

Bathrooms, Bubbles and Systems:
Archigram and the Landscapes of Transience

by
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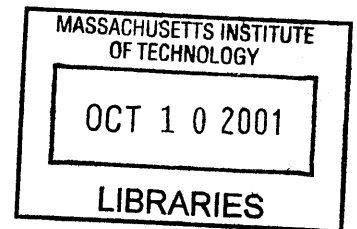
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ABSTRACT

The dissertation studies the *Archigram*, the primary avant-garde architectural publication in Britain from 1961 to 1970, and the related avant-garde practices that engendered the high-tech movement. Drawing on the histories of technology, architecture and popular culture, the study explores the roots of architecture's foray into the realm of electronic information. By challenging the machine-based model of technology that had defined modernist architectural theory and production, my thesis unfolds, the publishers of the *Archigram* struggled to reconcile architectural form with emerging technologies and to represent visually the dissolution of the artifact into a landscape of complex and indeterminate systems. This attempt to conceive an essentially material object, such as a house, in a world viewed as a series of impulses was among the earliest architectural explorations of the dilemmas introduced by electronic culture.

Using the concept of mobility and flux as a unifying thread, the dissertation examines the strategy for developing an architecture based in the practice of representation and of dissemination. The desire to set structures in motion by liberating them from the anchor of urban infrastructures required a reconsideration of the architectural object. For architecture to fully abandon its traditional role as environmental hardware, the conflict between the processes of indeterminacy and the dependence of those processes on a closed system would have to be overcome. This tension between the physical and the dematerialized led from megastructural networks to self-contained skins, and finally to the disintegration of architectural objects into a technologically driven version of the Picturesque. In the ultimate merging of the environmental domain with that of information, architecture would become its absence, marked in the landscape only as the residue of a nomadic culture of information.

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Introduction: The Permanence of Impermanence

History is always written from the sedentary point of view...even when the topic is nomads. What is lacking is a Nomadology, the opposite of a history.

G Deleuze & F Guattari, *A Thousand Plateaus*

Context

Transformation loomed large on the horizon of the postwar intellectual milieu. Cultural awareness of the shift to a speed-based mode of technology was accompanied by a fluctuation of beliefs. From science to philosophy, the concept of change was being positioned at the very center of Western thought. Whether analyzed for its epistemological and social status, as in Karl Popper's *The Open Society and Its Enemies* (1945), or defined as an architectural position, as by the Metabolists, the notion of flux dominated the cultural climate. Popper traced the idea of an unstable universe from its inception, attributed to Heraclitus, through to a world full of objects deteriorating away from their ideal forms;¹ Aristotle's reversal of that principle led, in turn, to the Hegelian nation-state struggling to reveal its essence. Popper cautioned his battle-weary public that Heraclitus and Hegel, whose philosophical systems had famously embraced instability, had also promoted war as a legitimate method of social transformation.² As

¹"Heraclitus was the philosopher who discovered the idea of change...the view he introduced was that there was no such edifice, no stable structure, no cosmos...He visualized the world not as an edifice, but rather as one colossal process; not the sum total of all *things*, but rather as the totality of all events, or changes, or *facts*. 'Everything is in flux, nothing is at rest', is the motto of his philosophy...In the case of Heraclitus, the emphasis upon change leads him to the theory that all material things, whether solid, liquid, or gaseous are like flames--that they are processes rather than things, and that they are all transformation of fire...But having reduced everything to flames, to processes, like combustion, Heraclitus discerns in the process a law, a measure, a reason, a wisdom...he declares that strife or war is the dynamic as well as the creative principle of all change, and especially of all differences between men. And being a typical historicist, he accepts the judgment of history as a moral one; for he holds that the outcome of war is always just: 'War is the father and king of all things...One must know that war is universal, and that justice--the lawsuit--is strife, and that all things develop through strife and by necessity.'" (London: Routledge, vol. 1, p.11)

²"We can say that Hegel's world of flux is in a state of 'emergent' or 'creative evolution'; each of its stages contains the preceding ones, from which it originates; and each stage supercedes all previous stages, approaching nearer and nearer to perfection. The general law of development is thus one of progress...The Spirit of the nation determines its hidden historical destiny; and every nation that wishes 'to emerge into existence' must assert its individuality or soul by entering the 'Stage of History', that is to say, by fighting the other nations; the object of the fight is world

