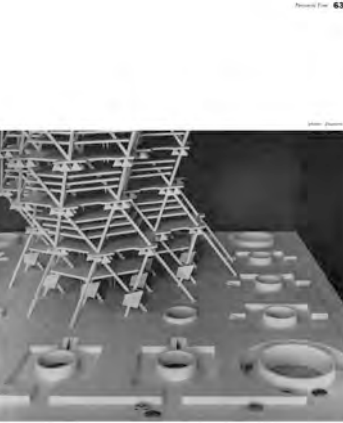


Fig. 1.9 Louis Kahn, "Toward a Plan for Midtown Philadelphia", *Perspecta 2* (1953) and "Order in Architecture", *Perspecta 4* (1957)

show the city as seen from a long distance, as a silhouette. The existence of this scale becomes clear within the city if man moves from one part to another over a long distance. Even on foot, the observations will not be those of individual buildings, but of ever changing aspects, slowly merging into one single image of the city as a totality. More obvious is the case if one drives by car from one end of the city to the other. Only in passing does one observe neighbourhoods, shopping areas or other concentrations. Whenever one, or both, of these scales are missing as a distinct expression, a city will become chaotic. Whenever they are present, an integrated pattern of hierarchy emerges. Europe has many examples such as Dubrovnik, Venice, Florence or Amsterdam - cities within which there is a human scale, and whose total form is a single entity.

But the development of locomotion has dis-



Photo: Michel Saffro



The city as a visual entity. Photo: John Reed

Juried the old laws of hierarchy that governed the creation of cities. The automobile, created by man, has taken its own place. It wants to travel fast and over long distances. It wants to experience the city as a totality only. Once the automobile arrives within the city it loses its purpose and meaning. However beautiful it may be in construction or in form - it enters into a world which is alien to its form.

Thus, the present requirements of the city have changed. The city must allow for two elements simultaneously, which are, the pedestrian, see when moving through the city. And when the automobile has arrived at the city the driver wants to be a pedestrian - in other words, he does not want to spend his time parking his car. But he also wants to be close to his place of business - be it work, shopping or entertaining. These two requirements can only be met radically, dramatically and with imagination. The basis of solutions is clear. The reestablishment of the visual scale of the pedestrian as well as the scale of movement. As in all art - form is generated by requirements.

It is therefore useless for the city planner and the architect - the city builder - to link with our present cities if he wants to create the form of the city. This applies not only to the future, but in fact, to the city of today or even yesterday.

This form can only consist of two distinct elements - the core and the peripheral sector. The core is the place in which all the activities of society at large take place - the economic, social and cultural interchange - of all the people.

The peripheral sector is the place where man lives, and where he works if he does not work in the core. The relation between the units is based on the scale of the automobile.

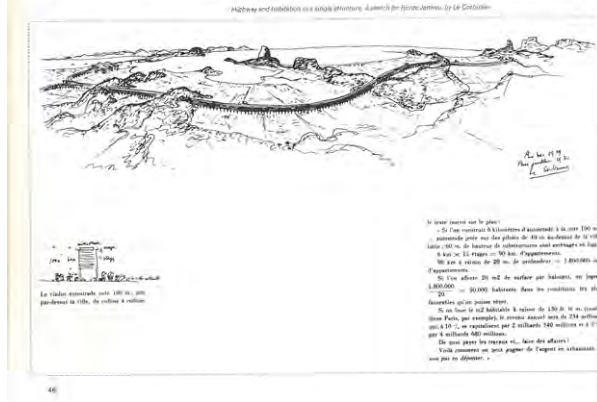
The automobile thus creates two requirements: the large scale roads linking the units and the terminal points at either end. The automobile has had an influence on our environment - its very presence, the traffic congestion, the parking lots, service stations, dumps etc. All of these are, however, superficial, most of them have occurred out of neglect or inexperience. The real impact of the automobile is in a new scale and a new way of living.

There is a very great difference between the impact of the automobile on the landscape versus that on the city. To the landscape it has added a new scale - a new dimension and a new form. The long double ribbon of concrete with its overpasses, underpasses and interchanges, if well designed, here most positively added a thus far unknown dimension to the landscape. This superhighway and its structures are the normal consequence of the new speed of motion. The engineer has designed for these speeds and integrated the

road with the landscape in a new and unique manner. He has created a new form without ever looking for one.

No such positive impact has as yet occurred in the city. In fact the only point in which a definite change has taken place is in the texture of the street and road: cobblestones were replaced by asphalt and concrete - creating a change of scale in the street itself. But the car has in no way changed our cities. The suburban areas started long before the car was common commodity and were based on mass transportation in America as well as in Europe. Our central areas are basically unchanged. The expressway invariably ends towards the centre of the city, without a real termination, as in Toronto or Chicago or like demolishes it as in Boston.

It is only in the mind of visionary people that a change of the city itself has become inevitable. And even among these there are but precious few who have produced an answer whether valid or not. Three of these come to mind. Le Corbusier, Louis Kahn and Kenzo Tange. Le Corbusier, in 1930, made sketches for the development of a modern city in which the superhighway is a huge structure four miles long, on top of a continuous row of apartments 15 storeys high, housing ninety thousand people. Throughout his long career Le Corbusier has been preoccupied with problems of locomotion and its impact on the city



Highways and buildings on a single structure. Sketch by Le Corbusier.

Si l'on veut voir le plan:
 - Si l'on construit à l'échelle d'aujourd'hui, à 100 m, on ne peut aller que sur des plots de 40 m de largeur et de 100 m de hauteur de construction et on arrive au fait: à 100 m de largeur - 100 m d'apartements - 100 m de hauteur de 20 m de hauteur - 1000000 m² d'apartements.
 Si l'on utilise 20 m² de surface par habitant, on peut en faire 500000. 100000 habitans. Avec les conditions les plus favorables on peut en faire 1000000.
 Si on veut le tout habitable à l'échelle de 150 m, on peut faire 1000000 habitans, à moins d'avoir une surface de 100 m² par habitant, ce qui est impossible.
 De tout cela on tire ce: pour des effectifs: 1000000 habitans on peut faire 1000000 m² de surface par habitant.

and in this sense Mondrian's *Broadway Boogie Woogie* identifies Manhattan with New York as well as with the whole of America and its dynamic rhythm.

The city, therefore, becomes the core, surrounded by the metropolitan region. The corridors connect every man with the core and even at great distance, he feels himself a "citizen."

It may be difficult to visualize that an element like the automobile, that has systematically wrecked our cities, ripped them apart and disintegrated them, can be the instrument that will help to create great cities in the future.

A recognition of the nature of movement at two different scales will enable us to do so. On the one hand it will allow us to move freely between the large sectors of which the city will be composed; and on the other, it will reduplicate the heart of the city to the small scale of the pedestrian.

A plan for the Roca Terepore, Caracas, by A. Sauter. A new relation between the car and the city in a small urban building street, around a hill. Photo: Cecil C. Harbridge. Courtesy: Architectural Design.

A plan for Tokyo, 1960, by Kenzo Tange and team. The large structures outside the spine contain all elements of the residential life. Photo: E. Torihata.

A plan for Tokyo, 1960, by Kenzo Tange and team. The large structures outside the spine contain all elements of the residential life. Photo: E. Torihata.

Fig. 1.10 Daniel van Ginkel, "The City", *Canadian Art* (January-February 1962), special issue on "Design with the Automobile" guest edited by Blanche Lemco van Ginkel

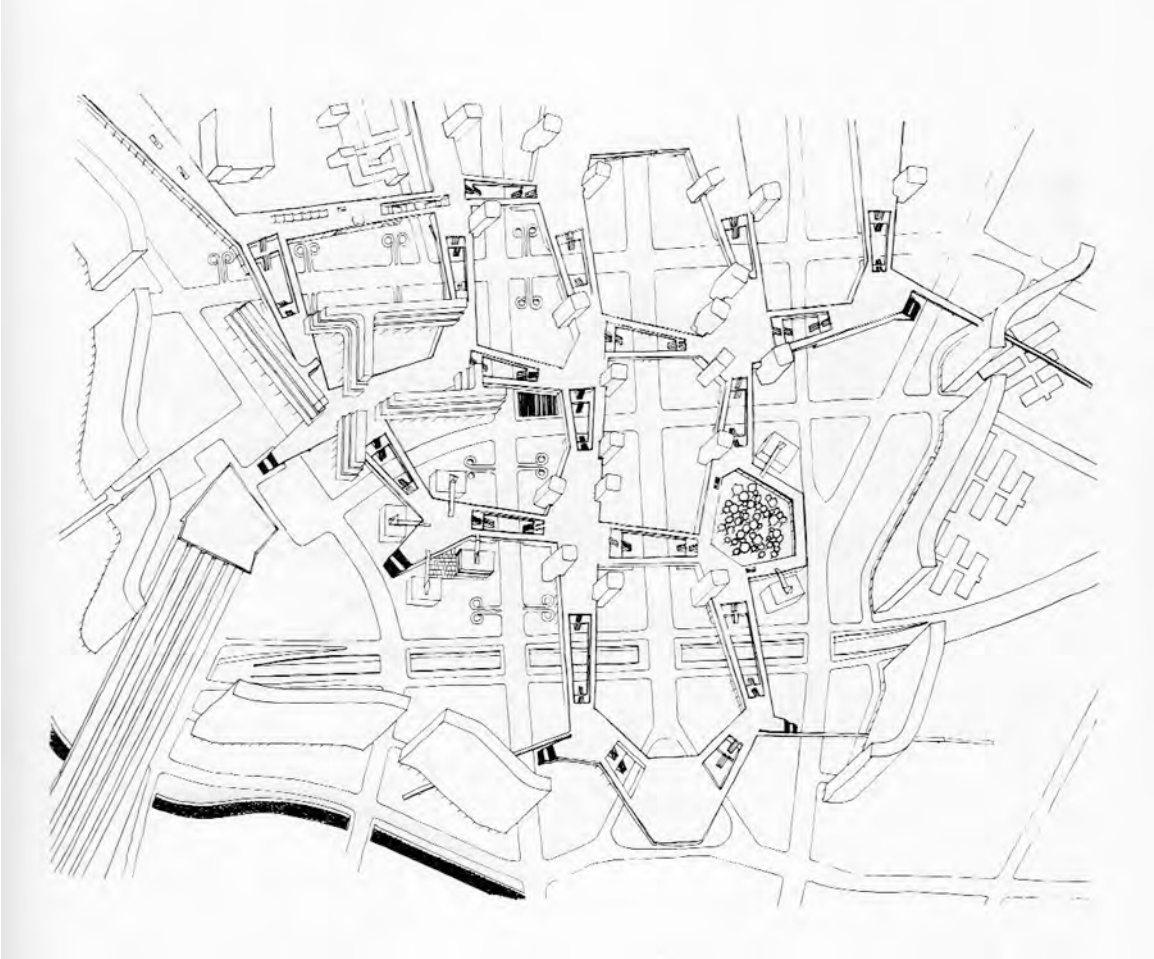
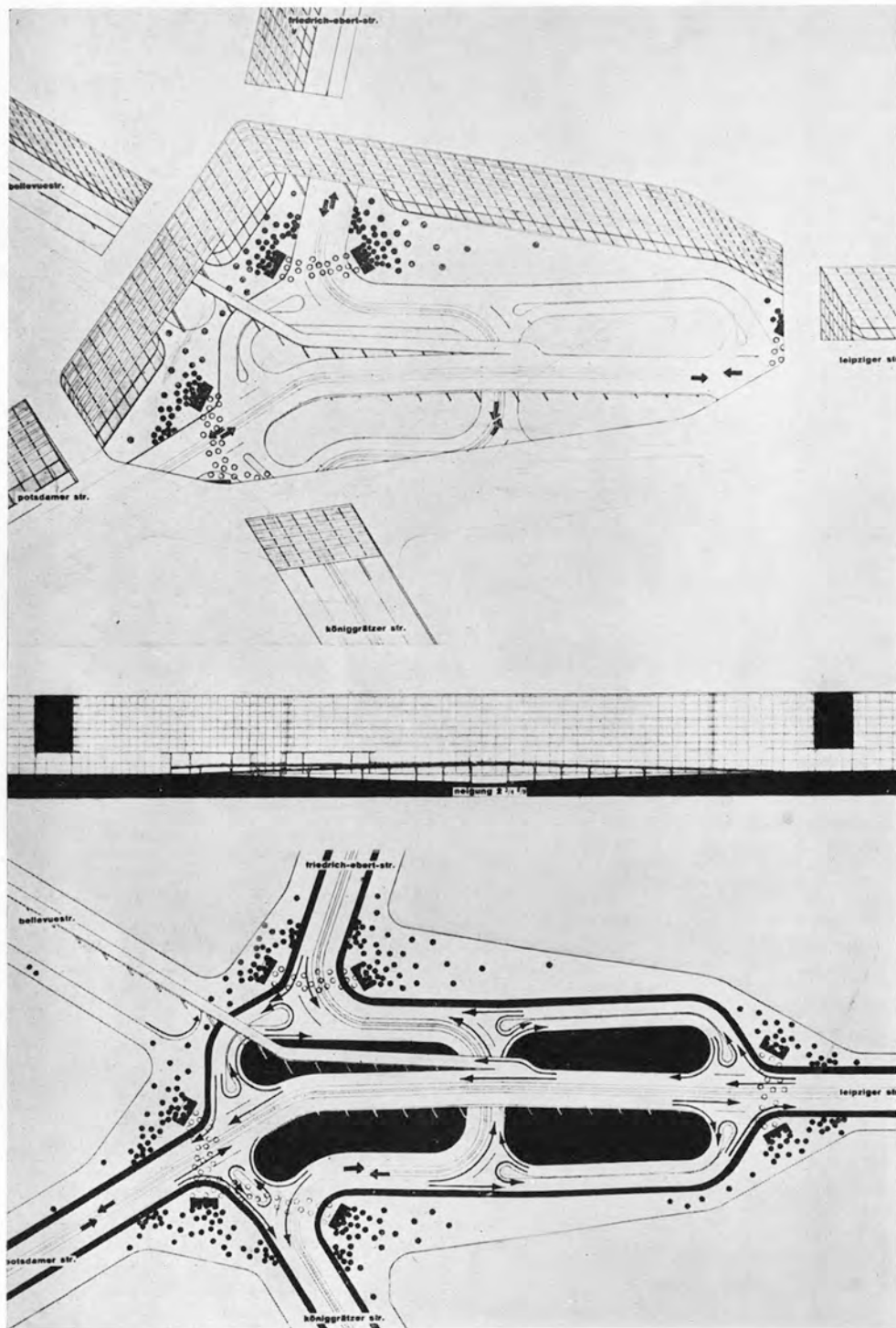


Fig. 1.11 Alison and Peter Smithson, Berlin-Hauptstadt completion project, 1958



64. Project: Potsdamer Platz, Berlin, 1928

Fig. 1.12 Marcel Breuer, Berlin Potsdamer Platz competition project, 1929: an image of Martin Wagner's World City Square ideal

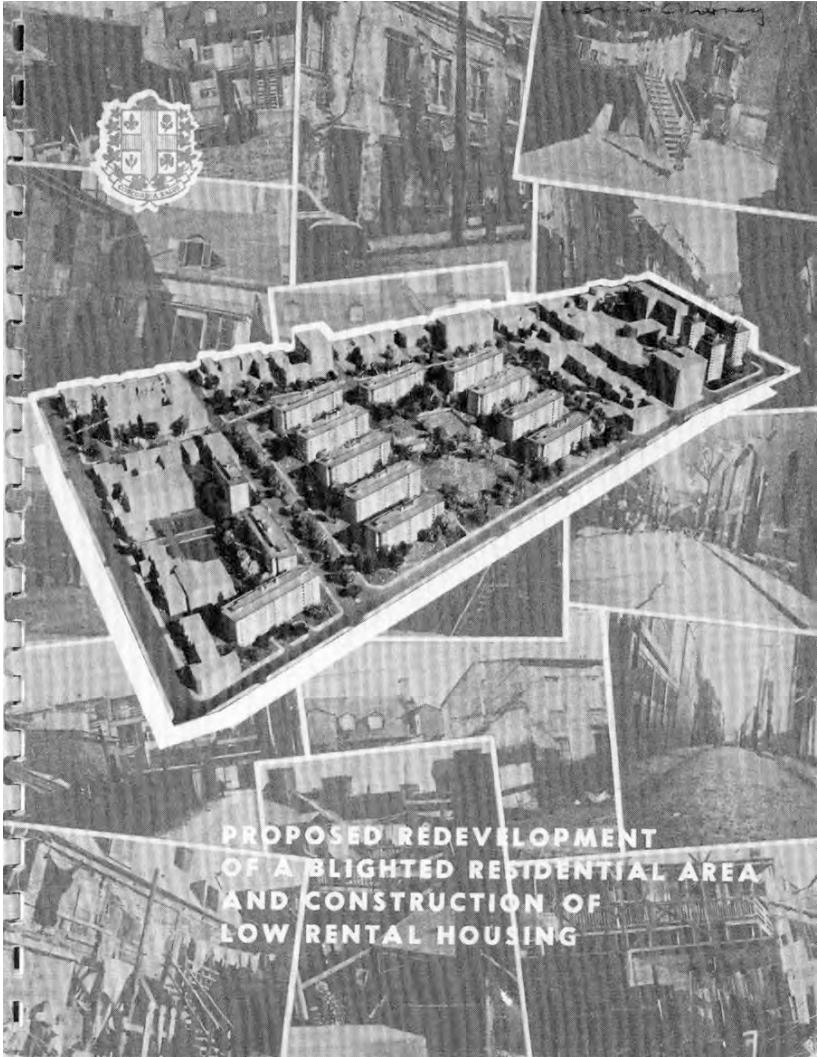


Fig. 1.13 Advisory Committee on Slum Clearance and Low-Rental Housing, City of Montreal, *Proposed Redevelopment of a Blighted Residential Area and Construction of Low Rental Housing* (1954)



Fig. 1.14 Jean Drapeau's early urban dreams: *Cité-Famille* (1957)



Fig. 2.1 *The Family of Man* exhibition, Museum of Modern Art, New York (photos: Ezra Stoller)

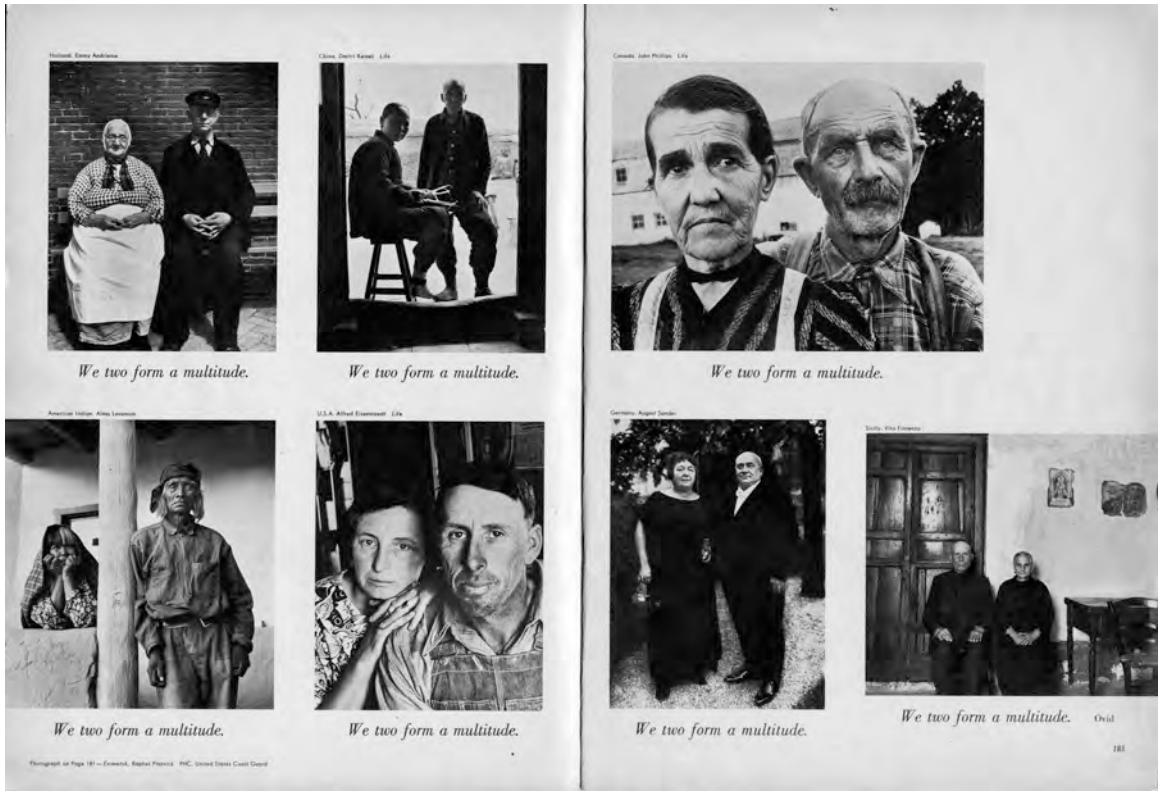


Fig. 2.2 *The Family of Man* exhibition catalogue (1955)

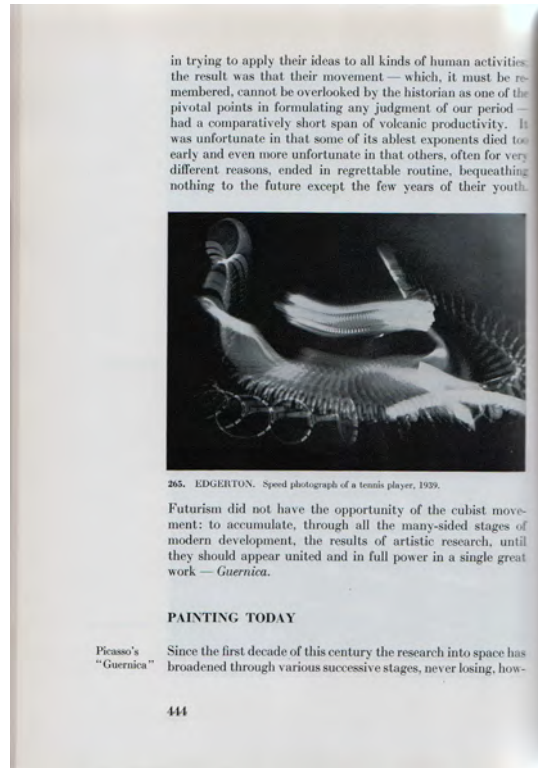
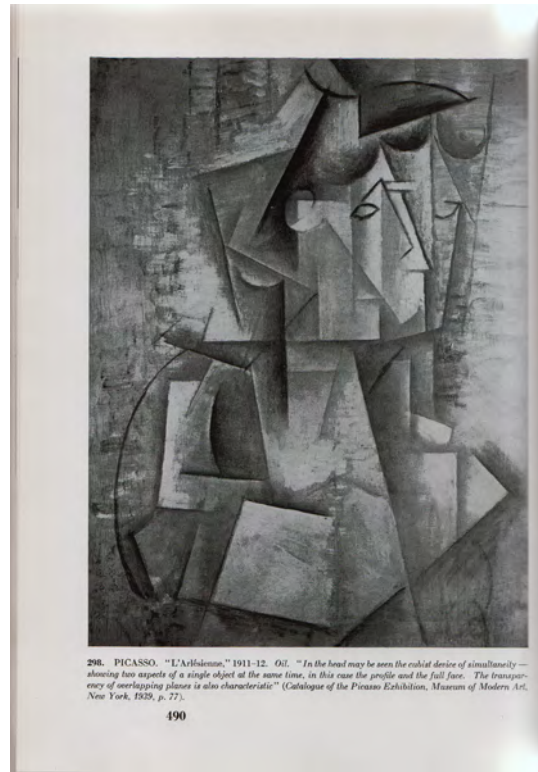


Fig. 2.3 Giedion's aesthetics of "interpenetration", *Space, Time and Architecture* (third edition, 1956)

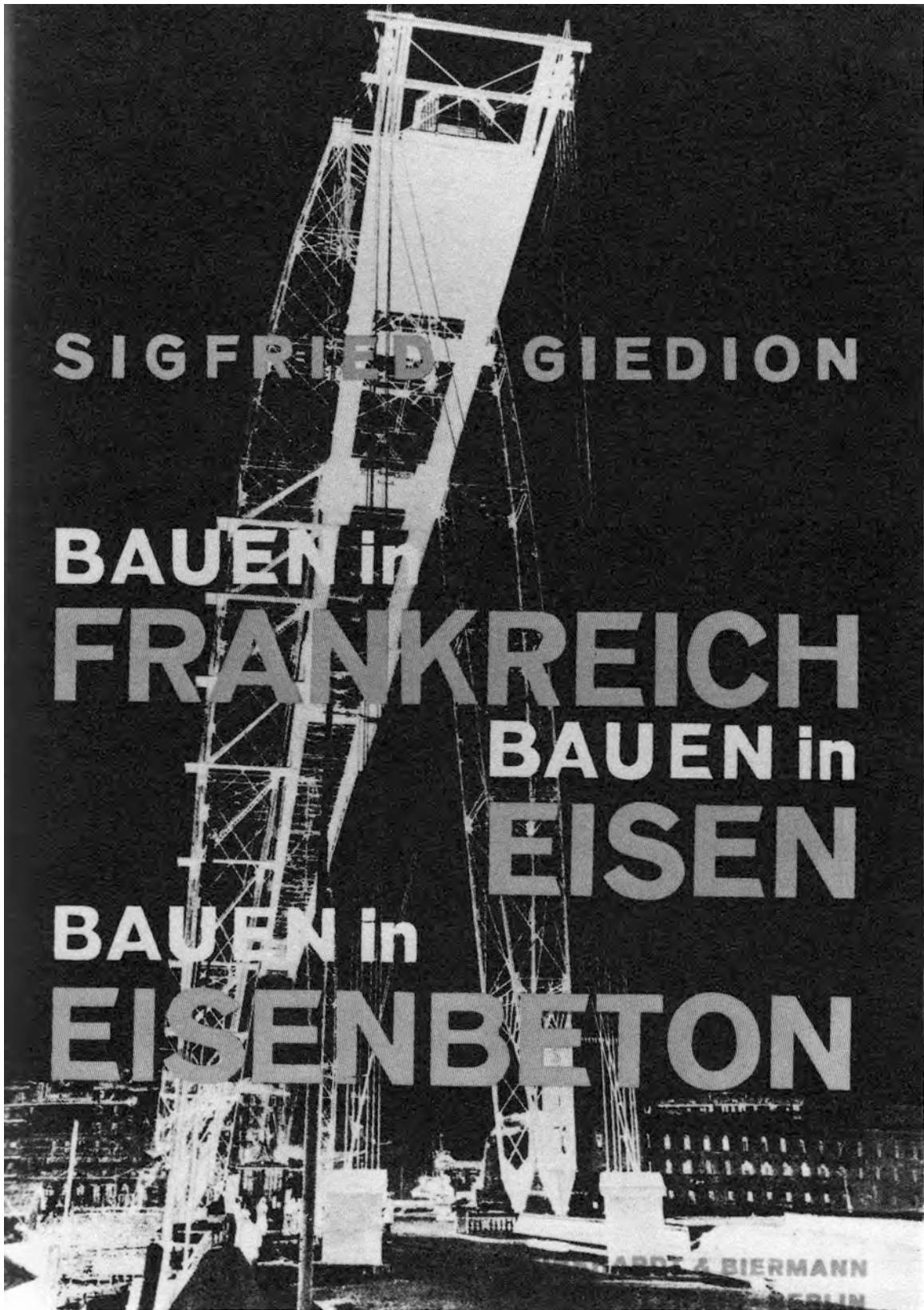


Fig. 2.4 Laszlo Moholy-Nagy's jacket design for Sigfried Giedion's *Building in France, Building Iron, Building in Ferroconcrete* (1928)

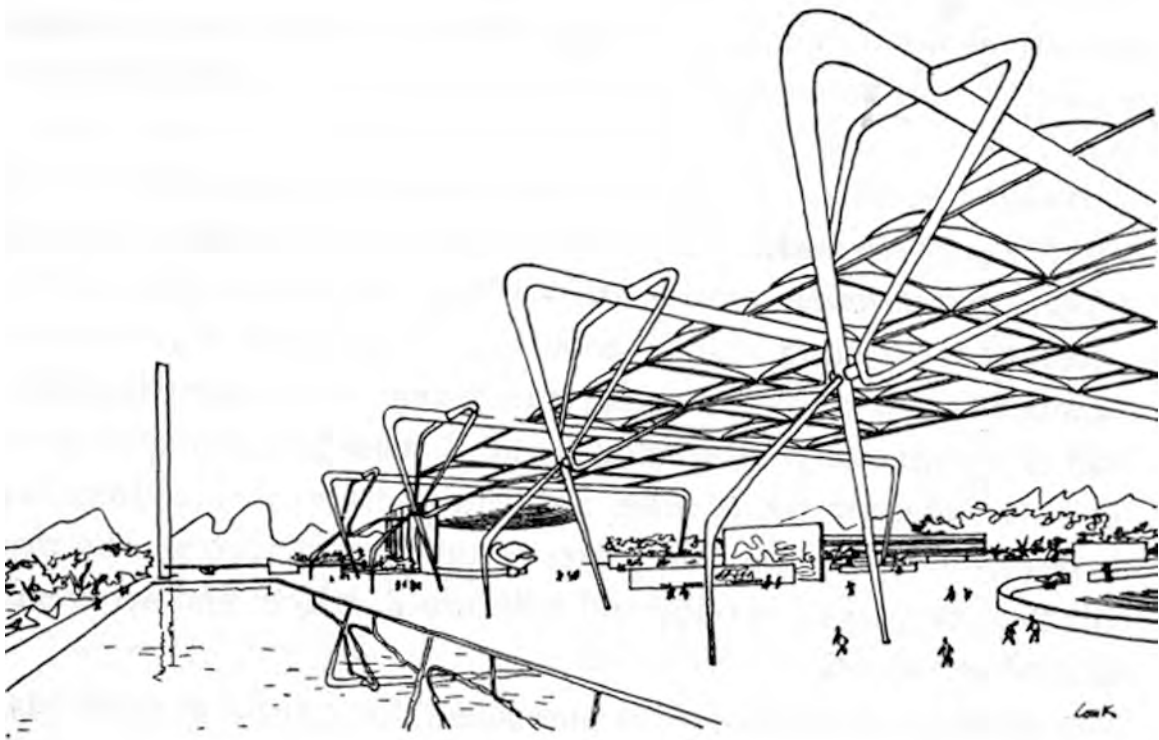


Fig. 2.5 Louis Kahn, "Monumentality", 1949



Fig. 2.6 Buckminster Fuller, geodesic dome for the United States Marine Corps, c. 1956

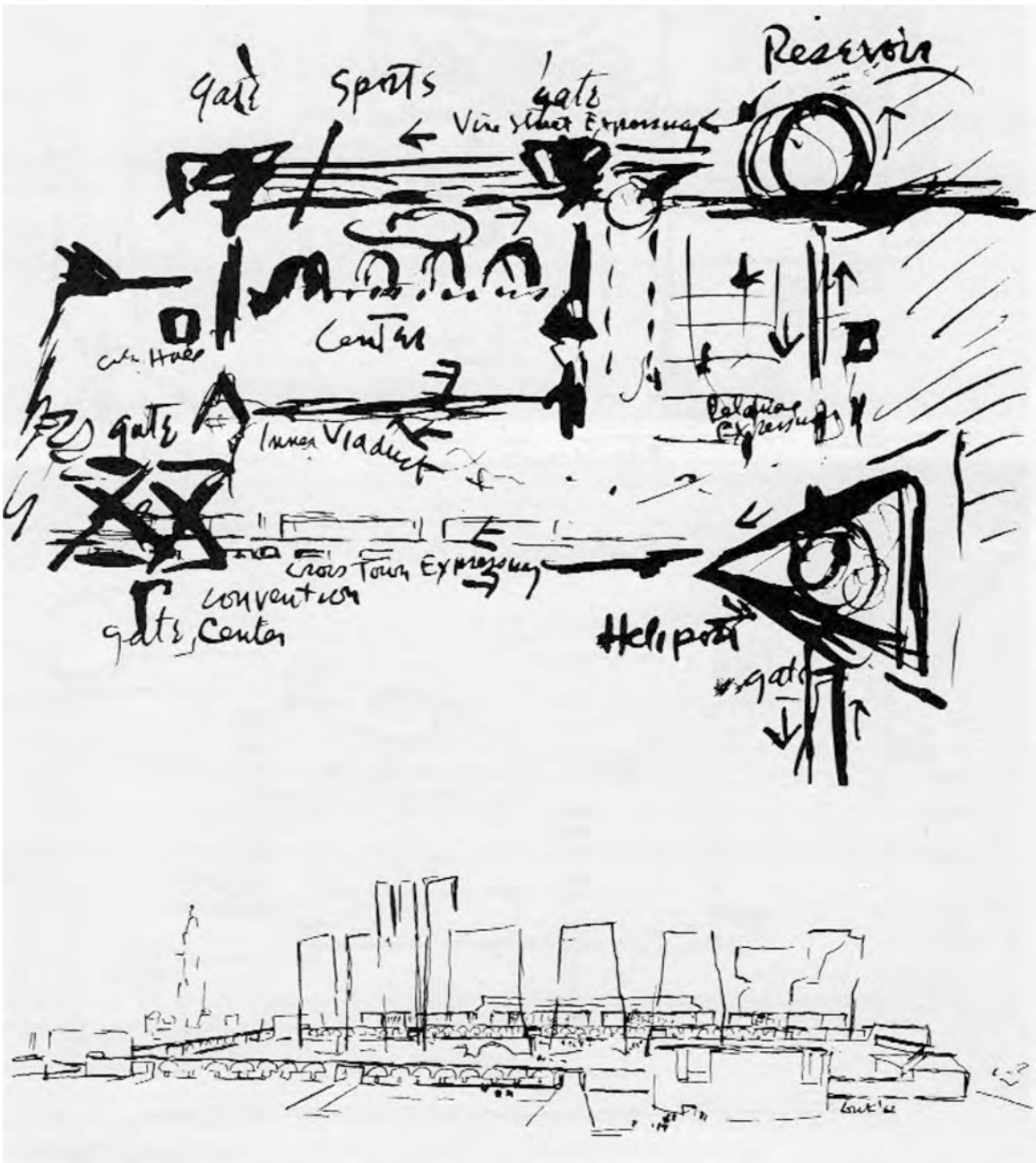


Fig. 2.7 Louis Kahn, Viaduct Architecture, 1962

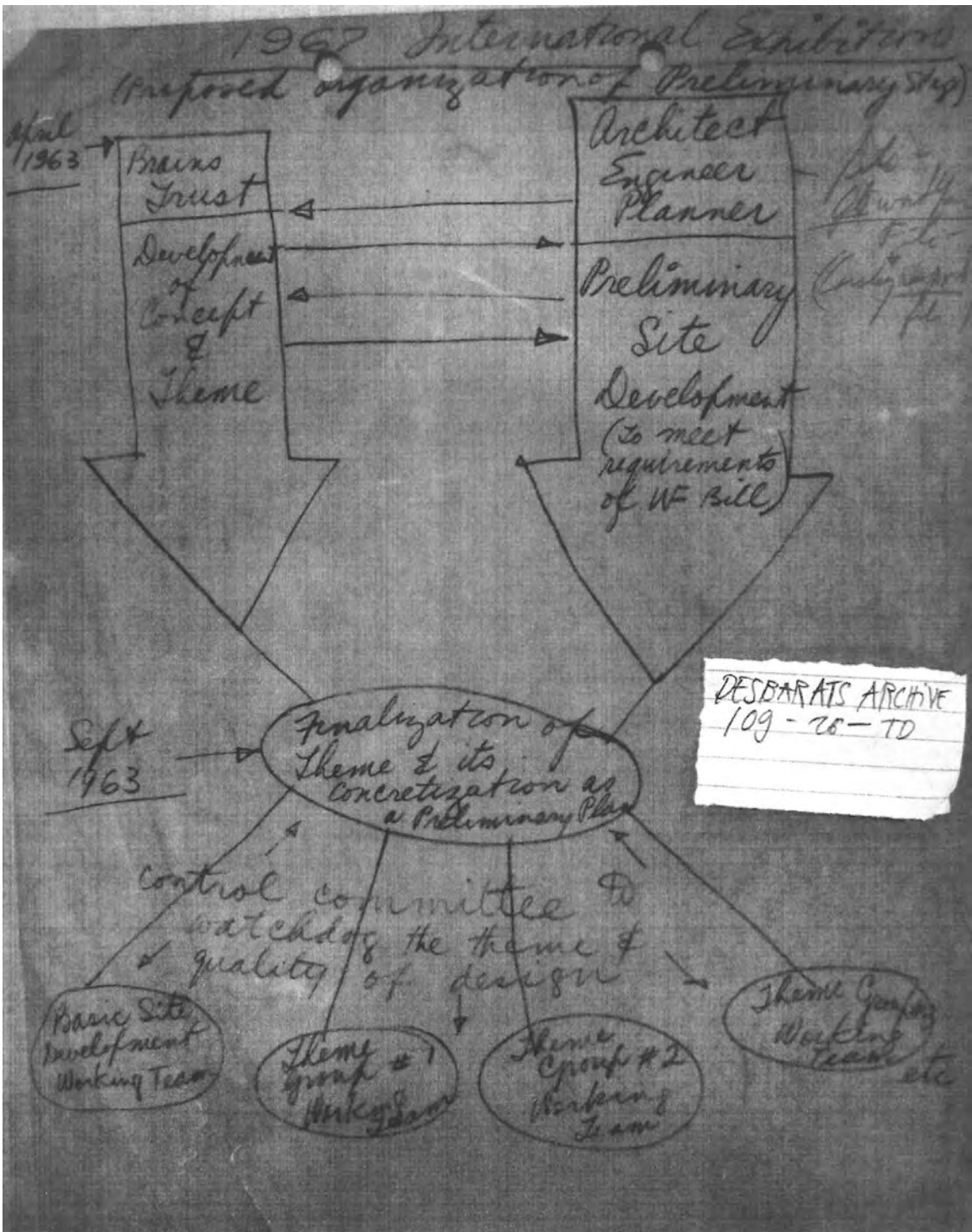


Fig. 3.1 The early intellectual division of labour: ideas versus design, April 1963

disturber itself offers the *continuity* of the phenomenon and its solution; every obstacle is dissolved and diluted, and, flexibly, the solution appears, simple and efficient. Miracle? Not even that! The disturber, mechanization, gives us elements of construction or reconstruction. The abscess is pierced, the way is clear straight ahead. It is the lesson of the meander, victory over oneself, a consoling lesson. Here is the “*law of the meander*”:

I draw a river (135). The goal is precise: to get from one point to another: river or idea. A slight incident takes place, the



135

premier obstacle/first obstacle // la loi du méandre/the law of the meander

incidents of the spirit: immediately, a small slight bend, hardly noticeable. The water is thrown to the left, it digs into the bank; from there, by reaction, it is thrown back to the right. Then the straight line disappears. To the left, to the right, always deeper, the water bites, hollows, cuts away; always wider, the idea seeks its way. The straight line has become sinuous; the idea has acquired incidents. The sinuousness becomes characteristic, the

Fig. 3.2 Le Corbusier, “The law of the meander”, *Precisions* (1930)

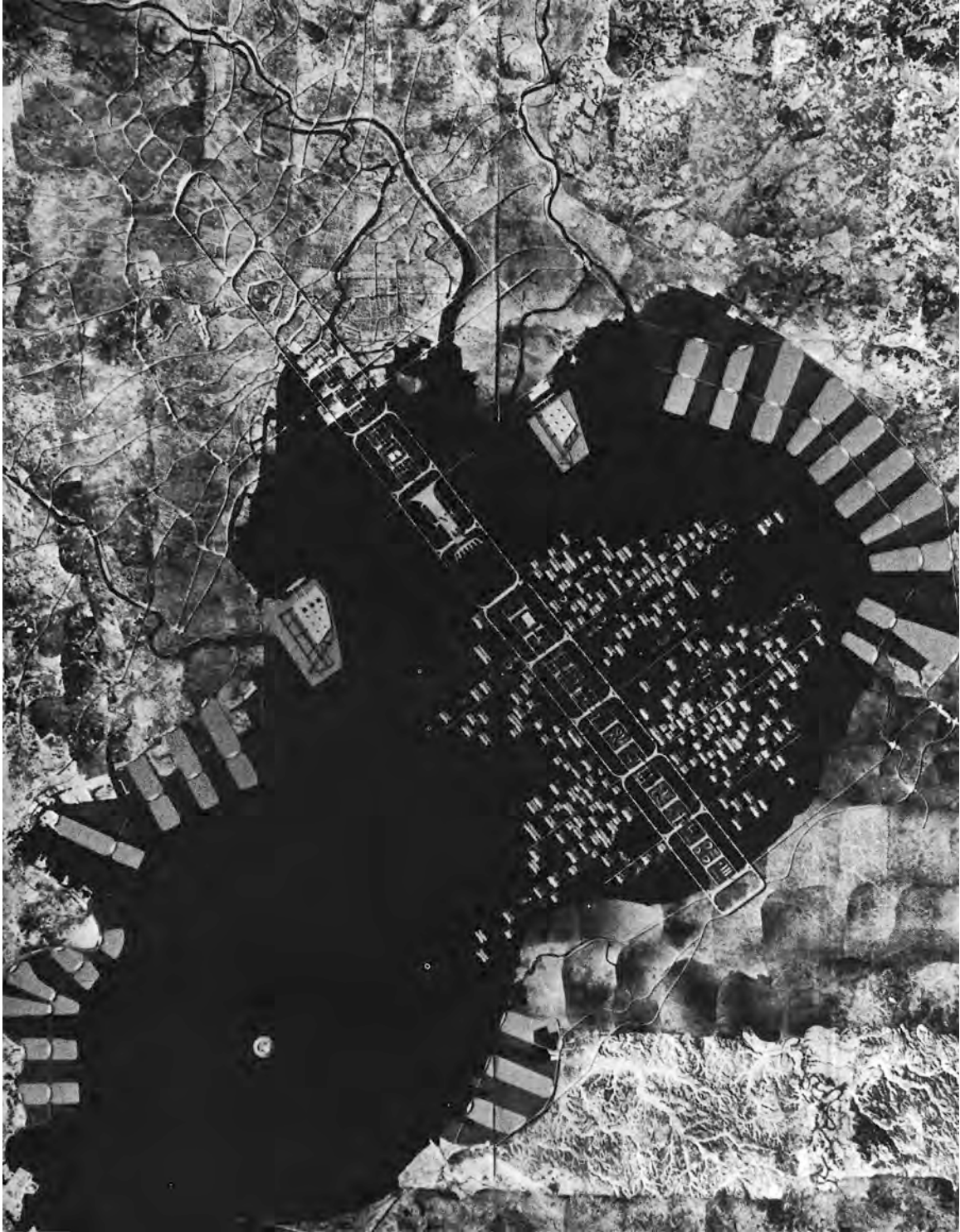


Fig. 3.3 Kenzo Tange, Tokyo Bay project, 1960



Fig. 3.4 Mayor Jean Drapeau presents his tower to the Montreal City Council



Fig. 3.5 The Expo islands emerge from the St Lawrence River, September 25, 1963

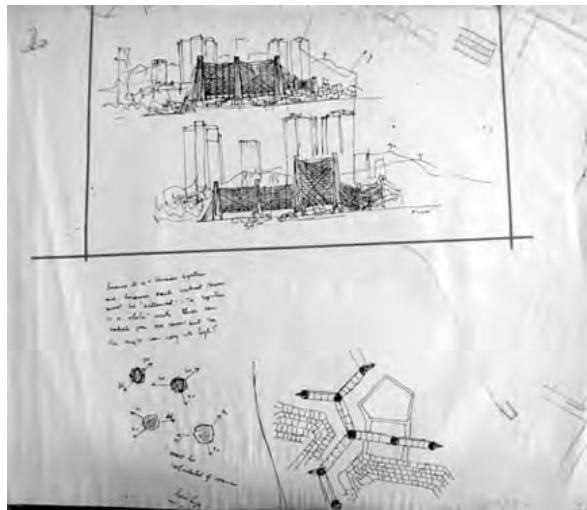
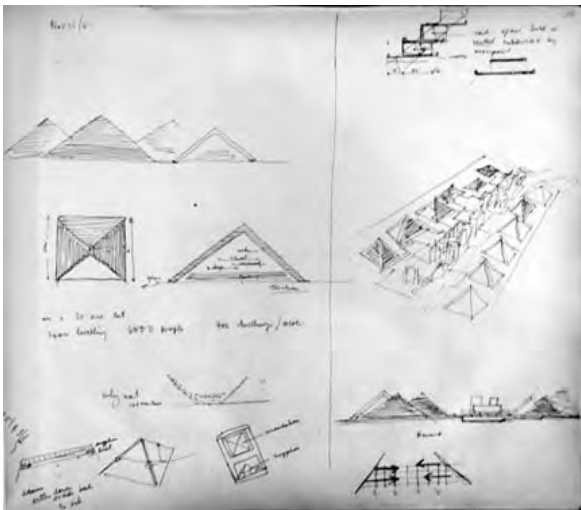