Nietzsche sardonically put it, the free man was a warrior who spit “on the contemptible type of well-being dreamed of by shopkeepers, Christians, cows, women, Englishmen, and other democrats.”³ Such views continued into the 20th-century: “Great Nations are born in war, and decay in peace. All things strong, virile, and manly spring up during a great war”.⁴

Napoleon’s certainty that an “aptitude for war is aptitude for movement” was another proof for Paul Virilio that “history progresses at the speed of its weapons systems,⁵ while Popper searched for answers outside historiography. On the other hand, Herbert Marshall McLuhan celebrated the flux that mass-communications introduced into daily life from his first book, *The Mechanical Bride* (1951), onward. Herbert Butterfield argued in *The Origins of Modern Science* (1949) that the history of science could be described as the history of the human mind trying to come to terms with motion and speed.⁶ Despite his craving for a stable universe, Gyorgy Kepes grappled with the contemporary scientific, psychological and social understanding of the world as “widely dispersed fields of dynamic energies”. Kepes accepted Butterfield’s position but believed that the “nausea that pervades the work of many of our best writers, poets, and artists is like motion sickness” and described the “immature cult of crude sensations” of Marinetti who “babbled about ‘the racing space, the acrobatic somersault, the slap in the face and the blow of the first--war, the bloody and necessary test of the people’s force’”.⁷ Two more texts published by central figures of European Modernism from their American exile were Siegfried Giedion’s *Mechanization Takes Command* (1948) and Laszlo Moholy-Nagy’s *Vision In Motion* (1947). Giedion was preoccupied with the historical problem of representing motion; Moholy-Nagy approached this same issue from an educational angle in this manual for his American Bauhaus.

domination. We can see from this that Hegel, like Heraclitus, believes that war is the father and king of all things. And like Heraclitus, he believes that war is just.” (*op.cit.*, vol 2, p. 37)

³Skirmishes in a War With an Age’, *Twilight of the Idols*, Oxford; NY: Oxford University Press, 1998, section 38.

⁴John FC Fuller, *The Foundations of the Science of War*, London: Hutchinson & Co, 1926, p.130.

⁵*Speed and Politics: An Essay on Dromology*, tr. M Polizzotti, NY: Semiotext(e), 1986, p. 68.

⁶“Of all the intellectual hurdles which the human mind has been faced with and has overcome in the last fifteen hundred years, the one which seems to me to be most amazing in character and the most stupendous in the scope of its consequences is the one relating to the problem of motion--the one which was not quite disposed of by Galileo.” (London: G. Bell & Son Ltd, p. 3)

⁷‘Introduction’, *The Nature and Art of Motion* (London: Studio Vista, 1965). Kepes was responding to Futurist articulations such as this one from the Manifesto: “We will glorify war--the only hygiene of the world--militarism, patriotism, the destructive gesture of anarchy, the beautiful ideas which kill, and the scorn of woman.”

These texts, especially those by McLuhan, Giedion and Moholy-Nagy were seminal for the loose aggregation of artists, architects, designers and writers who assembled at London's Institute for Contemporary Art (ICA) from 1951 to 1956, known as the Independent Group.⁸ The Independent Group opposed the self-referential modernism of Herbert Read's ICA and shared the view that artists should address a broader range of representation, especially that produced by mass communications, in a sociological context.⁹ For the Independent Group artists, the visual was the most powerful realm of consumer culture and they were attracted to authors who relied on imagery as much as text to convey a message. McLuhan's *Mechanical Bride* selected familiar or generic imagery from popular sources such as advertisements, comic strips and pulp-fiction, and then "dislocat[ed] it into meaning by inspection."¹⁰ Moholy-Nagy believed that it was the role of the visual arts to capture the defining feature of modernity: the constancy of motion. It was the social responsibility of the artist to depict the trajectory of objects moving through space and to capture the phenomenon of the ever-changing viewpoint in a coherent artifact. He felt that the revolution in spatial understanding introduced by the theory of relativity should be expressed over the static feel pervasive in most modern art and architecture. "Mobile architecture", he wrote, "is a space-time reality... Unfortunately, [automobiles and trains] are still largely designed with the traditional principles of static architecture, a more or less obsolete superstructure erected upon a new type, the mobilized base."¹¹