Fig. 3.6 Kenzo Tange, Tokyo Bay project, 1960 (*above*); Moshe Safdie, sketches for Meadowvale New Town prepared in the office of Van Ginkel Associates, 1962 (*below*)

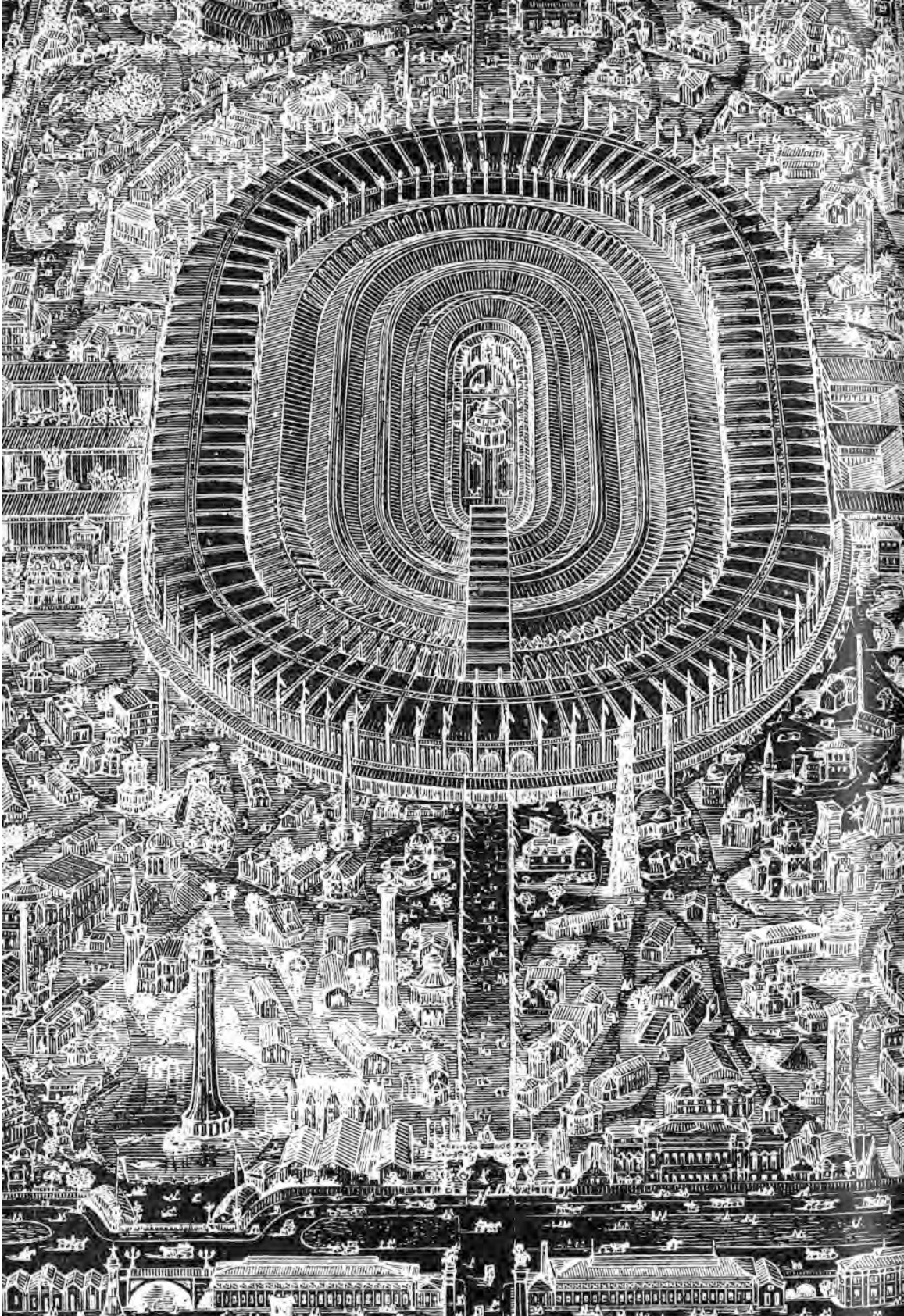


Fig. 3.7 Frédéric Le Play's "Colisée de Fer" at the 1867 Paris Exposition Universelle

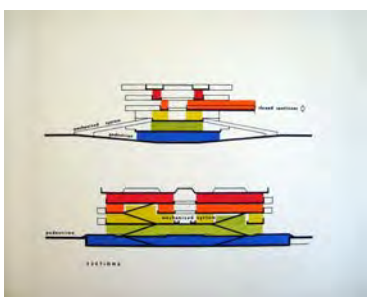
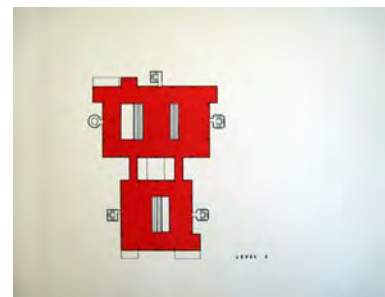
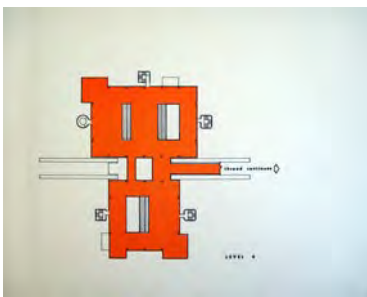
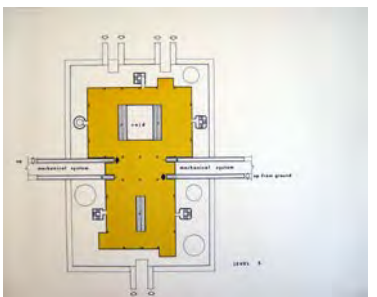
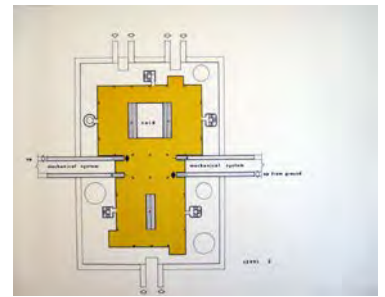
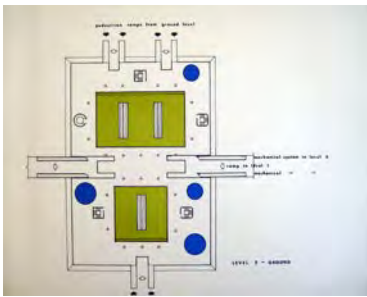
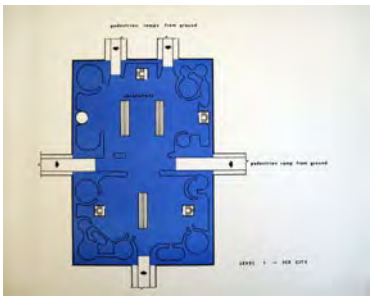
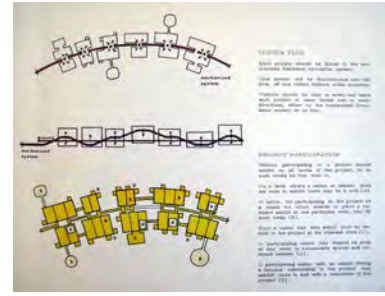
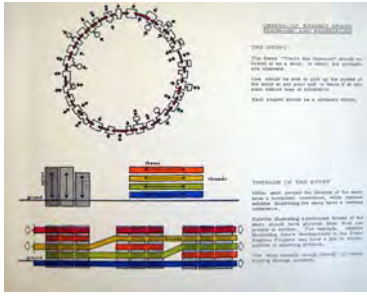
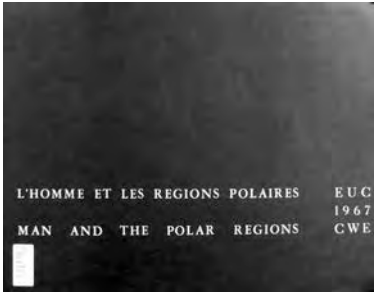


Fig. 3.8 Man in the Polar Regions (1963)



Fig. 3.9 Frobisher Bay New Town, designed by architects in the Department of Public Works, Government of Canada, 1959



Fig. 3.10 Shadrach Woods, Alison Smithson, and Adèle Naudé at the Team 10 Meeting in Royaumont, 1962

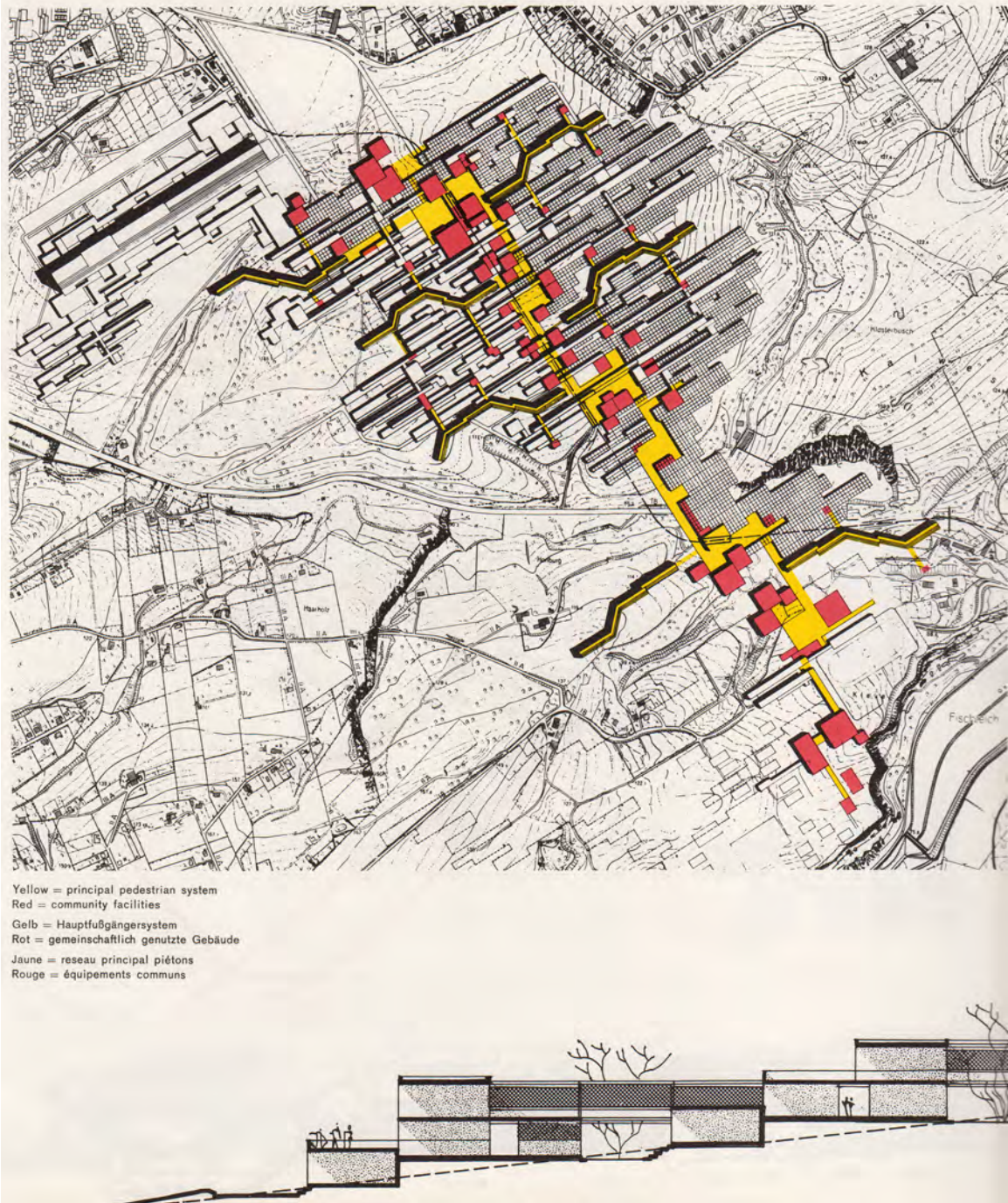


Fig. 3.11 Candilis-Josic-Woods, Bochum University completion, 1962: “Articulation of Public and Private Space in Large Scale Development, the Basis of ‘Organic’ Structuring Systems: from Cluster to Stem”

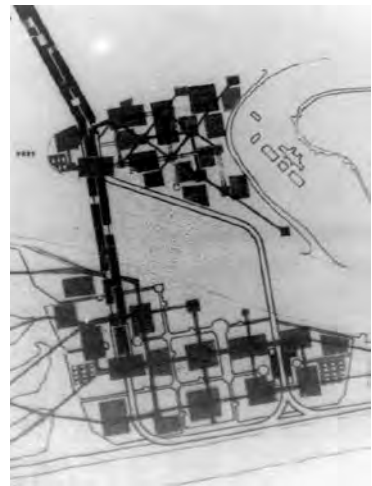
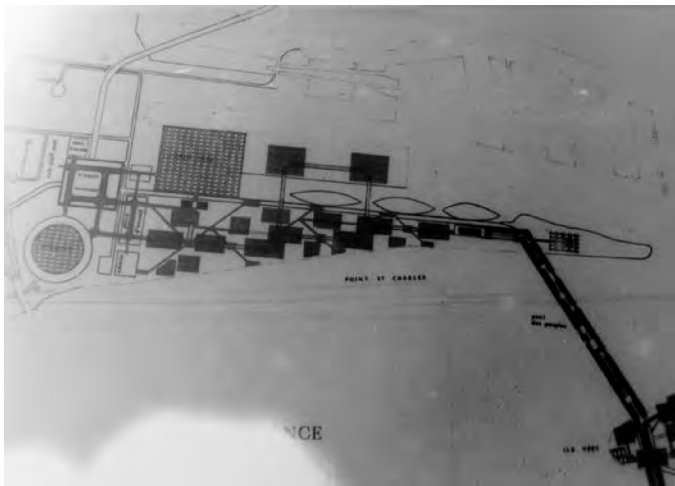
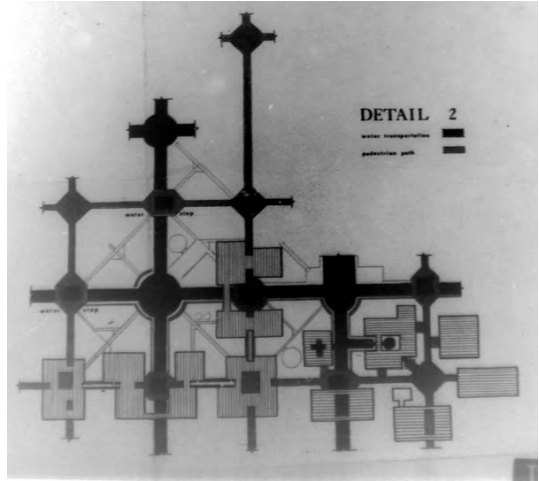
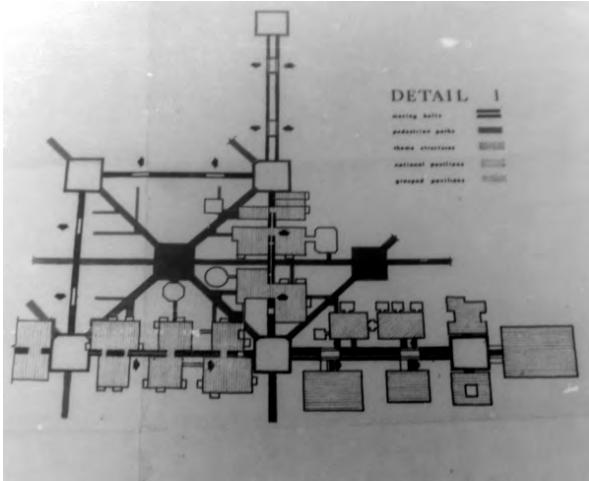


Fig. 3.12 Above: Naudé's "precincts" with "moving belts" and pedestrian paths connect "theme structures", "national pavilions", and "grouped pavilions", late-summer 1963; Below: "precincts" at the scale of the Expo 67 islands, summer 1963

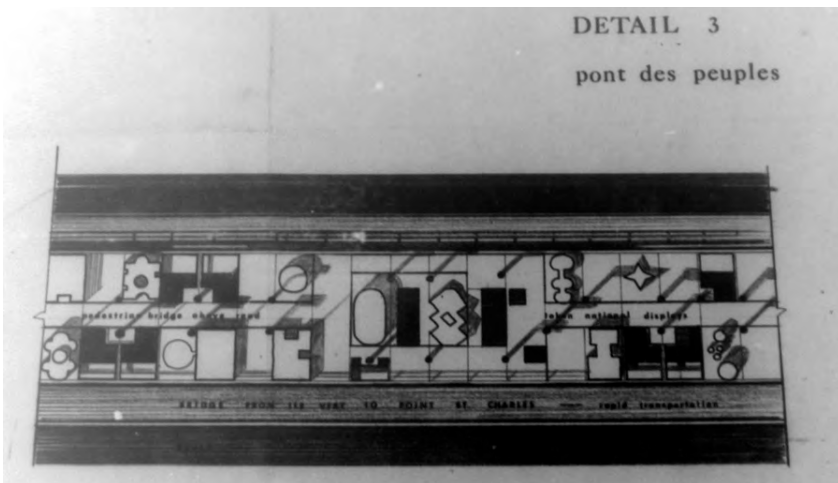


Fig. 3.13 "Pont des Peuples" imagined spanning between the Expo 67 islands and the only space for national pavilions, late-summer 1963

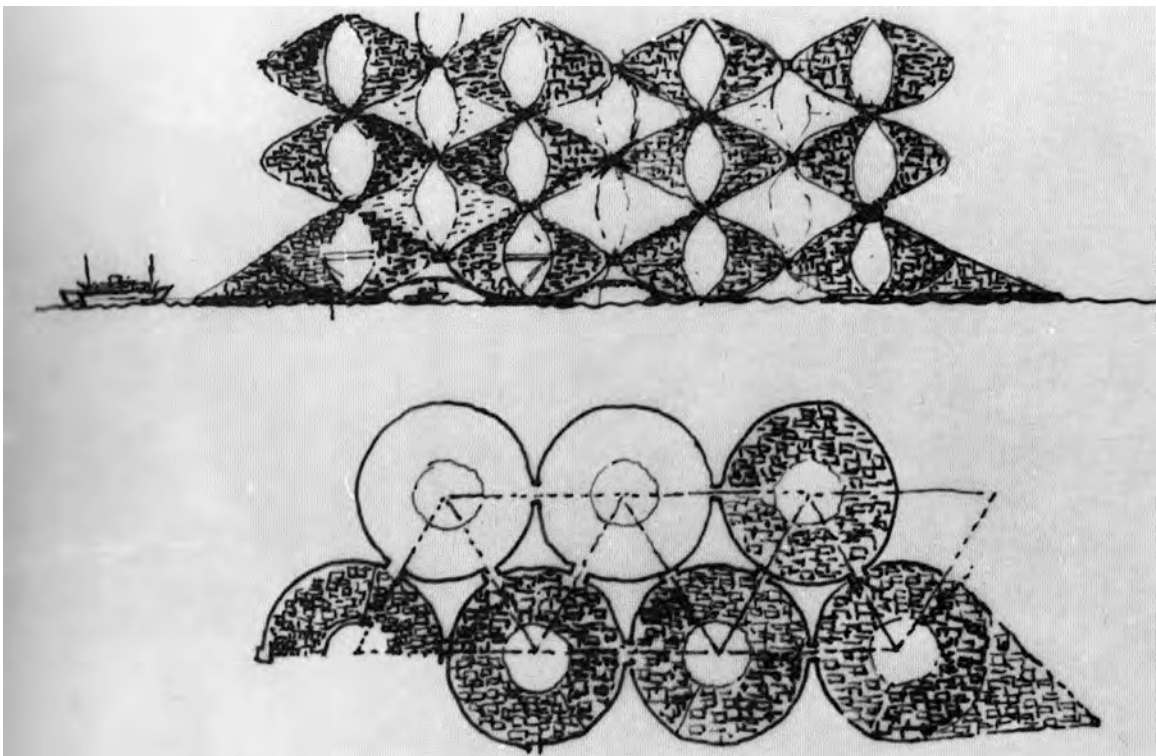
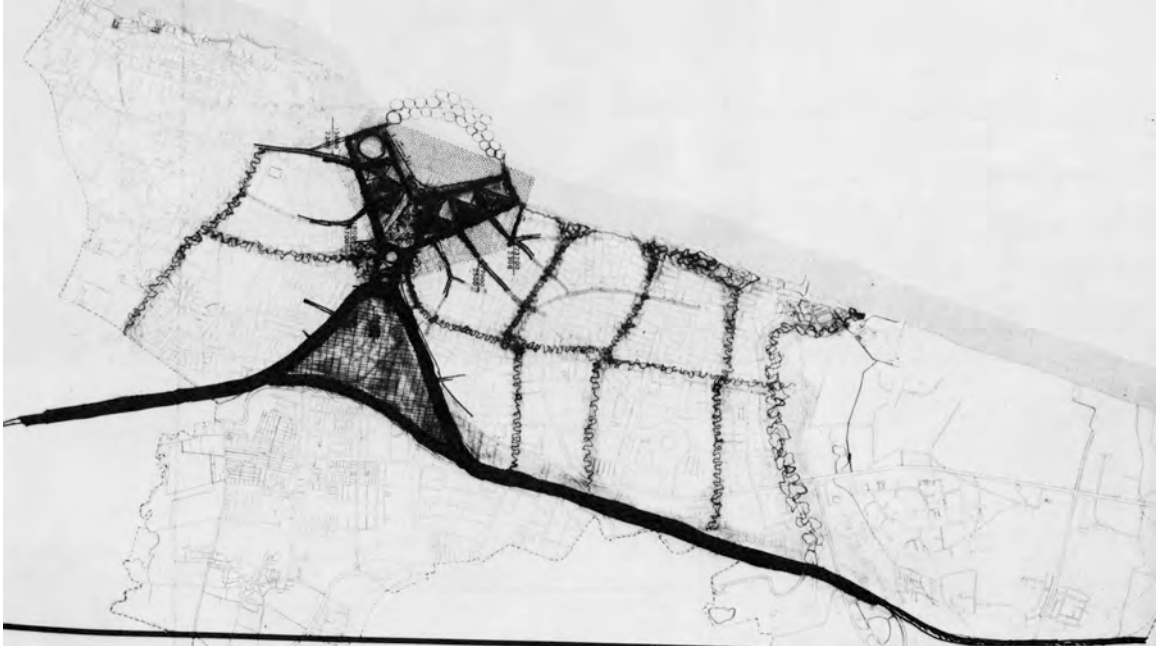


Fig. 3.14 Moshe Safdie, "The Concept of Gnomic Growth", competition entry for the Manchia Plan, Tel Aviv, 1963

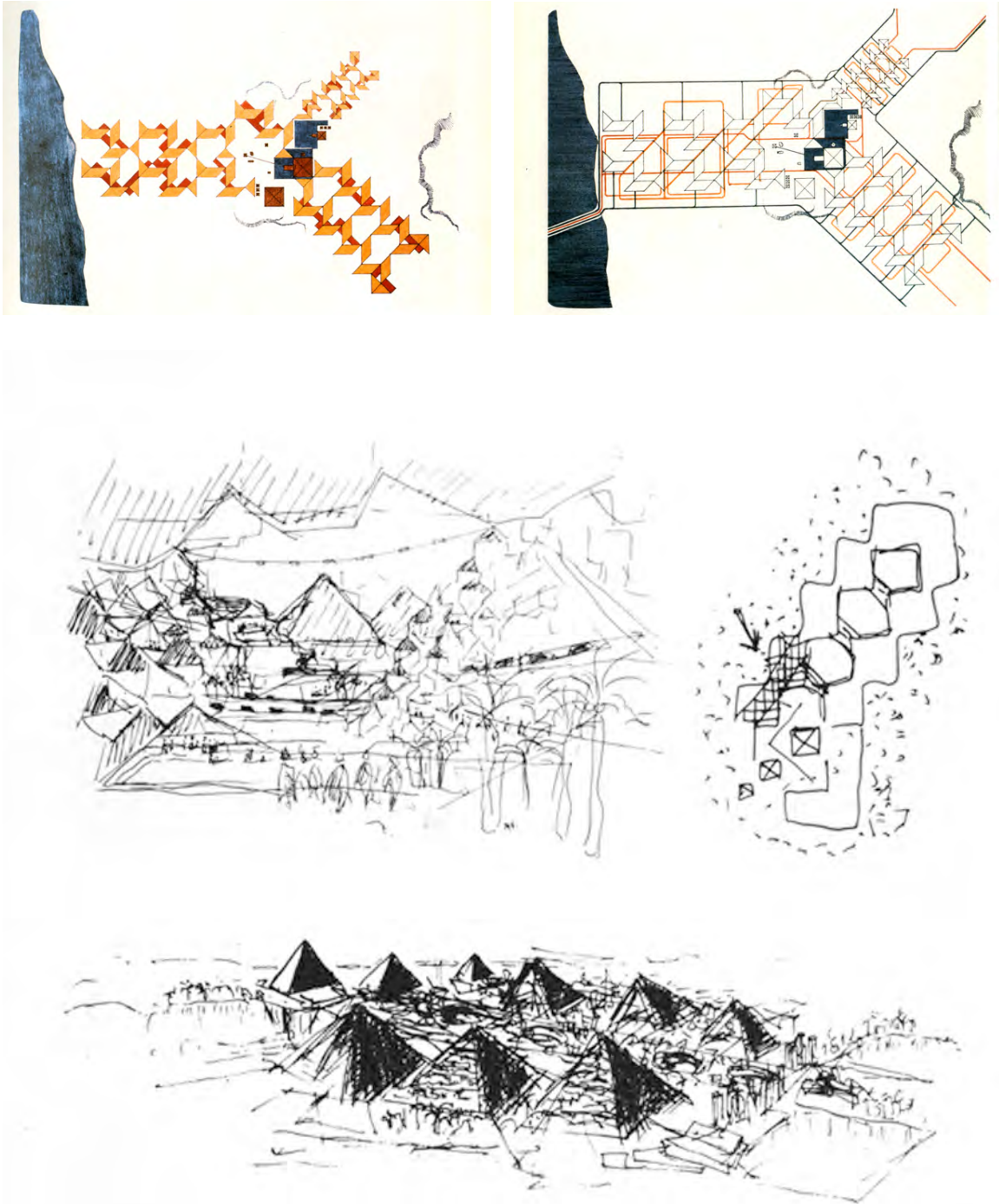
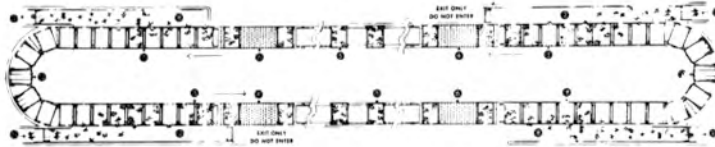


Fig. 3.15 Moshe Safdie, Proposed City at Giza competition project, 1962; *upper left*: land use diagram; *upper right*: transportation network; *bottom*: sketches showing “growth” patterns of pyramidal housing linked to a transportation spine

91.
Elevated carveyor proposed for Chicago.
Totally enclosed system, more economic to
heat than individual cars.



92.
Plan of carveyor system showing 60-foot
long conveyor stations, separate, for
boarding and leaving.



93.
Test track of carveyor system, showing
people stepping on conveyor.
All photographs courtesy Stephens-
Adamson



94.
Carveyor system shown superimposed on
existing street. Cars shown bunched are
loading and unloading.

Fig. 3.16 Moving sidewalks in Team 10 member Brian Richards's book *New Movement in Cities* (1966)

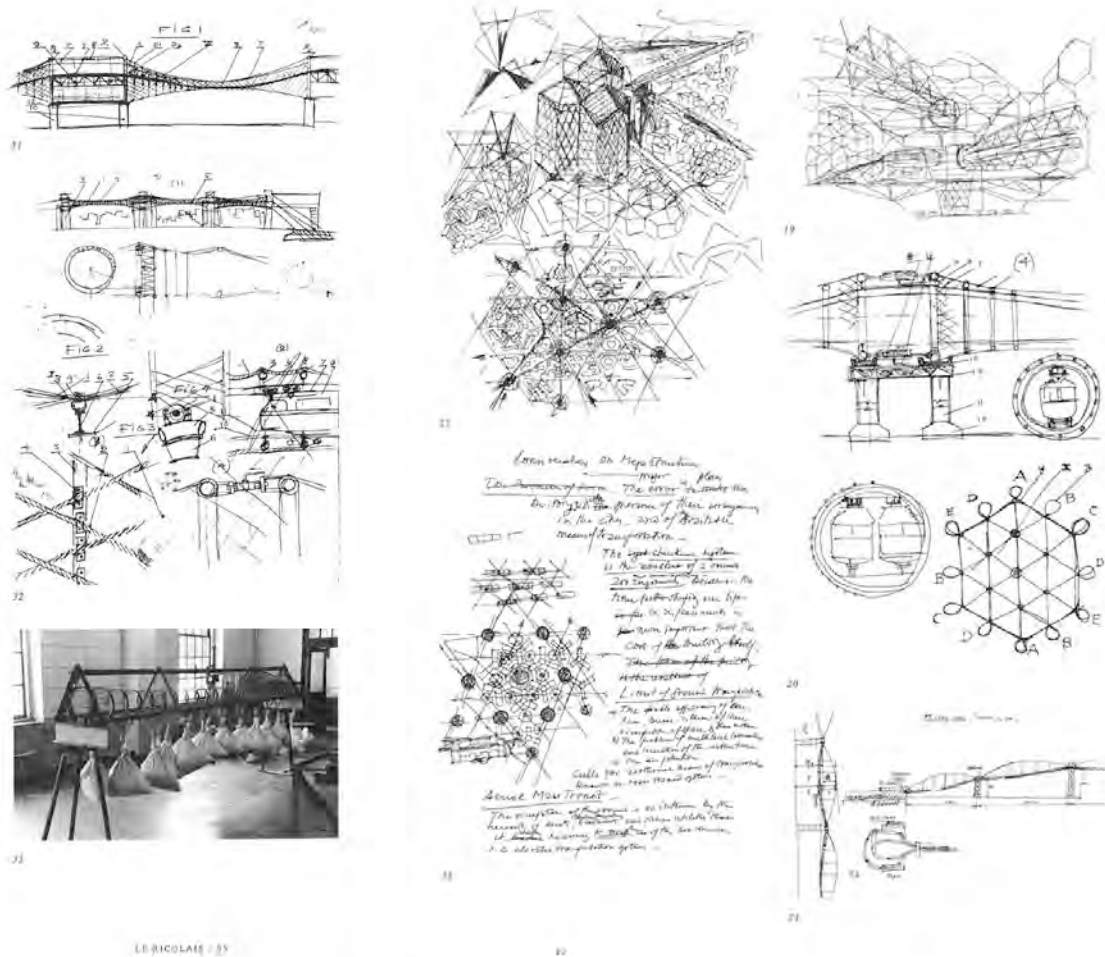


Fig. 3.17 Robert Le Ricolais, “Tension-Net” bridges (*left*); Skyrail and Starhex network (*middle and right*)

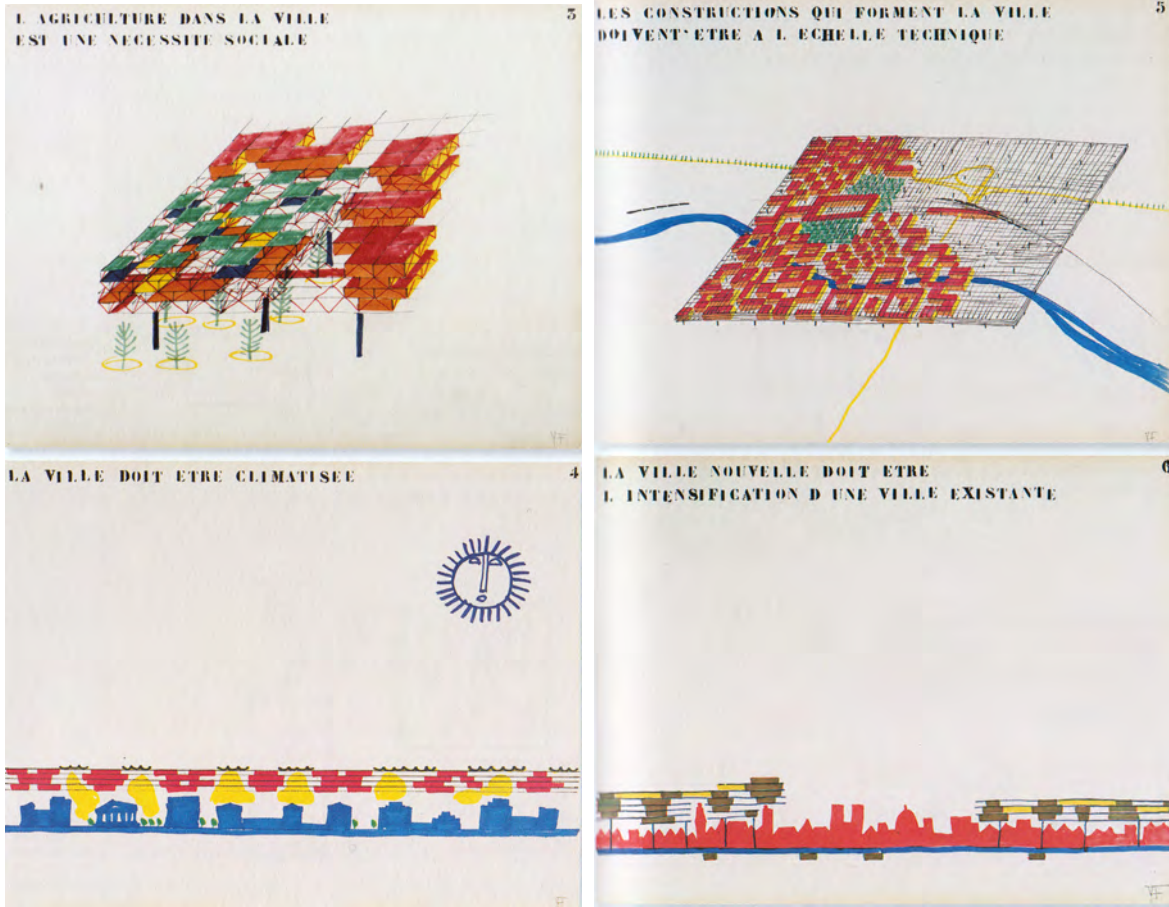


Fig. 3.18 Yona Freidman, “Ten principles of mobile town planning” (1959)

Here is a refreshing proposal for a new kind of residential district, an alternative to the sprawling, single-family development and the crowded apartment towers of urban renewal projects.

Density by design

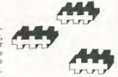
BY RICHARD A. MILLER

How many people per acre?

Sprawling developments of small houses like Levittown, Long Island, waste valuable land and destroy rural open space—yet house only 5 to 25 persons per acre of land.



Crowded housing, like Carle Place in New York City, consists entirely of tower apartments because they are the only way to house 200 to 600 persons per acre of land.



DENSITY BY DESIGN



Row houses and tower apartments in one section of Cambridge project (left) would offer a choice of four-bedroom (two half row houses by designer Masao J. Haruhiko (plan, right) or three-, two-, or one-bedroom duplex apartments by designer William N. Moskop (plan, extreme right). In the lower apartment plan, shaded apartments in lower and upper living areas for apartment units, areas labeled "A" contain living areas for apartments with bedrooms on the floor above, and areas labeled "B" contain bedrooms for units having living areas and entrance on the floor below.

Two residential clusters, four kinds of housing



Walk-ups and slab apartments in another section of Cambridge project (left) are based on the slab apartment plan of designer George M. Notter Jr. (plate right) and the "manometer" type walk-up group by designer Michael J. Zinner (plan extreme right). Notter's design has elevator steps at corridor floors which are sandwiched between "skip" floors. A duplex apartment section occupies the fifth and sixth floors. The Zinner design combines three- and four-bedroom duplex units on the first and second floors with one- and two-bedroom units accessible from a third-floor gallery. The two-bedroom units have rooftop living rooms. EBN

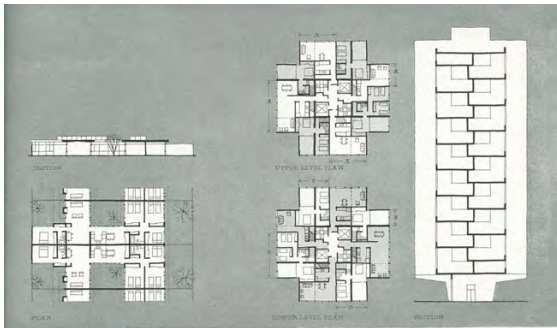
alternative, José Luis Sert, dean of Harvard's Graduate School of Design, last year organized a team of graduate students in architecture, landscape architecture, and city planning to study other possibilities and to test the findings by designing two residential sectors for actual sites nearby. The results, shown on the following pages, offer a new kind of urban pattern in which row houses, walk-up apartments, and "high-rise" elevator apartments are mixed together in clusters much more intensively populated than the ordinary suburb and yet substantially less densely populated than the average urban renewal project.

New departures

Each of the 24 architectural students in the experiment (under Sert, Professors Hosen Jackson and Hideo Sasaki and visiting critics Alvaro Ortega and Blanche Van Ginkel) developed designs for housing clusters for 1,000 persons in one dwelling type and 5,000 persons in "mixed" clusters. At the same time, the six planner members (under Professor Reginald Isaacs) were studying the governmental, social, and economic problems of residential development in Metropolitan Boston and selecting the downtown and outlying sites against which the team would test its conclusions. After a study of the findings, the team applied the selected housing types to the chosen sites and also designed the shopping centers, schools, and recreation areas needed for a sound community life.

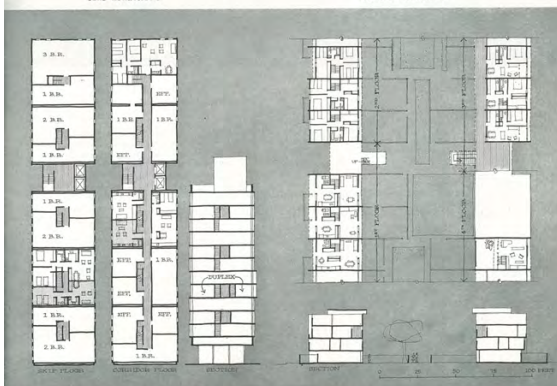
Perhaps the most significant innovation was the development of a novel technique for dealing with housing "density." Today's urban renewal planners almost invariably take the desired population density of an area as a point of departure in planning, but the Harvard group began its plan for the selected sites without any preconceptions of what the density would be. Instead the team started by designing housing units that would answer a variety of typical family needs. Then, with the help of the planners' findings, the individual housing units were grouped as tightly as possible, but still allowed ample space for community needs and open space, for automobile storage, and for sunlight and fresh air for the dwelling units. Only after these requirements were satisfied did the research team measure the population density of the area. The Sert team found that, depending on the size and type of dwelling units used, their density figures stood somewhere in the range of 80 persons per net acre for row-house groups and 175 persons per net acre for slab-apartment groups, with

Balanced alternative for Cambridge, Massachusetts provides row houses, walk-ups, and tower apartments in a lively residential sector housing 150 to 175 persons per acre.



ROW HOUSE

TOWER APARTMENT



SLAB APARTMENT

WALK-UP APARTMENT

Fig. 3.19 "The Residential Sector", Harvard GSD design studio, fall 1957. Lemco van Ginkel would join Josep Lluís Sert and others as a studio critic

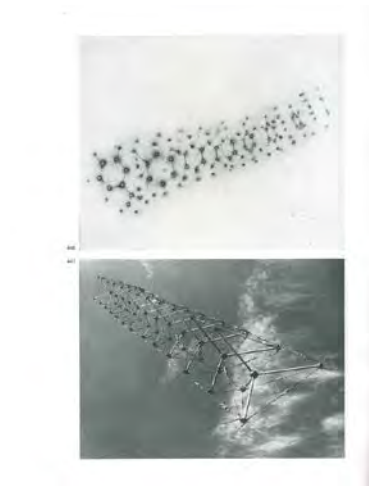
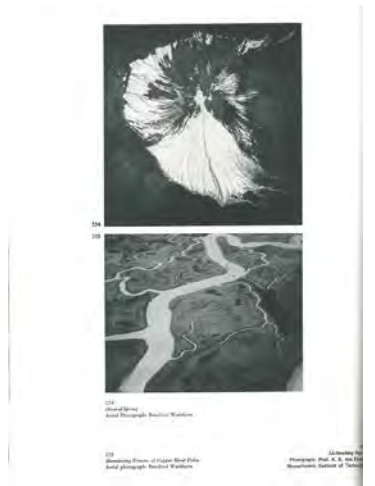
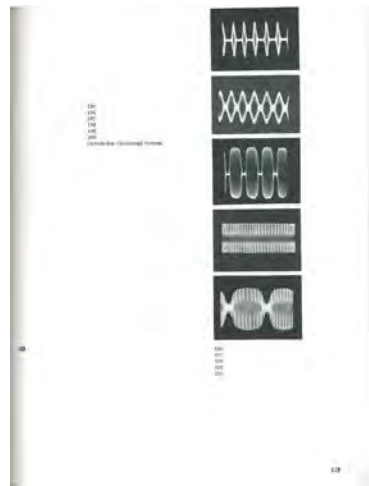
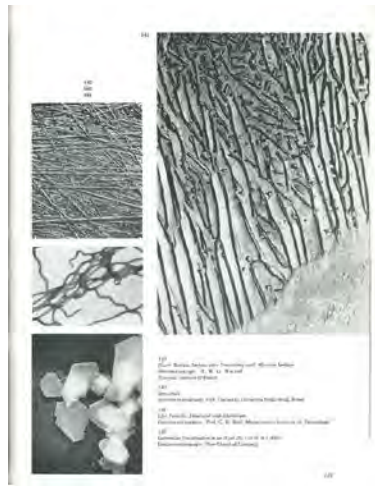
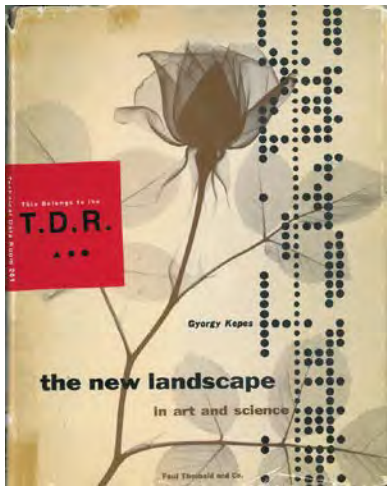


Fig. 3.20 Gyorgy Kepes's "patterns" informing *The New Landscape in Art and Science* (1956)

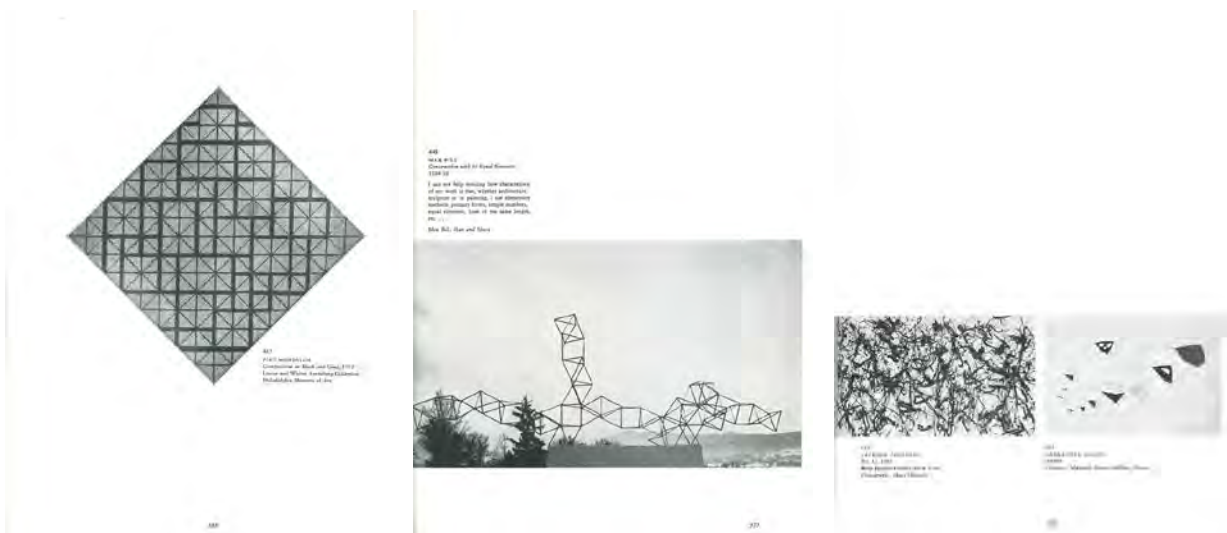
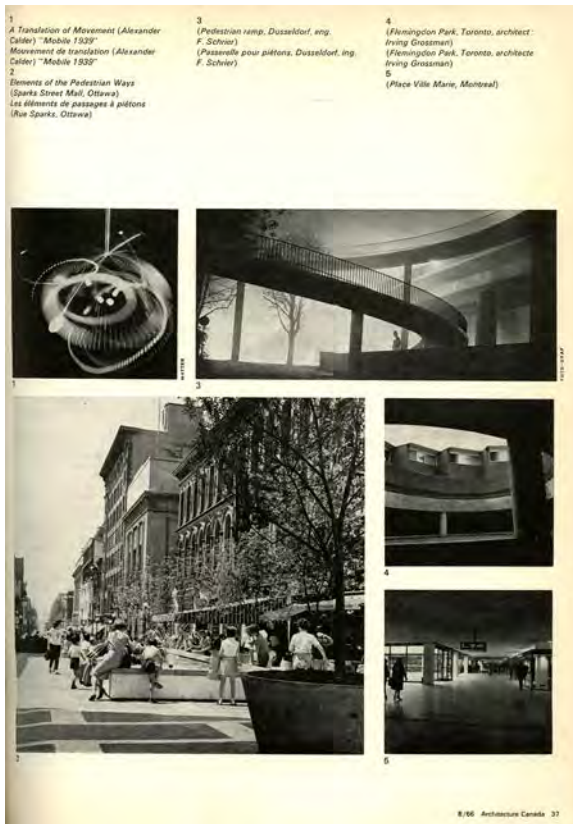


Fig. 3.21 Above: Blanche Lemco van Ginkel, "City Centre Pedestrian", *Architecture Canada* (August 1966)
Below: Works by Piet Mondrain, Max Bill, and Alexander Calder informing Gyorgy Kepes's "new landscape", circa 1956

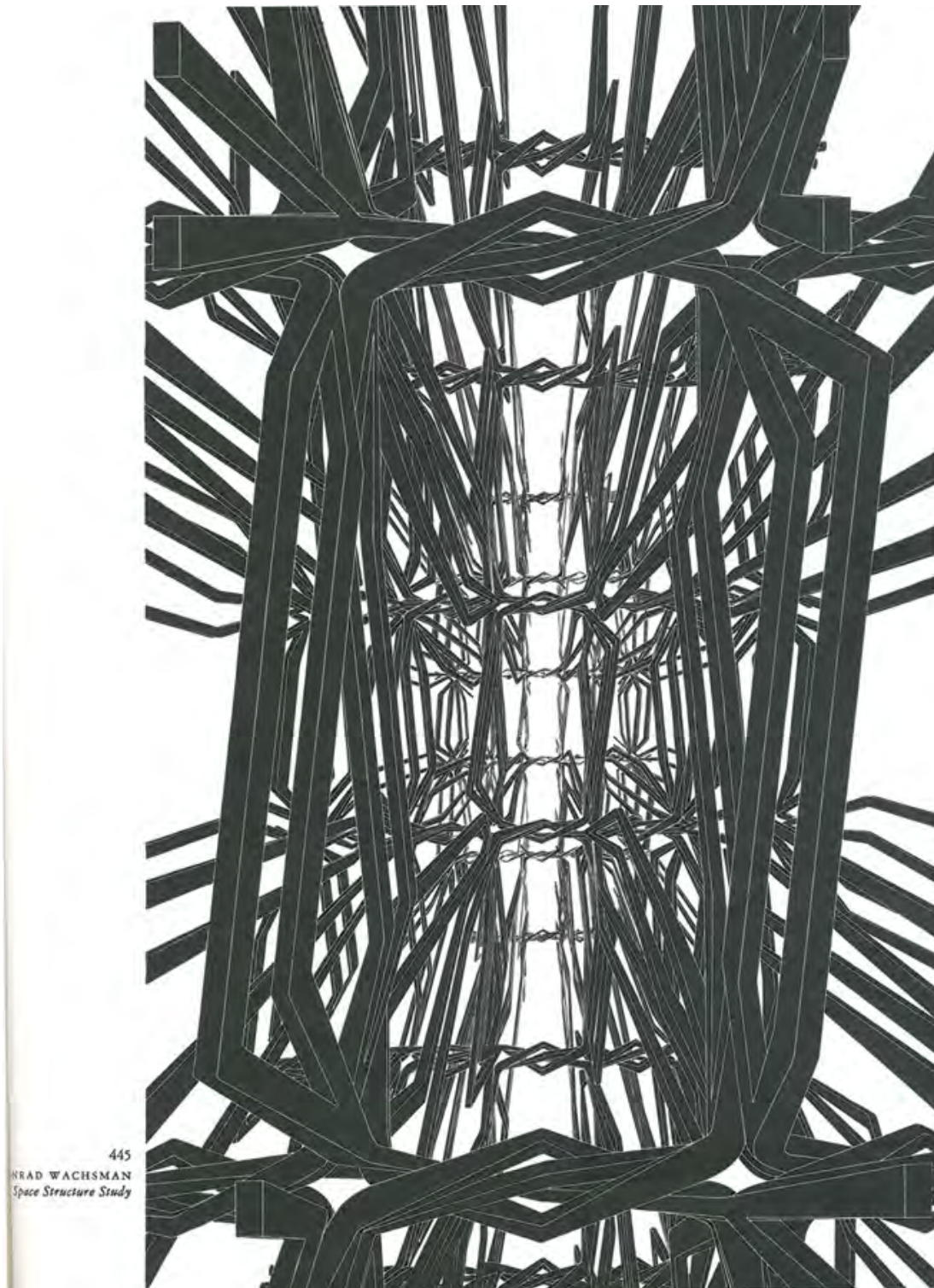


Fig. 3.22 Konrad Wachsmann, "Space Structure Study" in Gyorgy Kepes's *The New Landscape of Art and Science* (1956)

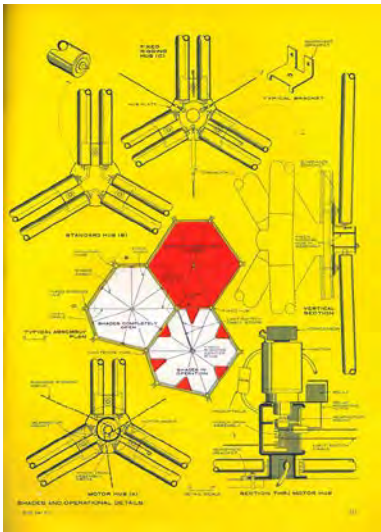
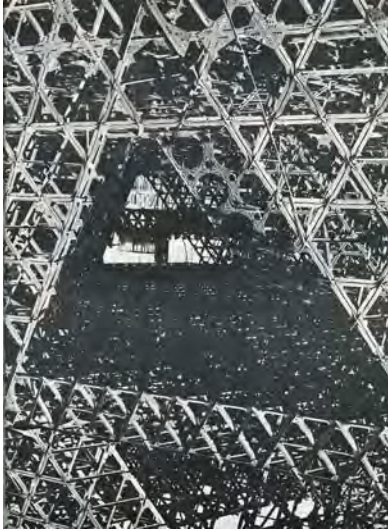


Fig. 3.23 "Man and His Space Frame" in *Progressive Architecture* (June 1967)

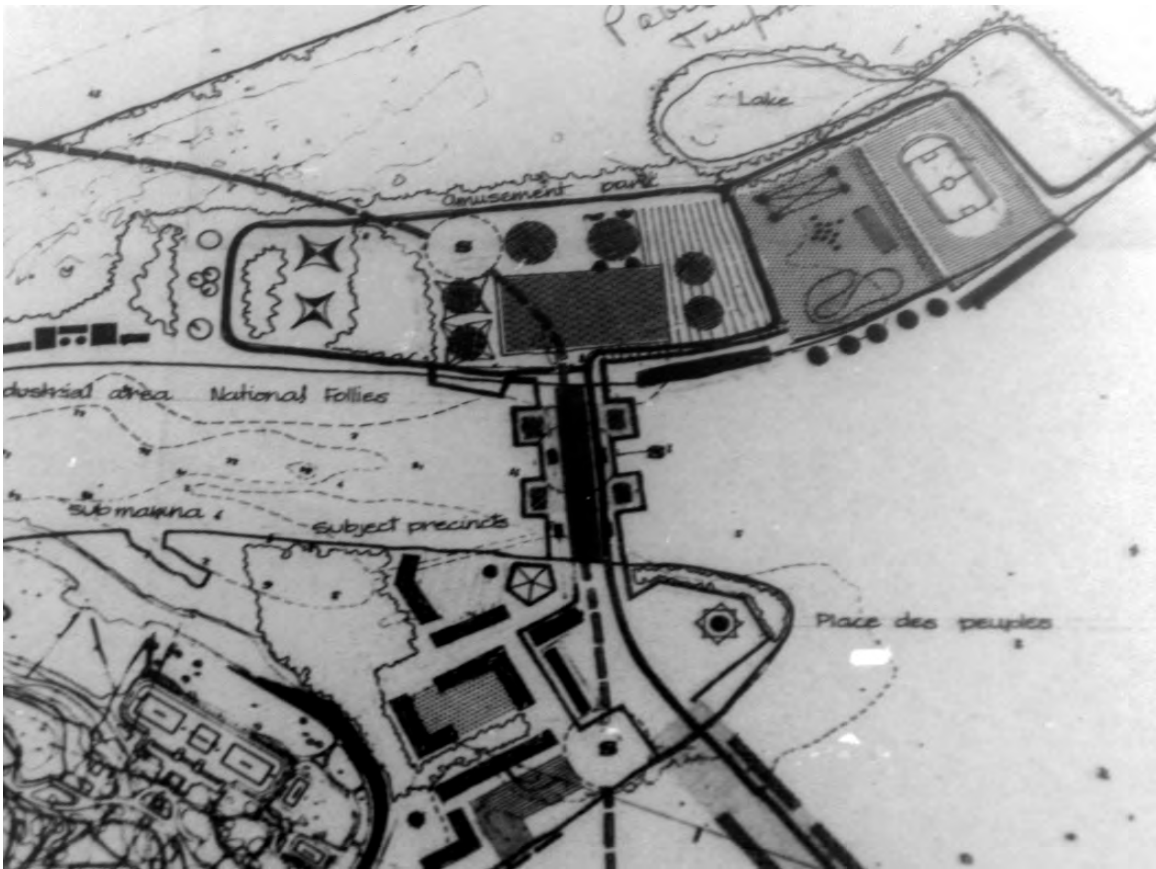


Fig. 3.24 Adèle Naudé's site studies showing the "subject precincts", summer 1963



Fig. 3.25 The Expo 67 Minirail



Fig. 3.26 The Expo 67 master plan, December 5, 1963 (above); Expo 67 master plan promotional brochure, December 1963 (below)

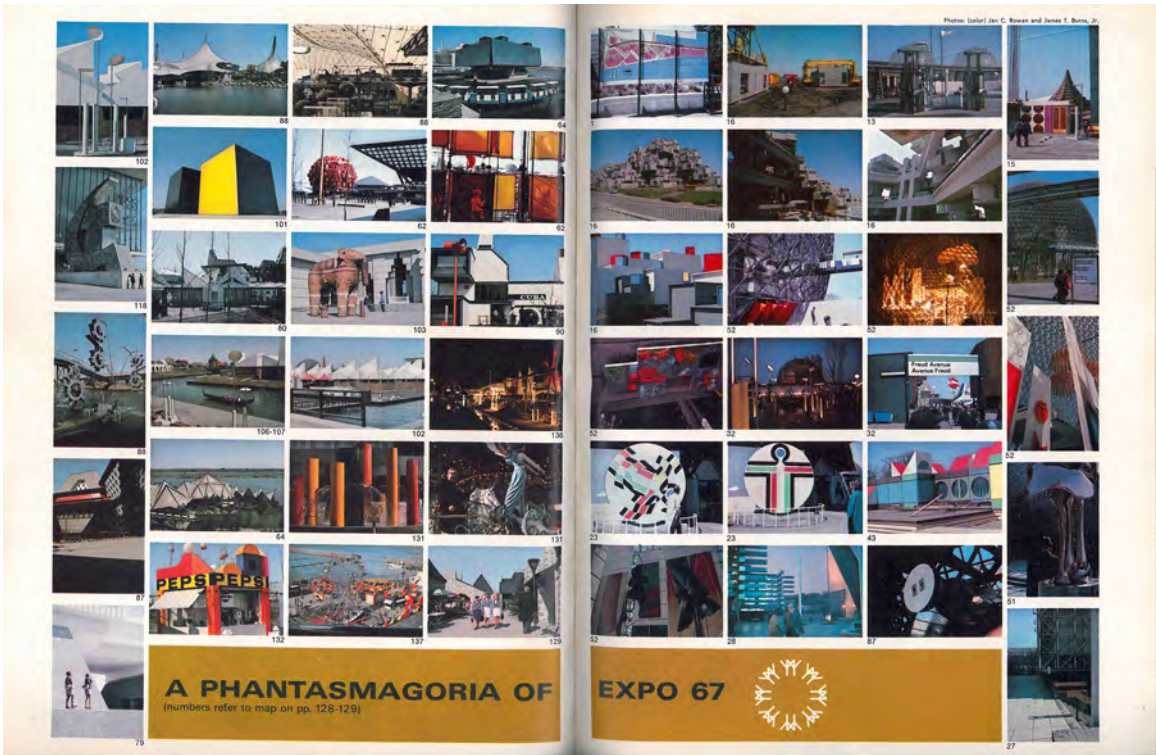


Fig. 3.27 A “phantasmagoria” of pavilions, *Progressive Architecture* (June 1967)

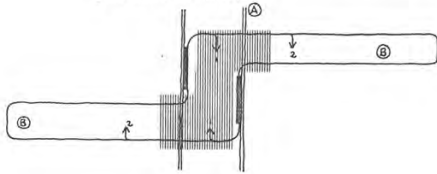
Moske di/ke Kif #680.
November 19, 1963.

PRELIMINARY A. NAUDE
J. MILLER.

ORGANIZATION OF THE THEMATIC AREA (3)

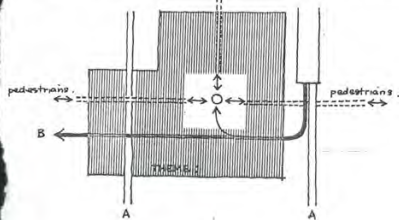
Relationship of theme structures to transportation: Ile Verte, Ile Ronde:

- System A links thematic areas.
- System A passes through or outside theme structures defining them.
- System B passes through theme structures with the first take off point within the theme.



Relationship of theme structures to pedestrian paths: Ile Verte, Ile Ronde:

Paths connect take off point on transportation system B within the theme buildings, to the external pedestrian path structure:

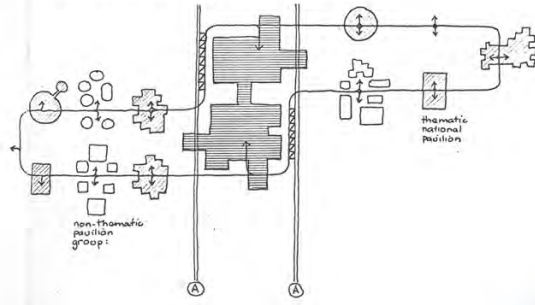


Relationship of theme structures to national pavilions:

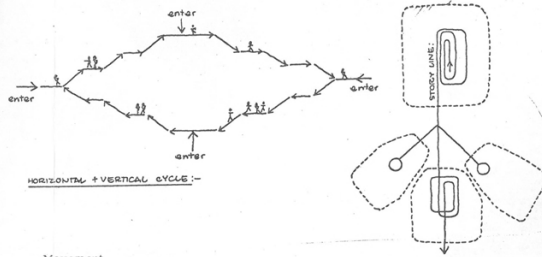
The transportation is part of a theme sub-division. All structures or complexes associated with transportation should be thematic, thereby the extent of thematic participation would be easily comprehended. It is proposed that system B connects national pavilions associated with the theme to the theme complex, in the same way as system A connects the thematic areas of the site. System B would have take off points within the pavilions:-

- ... the theme areas could remain well defined.
- the structural links between pavilions and the theme structure are eliminated.
- Pavilions associated with the theme can be dispersed, and the area of thematic influence extended.

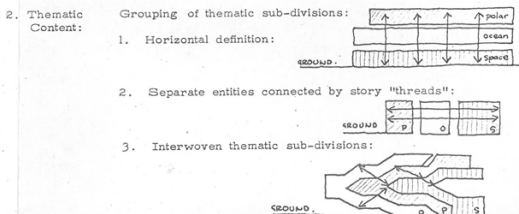
System B becomes part of the storyline thread:



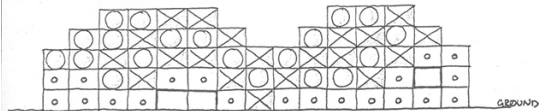
leading from one complex to another, i.e. occur at points at which the storyline can be entered, or story branches.



Movement Services: Flexible service grid integrated with the structural system:



- Identity: to be given to
- a) Sub-divisions of the theme.
 - b) Major contributions of nations/organizations (as in polar regions)
 - c) Where possible the threads of the story should be externally as well as internally visible.



3. Structure: Temporary:

1. System to be used for 5 parts of the theme on Ile Ronde, Ile Verte.
2. Modular space system to give a variety of spaces of the same order (for services, for exhibits).
3. System to allow for numbers of links between thematic sub-divisions.
4. System to accommodate movement patterns: services, people.
5. System to be able to grow or shrink.
6. System to allow variations in space closure.

A. M. Naudé

Fig. 4.1 Towards theme pavilion: Adèle Naudé's Xs and Os, November 1963

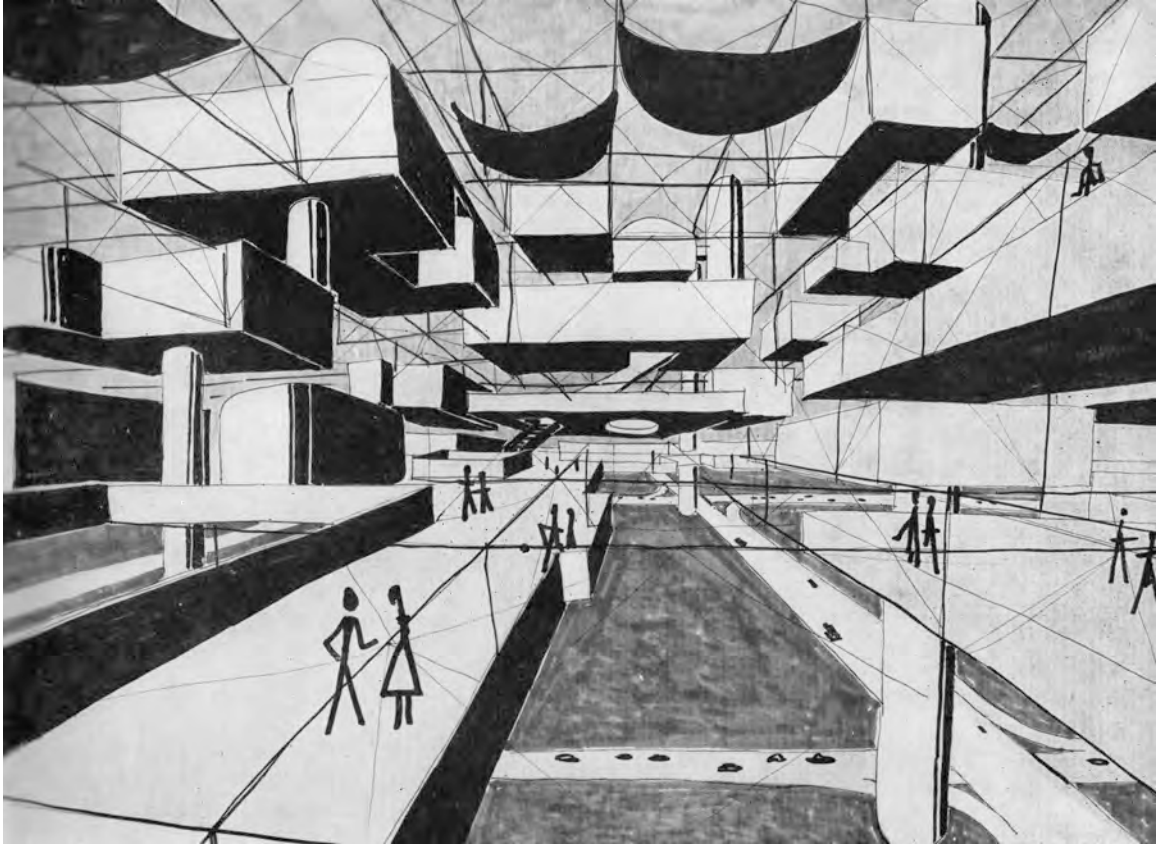


Fig. 4.2 Yona Friedman's *Ville spatial*, published in *Les Visionnaires de l'Architecture* (1965)

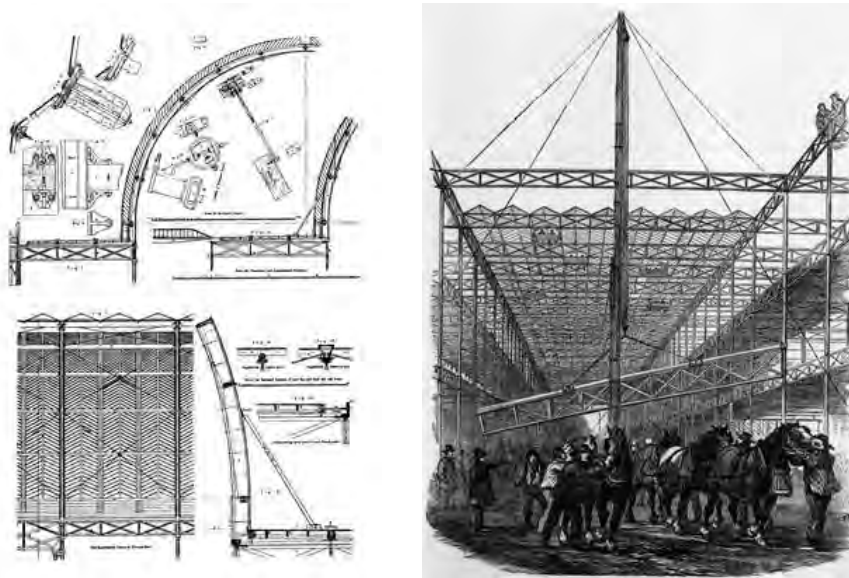


Fig. 4.3 Joseph Paxton's Crystal Palace, 1851: a "kit-of-parts" emphasising *process* over *form*

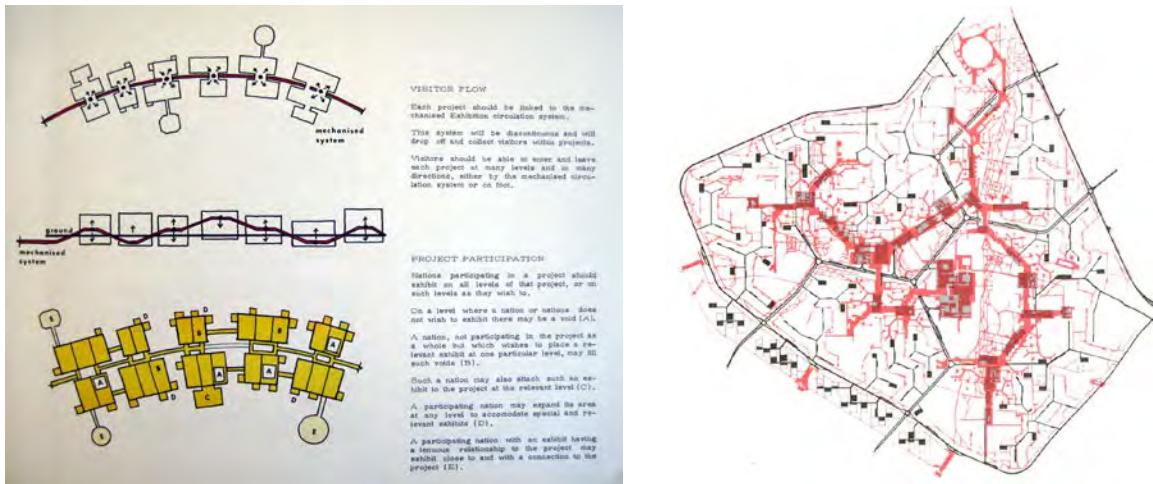


Fig. 4.4 Adèle Naudé et al., Man Polar Regions diagrams, 1963 (left); Shadrach Woods, “web” diagram, Toulouse-Le Mirail competition project, 1961 (right)



Fig. 4.5 The hexagons of Man the Producer and Man the Explorer, with Frei Otto’s West German pavilion in the foreground

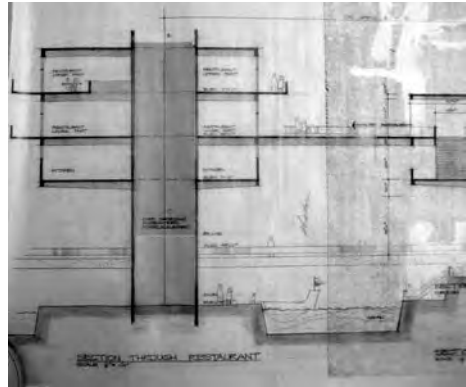
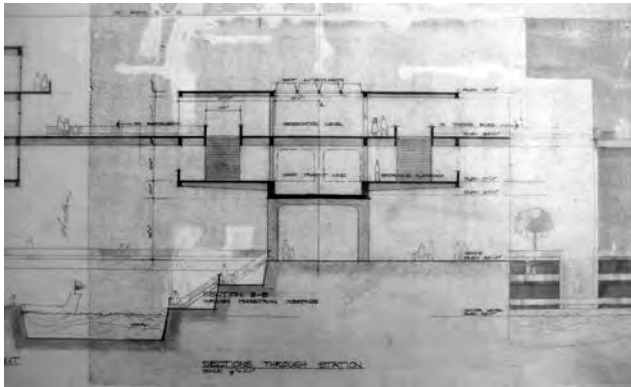
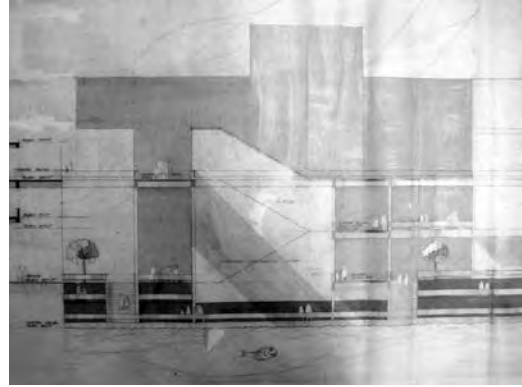
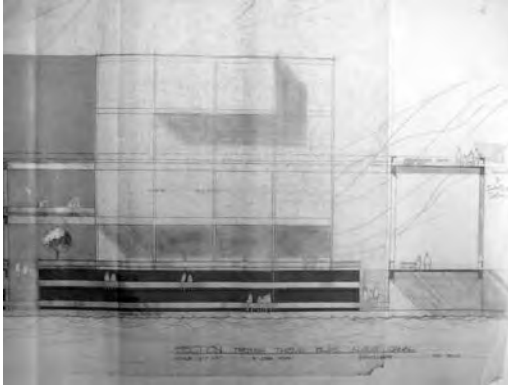


Fig. 4.6 Arcop, first sectional study on the theme pavilion, June 1964

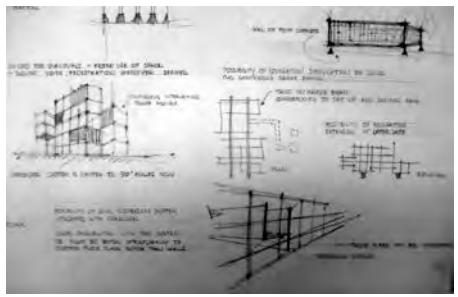
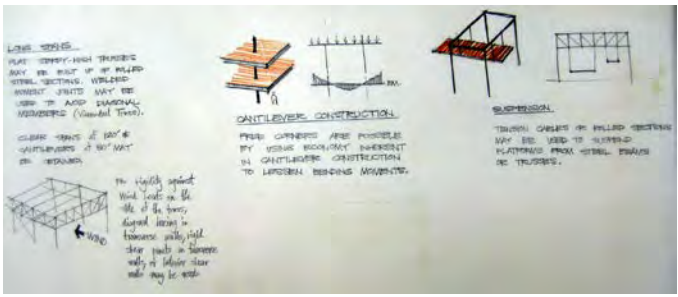
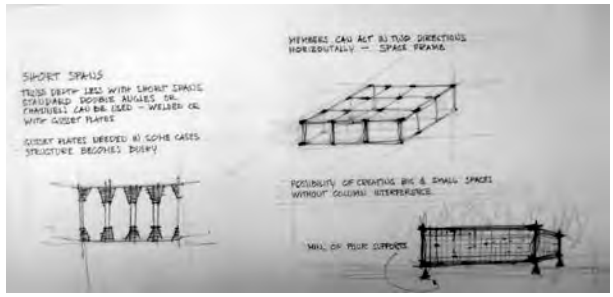
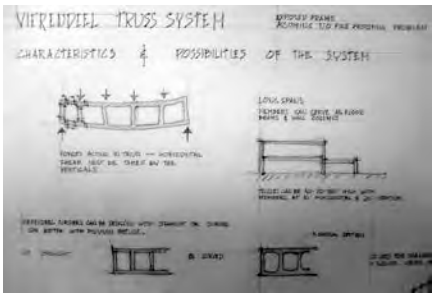
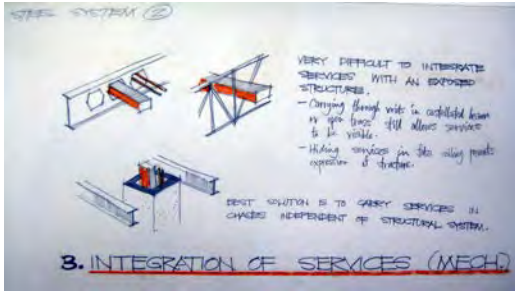
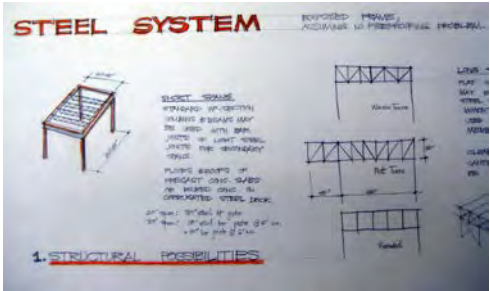


Fig. 4.7 Arcop, theme pavilion steel structures studies, summer 1964

Theme Buildings/Expo '67

Consulting Architects/Affleck, Desbarats, Dimakopoulos, Lebensold, Sise

Partner in Charge/Guy Desbarats (A)
Project Architect/Thomas Ewing Blood; Project Manager/R. H. P. Marshall
Consulting Engineers/Eskenazi, Baraes, deStein & Associates
with Professors Jaeger and Harris, McGill University

The Truncated Tetrahedral Space Frame

The briefing or design program as prepared by the Canadian Corporation for the 1967 World Exhibition embodied a most comprehensive and challenging program which took careful note of the complex building requirements, together with a rigid timetable necessary to ensure the completion of the buildings, services and exhibits in time for the opening of "Expo '67". The physical requirements for this program are summarized as follows:

- (a) The buildings would be of a temporary nature;
- (b) The structural system must accommodate spans of over 100 feet with average live loadings at 125 pounds per square foot;
- (c) The structural system should be able to form large volumes for exhibits;
- (d) The building system should be able to change its configuration during the latter stages of working drawing production;
- (e) The structure should accommodate a flexible installation of the separate services and their integration with exhibits;
- (f) If possible the buildings should be easily demountable to minimize the cost of clearing the land at the conclusion of the Fair;
- (g) The character of the buildings must present an unmistakable visual link between the two buildings in their positions on two sites of widely varying characteristics;
- (h) The buildings should act as orientation and focal points for the visitors to the fair grounds.

The overlapping between design development of the superstructure and the construction of the substructure created the need for a disciplined yet versatile structural unit, which also offers a variety of solutions to the many problems inherent in the program. In the early stages of design development a large number of structural systems were investigated and found lacking for various reasons. In addition to well-known systems, studies were made of the possible use of suspen-

sion structures; interlocking Vierendeel trusses in both concrete and steel; space frames with the various nodal systems presently available; and cellular or block construction.

The principle of devising a structural system based on a "universal cell" or "building brick" which might form walls, floors and roofs appeared to be a solution to the program. A structure based on such a cell would ideally be clipped together in a basic pattern that could be adjusted to meet the developing requirements of the various exhibit designers without interrupting the production of working drawings or construction. To impose a further design requirement on the idea of a cellular construction, the unit should enable the development of open spaces where required, yet withdraw into a quiet grid in those areas where the structure should become the background to individual exhibits.

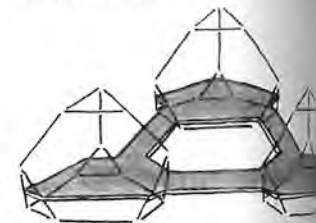
It was quickly found that there was but a limited variety of geometric forms which "nested" or "filled space" in such a manner as to disclose two parallel planes. One of the least complex of these forms which also suggests a structural system is the truncated tetrahedron.

The surfaces formed by this geometric unit contain a pattern of regular hexagons and triangles; the edge configuration consists of regular hexagons separated by pairs of triangles. After a review of the structural system suggested by the development of a geometry based on the truncated tetrahedron, it became apparent that the assembly offered intriguing solutions to the exhibit, architectural, structural, and mechanical distribution design criteria. As the structural engineering consulting team studied the problem of analyzing a structural system based on this geometry, the architects launched a program of defining the "vocabulary" of intersections.

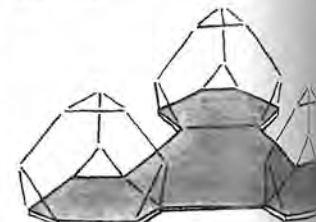
A structure based on the principle of building large assemblies from small members places very heavy emphasis on the study and successful resolution of a



The Structural Unit



Connected



Combined



Combination

Fig. 4.9 Jeffrey Lindsay's study models, published in *RAIC Journal* (October 1964)

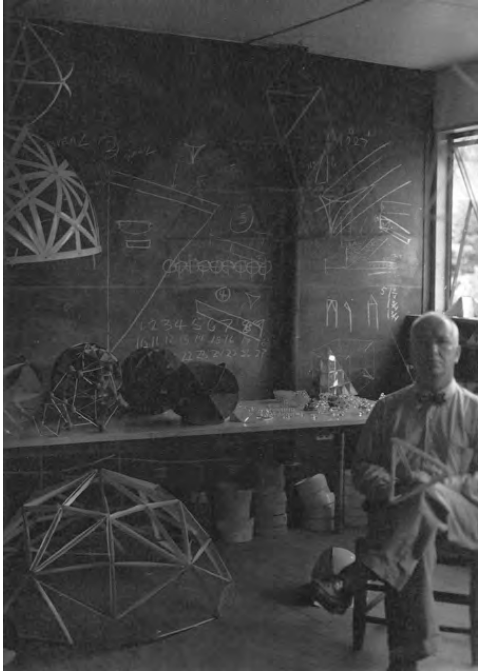


Fig. 4.10 Buckminster Fuller at Black Mountain College, 1949; a shirtless Jeffrey Lindsay assembling an early geodesic structure, Black Mountain College, 1949

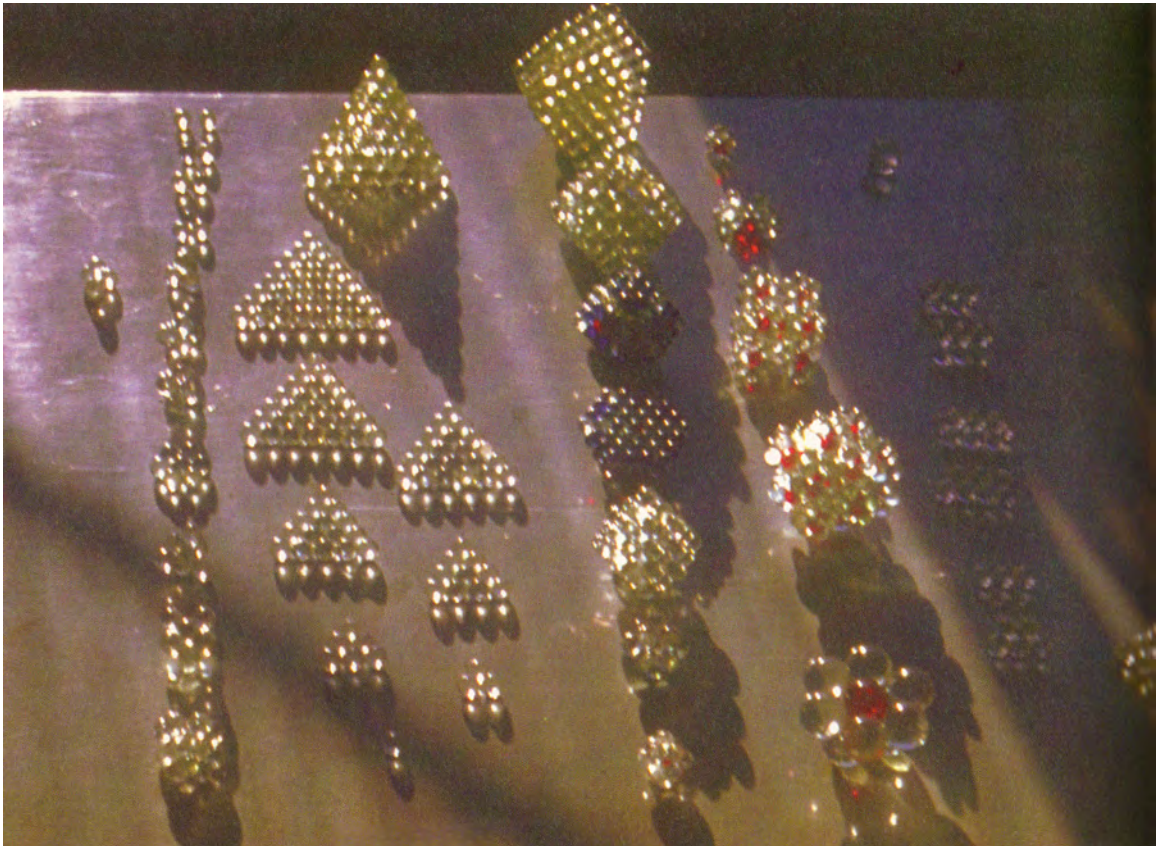


Fig. 4.11 Buckminster Fuller's studies on the close packing of spheres, Chicago Institute of Design, 1948