Giedion's *Mechanization Takes Command*, a comprehensive study of American industrial culture researched in the archives of corporations and the Patent Office, was prefaced by an overview of the ways in which motion had been committed to paper.¹² His ensuing analysis of the growing concern with locomotion was optimistic overall, but not without qualification. For example, Giedion described how the progressive

⁸Hamilton recounted the discovery of *Mechanization Takes Command* and mages from *The Mechanical Bride* and *Vision in Motion* were used in the Independent Group works. David Greene also recalls the influence of these books. Peter Cook, however, has claimed that Moholy-Nagy was left out of his schooling. (Columbia Symposium, 13 March, 1998)

⁹for more on the Independent Group, see David Robbins, *The Independent Group: Postwar Britain & the Aesthetics of Plenty*, Cambridge, MA: MIT Press, 1990; Anne Massey, *The Independent Group*, Manchester: Manchester University Press, 1995.

¹⁰NY: Vanguard Press, 1951, p. vi.

¹¹He continued, "Gropius and Wagner are advocating demountable, movable houses for future cities. There are projects not only of movable but moving houses too; sanitariums, for example, turning with the sun...Professor JD Bernal of Cambridge, England, [plans] to construct houses whose walls are produced by compressed air, by rotating air streams or opaque gases." (*Vision In Motion*, Chicago: Paul Theobald & Co., 1947, p.256)

¹²Giedion had dealt with the space-time issue in *Space, Time and Architecture* (1941).

advancement of the cause of economic mobility resulted, most famously in the theories of Frederick Winslow Taylor, in the very restriction of human activity to a single, repetitive task on the production floor.¹³ One of the text's dominant themes was the point where the machine intersects with the organic, technology with the natural. One section was dedicated to the making of the perfect abattoir, from the removal of the slaughterhouse from the city-center as Haussman did when he moved the Grande Boucherie from Châtelet les Halles to La Villette in 1867 to its apotheosis in "pork-making by applied mathematics" as it was notoriously put in Upton Sinclair's novel, *The Jungle* (1906) about the Union Stockyards. Giedion presented the cranes and conveyer belts developed in the US slaughterhouses of the 1860's to standardize the slaughter of squirming, non-identical animals as precursors to Ford's assembly lines [figure 1]. This narrative of technology, disquieting at best, grew to have an ominous resonance as Hitler's public admiration for Ford's theories of efficiency became known. Hitler had kept a large portrait of Ford hanging in his office and had singled him out in 'Mein Kampf' as the only American industrialist not to submit to Jewish control; Ford's own anti-Semitic activities included the publishing of *The International Jew*, a compilation of his newspaper articles concerning the Jewish threat, as well as accepting the Grand Cross of the German Eagle, the highest accolade of the Nazi party, in honor of his 57th birthday.¹⁴ The connection between 'scientific management' and the mechanization of death read as more than pure coincidence. As Giedion himself reflected:

The death cries of the animals whose jugular veins have been opened are confused with the rumbling of the great drum, the whirring of gears, and the shrilling sound of steam. Death cries and mechanical noises are almost impossible to disentangle... each animal hangs head downwards at the same regular interval, except that, from the creatures to his right, blood is spurting out of the neck-wound in the tempo of the heart beat. In twenty seconds on average, a hog is supposed to have bled to death. It happens so quickly, and is so smoothly a part of the production process, that emotion is barely stirred. What is truly startling in this mass transition from life to death is the complete neutrality of the act. One does not experience, one does not feel; one merely observes...How far the question is justified we do not know, nevertheless it may be asked: Has this neutrality toward death had any further effect upon us? This broader influence does not appear in the land that evolved mechanized killing, or even at the time the methods came about. This neutrality towards death may be lodged deep in the roots of our time. It did not bear itself on a large scale until the War, when whole populations, as defenseless as animals hooked head downwards on the travelling chain, were obliterated with trained neutrality.¹⁵

¹³Marx posited this mechanization, along with the tyranny of the clock that regulated it, as the root of alienation.

¹⁴For a detailed account of Ford's anti-Semitic beliefs and Hitler's admiration for Ford see Albert Lee, *Henry Ford and the Jews*, NY: Stein & Day, 1980.