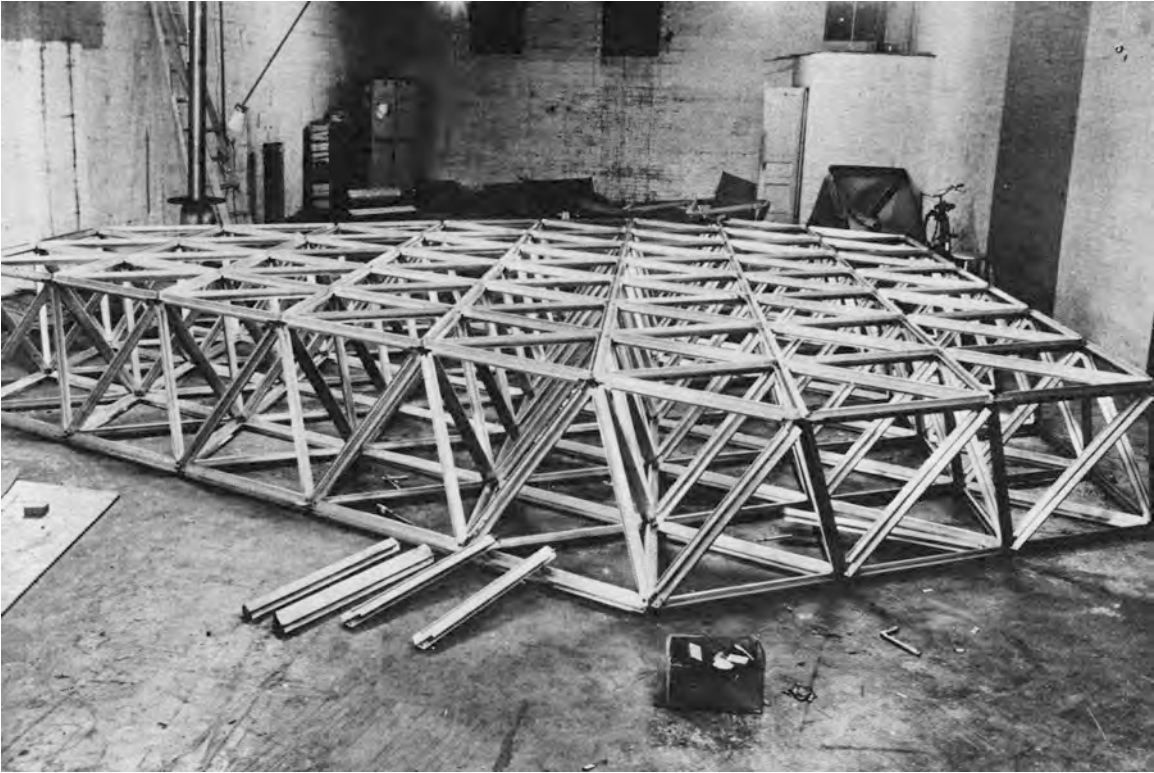


Fig. 4.12 Buckminster Fuller's "Octet" truss, circa 1959

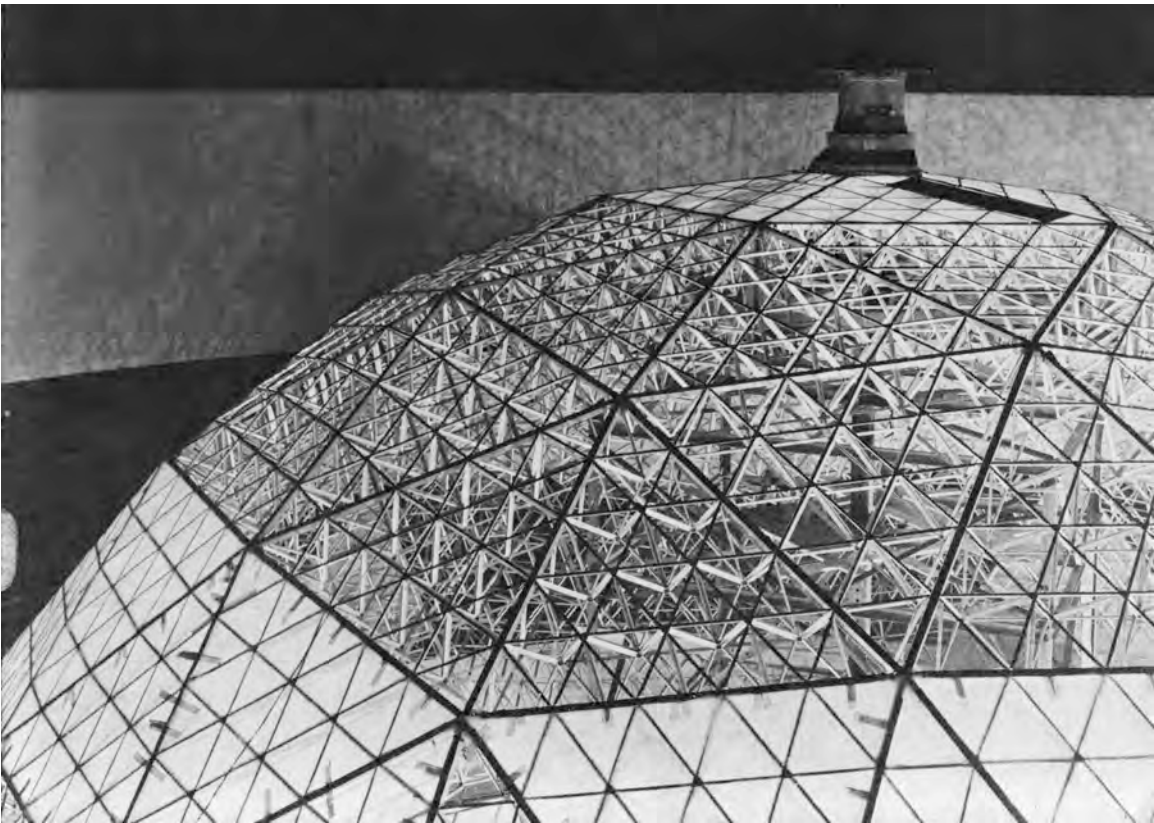


Fig. 4.13 Buckminster Fuller's Ford Rotunda dome made of octet trusses

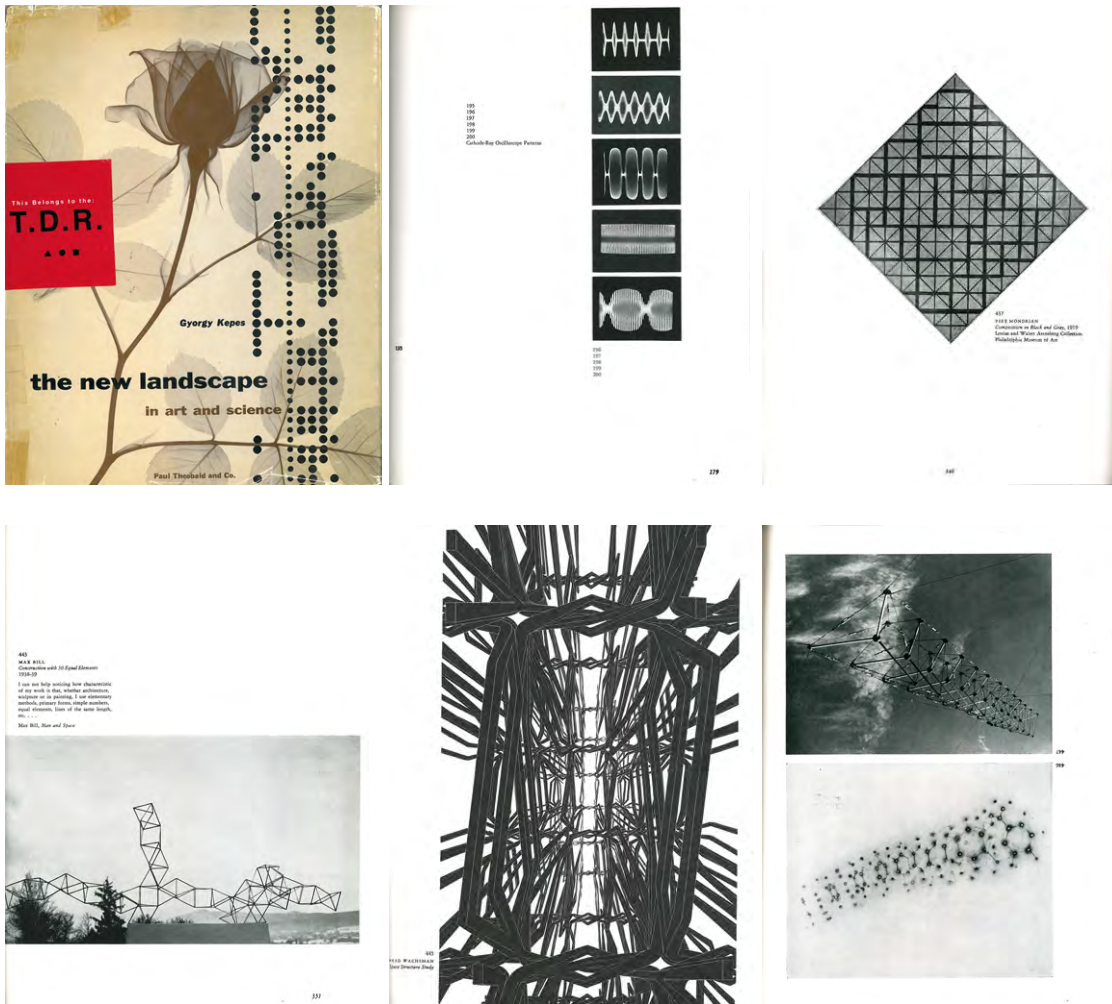


Fig. 4.14 Gyorgy Kepes's "new landscape", circa 1956

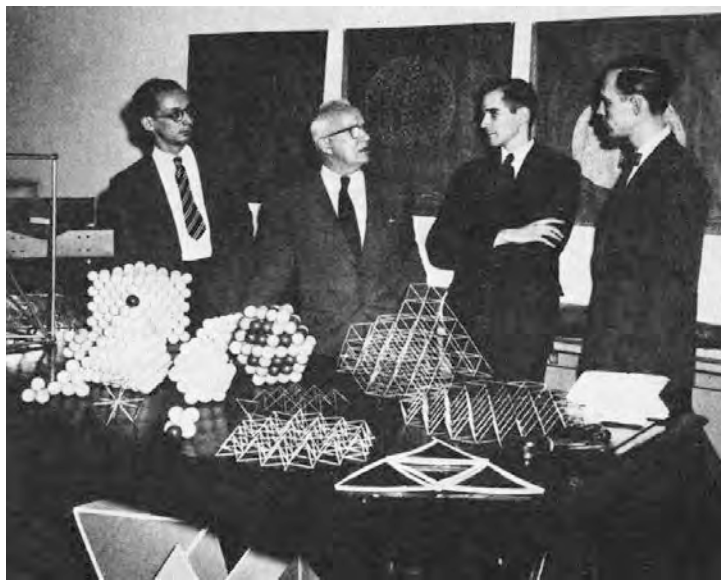


Fig. 4.15 Buckminster Fuller with students at the Chicago Institute of Design, 1948

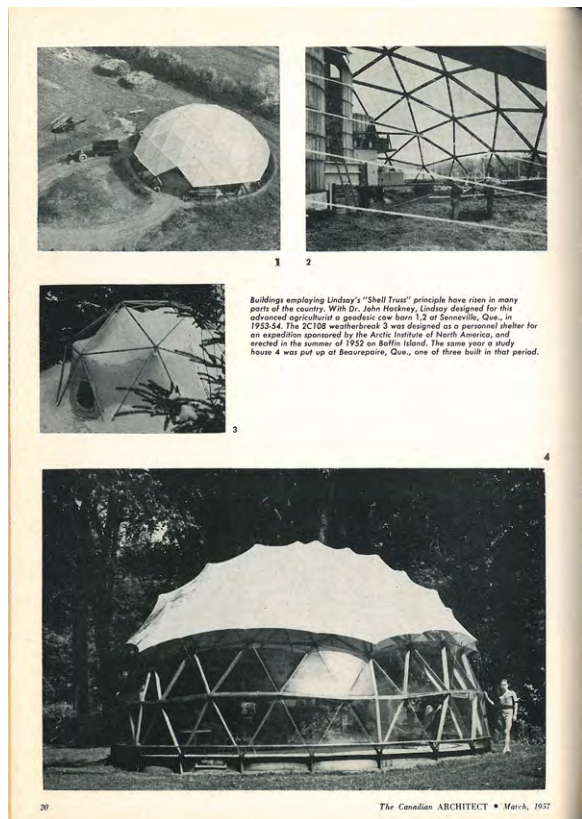
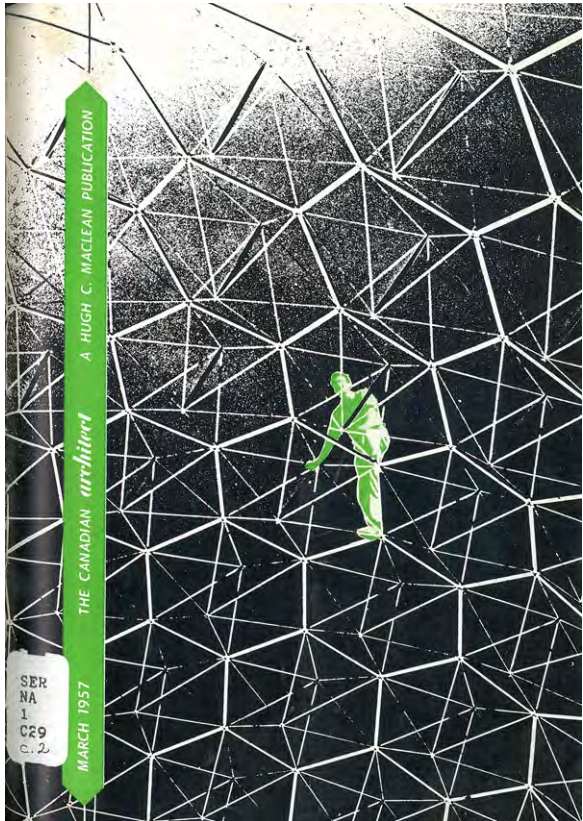


Fig. 4.16 “The Work of Jeffrey Lindsay”, *The Canadian Architect* (March 1957)

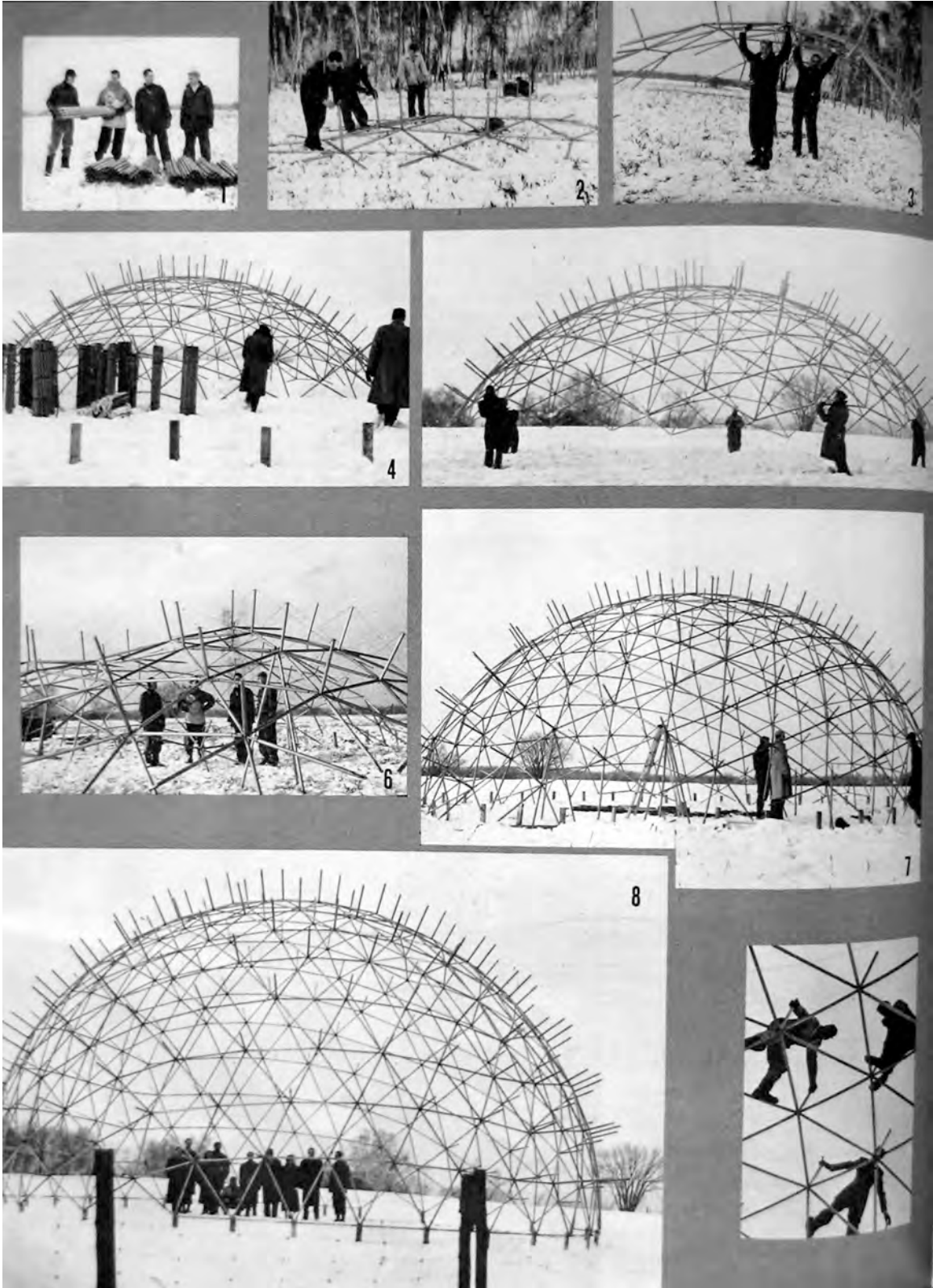


Fig. 4.17 Jeffrey Lindsay's Weatherbreak dome published in *Architectural Forum* (December 1950)

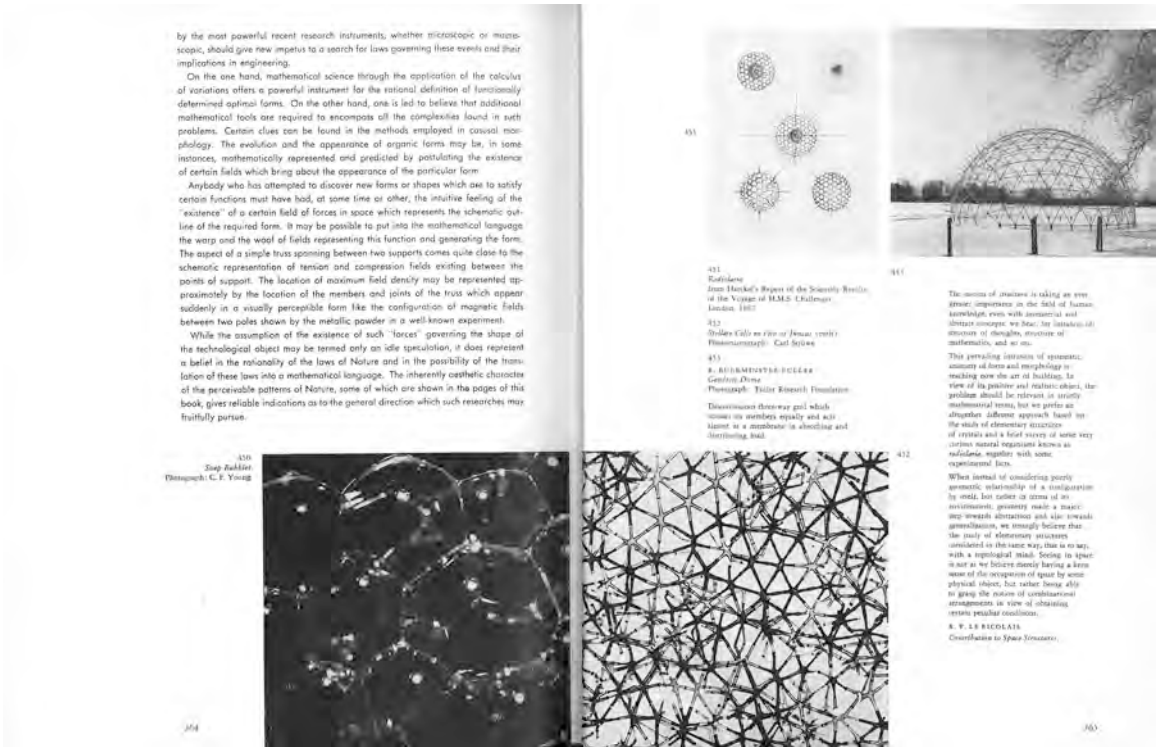


Fig. 4.18 Jeffrey Lindsay's Weatherbreak dome culminating the engineer Paul Weidlinger's models of structural efficiency published in Gyorgy Kepes's *The New Landscape of Art and Science* (1956)

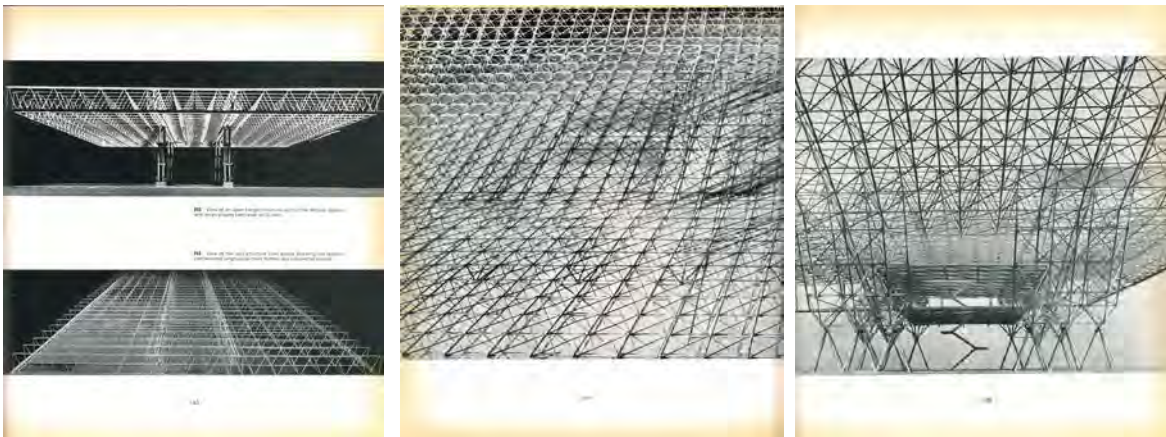


Fig. 4.19 Konrad Wachsmann's space frame hangers

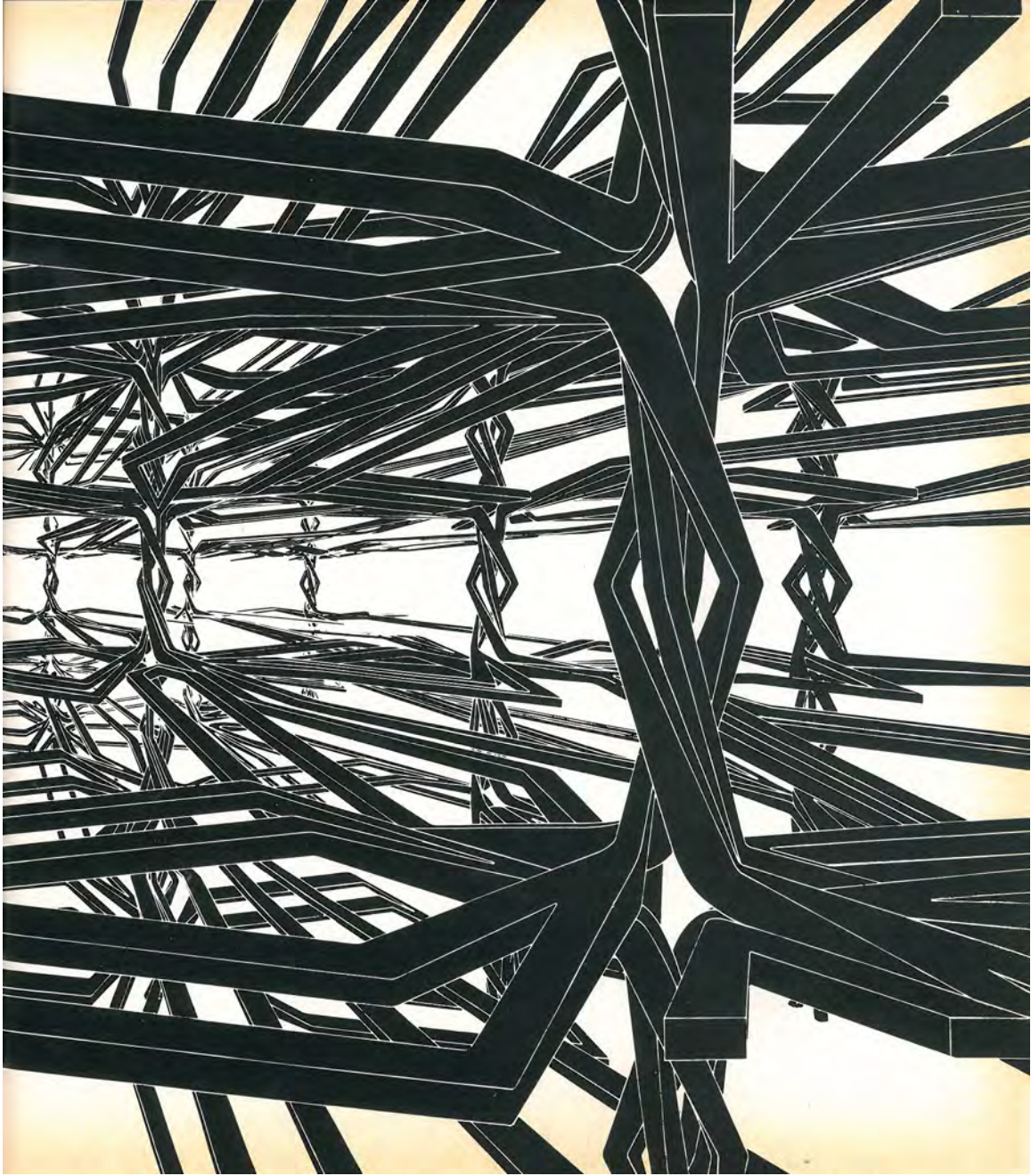


Fig. 4.20 Konrad Wachsmann, "Space Structure"



Fig. 4.21 Arthur Erickson, Simon Fraser University, Vancouver (1965), with a space frame by Jeffrey Lindsay

ANALYSIS
OF THE
TRUNCATED
TETRAHEDRON

affleck
desbarats
dimakopoulos
lebensold
sise

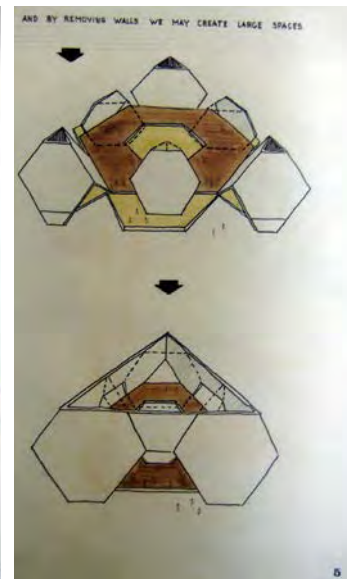
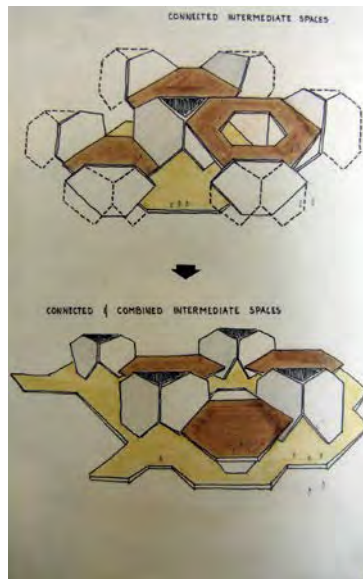
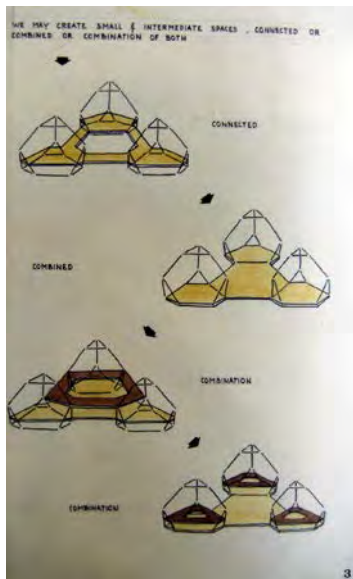
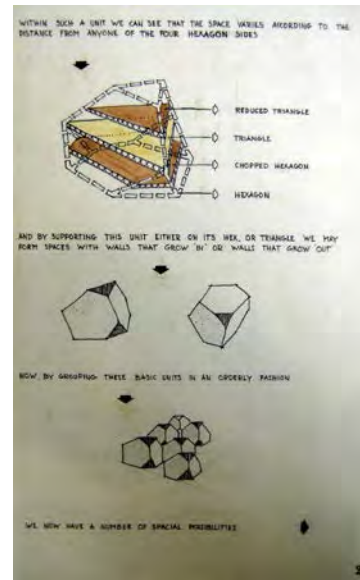
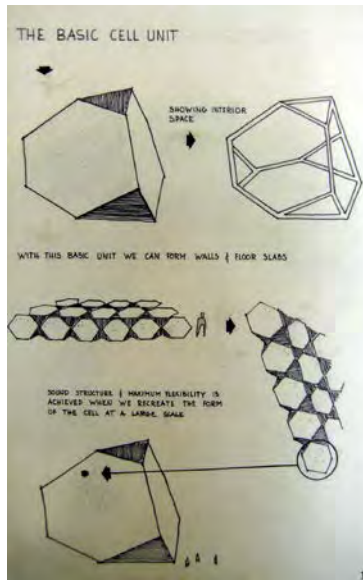


Fig. 4.22 Arcop, Analysis of the Truncated Tetrahedron, summer 1964



Fig. 4.23 Jeffrey Lindsay's tetrahedrons made of injection-moulded clear acrylic

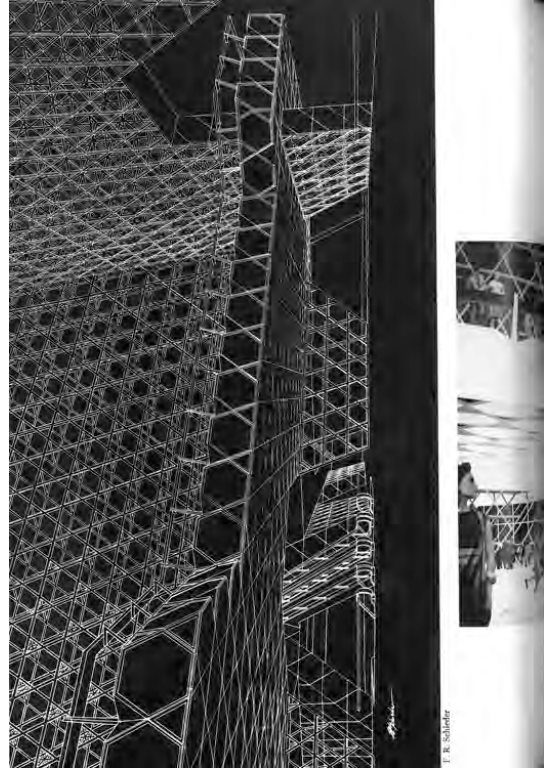
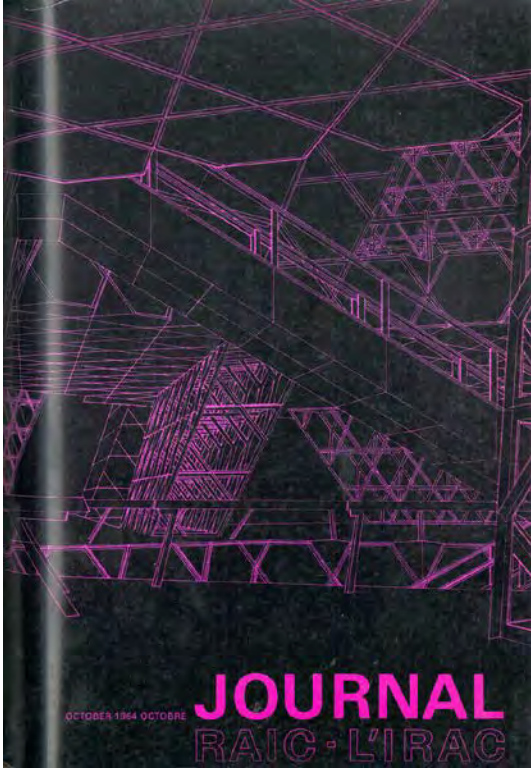


Fig. 4.24 Man the Producer first published in October 1964

fabrication and jointing system. Several systems are now under study, each showing particular promise in solving a portion of the problem. It should be noted that the spans and loads to be carried by this space frame are quite large. The stresses anticipated at the critical nodal points exceed values that can be accommodated by most, if not all, nodal systems presently commercially available. It is anticipated that a combination of the various systems under study will yield a straight-forward, comprehensive solution to the assembly of the structure. One of the techniques being studied has been erected, in model form, at one-sixth full size and is a potential solution to the design of the nodes. A recent study of the fabrication and erection procedures for this space frame have yielded additional economies in the structural system with the promise of further simplification still possible.

Thomas Ewing Blood

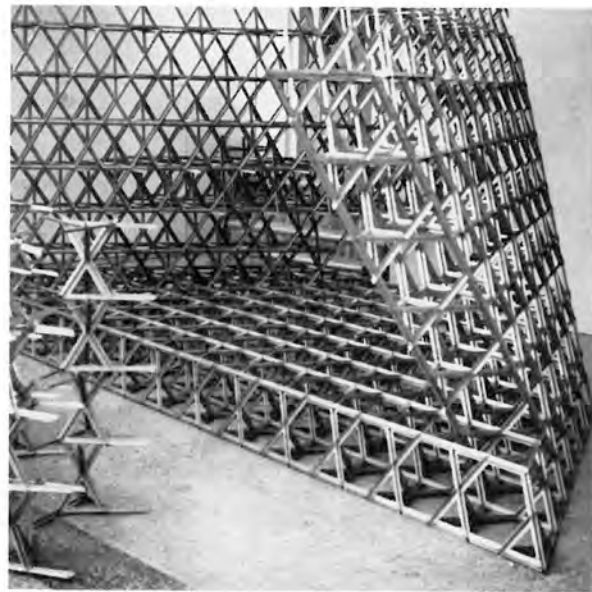
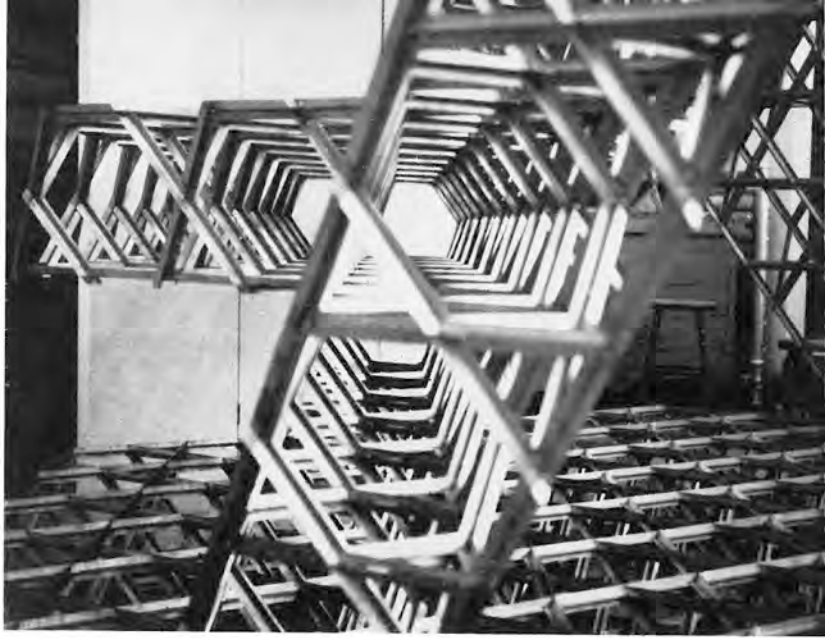


Fig. 4.25 Man the Producer space frame study models



Pavillon Architecture
Pavillons Thématiques-Partie Architecturale

L'expression architecturale découle naturellement de la forme de la cellule laquelle, à cause de sa flexibilité de juxtaposition, permet plusieurs formes de constructions. Le dessin géométrique régulier qui définit la surface des murs peut s'accommoder de revêtements détachables en matière plastique, ou en canevases, de façon à obtenir, à volonté, des murs transparents, translucides ou opaques.

The architectural expression is directly related to the geometry, and is a combination of many forms possible due to the flexibility of the system. The regular pattern produced on the surface of the walls can be clad with standard man-in panels faced with various textures to produce an open transparent building or an opaque and closed form as required.



Pavillon de l'Homme à l'oeuvre. En premier plan: gare du monorail.

Man the Producer Pavilion with A. Transit System Station in the foreground.



Pavillon de l'Homme à l'oeuvre, vue générale.

Man the Producer pavilion—general view.

3



Man the Explorer
L'homme Interroge l'Univers

Scenario

La cellule, matériau fondamental de la Vie et univers microscopique

Nous voyons d'abord une cellule grossie d'environ un million de fois: le visiteur y pénètre et, grâce à des explications sur la fonction cellulaire—explications facilitées par des jeux de lumière et probablement de mécanique—il peut reconnaître toutes les parties de la cellule et saisir leur rôle respectif. Puis, traversant la membrane cellulaire, il entrera dans un monde tout différent: celui de la cellule désorganisée par un cancer. L'équipement, on le renseignera alors sur la croissance des virus, les formes et fonctions des bactéries, l'influence de l'hérédité, ainsi que les processus biochimiques de certaines cellules.

Après cette première initiation, le visiteur montera, par un escalier roulant, à l'étage supérieur où il verra cette fois de vraies cellules, où lui seront révélés leur organisation dans le vivant, l'évolution du système nerveux, le mécanisme cérébral, tout cela relié aux différents stades du comportement.

Des réflexes au raisonnement

Nous passons ici d'un extrême à l'autre: depuis l'être unicellulaire mé usiquement par des réflexes, jusqu'à nos connaissances actuelles sur le cerveau humain (sel le système du centre de l'encéphale, proposé par le Dr Penfield). L'exhibé est en trois sections. Section I: de l'animal unicellulaire au multicellulaire; Section II: évolution de la cellule matresse—le neurone—et perfectionnement des autres cellules en des spécialités spécialisées sans l'action directrice du neurone; Section III: évolu-

Story Sequence:

The Cell—life's building block, and the Microscopic World. The exhibit begins with the cell itself, magnified about one million times. The visitor enters the cell-body on the middle-floor of this pavilion and as he walks through, he can examine the component parts and observe their dynamic relations, accessed by selective illumination and possibly movement, coordinated with explanations of cellular function. Going through openings in the cell wall, simulating the passage through the cell-membrane, or walking about this 35-foot cell, the visitor will see various specialized cells and be given information about abnormal cell functions in cancer; the growth of viruses; the form and function of bacteria; the influence of genetics; and the biochemical processes of certain cells. The spectator then moves by escalator to the third or upper floor where he will become acquainted with various kinds of actual cells, their organization in the living animal and the evolution of the nervous system and brain mechanisms, with corresponding development of behaviour.

From Reflex to Reason: The story here builds up from actual one-celled animals to the current knowledge about the organization of man's mind (e.g., Penfield's centrencephalic system) in three areas: Area I, from unicellular to multicellular animals; Area II, evolution of the neuron, the "master cell" and the accompanying development of other specializations that would not be possible without the neuron to coordinate them; and Area III, evolution of the nervous system and of the behavioural capacity, from the lower-level reflex animal

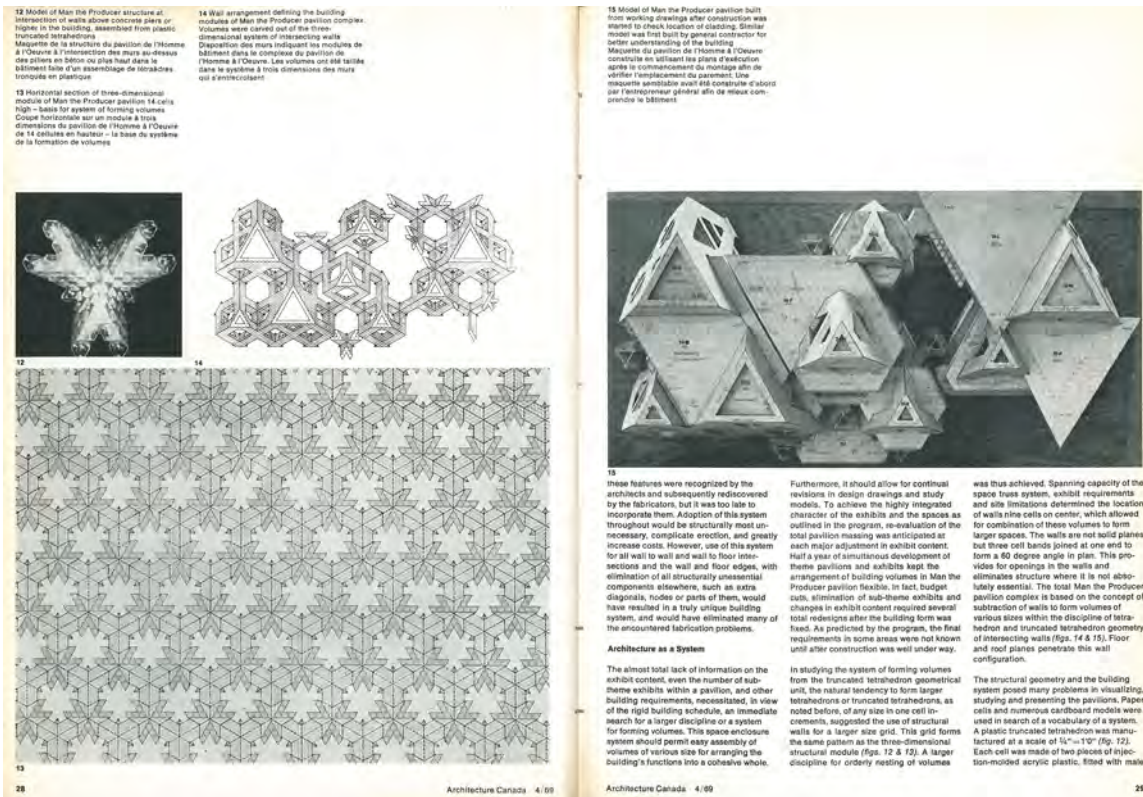


Secteur de l'exhibé de la Cellule humaine. Secteur: l'Homme et la vie.

Exterior entrance of Man and Life pavilion showing the "Cell".