¹⁵*Mechanization Takes Command*, Oxford: Oxford University Press, 1951, p.246.

Citing this passage in his study on the rationalization of slaughter in the modern age, Daniel Pick explained the how the precise separation of tasks and mechanical operations described by Giedion fit the concept of war as a machine following an internal logic.¹⁶ From the 19th-century, Pick reminded the reader, the linking of factory production and the view of war as a motorized phalanx was pervasive was speculated on by theorists as disparate as Marx,¹⁷ Foucault,¹⁸ and Zygmunt Bauman.¹⁹

The weeping Lichtensteinian women, soldiers and guns of Derek Boshier's spoof of comic strip imagery and American pop, 'Sex War Sex Cars Sex' (c. 1967) declared, "But we must increase production" and "we should bomb them with Cadillacs" [figure 2]. Gustav Metzger, the radical author of the manifesto on Auto-Destructive Art (1959), saw the evils of slaughter and car technology as equally pernicious: "We are in a society whose basis is the production, the selling and maintaining the systems of mass-murder. It is against this reality that other forms of social activity must be placed."²⁰ Certainly more public than patent drawings for automated slaughter in an academic text or avant-garde practice were the photographic images of butchery shot by Robert Whitaker for the cover of the Beatles' album, *Yesterday and Today* (1966) [figure 3]. In image selected for the album cover, Whitaker draped slabs of meat over the laps and shoulders of the 'fabulous four', scattered bloody doll's heads about them, then seated the decapitated bodies on the shoulders of the smiling Beatles. After an initial production of 750,000 copies, the cover was withdrawn because American disc jockeys were reported to be 'almost retching' over it. When asked by a reporter about the relevance of the imagery,

¹⁶*War Machine: The Rationalization of Slaughter in the Modern Age*, New Haven: Yale University Press, 1993, pp. 165-188.

¹⁷"Is there anywhere where our theory that the *organisation of labour is determined by the means of production* is more brilliantly confirmed than in the human slaughter industry?" (Marx and Engels, *Correspondence: A Selection, 1846-95*, Westport, Conn: Greenwood Press, 1975, p. 209.)

¹⁸Foucault linked the concept of time to the regimentation of the body in the prison, army and factory in *Discipline and Punish*.

¹⁹"[Auschwitz] was also a mundane extension of the modern factory system. Rather than producing goods, the raw material was human beings and the end product was death, so many units per day marked carefully on the manager's production charts. The chimneys, the very symbol of the modern factory system, poured forth acrid smoke produced by burning human flesh. The brilliantly organized railroad grid of modern Europe carried a new kind of raw material to the factories...Modern civilization was not the Holocaust's *sufficient* condition; it was, however, most certainly its *necessary* condition." (*Modernity and the Holocaust*, Ithaca, NY: Cornell University Press, 1989, pp. 8-13)

²⁰quoted in Mellor, *The Sixties Art Scene in London*, London: Phaidon, 1993, p. 190. Anecdotes abound regarding Metzger's anarchist activities. The Archigram group would have firsthand experience of his tactics when he disrupted proceedings at the IDEA conference they held in 1966 at Folkestone.

Lennon answered that it was “as relevant as Vietnam”²¹--drawing a direct connection between the mechanics of modern warfare, butchered meat and four grinning pop icons in clean white smocks. The relationship of the performer to spectacle and slaughter, as Mikhail Bakhtin explained in quite another context, is bound up with the revel of carnival, an atmosphere not unlike that of ‘Swinging London’. Right down to the liberation of bodily functions, the use of street idiom and the strong element of play, carnival proposed the antithesis to established Order and was crucial, as we shall see, to the avant-garde plans of the sixties. Carnival, as Bakhtin showed, was inextricably linked to the continuum of time, to breakdown of class hierarchies, the production of spectacle and the culture of the marketplace.²² But something had gone awry in the ritualized act of production on the mass scale. Disseminated in the context of an already thriving consumer market, however, rather than the period of austerity associated with the fifties, such artistic ambivalence of manufactured culture in the realm of popular representation were overwhelmed by politically bolstered abundance.

Raymond Wilson perceived that the contemporary obsession with transience and the nomadicity of modern life within the architectural discipline came from a newfound awareness of the devastating flipside of developing technology. Wilson’s writings of the 1960’s focused on the altered relation of architectural practice and the assembly line and his often republished article, ‘Mobility’, introduced the issue: “We have now such colossal means of destruction that even permanent architecture is ludicrously impermanent. Destruction of many of our so-called ‘roots’ through wars, migrations of population, and communications has developed new attitudes towards permanence”.²³ Thus the advent of the war laid out the conditions for a more complicated and nuanced

²¹Mellor (*op.cit.*, pp. 25-6) draws the information about the cover from P. Norman, *Shout: The true story of the Beatles*, 1982, p. 278

²²“Because of their obvious sensuous character and their strong element of play, carnival images closely resemble certain artistic forms, namely the spectacle. In turn, medieval spectacles often tended toward carnival folk culture, the culture of the marketplace, and to a certain extent became one of its components...The feast is always essentially related to time, either to the recurrence of an event in the natural (cosmic) cycle, or to biological or historic timeliness. Moreover, through all the stages of historic development feasts were linked to moments of crisis, of breaking points in the cycle of nature or in the life of society and man. Moments of death and revival, of change and renewal always led to a festive perception of the world...As opposed to the official feast, one might say that carnival celebrated temporary liberation from the prevailing truth and from established order; it marked the suspension of all hierarchical rank, privileges, norms and prohibitions. Carnival was the true feast of time, the feast of becoming, change, and renewal. It was hostile to all that was immortalized and completed.” (*Rabelais and his world*, tr. H Iswolsky, Bloomington: Indiana University Press, 1984, pp.7-10)

²³‘Mobility’ was published posthumously in *Architectural Design*, May 1967, p. 217, and often republished.

attitude towards rational methods of technological production on a variety of ethical levels. If the strife in Heraclitus' time proved to him that the world was not an single edifice struggling to maintain its equilibrium but a series of systems in flux heading towards disintegration, WWII produced an analogous effect on the edifice of Modernism. As Philip Johnson reflected:

When Alfred Barr asked me to join the Museum of Modern Art in 1930, our attitudes toward art didn't come from Heraclitus; they came from rational, Cartesian, Enlightenment thinking, and especially from Plato. Alfred's foreword to "Machine Art" quoted Plato: "By beauty of shapes I do not mean, as most people would suppose, the beauty of living figures or of pictures, but, to make my point clear, I mean straight lines and circles, and shapes, plane or solid, made from them by lathe, ruler and square. These are not, like other things, beautiful relatively, but always and absolutely." Once you acknowledge, with Heraclitus, that there are absolutes except change, you can get beyond Platonic solids. Then things like choice, taste, shapes get back into design-- anything goes...²⁴

Belief in a total environment in which every element played a mutually supportive role disintegrated. Ambivalence towards what the modernists had celebrated was compounded by a general sense of personal insecurity and homelessness that had resulted from the bombing of civilian targets.²⁵ Yet, despite the pessimism, the ambivalence was inflected further by the McLuhanesque faith in the 'global village'. This was a period when an entrenched and suspect mode of technological production was about to be superseded by the emergent communications technologies with their wild promises. The emergence of complex technology within architectural thinking coincided with its emergence within the popular domain of consumer products and services, with the obvious time lag behind the technological potentialities of the laboratory.

It was in this period that architectural culture engaged the emerging technologies of communication. Architectural theory, which had until now postulated for the technology of production, encountered the technology of consumption. 'Mobility' had a well-established value within the logic of production and the mode of architectural discourse accompanying it that focused on the practicalities of pedestrian and automotive circulation. Beginning with the critique of mainstream modernism after the Second World War, the obsession with unobstructed vehicular and pedestrian traffic flow around architectural objects extended to the objects themselves. The modernist understanding of

²⁴Philip Johnson's 'Starck Choice', *New York Times Magazine* (13 December, 1998).