5

Fig. 4.26 CCWE promotional booklet featuring Arcop's study models, 1965



12 Model of Man the Producer structure at intersection of walls about concrete piers or hinges in the building, assembled from plastic truncated tetrahedrons
Maquette de la structure du pavillon de l'Homme à l'Œuvre à l'intersection des murs en béton et des piliers en béton ou plus haut dans le bâtiment faite d'un assemblage de tétraèdres tronqués en plastique

14 Wall arrangement defining the building volumes of Man the Producer pavilion complex. Volumes were carved out of the three-dimensional system of intersecting walls
Disposition des murs indiquant les volumes de bâtiment dans le complexe du pavillon de l'Homme à l'Œuvre. Les volumes ont été taillés dans le système à trois dimensions des murs qui s'entrecroisent

13 Horizontal section of three-dimensional module of Man the Producer pavilion 14 cells high - basis for system of forming volumes
Coupe horizontale sur un module à trois dimensions du pavillon de l'Homme à l'Œuvre de 14 cellules en hauteur - la base du système de la formation de volumes

15 Model of Man the Producer pavilion built over working drawings after construction was started to check location of cladding. Similar model was first built by general contractor for better understanding of the building
Maquette du pavillon de l'Homme à l'Œuvre construite en suivant les plans d'exécution après le commencement du montage afin de vérifier l'emplacement du parement. Une maquette semblable avait été construite d'abord par l'entrepreneur général afin de mieux comprendre le bâtiment

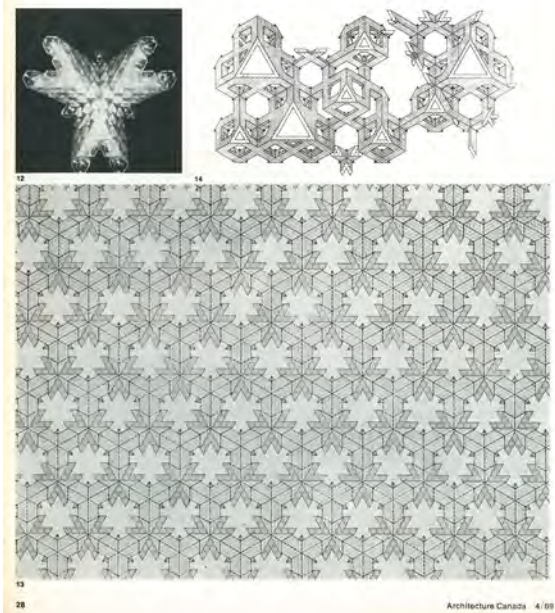


Fig. 4.27 Man the Producer: the tetrahedral "system"

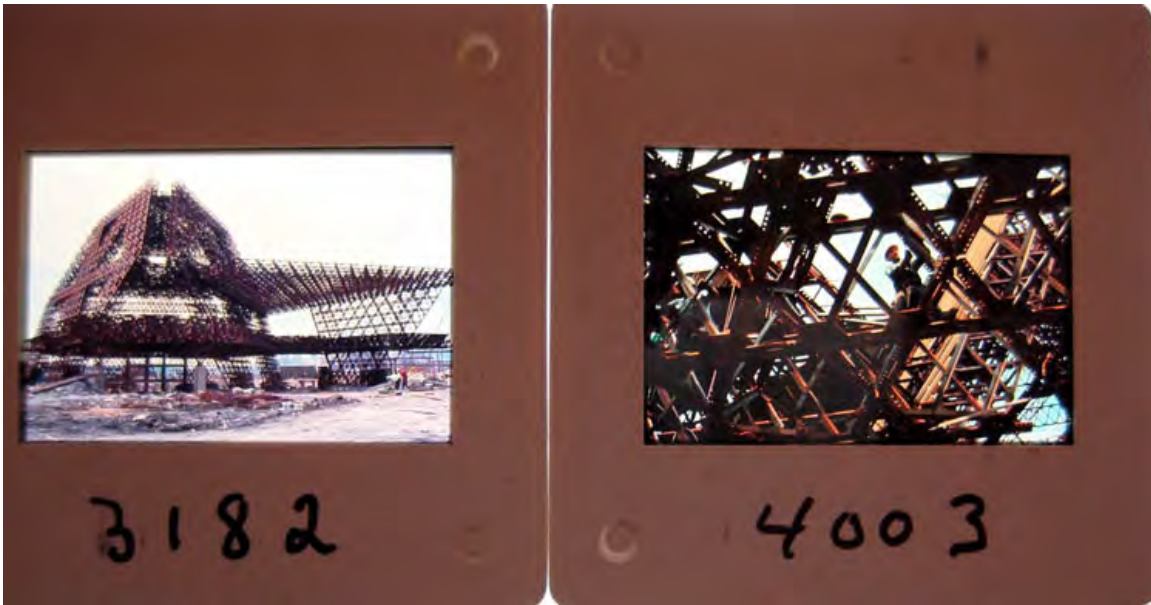


Fig. 4.28 Man the Producer under construction, autumn 1966

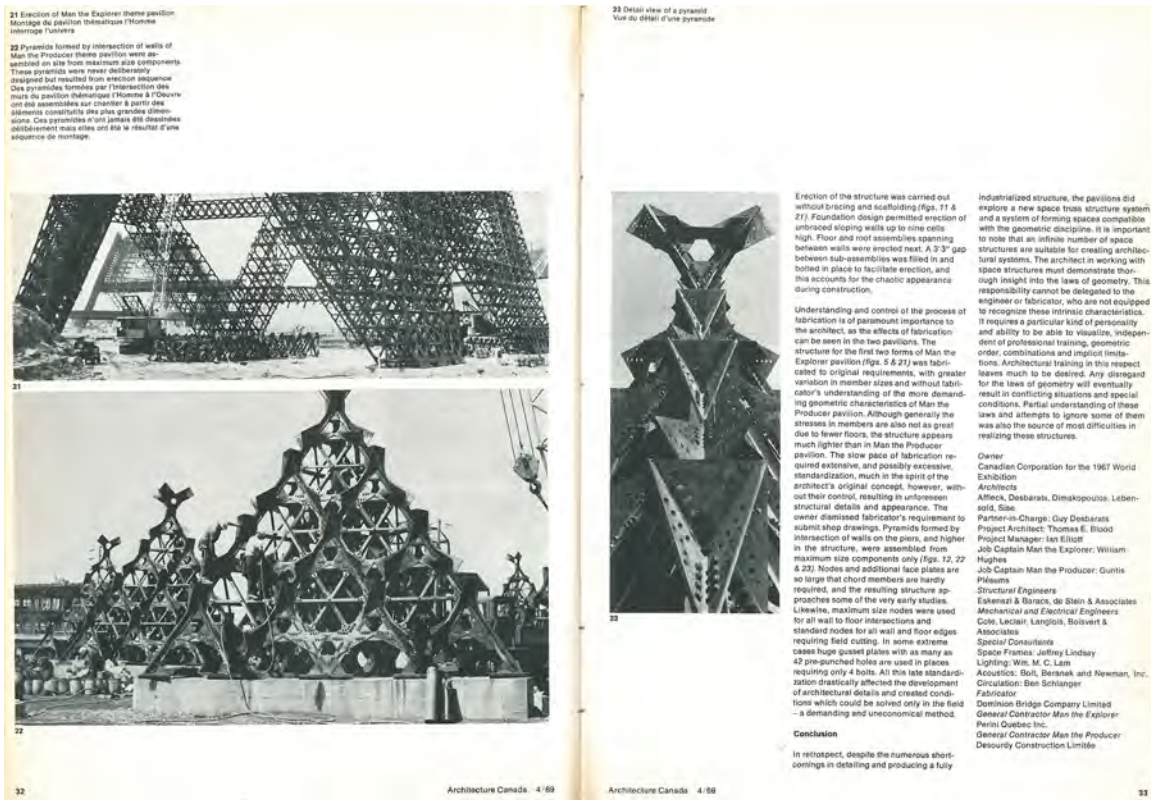


Fig. 4.29 Man the Producer under construction: the ideality of space frames theory meets the reality of onsite production

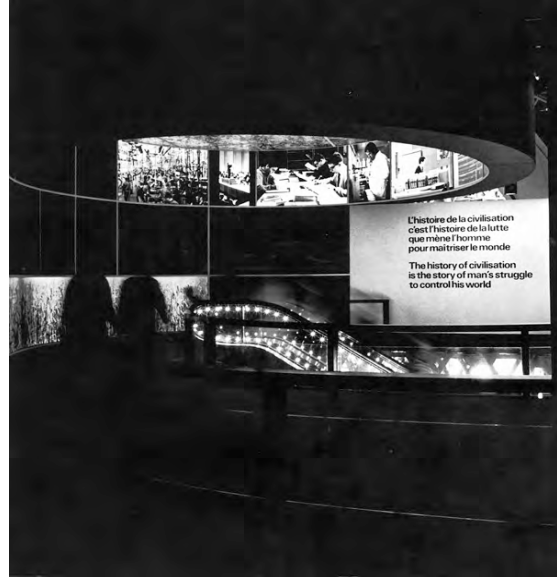
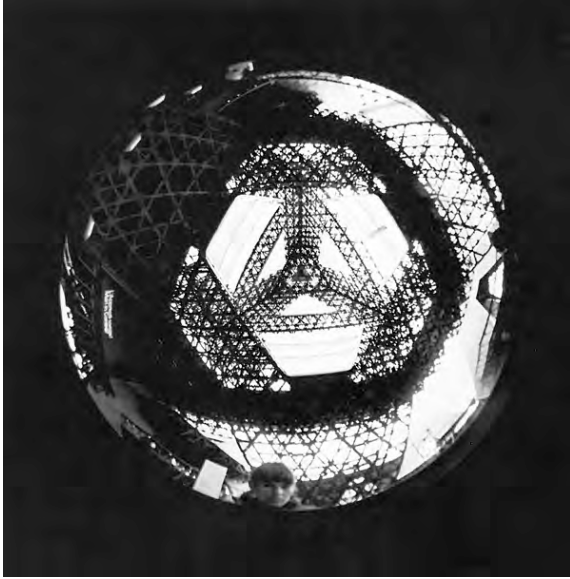


Fig. 4.30 Deep inside Man the Producer

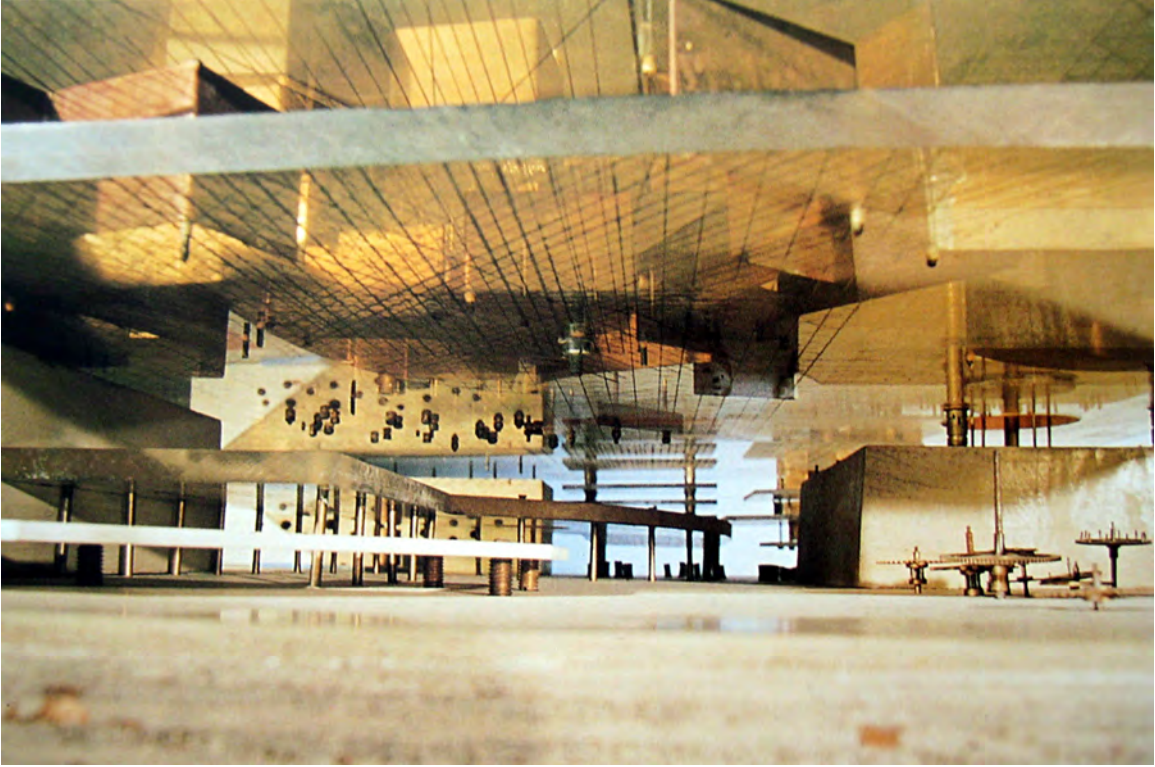


Fig. 4.31 Constant Nieuwenhuis, New Babylon, circa 1964

(hairdo, waistline) as she walks and turns to and fro. And there is the jolly movie in which the plot is adjusted at intervals to accord with the wishes of the audience. And the Czechs' old *Laterna Magika* show is back again, but over in La Ronde, not in the national pavilion.

In all this, the most promising single factor is that modicum of audience participation in the adjustable movie, the promise that the visitor will be treated as a participant—not as a simple dazed receptacle of respectful impressions, like in the Russians' giant five-and-ten-rouble bazaar of capital equipment. But it's only the Czechs who did it. When you think that this Expo is officially subtitled "*La Terre des Hommes*," and what fun they had with *la Terre*, dredging up artificial islands and lagoons and things all over the Saint Lawrence, it is astonishing how little they do with *l'Homme*.

He is viewed through the filters of statistic and the lenses of rhetoric; he is sentimentalised in technicolor and stereophonic sound; he is hectored, directed and asked to respect the yellow line at the edge of the platform. And he is there, live and in person, at least a hundred thousand of him most days, some days half a million, and hardly anyone has had the wit to put him on stage.

Yet, at many points, *l'Homme* and the

Oiseau he has brought with him are the saving of Expo. Many an acre of boring (and sometimes prematurely crumbling) pavement is made into a people-garden by the almost mandatory lime-green trouser suits (21 in view simultaneously at one point) and orange or yellow stretch-pants of the bird life, the illustrated windcheater jackets of high-school athletes and all those nutty hats from the concession shops.

But they weren't doing this exterior decorating by design. The only place where the human race was fully written into the act is in the most underrated, yet probably the best, building there—the Canadian theme pavilion "*L'Homme à l'Oeuvre*." Architected by the Affleck-Desbarats partnership (locals again) it is . . . hum . . . well . . . like, try to imagine a cross between Piranesi, the Eiffel Tower, and the Fun Palace project. An incomprehensibly endless-seeming structure of rusting steel tetrahedra, rational but romantic, it straggles across a canal, shelters things like snack bars and toilets among its feet, covers a number of entrances, and rises to an assortment of summits.

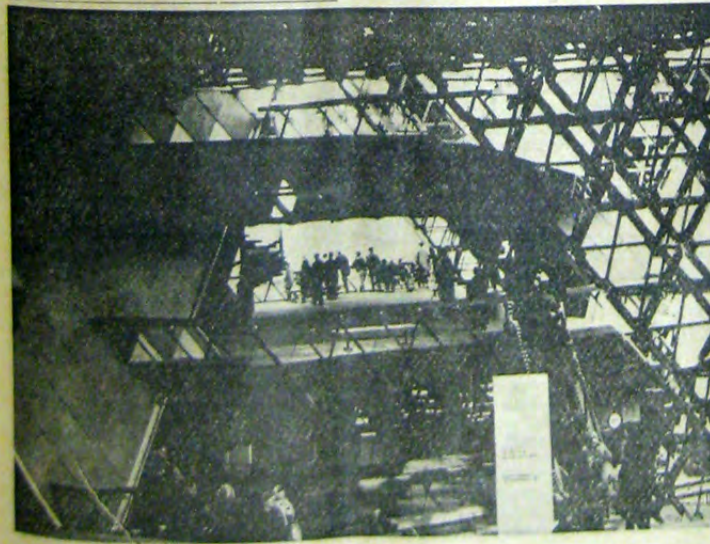
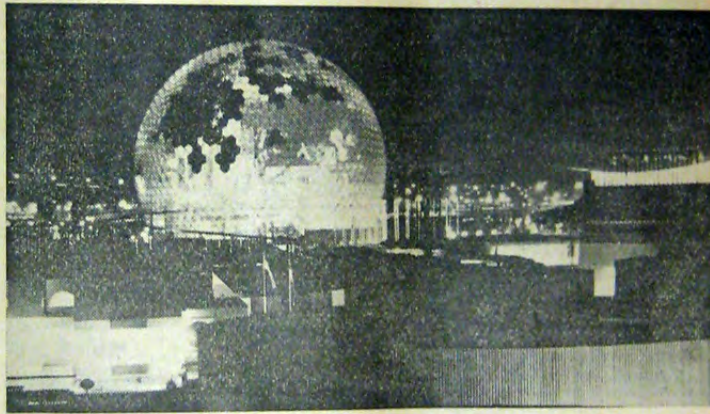
It has the dumb authority of primitive industrial plant, and through it are threaded staircases and escalators, delivering the visitor to galleries and walks and platforms, on and from which he sees other visitors living,

moving and having their being and vanishing from time to time into dark holes to view theme displays didactically but brilliantly presented (I suspect the hand of Jacques Guillon here—another local) and emerging, slightly to their surprise, on walks and galleries they didn't remember seeing before. It is so vast and three-dimensionally complex that in three visits I know I didn't visit every exhibit, work every gadget, walk every platform—it is an Expo in itself. And because it is so vast and complex, it swallows queues before they form, and permits almost random circulation inside.

It also establishes the (admittedly very high) standard by which the US pavilion has failed. Buckminster Fuller gave this a far more advanced and elegant structure, probably the best big dome he has ever done; and there are some wild things inside—the king-size New York School paintings, the space tackle, the mini-rail plunging straight through and out the other side. But its internal circulation is tight, linear and non-permissive (by the standards of *L'Homme à l'Oeuvre*, that is) and much of the stuff on display looks, at a second visit, no more than serendipitous, as if the Cambridge Seven design group, instead of designing to communicate a theme, had simply taken the opportunity to collect goodies (bead mats,



Photographs, left to right, show Habitat, a miral, the theme *L'Homme à l'Oeuvre* exhibition, and the US pavilion



decoy ducks, old movie-star pin-ups, a hundred and fifty representative US hats) they couldn't normally afford. All marvellous things but . . .

But, chiefly, it is not Bucky Fuller's original project. This was for a giant flat space-frame on legs, sheltering a public gallery with control panels on which visitors could set up coast-to-coast strategic games, population movements, natural resources, ethnic distributions, conservation programmes, on an enormous map of the US that covered the whole floor of the pavilion. That's the sort of level that great exhibitions ought to be working at nowadays.

In the meantime the Canadians, with *L'Homme à l'Oeuvre*, and the lesser theme pavilions that use the same structure, are left securely in control of the field and arguably pointing the way to the most vital topic to be explored by the next wave of "universal and international exhibitions licensed by the International Exhibitions Bureau in Paris." Not structure, however brilliant may be devices like Frei Otto's free-form tent over the German exhibit; not transportation, whatever the success of the two British hoverferries; but the great exhibit himself—*homo sapiens*.

Fig. 4.32 Man the Producer as seen by Reyner Banham in *New Society* (1 June 1967)



Fig. 4.33 *Progressive Architecture* (June 1967)

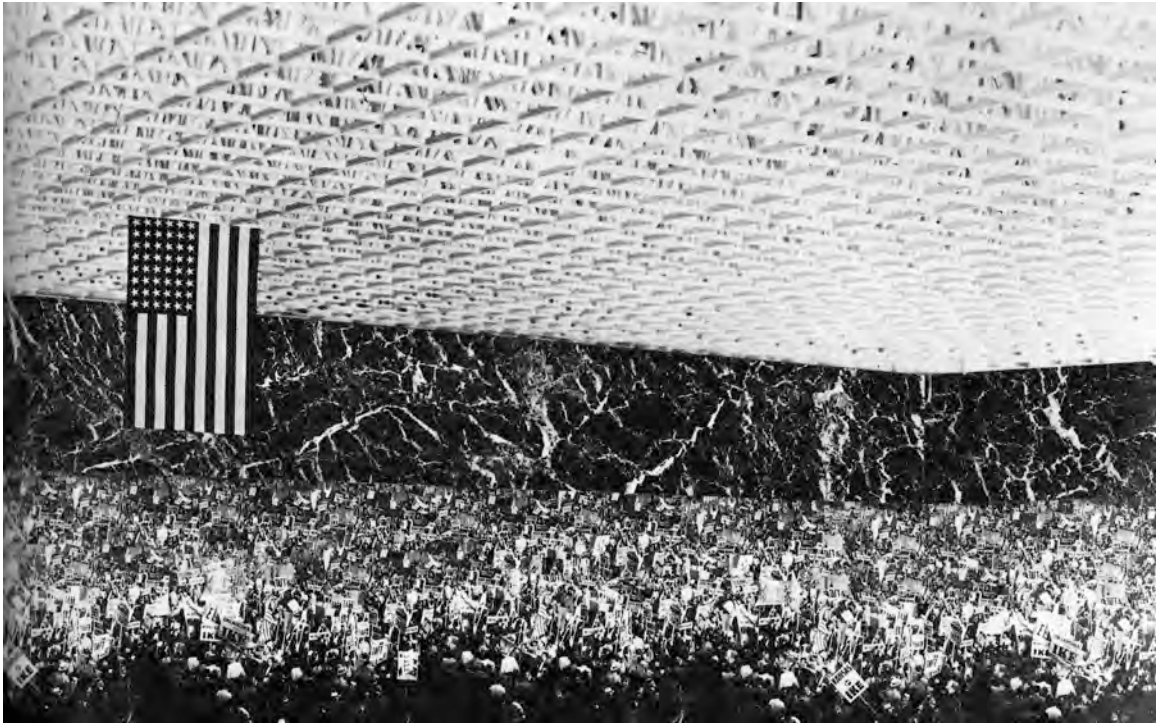


Fig. 4.34 Space frames: Mies van der Rohe, Convention Hall project, 1953-1954

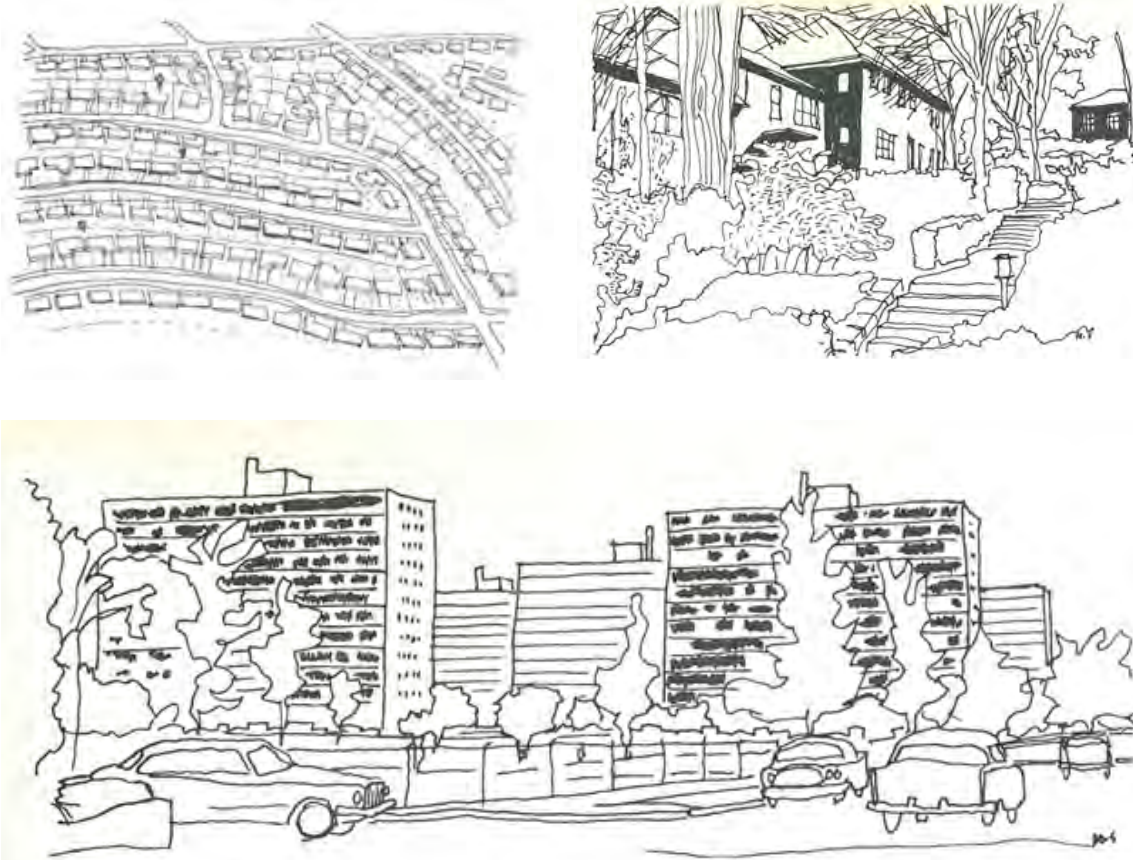


Fig. 5.1 Moshe Safdie's sketches from his CHMC-sponsored study on North American housing prior to beginning his final thesis project at McGill: a "suburban subdivision" (*upper left*); Chatham Village, Pittsburg (*upper right*); Skidmore, Owings & Merrill, Lake Meadows, Chicago

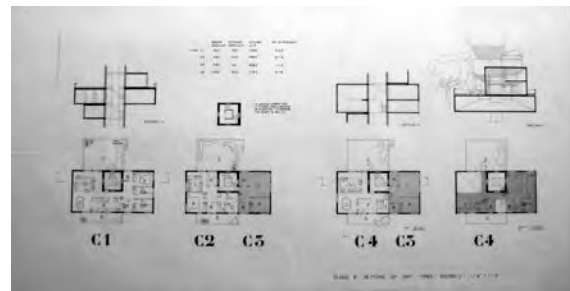
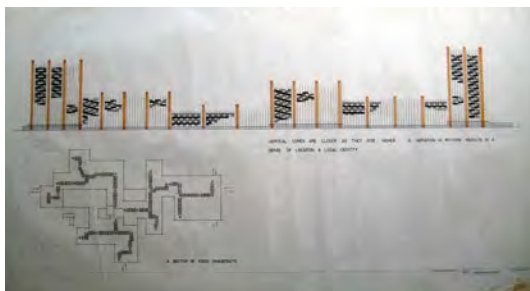
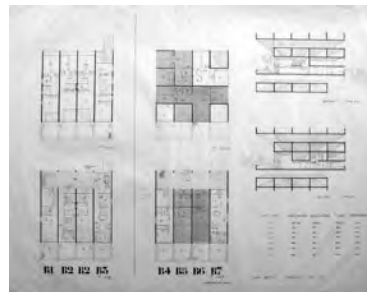
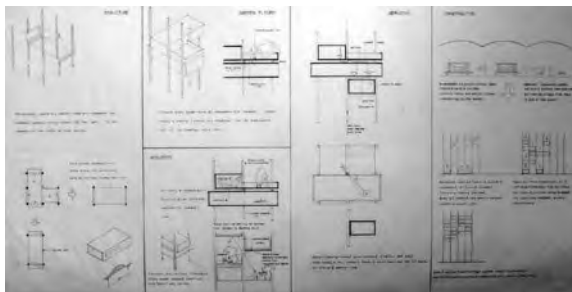
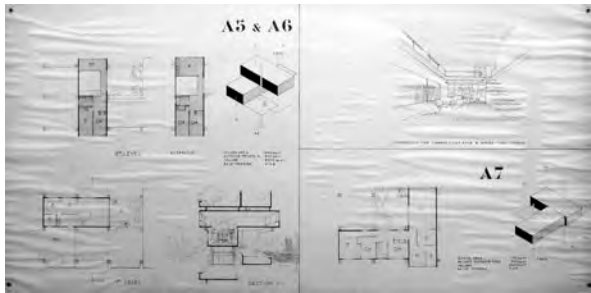
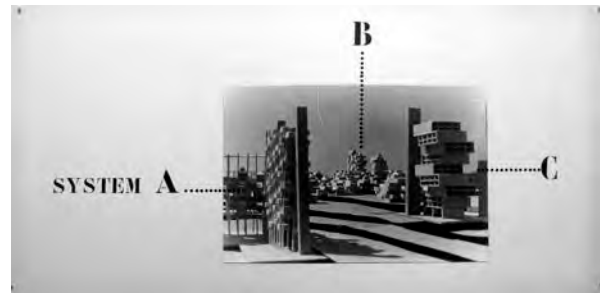
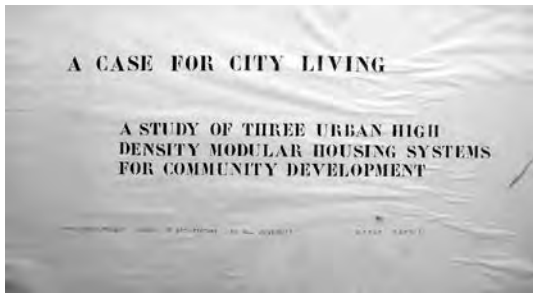


Fig. 5.2 Moshe Safdie, “A Case for City Living”, Bachelor of Architecture thesis project, McGill University, 1961

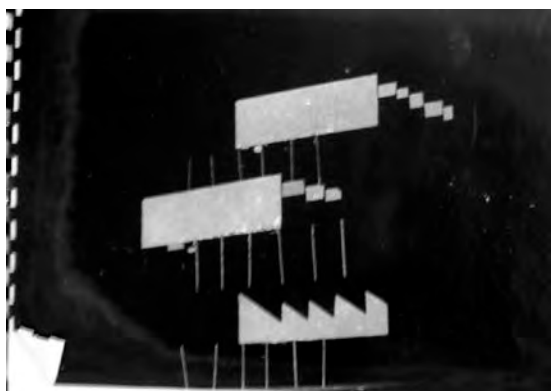
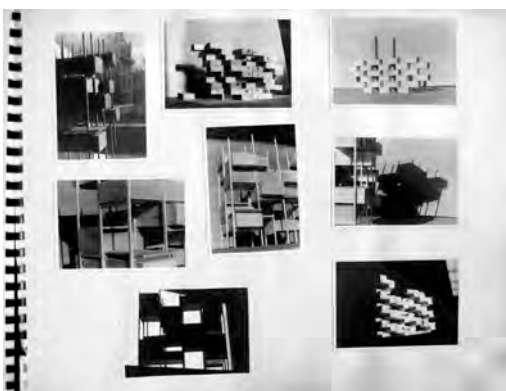
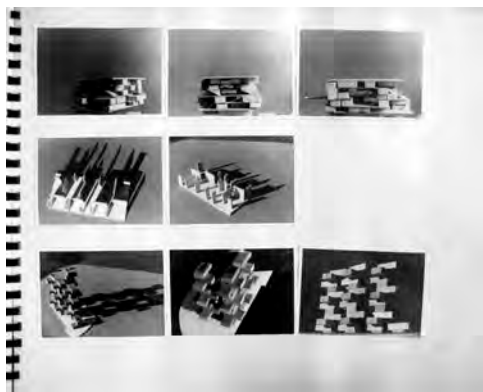
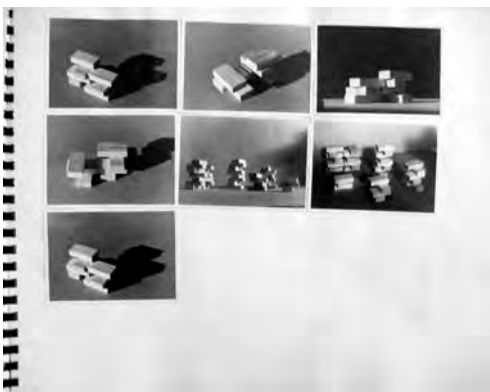
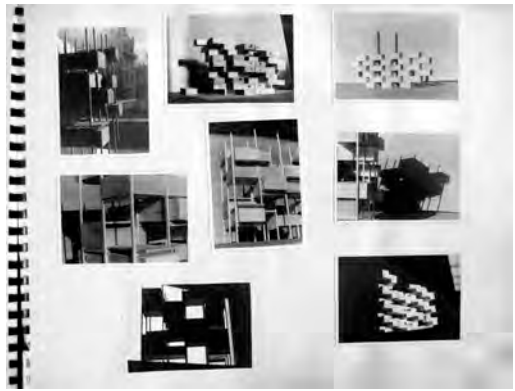
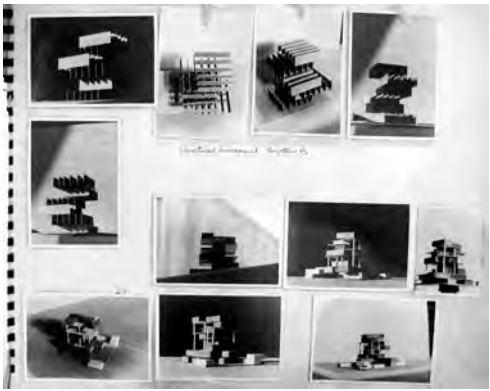
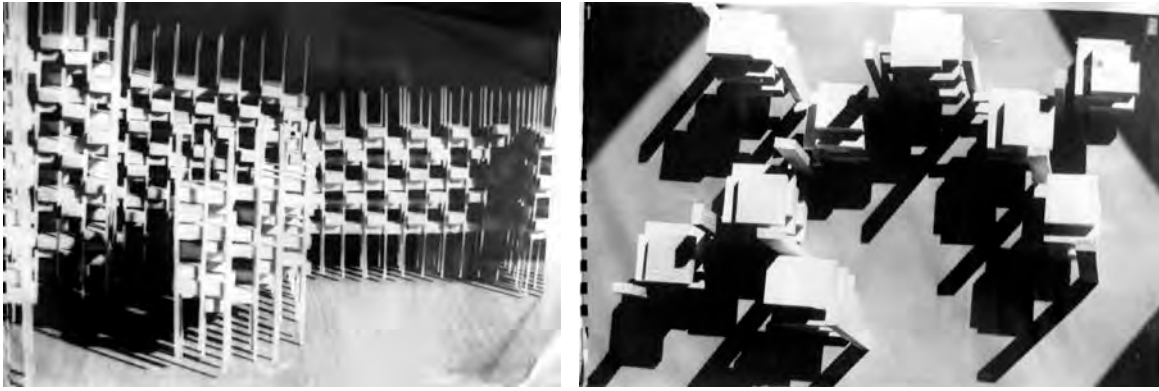


Fig. 5.3 "A Case for City Living" study models, 1960-1960

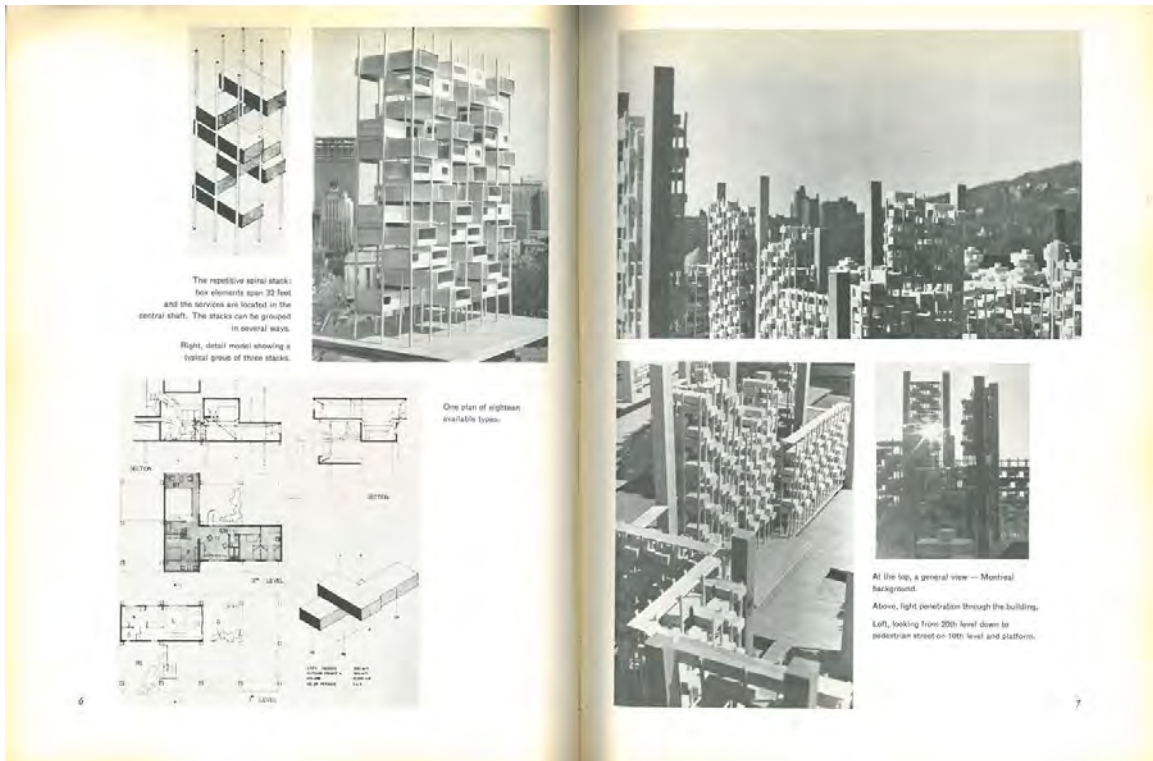


Fig. 5.4 “A Case for City Living”: Safdie’s models juxtaposed against the Montreal skyline. Published after his graduation in the Central Mortgage and Housing Corporation journal *Habitat* (November-December 1962)

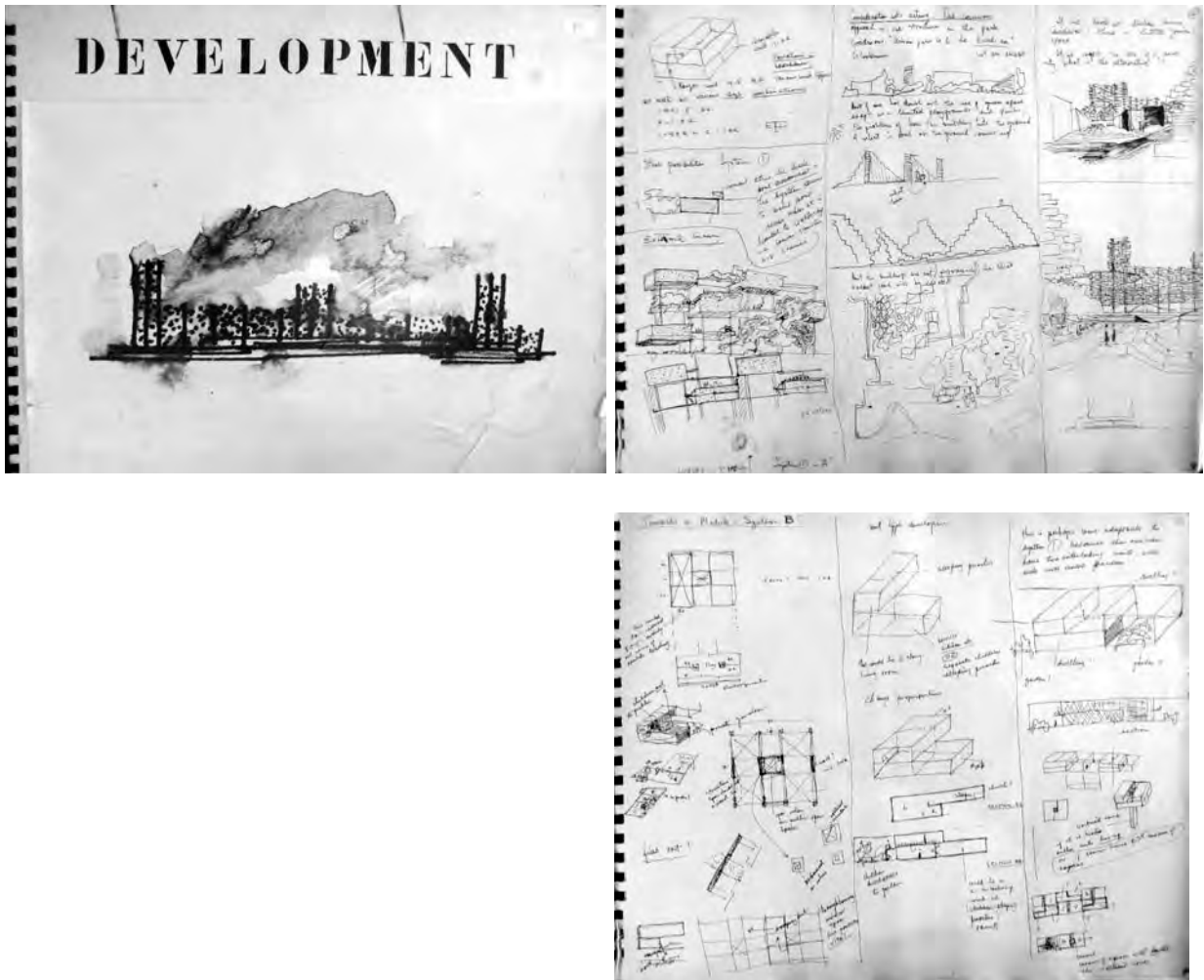
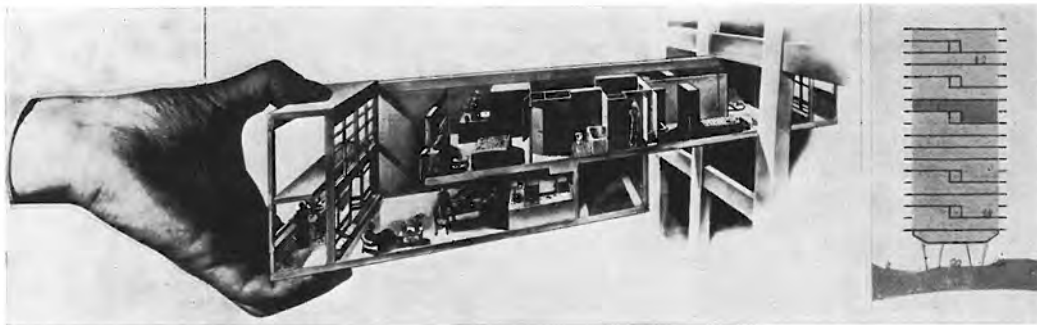


Fig. 5.5 Moshe Safdie, "Towards a Module – System B", Development sketchbook, Bachelor of Architecture thesis project, McGill University, 1961



Une cellule normalisée et standardisée: le feu, le foyer

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La Bouteille

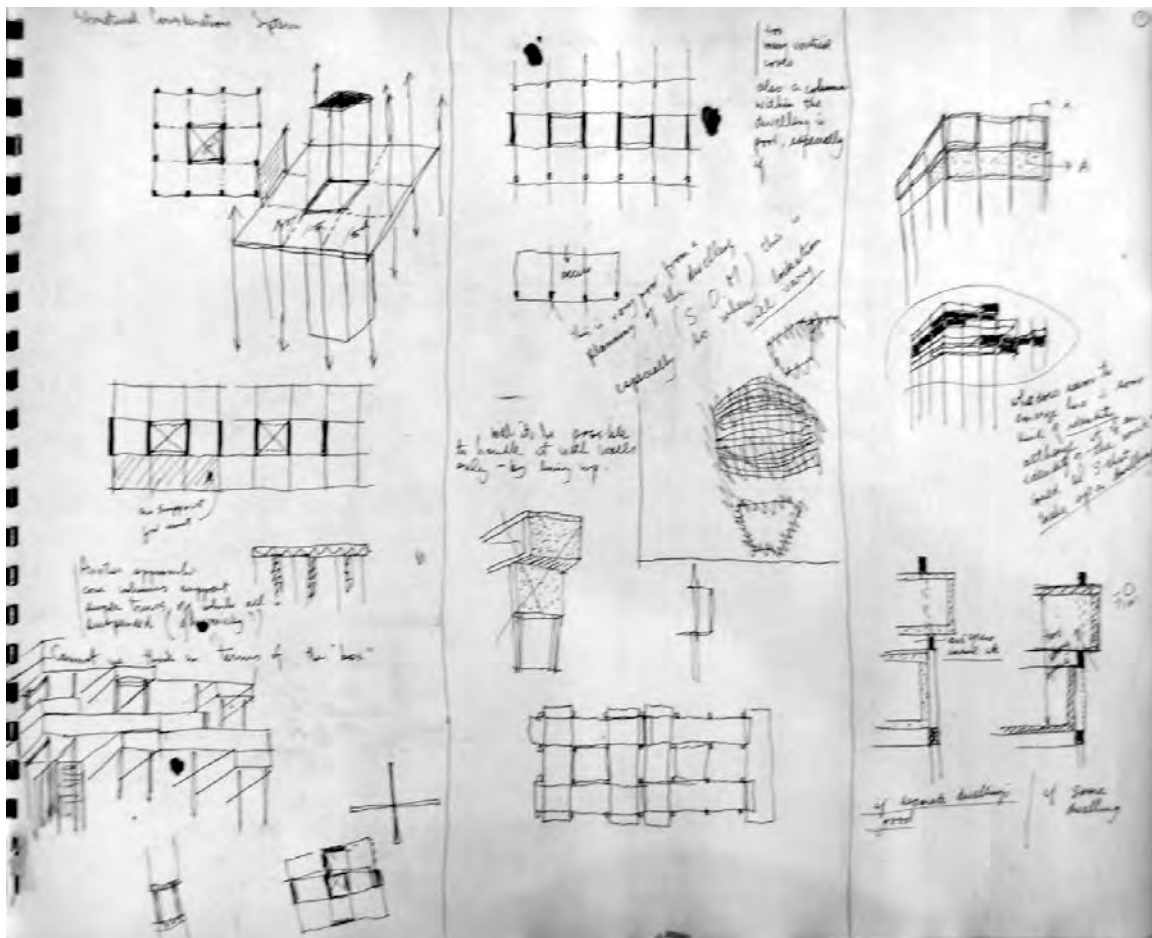


Fig. 5.6 Le Corbusier's "bottle and bottlerack": the dwelling unit and structural frame for the Unité d'Habitation (*above*); Moshe Safdie, units and structural frame, "Development" sketchbook, 1961 (*below*)