²⁵Robert Maxwell wrote about "the gradual realization, in the whole immediate postwar period up to 1954 (in England at least) that the redemptive qualities of the functionalist approach, so ardently looked for in 1929, had proved to be an illusion. It was not after all possible to arrive at an architecture which would transparently transmit the content of the building task and no other content." (*New British Architecture*, NY: Praeger, 1993, p. 15)

technology needed to accommodate the very different logic of flux and flow. Conjectures would range from systems design and cybernetic planning to ephemerals of all kinds, including tensile, auto-destructive and inflatable structures. The role of architecture shifted from its traditional task of designing hardware (walls, floors, masonry) to that of designing “software”--programs that would enable diverse social situations in a given space.

Text

This study investigates the rise of an idea and of its image: that of the architectural global village. It dwells on this conceit in the context of the preoccupation with ambulatory models--from mechanization to restlessness--which accompanied industrial invention. Specifically, the dissertation focuses on the *Archigram*, the primary avant-garde architectural publication in Britain from 1961 to 1970, and related practices that engendered the high-tech movement. The *Archigram* was published at irregular intervals by six architects who would become known as the Archigram Group: Warren Chalk (1927-88), Peter Cook (1936-), Dennis Crompton (1935-), David Greene (1937-), Ron Herron (1930-94) and Michael Webb (1937-). The enterprise, however, is not monographic.²⁶ Rather, this work evaluates the assessment of a project as one which, in its time, provided “a new agenda where nomadism [was] the dominant social force; where time, exchange and metamorphosis replace stasis; where consumption, lifestyle and transience become the programme; and where the public realm is an electronic surface enclosing the globe.”²⁷ The publishers of the *Archigram* struggled to reconcile architectural form with emerging technologies and to represent visually the dissolution of the artifact into a landscape of complex and indeterminate systems. Their attempt to conceive an essentially material object, such as a house, in a world viewed as a series of impulses was among the earliest architectural explorations of the dilemmas introduced by electronic culture. As technological laymen, their conceptions reflected a popular, not specialist, climate, interpreted through the lens of an architectural education.

Using the concepts of mobility and flux as a unifying thread, the dissertation examines the web of political, social and historical forces at work within modern architectural practice in Britain. At the same time as the *Archigram* took on the global conditions of mass culture, the architectures were generated by conditions which often

²⁶This task has been undertaken by Simon Sadler as a PhD thesis, Open University, England.

²⁷David Greene, ‘Prologue’, *Concerning Archigram*, ed. D Crompton, 1998, London: Archigram Archives, p. 3.

were local to postwar Britain, even London, in the extreme. Despite claims for universal applicability, attitudes towards the technological have remained as regional as materials and landscape and were often more influential in producing new forms than developments in technology itself. The histories of technology, architecture and popular culture, as well as political and social considerations, all come into play in this study. For example, the extravagant fantasy of technological potential was based on a view of America very little of which was based on personal experience but a fantasy of mass media transmitted by the media.²⁸ The idea of America was significant for the Archigram group, as was the practice: four of them taught in the United States, as did their chief spokesperson Peter Reyner Banham (1922-88). Americana also had its importance, as in Ron Herron's uniform of cowboy boots and jeans, Warren Chalk's dedication to jazz and science-fiction magazines like *Astounding Science Fiction* and Marvel Comics.

The fantasy of abundance had its roots in the era of austerity with the British Pop movement of the fifties. And no matter what the potentialities of the laboratory were in the sixties, the architecture of the Archigram group was seriously fantastical in relation to everyday British life: only 50% of the population owned that symbol of American abundance as late as 1968, in accordance with Vittorio Gregotti's postwar 'myth of the refrigerator'.²⁹ But the sixties were more prosperous than the immediate postwar era, and while the fifties had to busy itself with the need to restore order, the next decade could afford the chaos of technological ebullience. Another example of globally inflected local conditions was the enthusiastic reception of the aging Richard Buckminster Fuller (1895-1983), another American import of technological assurance.³⁰ Fuller represented the true application of technology, *i.e.* the truly modern, over modernist aestheticism for the Archigram group and their like-minded contemporaries. A figure who in his native milieu had a reputation as an eccentric was admired for his quest to develop technologically sophisticated shelters of the lightest possible weight. Even the RIBA would acknowledge his significance to the local scene with a Royal Gold Medal.³¹

²⁸for an investigation of this phenomenon, see John A. Walker, *Cultural Offensive: America's Impact on British Art Since 1945*, London: Pluto Press, 1998.

²⁹This statistic, among other illustrations of economic bleakness, is quoted in *20th Century Britain: Economic, Social and Cultural Change*, by Paul Johnson, London: Longman Group Ltd., 1994, p.247.

³⁰John McHale described Fuller as representing a gateway for Europe into the new world.

³¹though not until 1968. The award was lamented by Malcolm MacEwen who thought that the official endorsement of the medal reinforced an "unlimited enthusiasm for technology with little understanding of its practical limits". (*Crisis in Architecture*, London: RIBA, 1974, p. 23)

In Fuller's opinion, the unquestioning acceptance of the infrastructural network provided by others fixed even the lightest of architectures in place. To liberate structure from the predetermined anchor of infrastructure required a radical questioning of the nature of architecture over the view of a building as an artifact that the building-as-machine motif of modernism had done much to reinforce. Yet the relationship of infrastructure and nomadism inevitably contained a tension between ephemeral and permanent: nomads leave paths; transient substances, like water, electricity and cars, require permanent conduits; the virtual web depends on a web of cables; cybernetic openness requires a closed circuit; and Fuller's minimalist position on infrastructure would, through the lens of the Archigram group, be translated into the monumentalization of services that was British 'High Tech' [figure 4]. The model of the city as a network was, on the one hand, all about impermanence. On the other, the articulation of buildings as transmitters for intangible entities as transient as energy transfers and information relays took on a decentralized, closed form by necessity.

Image

The work of the Archigram group is commonly associated with that of the British 'High Tech' movement that is seen to have followed the footsteps of the former. When the Archigram group saw the Centre Pompidou (1977) for the first time, however, they were disappointed.³² Though they saw their cartoons in it, the translation of their color-coding was too literal and the structure's lack of dynamism was fundamentally unlike their goals. They felt that Renzo Piano and Richard Rogers had converted their project into a traditional building. In a drawing one could approach an altered reading of the familiar, confront a radically new structural and social possibility, and explore the contours of intangible entities. Imagery had a different function to built form.

For this reason this study focuses on the Archigram imagery rather than the more common group activities, such as the Folkestone conference of 1966 or their only commission, an unexecuted entertainment complex for Monte Carlo. The *Archigram's* homespun appearance in addition to its fantastical propositions, misspellings, lowbrow preoccupation and short life has led to its not being considered worthy of sustained scholarly investigation. It is, however, precisely those characteristics that make it ideal for this study: "A misreading of [the work of Archigram] as a set of proposals, a set of windows through which to see a 'new world', is only a rather pathetic regurgitation of the

³²That encounter, including some of the bus trip from London to France, is recorded in Dennis Postle's, *Four Films*, Tatooist International Productions, Arts Council, 1980.

dogma which asserts that architectural drawings are representations of something that wishes to become. Archigram's efforts lay not in this tradition; they were not restyled modernism, they represented a conceptual shift, in common with other creative enterprises, away from an interest in the commodity (in this case, say, the building or the city) towards an interest in the protocols, structures and processes of mid twentieth-century culture...Archigram is about the possibilities for architecture--the both/and rather than the 'either/or'--not only with regard to speculation on architectural language and form, but also in terms of the widening of the site of conceptual interest that the architectural object might occupy and the kind of drawings (propaganda) that could be a tool of speculation."³³

The publication was a venue to explore how the architecture of the city could reflect a chain of events, continuous or disjointed, rather representing buildings as foregone, manufactured conclusions. Archigram's project, as defined in this study, was to represent architecture, not as fixed points on a map, but as a record of events dependent upon changing conditions along the axis of time. As such, change runs like a thread through all the projects and is a unifying feature, in a sense the only constant. Change was the pervasive theme of the cultural climate in the sixties, from the socio-economic mobility with which the 'provincial' Archigram members themselves toyed, to the nomadic built environment.³⁴ Social processes made up the environment, not just the domain of built things, and the Archigram group sought to extend the understanding of architecture to every part of the social experience that was in some way about exchange--of energy, of goods, of services. Architecture was that which circulated. Communication and commerce, linked since Hermes, extended to the exchange of information. The *Archigram* imagery was an effort to build a mode of communicating that had communication as its subject and that could serve as a tool to disseminate information about an architecture of information. In this terrain, information was a formative substance for the city and its components. Because the newsletter's contents were not intended as blueprints but as ideas about structure, the *Archigram* imagery illuminates a conceptual shift shared with other creative processes of mid twentieth-century culture in a manner that no executed project could.