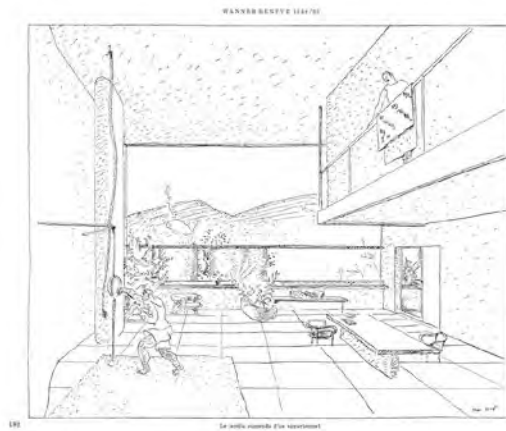


Fig. 5.7 Le Corbusier, “Le jardin suspendu”, 1928 (left); “M.S. (after LC)”, circa 1960-1961 (right)

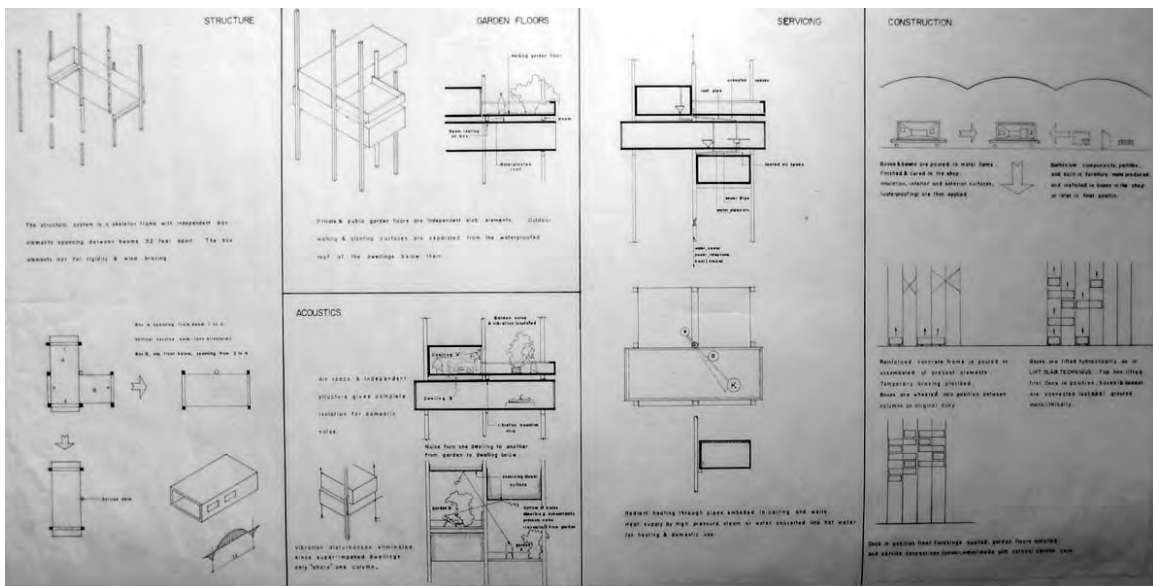


Fig. 5.8: The “lift-slab” technique for building A Case for City Living

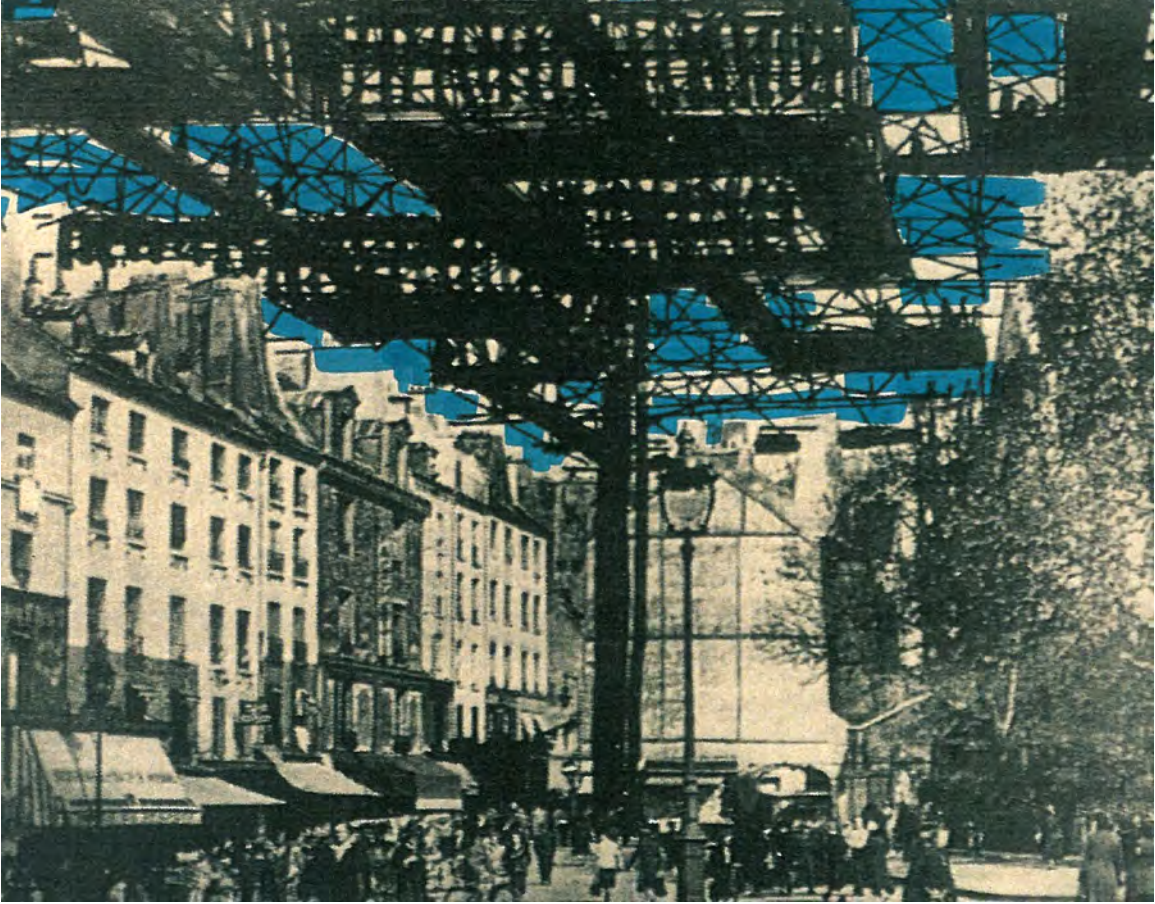


Fig. 5.9 Yona Friedman, Paris Spatial, 1959

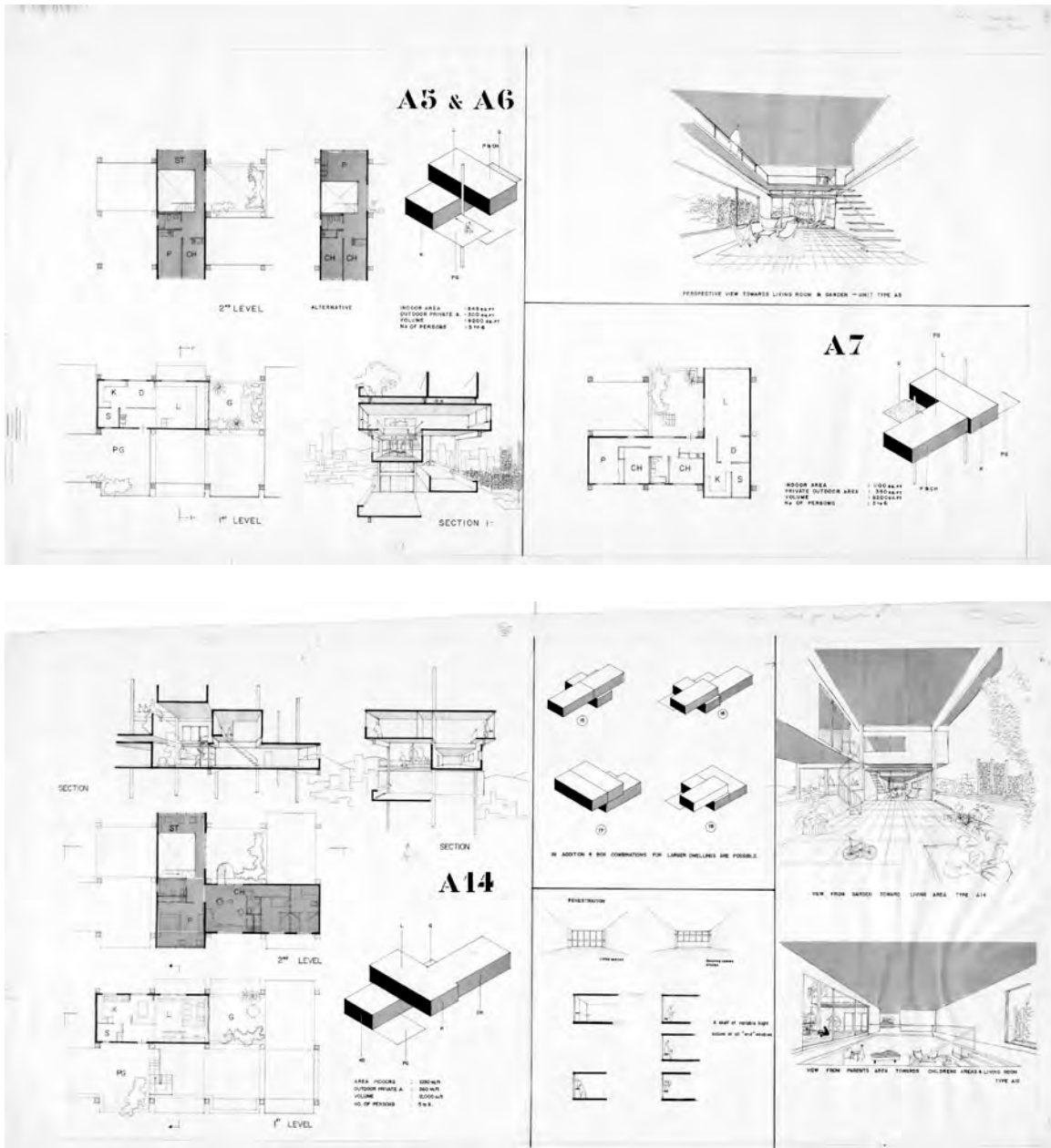


Fig. 5.10 Moshe Safdie, “A Case for City Living”, thesis presentation boards, 1961

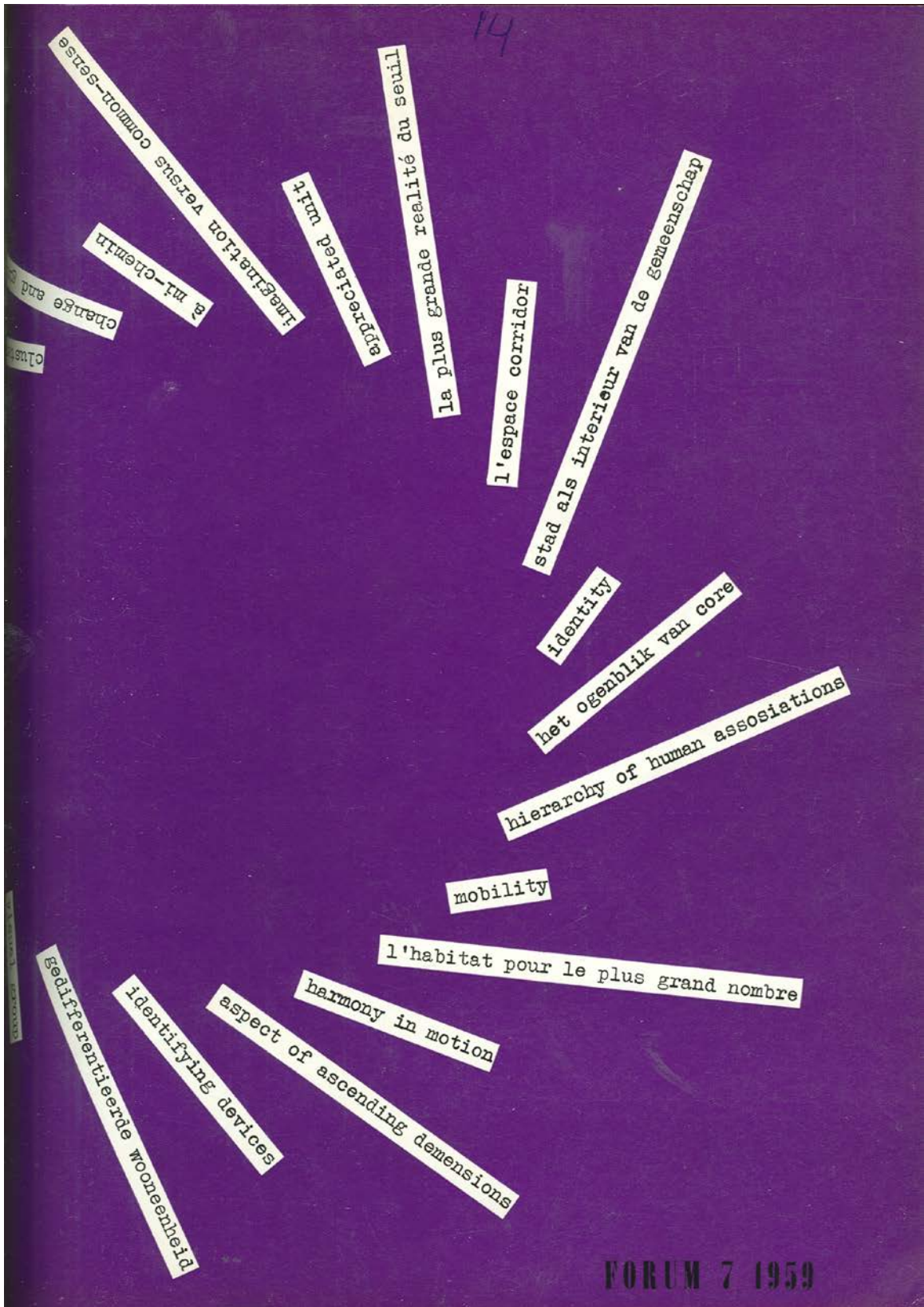


Fig. 5.11 Team 10 terminology collected in Aldo van Eyck's "The Story of another Idea", *Forum* (September 1959)

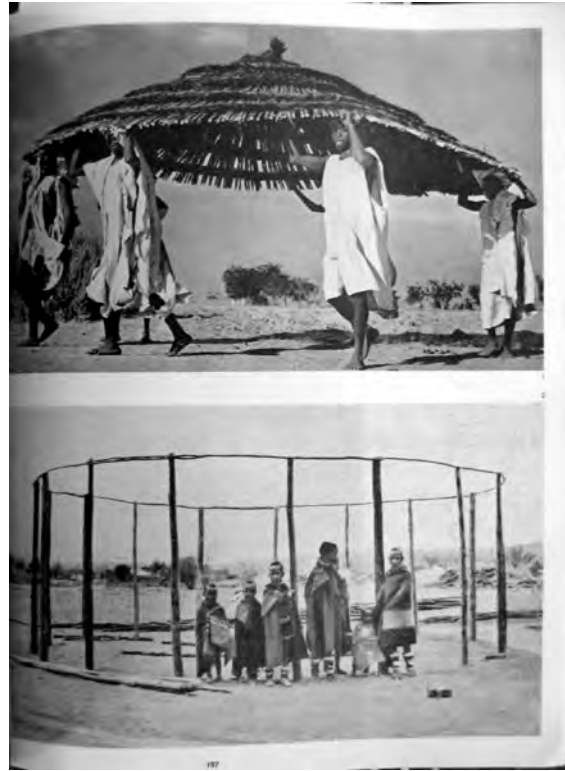
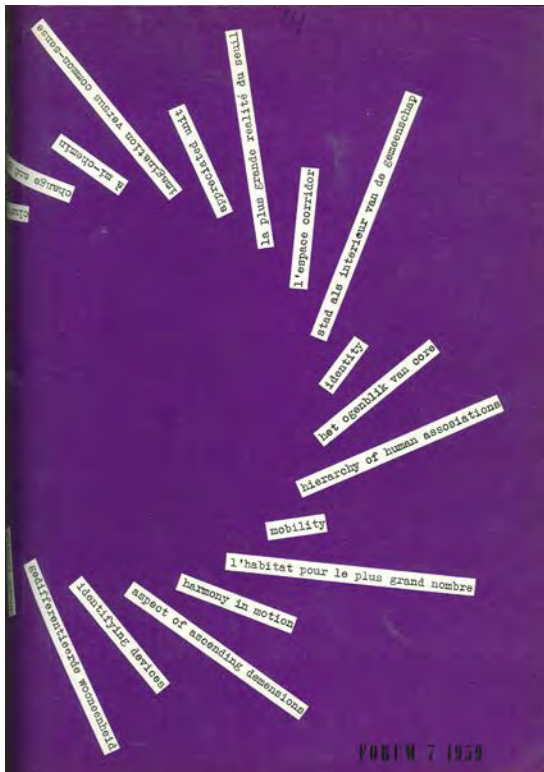


Fig. 5.12 Aldo van Eyck's juxtaposition of vernacular architectures and modern urbanism (the newly built Lijnbaan pedestrian mall in Rotterdam) in "The Story of another Idea", *Forum* (September 1959)



Fig. 5.13 Aldo van Eyck, "Architecture of the Dogon", *Architectural Forum* (September 1961)

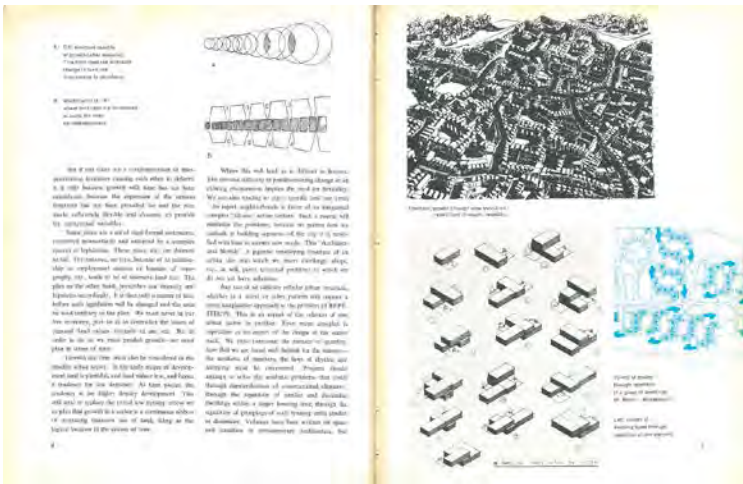


Fig. 5.14 Moshé Safdie, "The Master Plan", *Habitat* (May-June 1962): a project by Piet Blom appears in blue

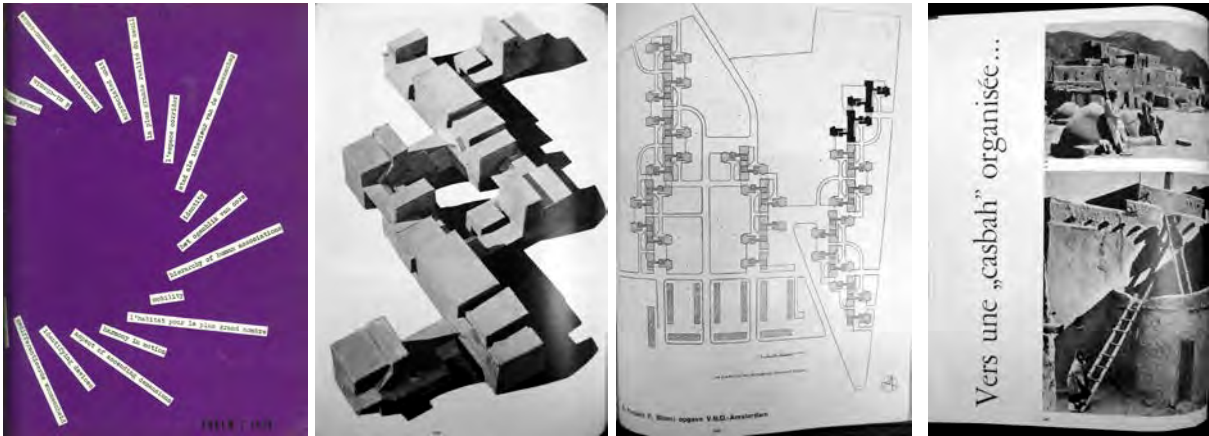


Fig. 5.15 Piet Blom in Aldo van Eyck, "Vers une 'casbah' organisée", *Forum 7* (1959)

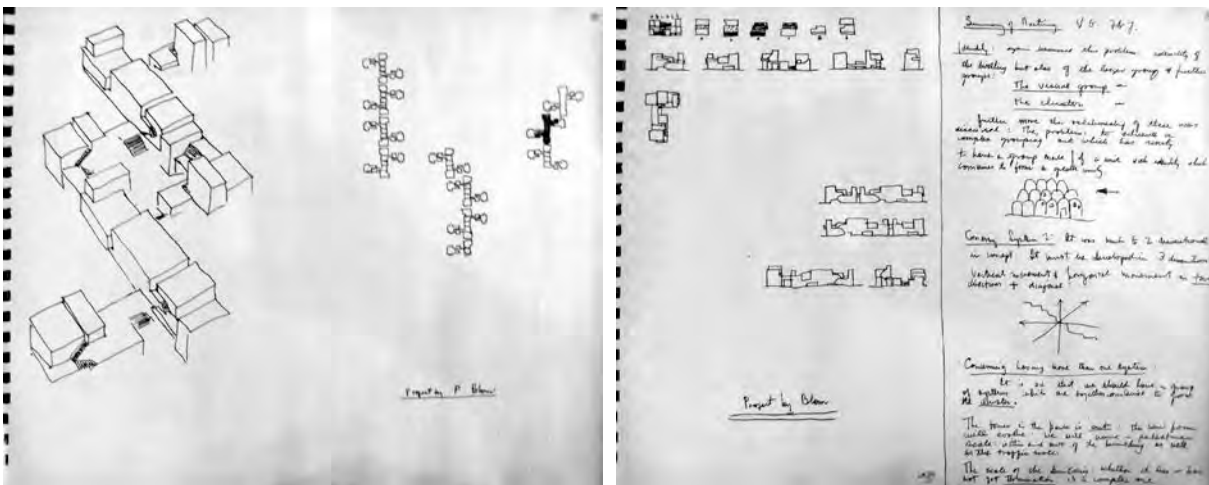


Fig. 5.16 Moshé Safdie, "Summary of Meeting V.G. [van Ginkel]" showing Piet Blom's project (left) and "cluster" forms inspired by van Eyck's images of Dogon granaries (right), Development sketchbook (February 1961)

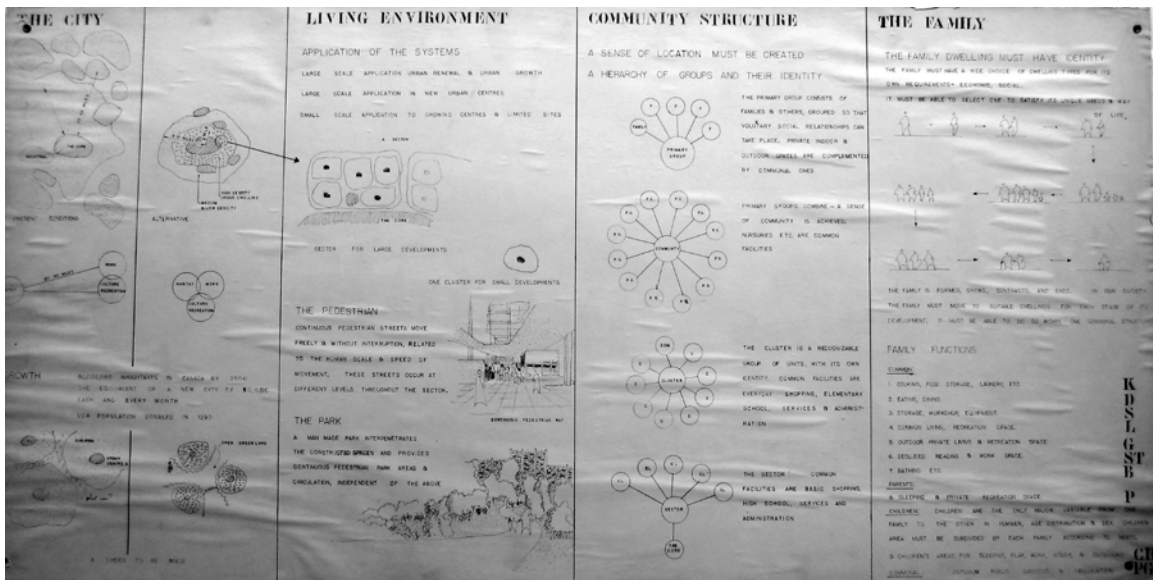
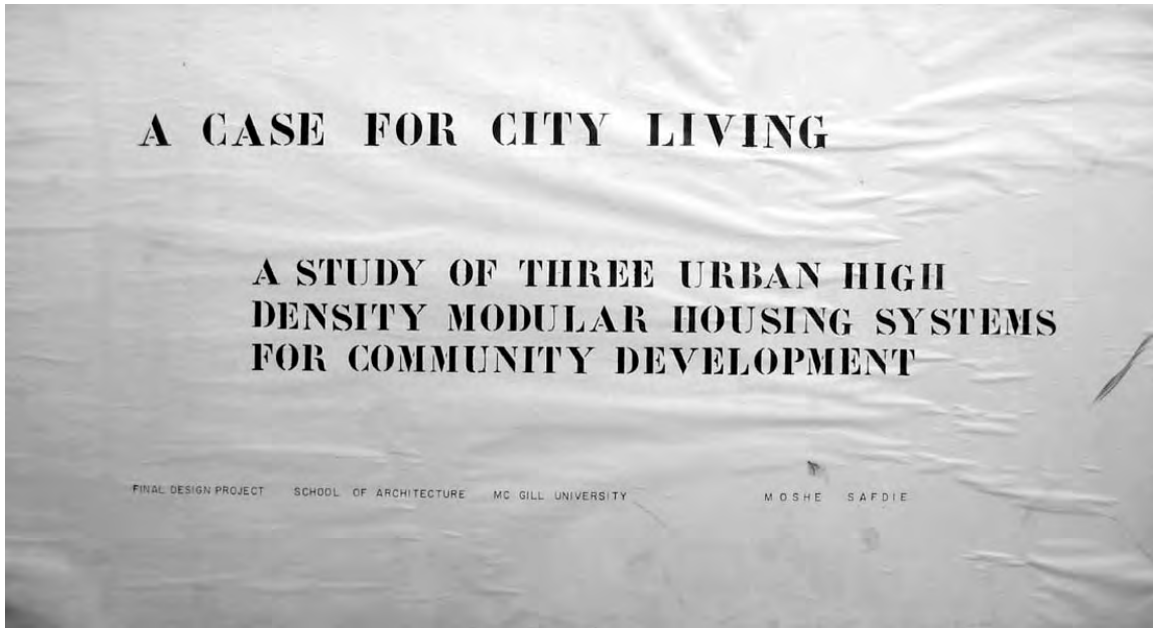


Fig. 5.17 Safdie's grille: A Case for City Living presentation board describing "The Family", "Community Structure", "Living Environment", and "the City" (1961)

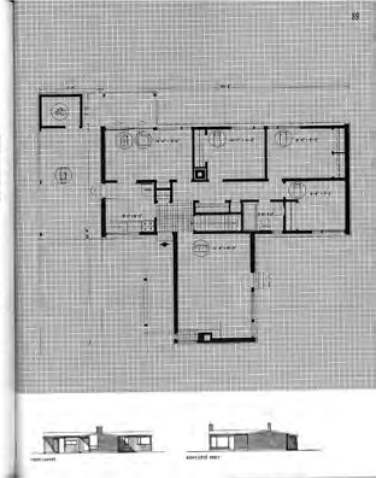
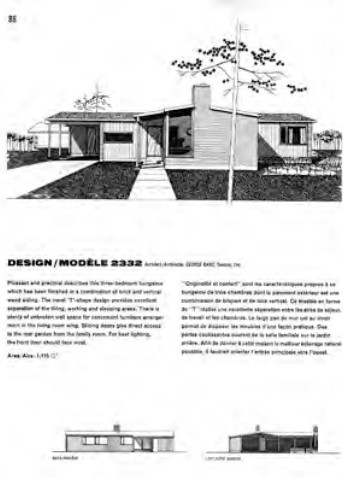
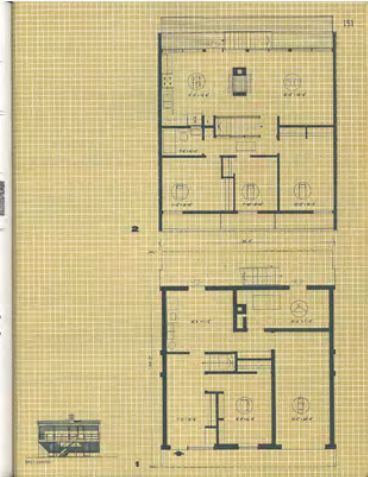


Fig. 5.18 CMHC, *Small House Designs* (1964)

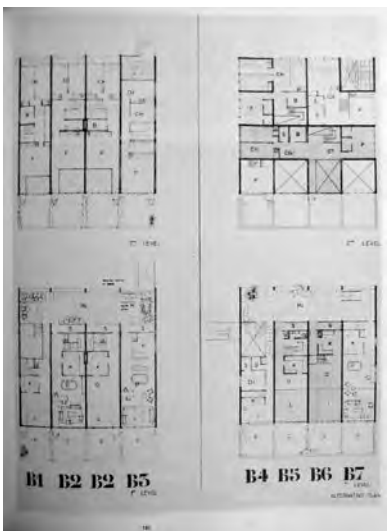
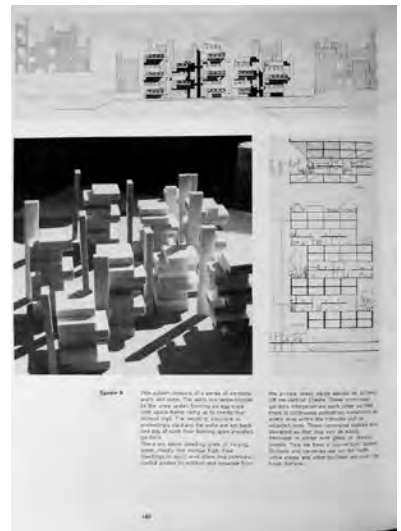
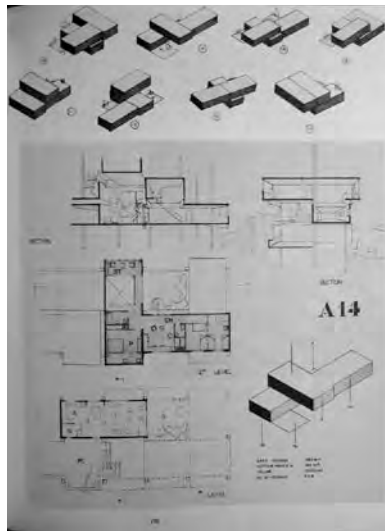
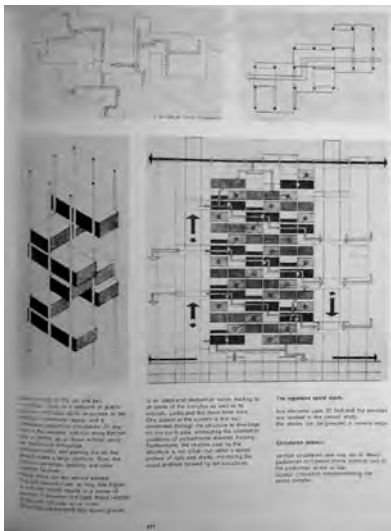


Fig. 5.19 Moshe Safdie, "A Case for City Living" published in *Forum 5* (1962)

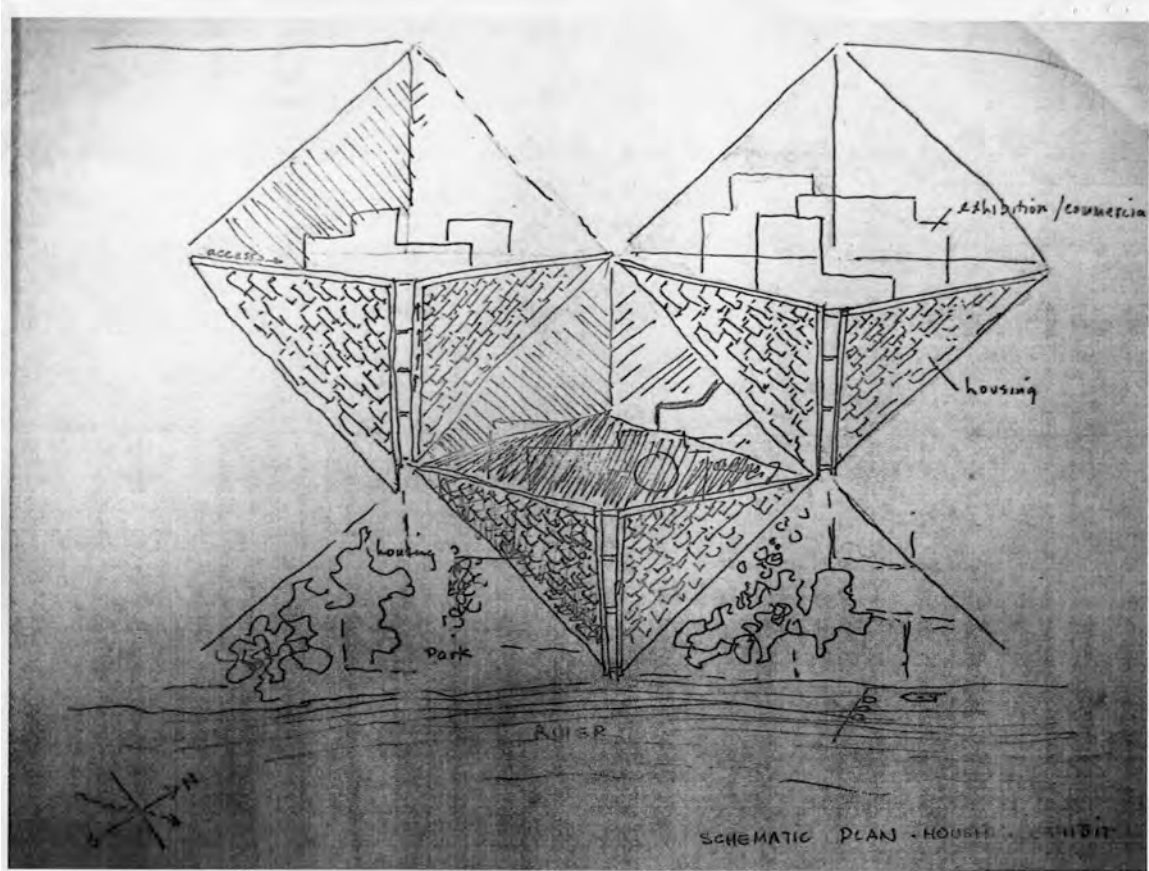


Fig. 5.20 Moshe Safdie, "Schematic Plan-Housing Exhibit" (October 29, 1963)



Fig. 5.21 Moshe Safdie, "The Master Plan" (1962); Kenzo Tange, Tokyo Bay project, 1960

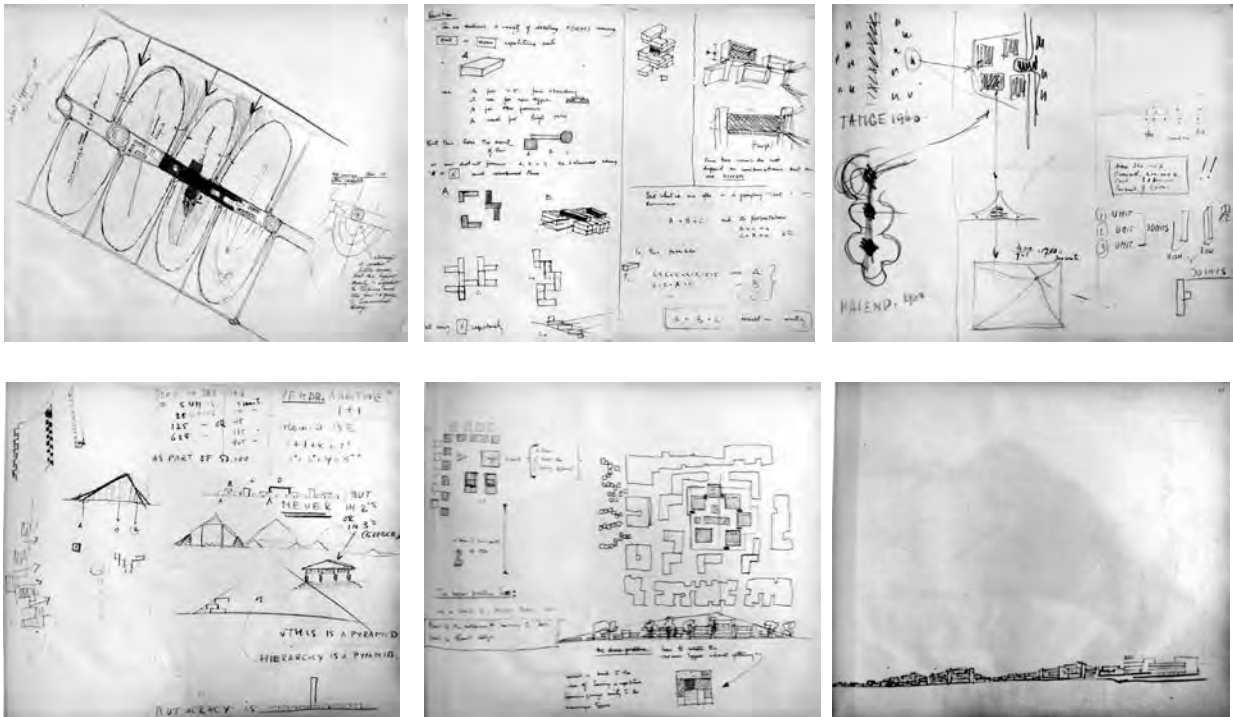


Fig. 5.22 Moshe Safdie, Meadowvale sketchbook (1961)

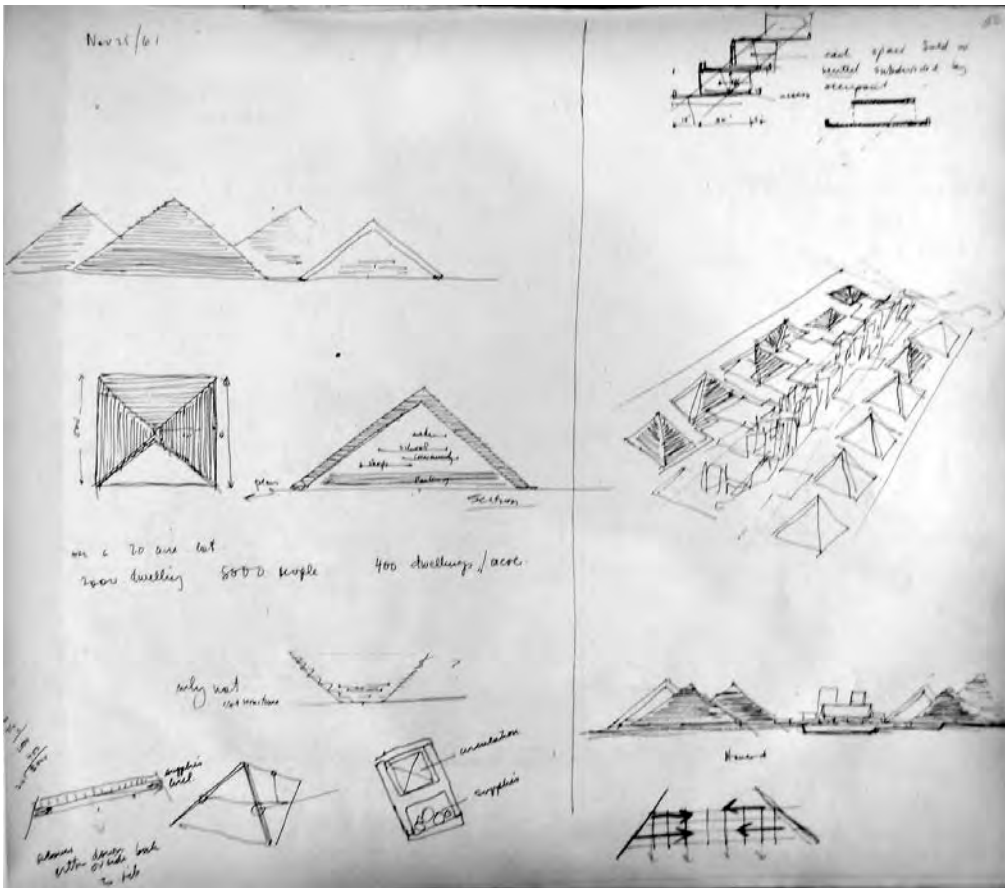


Fig. 5.23 Moshe Safdie, Meadowvale sketchbook (1961)

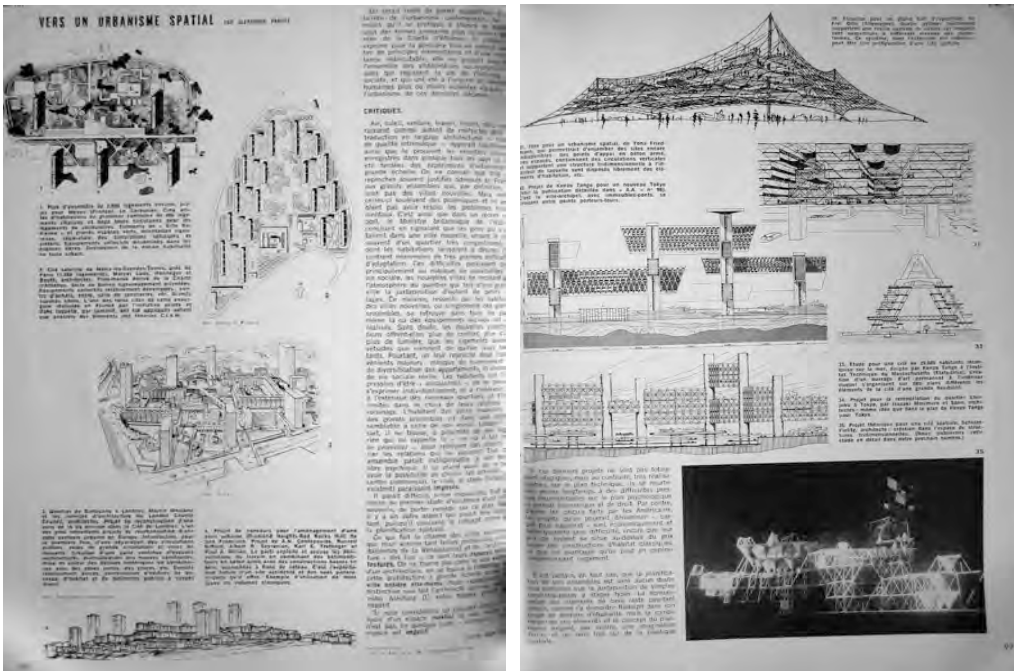


Fig. 5.24 Alexandre Perstiz, "Vers un urbanisme spatiale", *L'Architecture d'aujourd'hui* (May 1962): appended to Lalonde's memorandum on Habitat 67



Fig. 5.25 Norman Bel Geddes's Futurama at the New York World's Fair, 1939

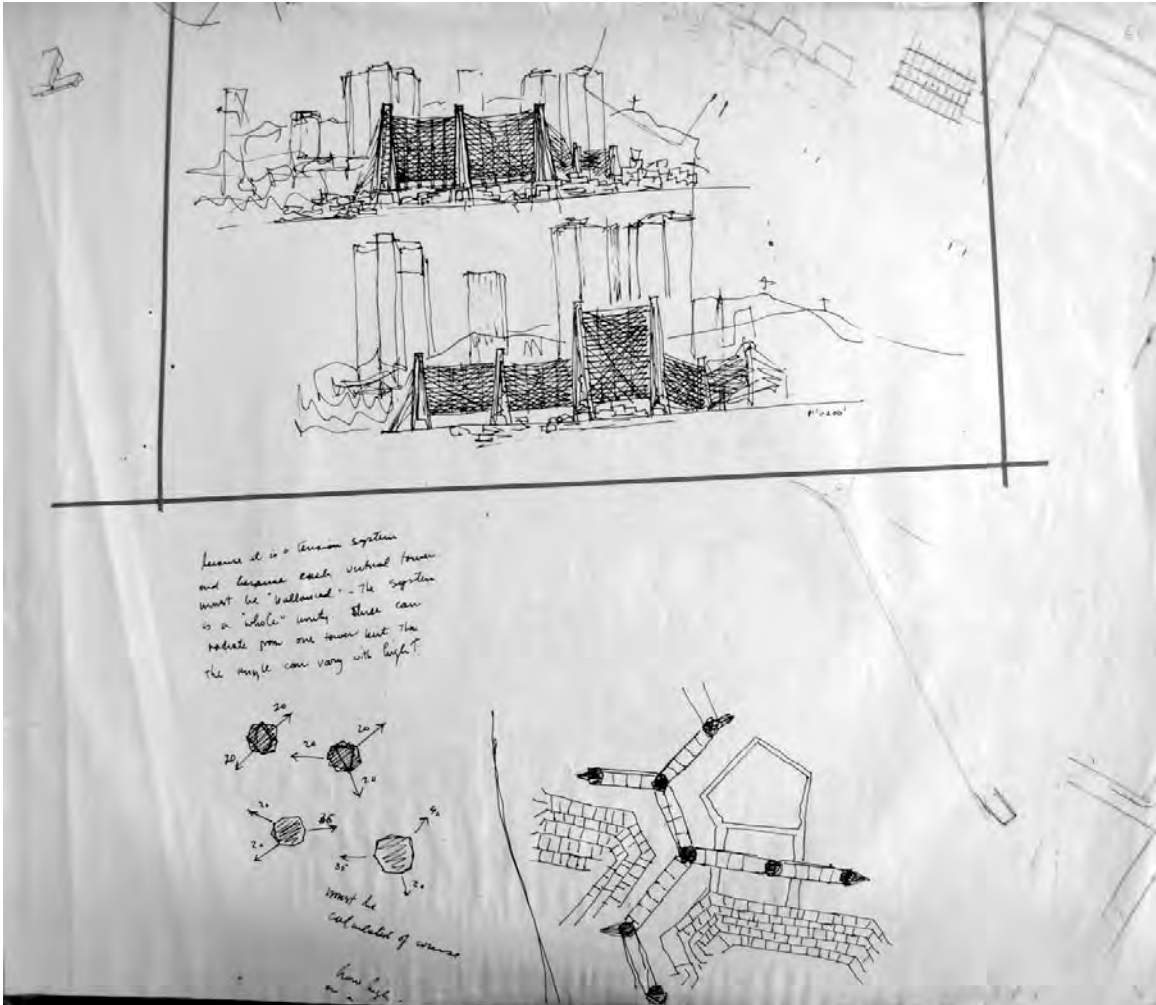


Fig. 5.26 Moshe Safdie, sketchbook, 1962: "Tension system" juxtaposed against the Montreal skyline

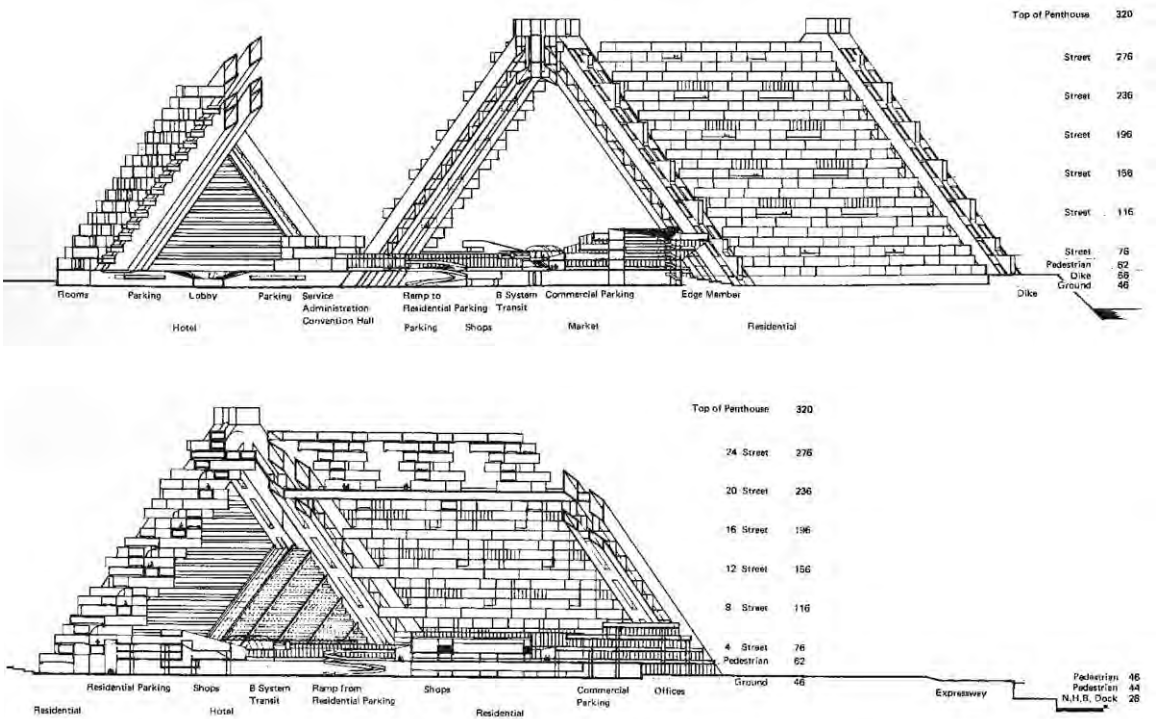
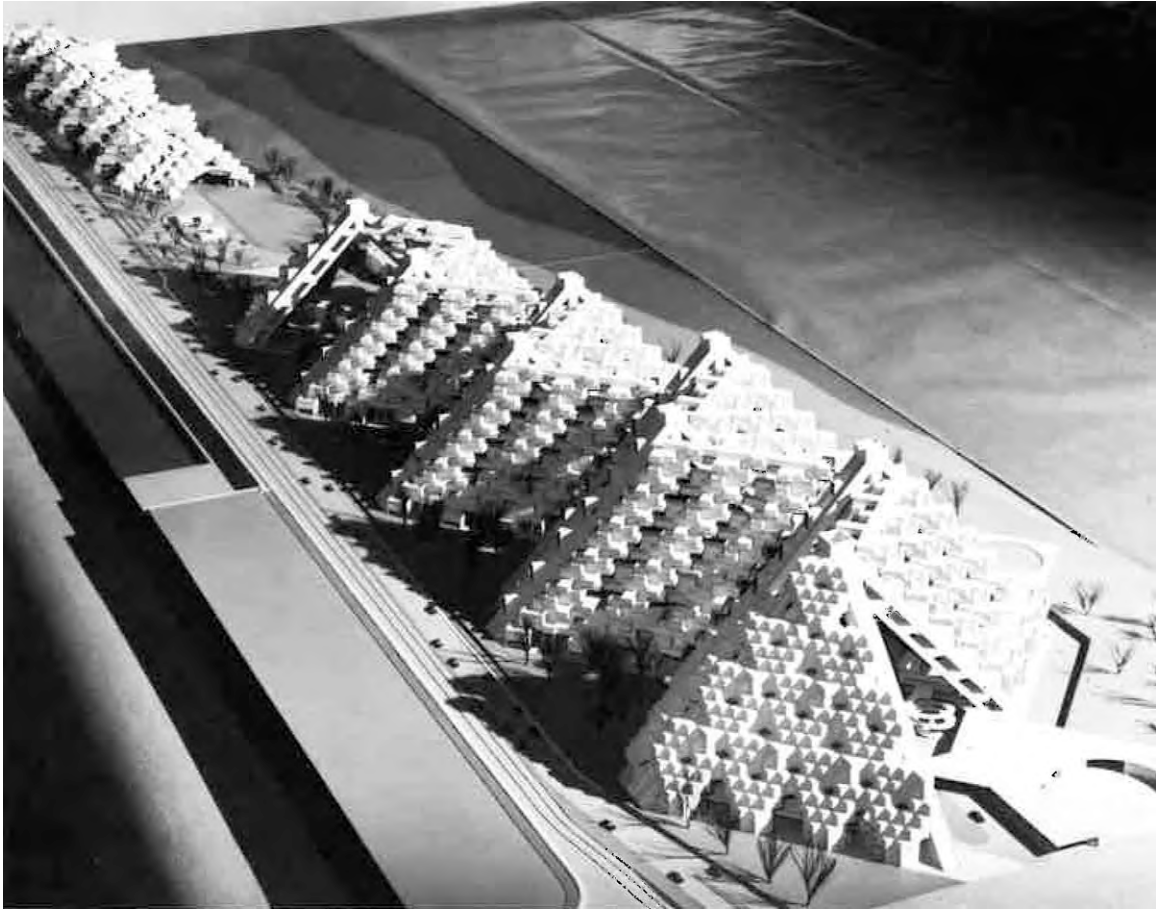


Fig 6.1 The first Habitat 67 scheme, early 1964

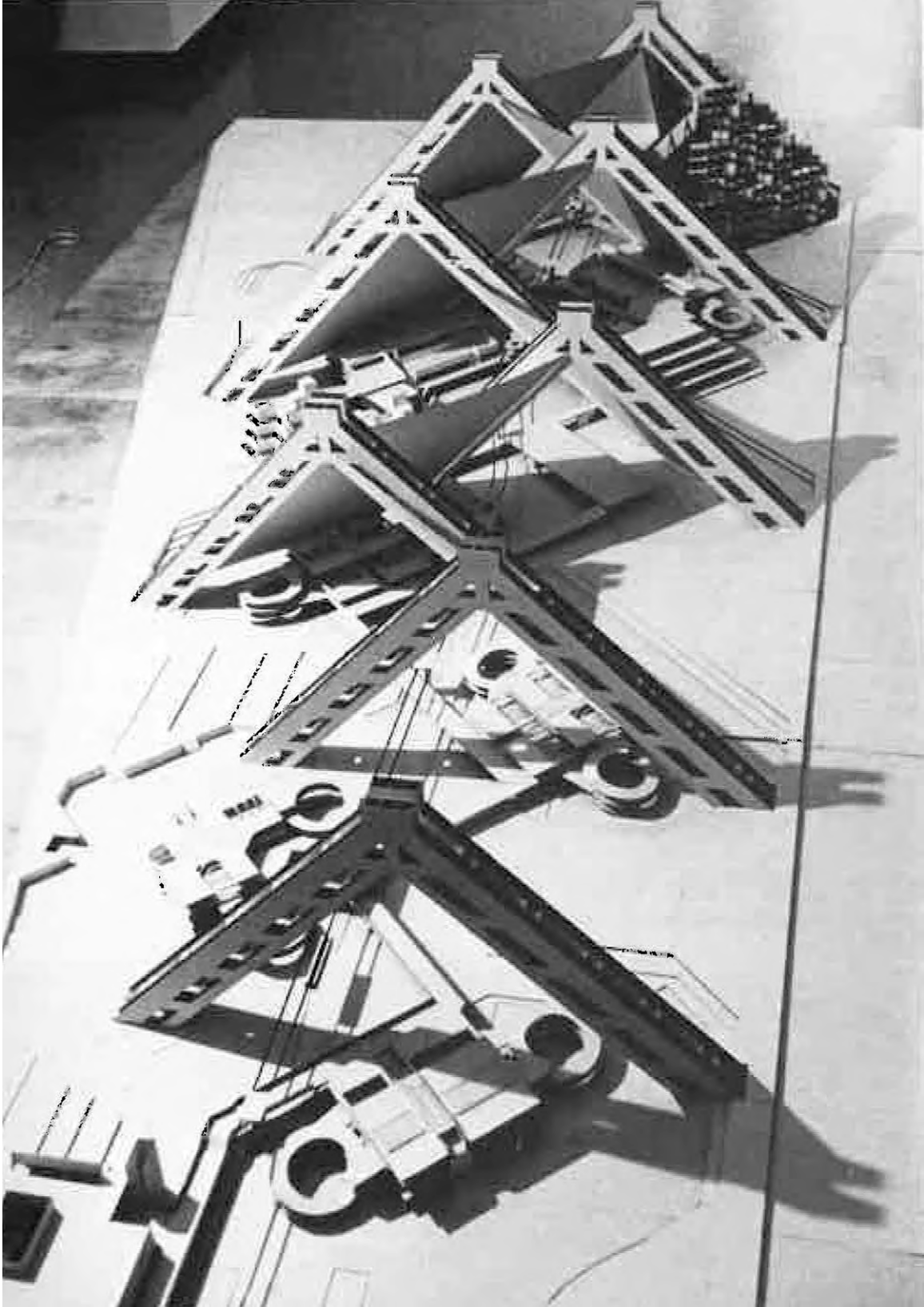


Fig 6.2 The massive A-frame structure of the first Habitat 67 scheme, early 1964



Fig. 6.3 Habitat 67

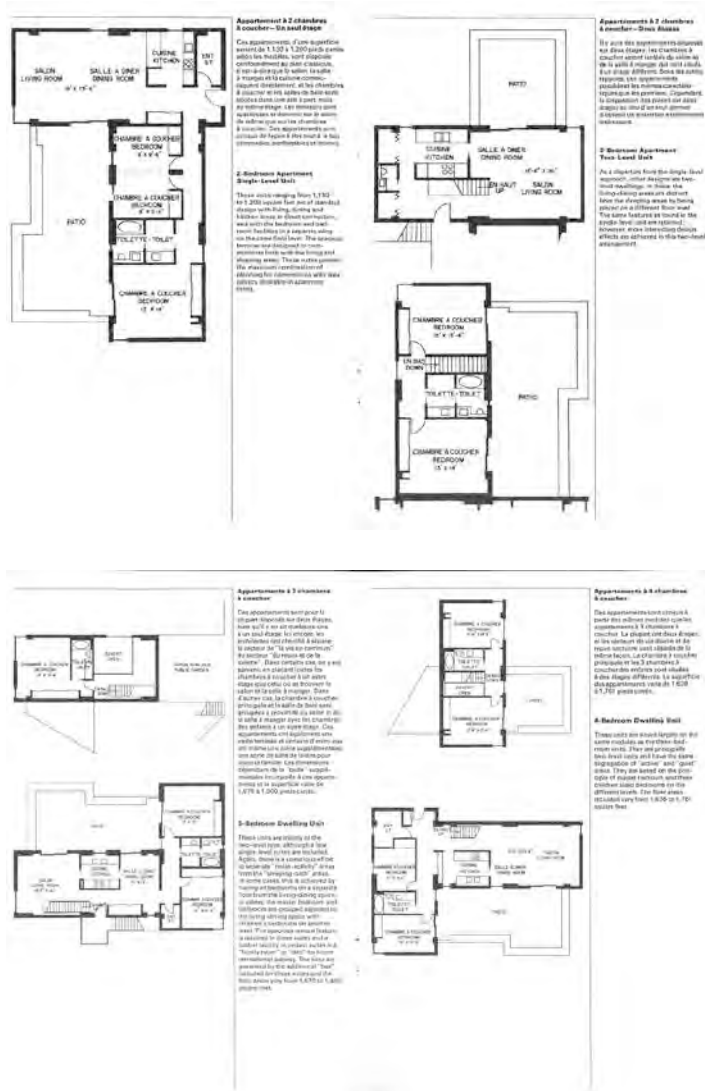
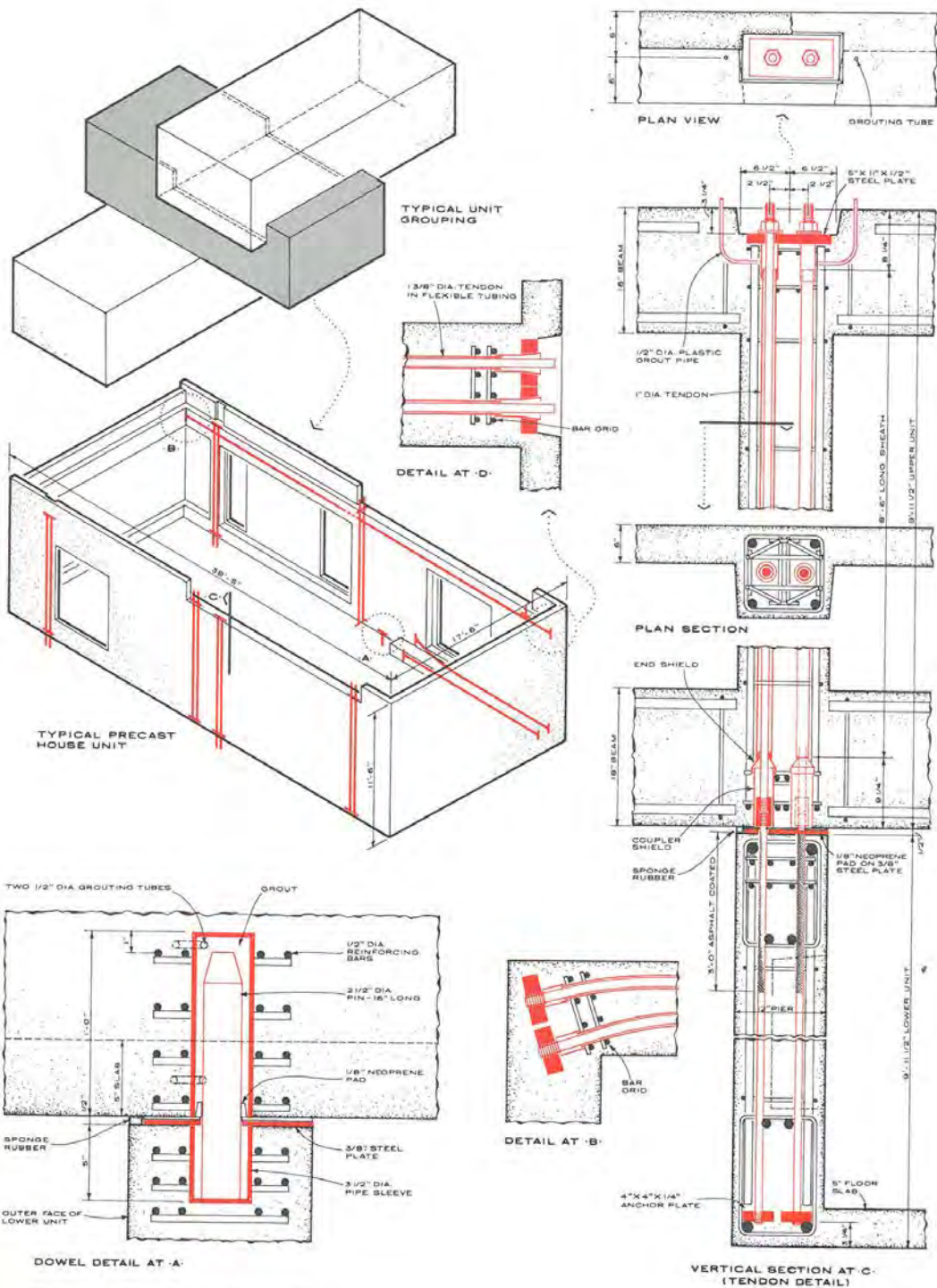


Fig. 6.4 The Habitat 67 units as first promoted by the CCWE in 1965



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Fig. 6.5 The Habitat 67 "cell", *Progressive Architecture* (October 1966)



Fig. 6.6 The proposed – and never realised – Commercial Centre for Habitat 67

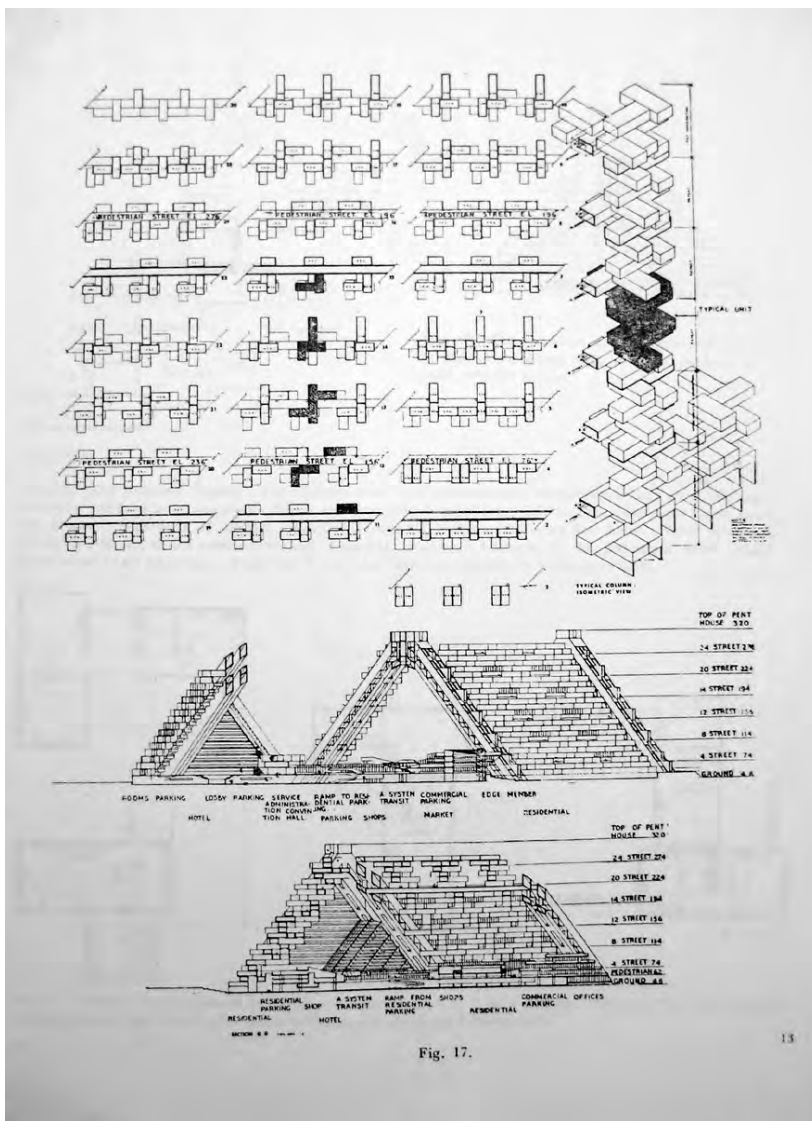


Fig. 6.7 Safdie's "clusters" presented at the *Changing Concepts of Human Habitation* conference in Roorkee, India, December 1965

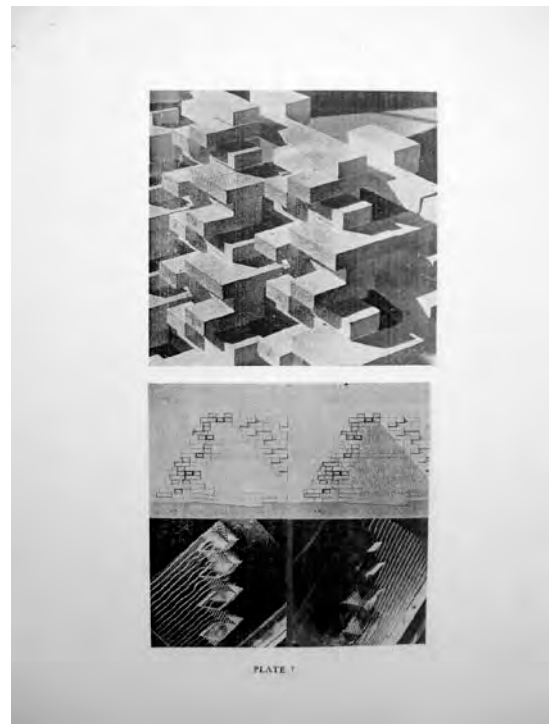
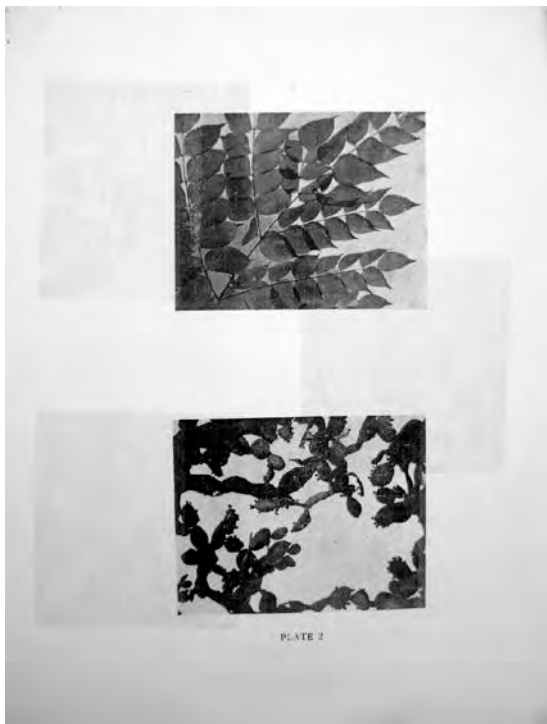
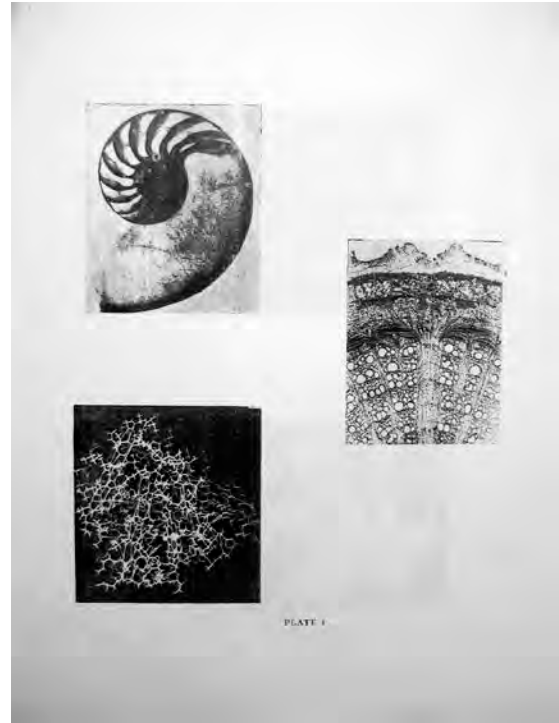
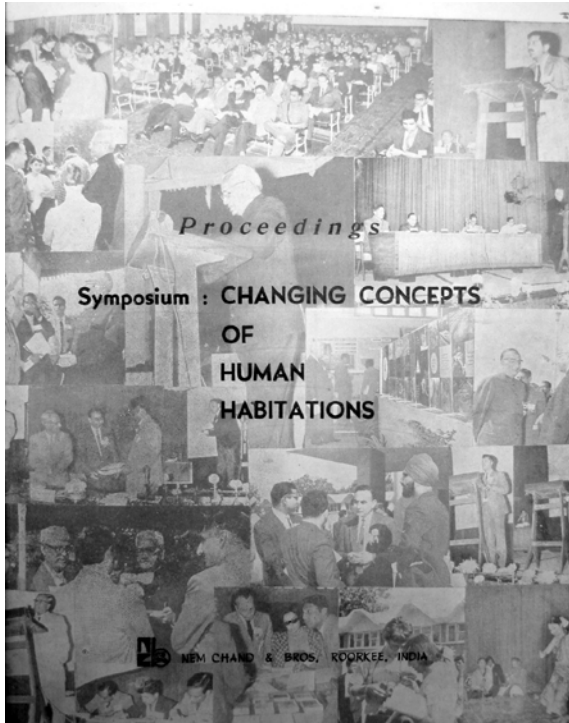


Fig. 6.8 Plates from Safdie's "Why Not Utopia" paper given at the *Changing Concepts of Human Habitation* conference in Roorkee, India, December 1965

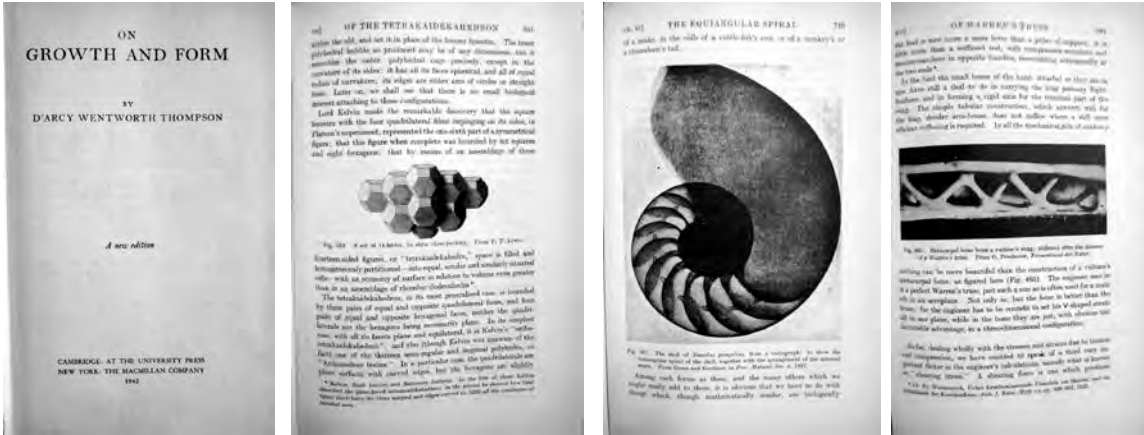


Fig. 6.9 D'Arcy Thompson, *On Growth and Form* (1917; 1942 edition): Thompson's view on "close packing" (left); the metacarpal bone of the vulture's wing – an image of structural efficiency in triangulation (right)

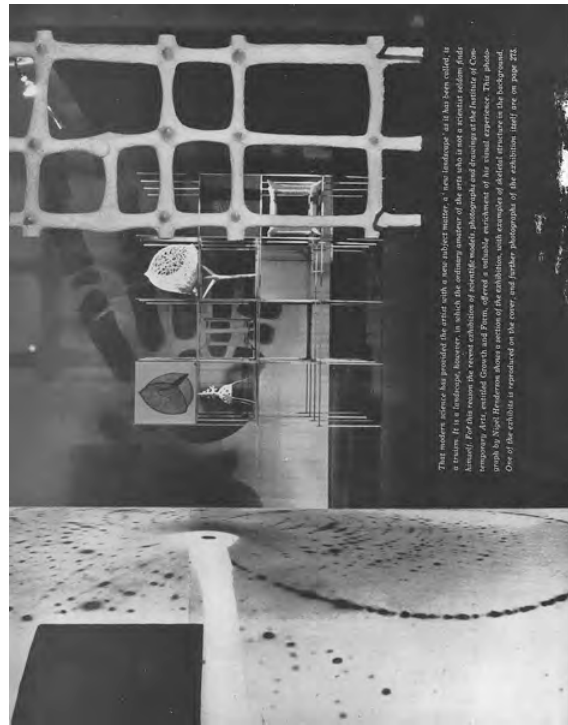


Fig. 6.10 *Growth and Form*, Institute of Contemporary Arts, London, July 1951

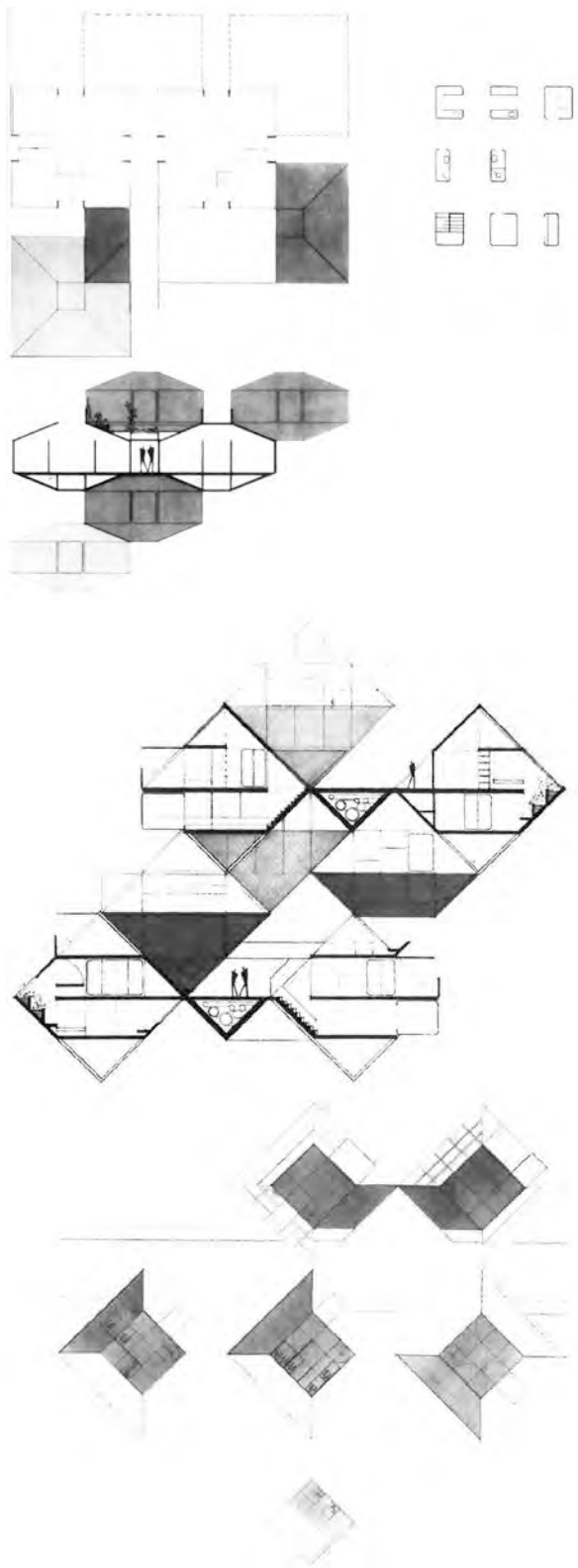


Fig. 6.11 Moshe Safdie, Urban System 1965: a response to “close packing”

BUILDING A CITY WITH KING KONG BLOCKS

A housing project rising in Montreal indicates possible directions of precast concrete construction.

Habitat 67, a housing project in Montreal, merits attention in P+A's concrete issue because it is the first practical use of concrete precast in house-size units.

Furthermore, Habitat can be viewed in two ways: first, as an advance in technology; and second, as a breakthrough in urban design. Both these viewpoints are open to dispute, in a greater or lesser degree. This is not surprising, considering the scale of the project and large amount of public money invested in it.

But before viewing Habitat through the eyes of its protagonists, it would be useful to review these unassailable facts:

Habitat comprises 158 houses with one to four bedrooms.

These houses are built with 354 precast boxes, each measuring 39½-ft long, 17½-ft wide, and 10-ft high.

The general contractor signed a \$10,500,000 contract.

The owner allocated a \$13,500,000 budget (without land).

Costs are rising above budgets.

Habitat is built with precast concrete boxes stacked on top of one another so that each house has a garden on part of the roof of the house beneath it. In its simplest form, the garden space is achieved by putting one rectangular box at right angles to the box below. Because these story-high boxes are stacked 12 high, with some sitting on the cantilevered halves of lower boxes, the structural engineering becomes more complex than if boxes were stacked vertically in a conventional, straight-sided, multistory building.

THE ARCHITECT'S HABITAT

Moshe Safdie, the young architect who designed Habitat, sees the project as an urban system for housing families, where, despite its city location and multistory construction, they will have the same amenities of privacy, identity, and open space as they would have in a single-

family house.

He thinks of Habitat as an inseparable advance in construction technology and town living. "It's a step toward the development of building systems for large-scale urban construction—both new and redevelopment. It's the beginning of a building system."

Safdie is enthusiastic but objective in his views: "Habitat is still crude, it's primitive, it's imperfect, it has a lot of things we are still learning, but it's the beginning of a system. And, as a system, it's both a three-dimensional urban pattern and a technical building system. They overlap."

"I don't think you can talk about the three-dimensional reorganization of a city without including new construction techniques, because without them it would be uneconomical. One is conditional upon the other, and is more critical in high-density construction than in single houses."

The Habitat system consists of precast, load-bearing concrete boxes, but Safdie did not start out to design a concrete project. Several years ago, when writing a thesis at McGill University, he thought of modular units installed in a multistory frame.

But he abandoned this concept because there were no suitable lightweight materials for the units: Plastics were too expensive, and steel has to be fireproofed. So, since concrete seemed to be the most practical material, Safdie decided to make the units loadbearing, because the codes required a wall that would have been ridiculously thick for a nonloadbearing unit.

Thus frames were eliminated from the Habitat concept, and, since then, Safdie has not regretted his decision. Recently, he said, "We should try to eliminate the redundancy of a frame with plug-in units."

Morphology Replaces Function

Habitat has been described as an offshoot of functionalism. Safdie comments: "I believe this approach to building goes back to the so-called functionalism of the 30's and 40's, except that they tended to look at it in a restricted way, which we don't."

"For example, the so-called functionalism of Mies van der Rohe, where he expresses structure, is really only using steel for a frame and expressing it as a frame. But structure is more than the material holding up a building. It is concerned with all the many aspects that make up a



Associated Architects: Moshe Safdie & David, Bevil, Bouché, Structural Consultants Dr. A. E. Kowarski, Structural Engineers: Mann, Leitch, Lewis, Nelson & Associates, Mechanical & Electrical Engineers: Fum Tikhoni, and Yehuda Feller & Associates, General Contractor: Ingénierie Québec, Ltd., Concrete Subcontractor: Procon Ltd.

Fig. 6.12 "Building a City with King Kong Blocks", *Progressive Architecture* (October 1966)

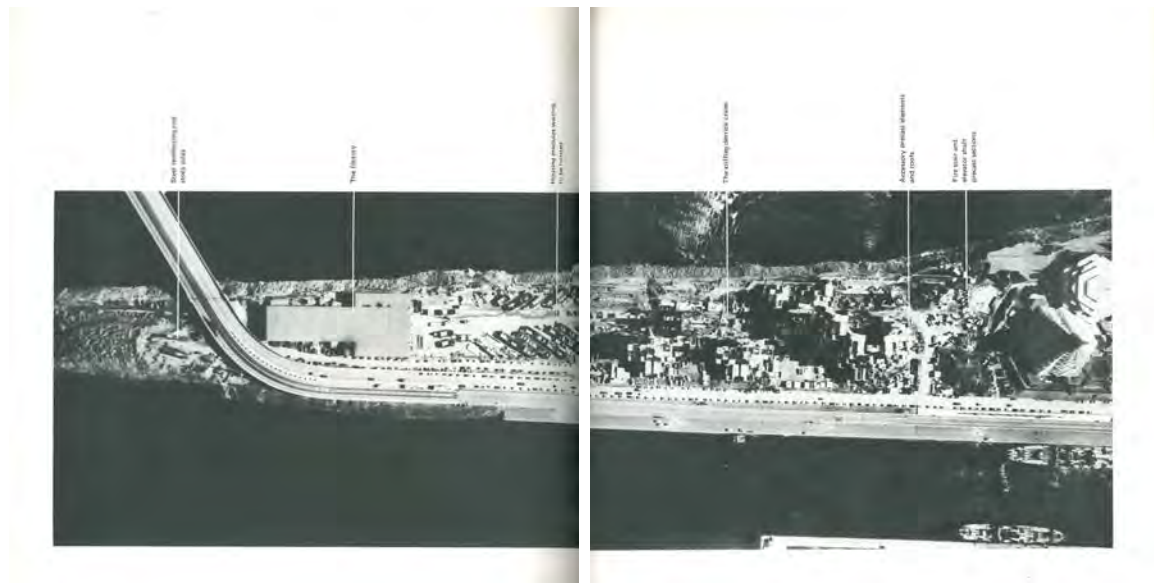


Fig. 6.13 “Assembly-line” construction, circa 1966



Fig. 6.14 The Fibreglas bathroom unit custom fabricated for Habitat 67

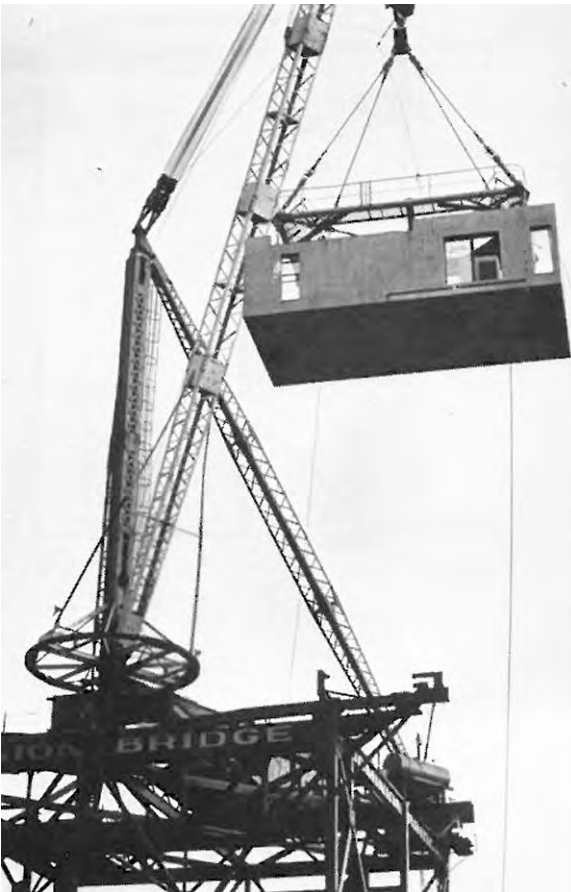


Fig. 6.15 The Dominion Bridge Company of Canada derrick crane, always judiciously photographed by Safdie and the CCWE to suggest a seamless construction process

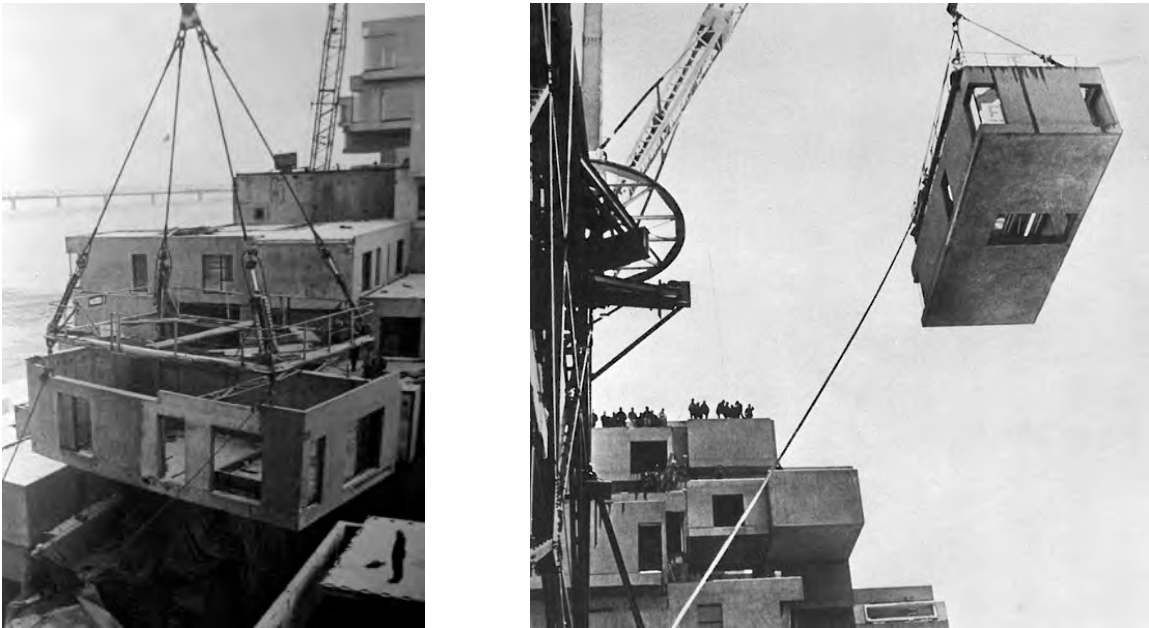


Fig. 6.16 Cropped photographs of the Habitat 67 dwelling unit and the derrick crane served Safdie's claim that "no work is done in the air beyond simple connections"

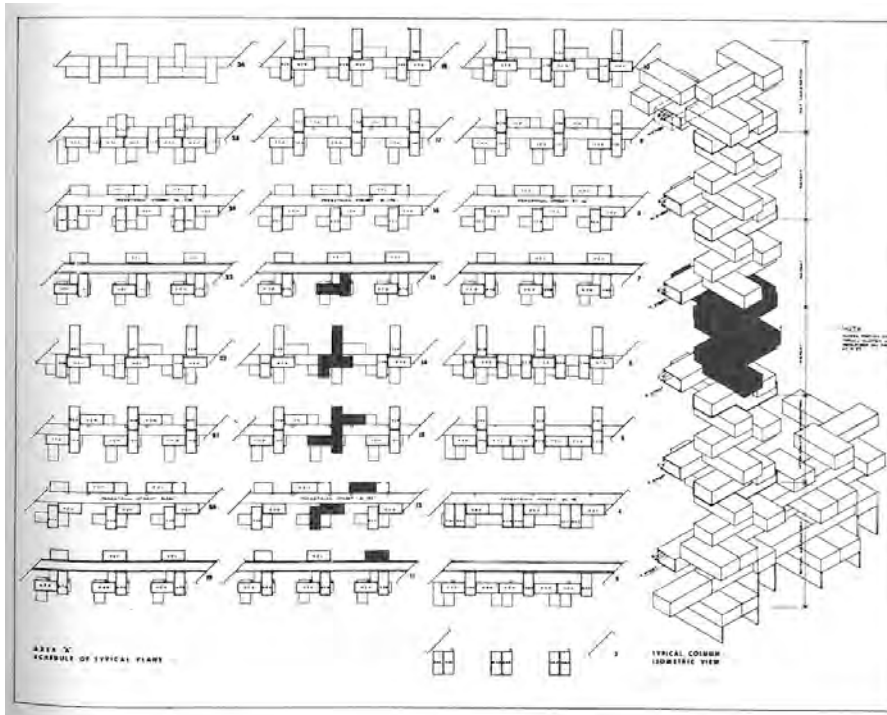


Fig. 6.17 In construction documents, axonometric diagrams explained sequences for stacking units in the field

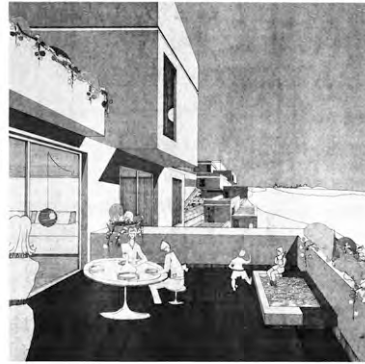
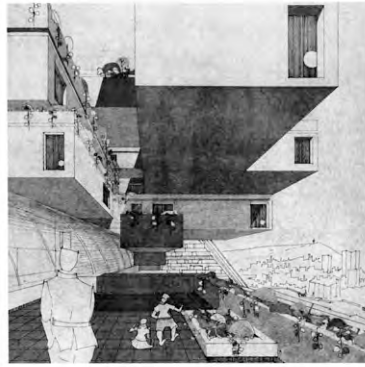


Fig. 6.18 Circulated by the CCWE as early as 1965, promotional sketches showed each dwelling with its own garden terrace and families relaxing amidst unmistakably contemporary furnishings



Fig. 6.19 The Habitat 67 units showcased with the most up-to-date furnishings at Expo 67

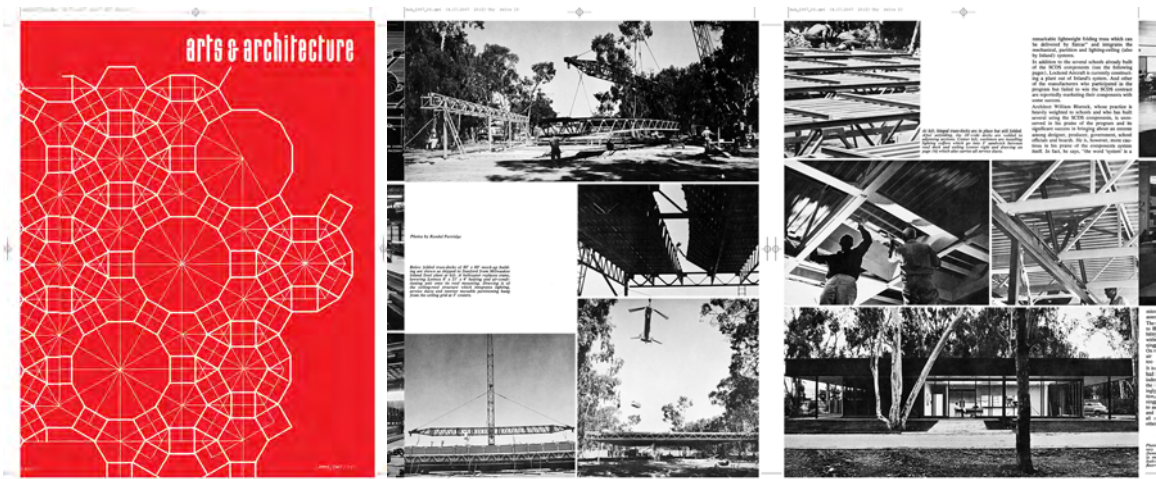
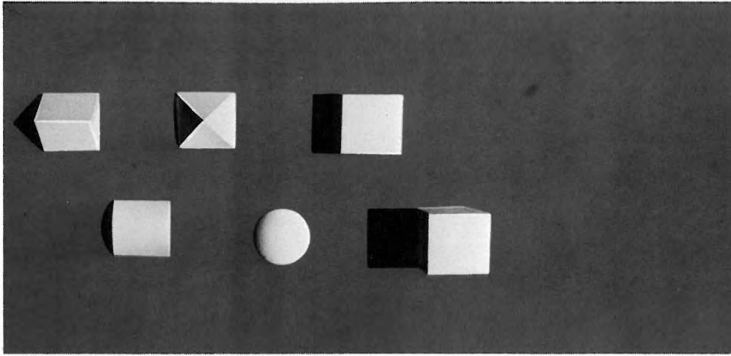
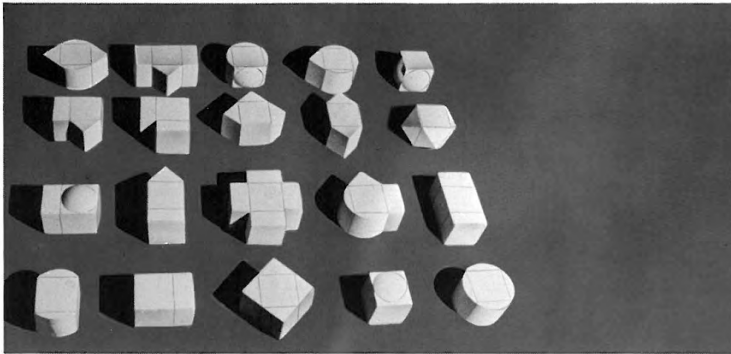


Fig. 6.20 School Construction Systems Development (SCSD), an influential industrialised building system developed in the mid-1960s

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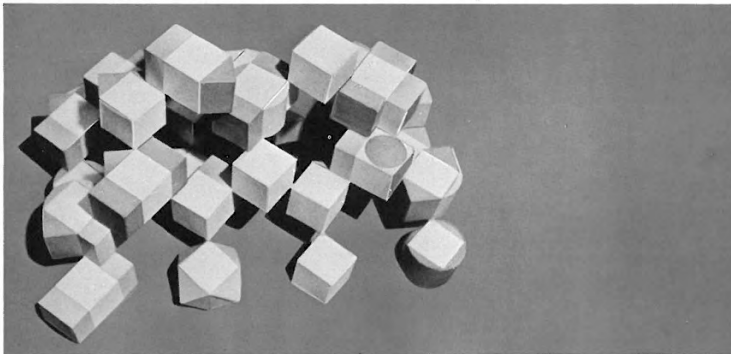


Fig. 6.21 Safdie’s new “system” presented at the 1968 Aspen Design Conference

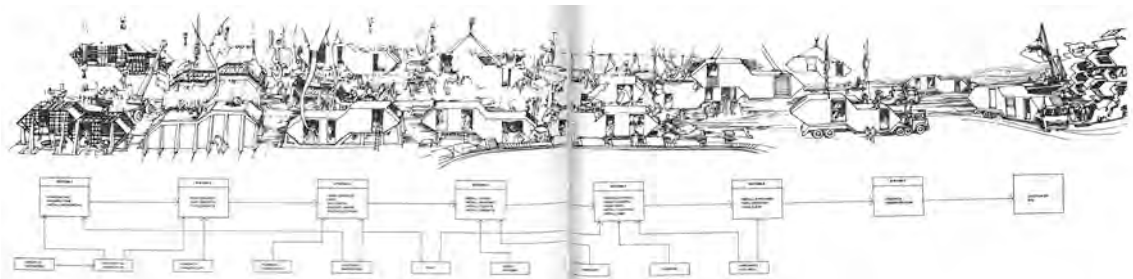


Fig. 6.22 U.S. Department of Housing and Urban Development Operation Breakthrough programme: originally developed in 1966, Safdie’s “assembly line” was later used by HUD for Habitat Puerto Rico

the canadian architect

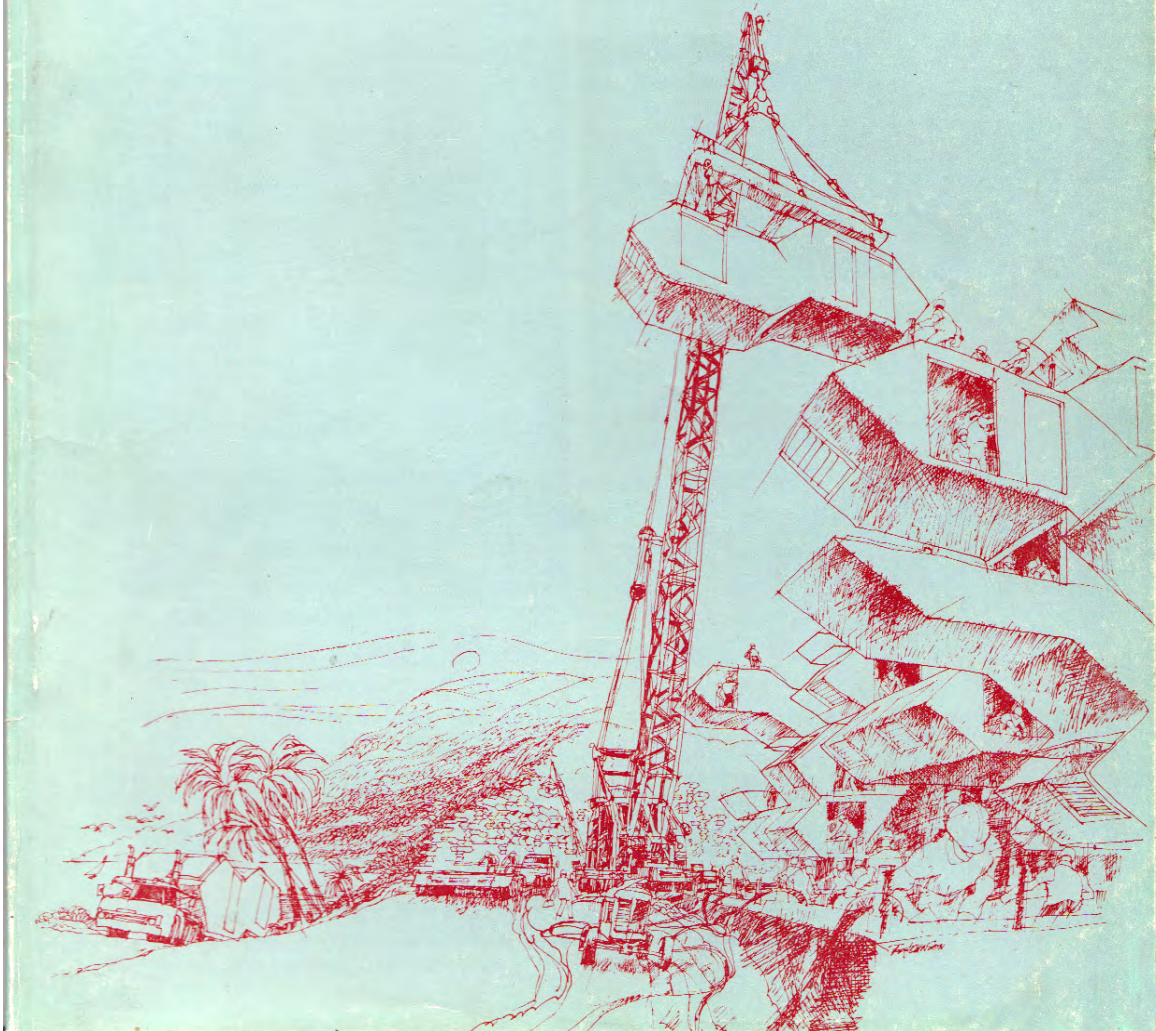


Fig. 6.23 Habitat Puerto Rico, circa 1968

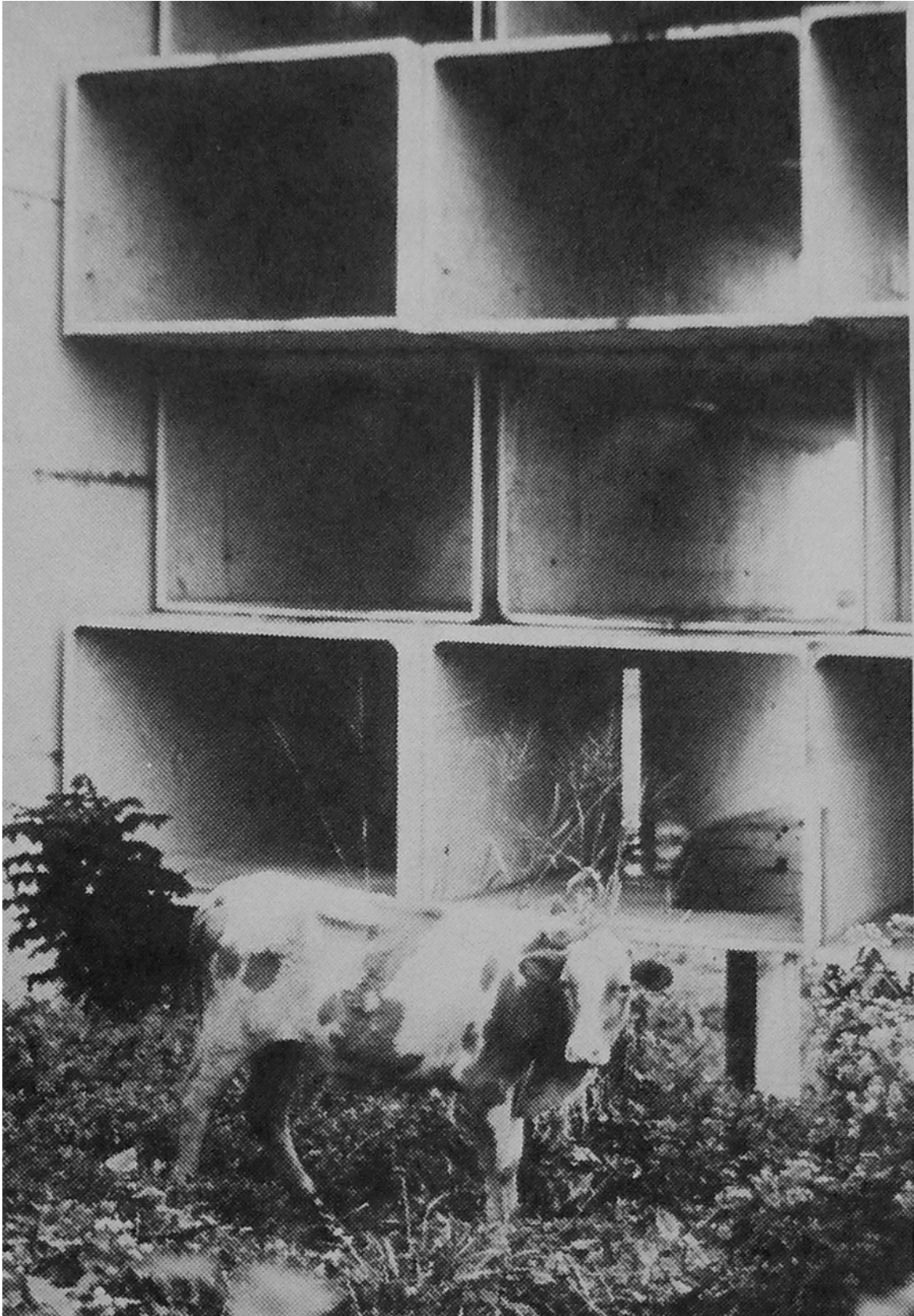


Fig. 6.24 Habitat Puerto Rico

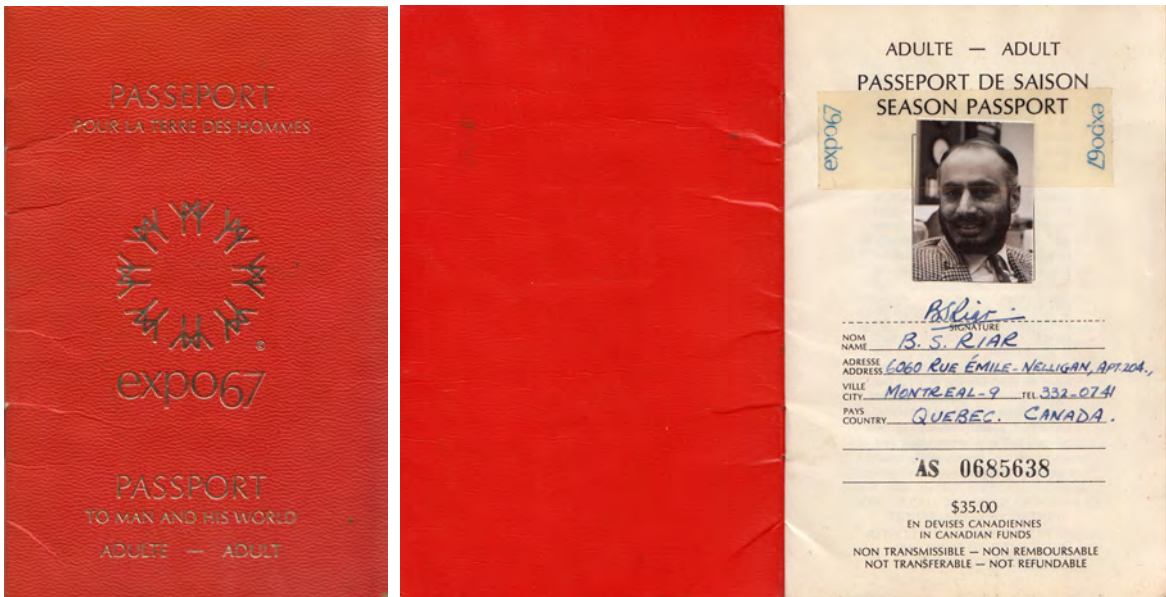


Fig. 7.1 Expo 67: a “Passport to Man and His World”



Fig. 7.2 The USA versus the USSR, Expo 67

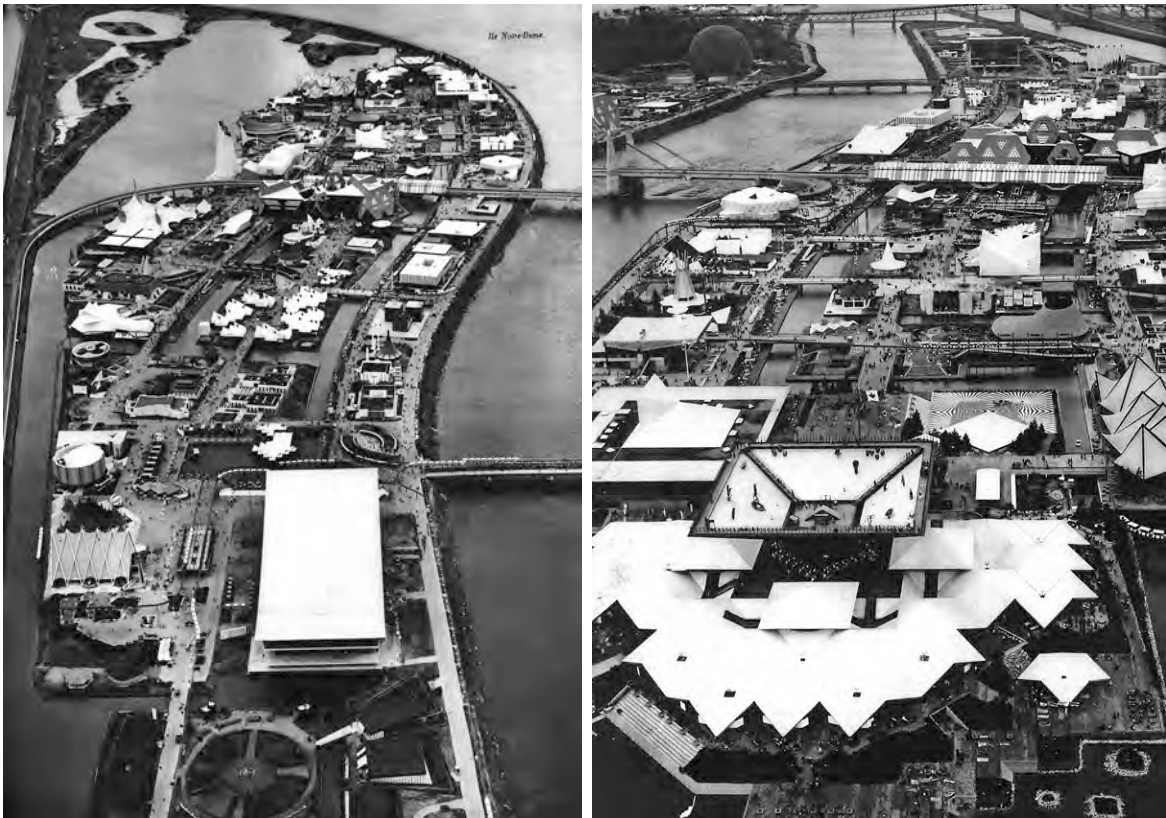


Fig. 7.3 The Expo 67 fairgrounds: Ile Ste-Hélène (*left*) and Ile Notre-Dame (*right*). Here, the CCWE declared, the visitor was brought “face to face with Man and His Work and, he himself, participated in the spectacle in which he took delight”



Fig. 7.4 The first chamber in the Labyrinth theme pavilion

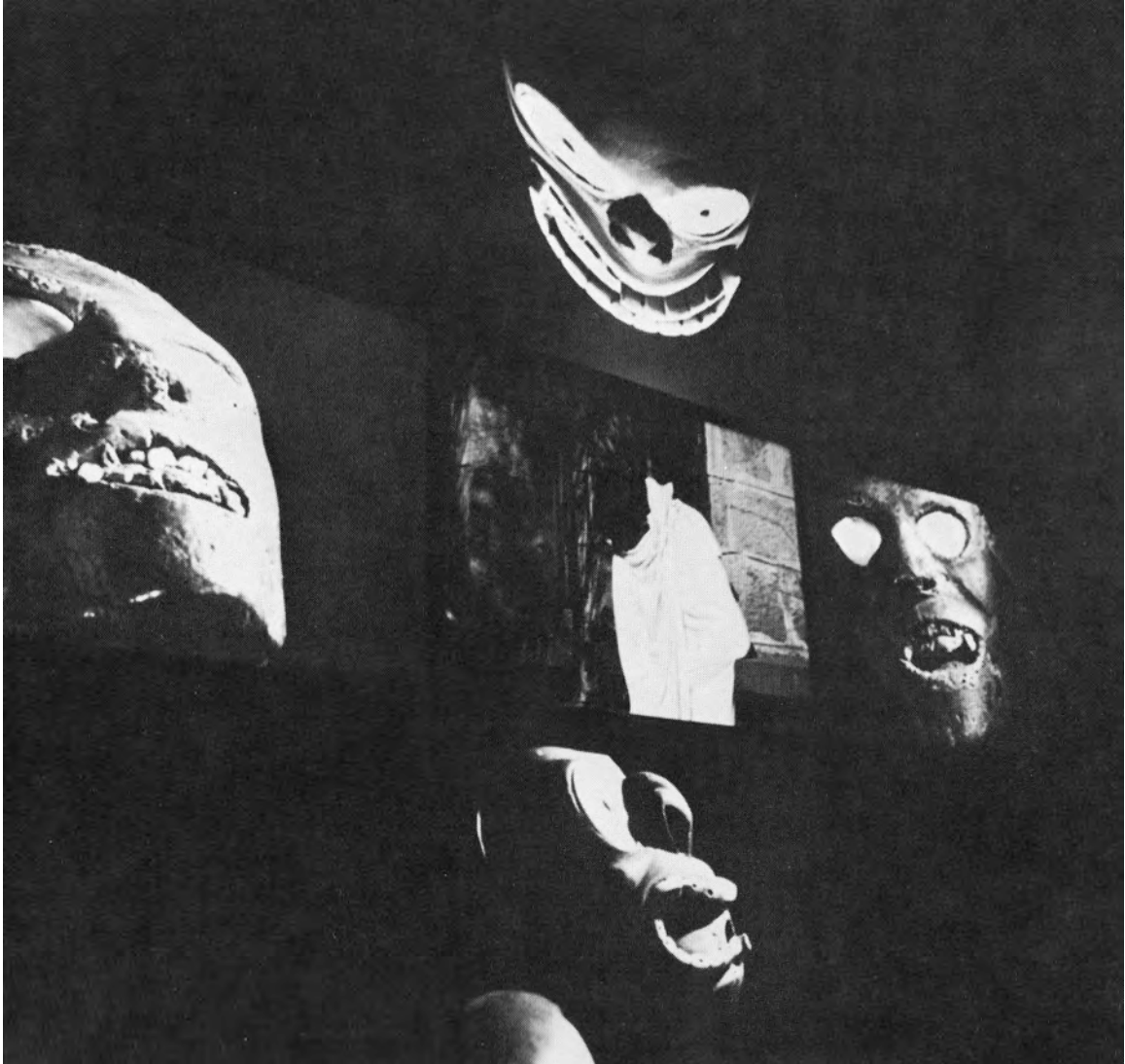


Fig. 7.5 *In the Labyrinth*, the ground-breaking multiscreen film produced by the National Film Board of Canada



Fig. 7.6 Buckminster Fuller, United States Pavilion, Expo 67

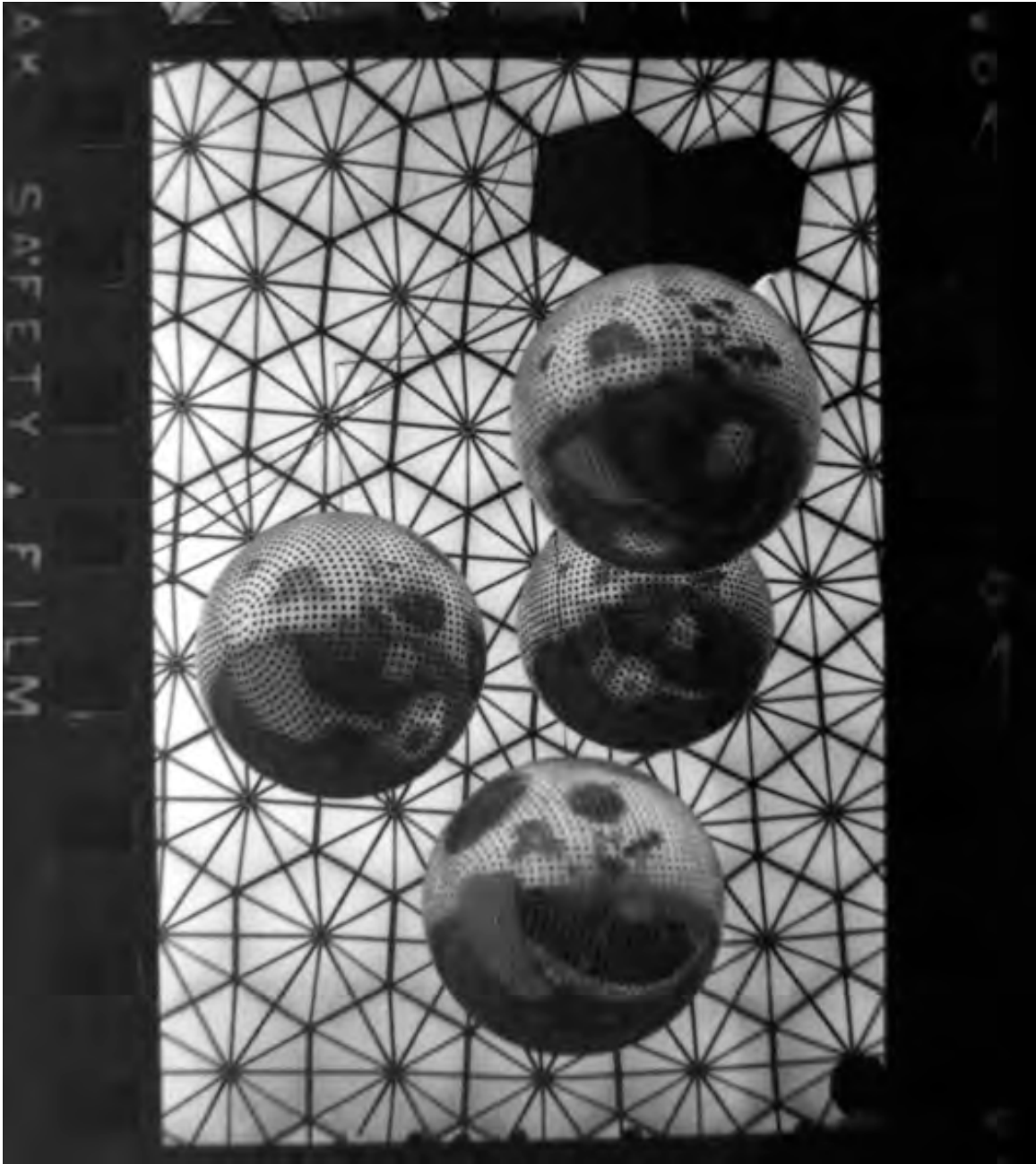


Fig. 7.7 Buckminster Fuller, United States Pavilion, Expo 67

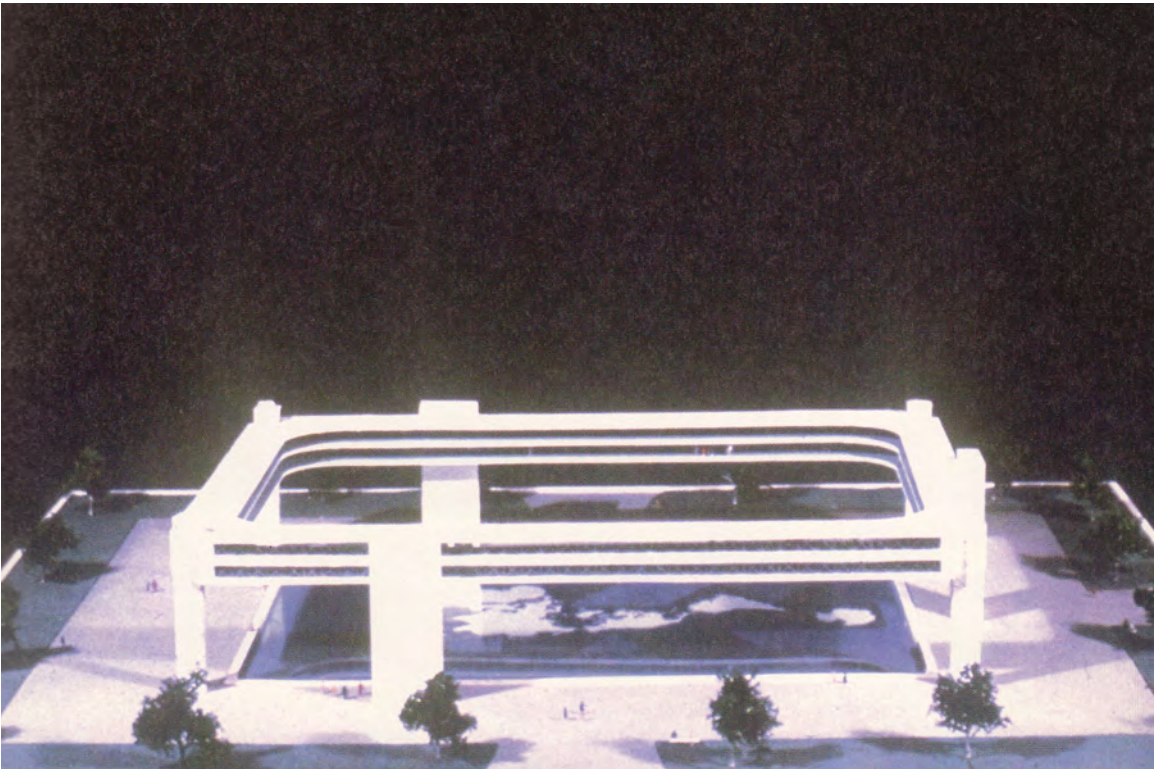
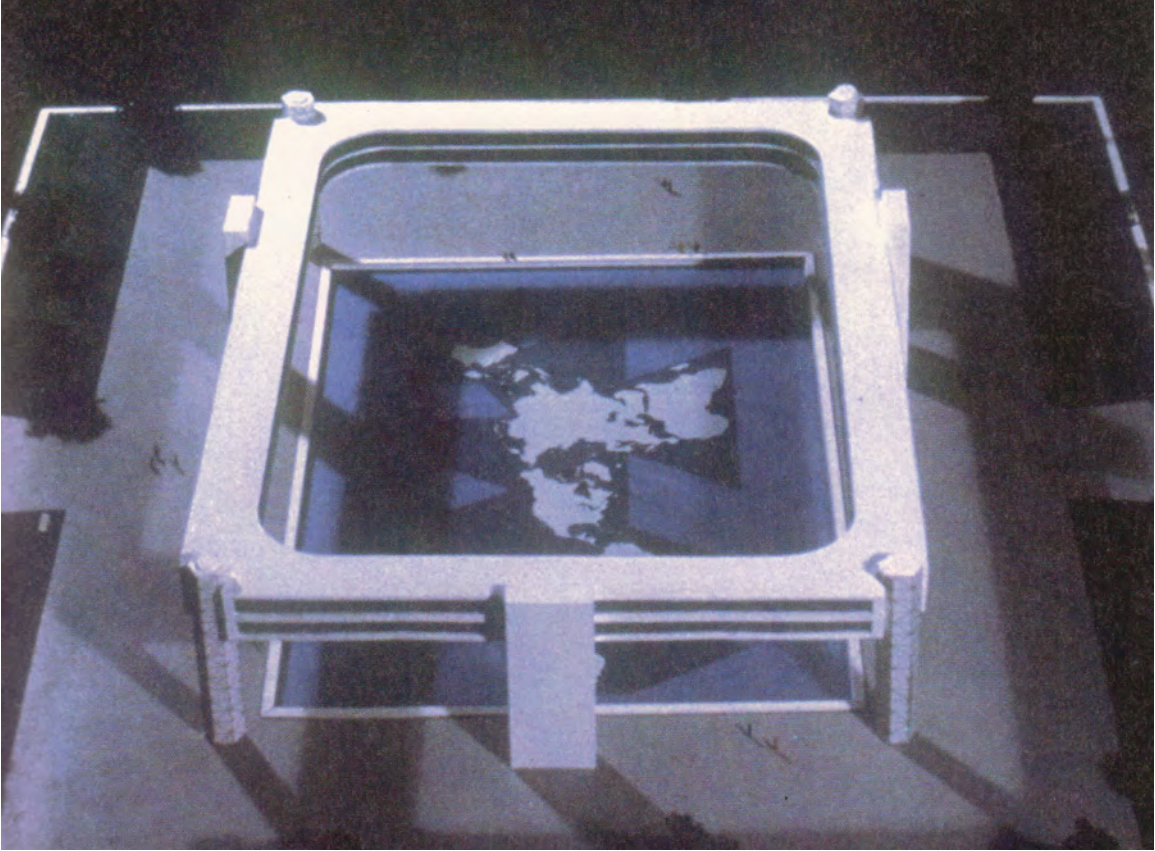


Fig. 7.8 Buckminster Fuller's original proposal for the US pavilion: a World Game



Fig. 7.9 Africa Place at Expo 67

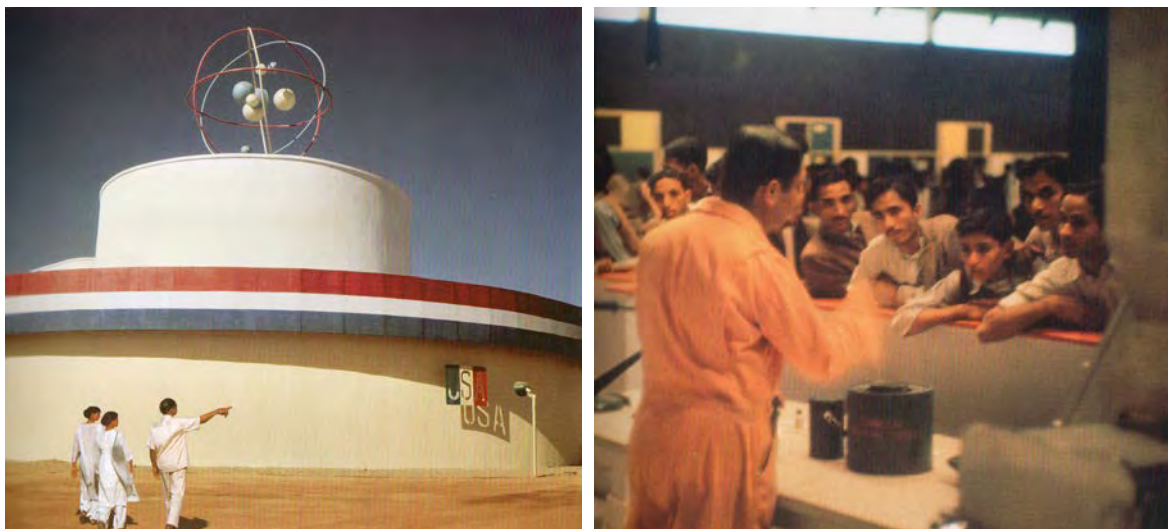


Fig. 7.10 “Atomics” Exhibition: The United States pavilion at the Indian Industries Fair, New Delhi, 1955; inside, multilingual guides explained a nuclear reactor and the peaceful uses of nuclear energy



Fig. 7.11 The Canadian complex: Quebec appears in its own moat, with the Western Provinces behind. The Indians of Canada pavilion rises at the back, next to the United Nations



Fig. 7.12 “Katimavik”, or “Meeting Place”, at the Pavilion of Canada



Fig. 7.13 The symbols of Katimavik: a mechanical clock, an African mask, an astrolabe, and a gyroscope



Fig. 7.14 Underneath Katimavik: “Growth”, “Resources and Energy”, and “Transportation and Communications”

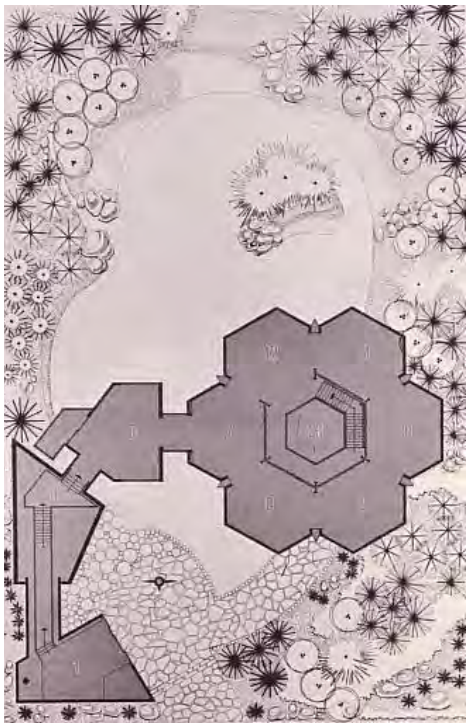


Fig. 7.15 The Indians of Canada pavilion at Expo 67



Fig. 7.16 Gottfried Semper's Canadian Court at the 1851 Great Exhibition, London



Fig. 7.17 Inside the Indians of Canada pavilion



Fig. 7.18 The royal yacht *Britannia* docks at Expo 67 and Queen Elizabeth II tours the Indians of Canada Pavilion, July 3, 1967



Fig. 7.19 Man the Producer, circa 1979: the site of a ruined planet in an episode of the science fiction television show *Battlestar Gallatica* (above) and a post-apocalyptic world in Robert Altman's film *Quintet* (below)