³³David Greene, *op.cit.*, pp. 1-3.

³⁴David Mellor notes that the artist Peter Hobbs, who often had his paintings photographed in bombsites, prefigured the schemes of the Archigram Group, imagining "a civic future inside flexible, organic structures, complete with weather control. Yet painting was currently unwanted; it was, in his view, on a limbo edge of history, nomadic." (*op.cit.*, p. 68)

The Group

The six core members of the Archigram group did not work as a pack until they were hired in 1962 by Theo Crosby (1925-1994), who was part of a newly formed Architect's Department at Taylor Woodrow Construction Company, to work on the renovation of Euston station. Until recruited by Crosby, Chalk, Crompton and Herron had been working together on the South Bank Centre at the Special Works division of the London County Council.³⁵ Cook, Greene and Webb were recent graduates of Architectural Association, Nottingham School of Architecture, and the Regent Street Polytechnic respectively. The relationship with Crosby was a fortuitous one. An active participant on the avant-garde scene of the fifties after his emigration from South Africa, Crosby began his London career as an employee of Maxwell Fry and Jane Drew while sharing a flat with Peter Smithson (1923-). The scene was very closely knit: Drew designed the Dover Street premises of the ICA, thus establishing an inside connection for Crosby there.³⁶ During this time, Crosby befriended many artists such as Eduardo Paolozzi (1924-), Ben Nicholson and Barbara Hepworth among others and was involved in Independent Group activities at the Institute for Contemporary Arts (ICA). After being "gently fired" by Denys Lasdun and Lindsay Drake who had taken over the office while Drew and Fry were in Chandigarh, Crosby was the technical editor of *Architectural Design* (AD) from 1953 to 1962 where, using his far-reaching connections, he was greatly responsible for the more daring approach of the magazine as compared with its consensus-forming counterpart, the *Architectural Review*. Besides working at AD, Crosby was actively engaged in revitalizing the scene of architectural publications throughout the fifties and sixties, editing alternative art journals such as *Uppercase* which featured the work of Peter and Alison (1928-1993) Smithson among others.³⁷

Crosby got the not-yet Archigram members their first show, 'Living City' (1963), at the ICA. Their first publication as a group was the show's catalogue that set the tone

³⁵The contrast between the conservative brutalism of the Hayward Gallery and the fantastical projects of the *Archigram* highlights the discrepancy between the implicit agenda that had been ingrained in these architects by training and the explicit agendas of their aspirations.

³⁶See 'Night Thoughts on a Faded Utopia', in Robbins, *op.cit.*, pp. 197-199.

³⁷As Richard Hamilton observed: "It was an odd phenomenon of the fifties in London that the most adventurous minds were those young architects who found an outlet through Theo Crosby when he edited *Architectural Design*. He also persuaded several painters and sculptors among the Independent Group to gain access to an audience through print that was denied to them by the galleries. Indeed it was as a result of Theo Crosby's invitation that I wrote on Duchamp for the first time in *Uppercase*, and another, longer, effort 'Urbane Image' for *Living Arts* which proved a turning point; interest in my work was established among a small group of London cognoscente solely by this publication and it produced an invitation to exhibit that had been refused me for eight years." (*Collected Words*, London: Thames & Hudson, 1982, p. 7)

for things to come. This initial collective effort challenged the limits traditionally imposed by architects on the parameters of the urban experience. Instead of functional or social categories the group prioritized the transient and ephemeral situations that occur within the city. From then on, the six collaborated on the *Archigram* publication. The first two issues had already been published by Cook and Greene in 1961 and 1962 as a promotional sheet for student work [figure 5]. With the first joint issue in 1963, the *Archigram* was remade into a forum in which to dispute the accepted parameters of architecture.

In retrospect, the publication has been crucial for the sense of these six people as a coherent group. As Banham wrote, “the group itself was something of a ‘historical illusion’ produced by the magazine.”³⁸ Even the official biography of the group in 1965 read: “The Archigram Group has not been formally constituted. Six young architects found interests in common, at times they developed their ideas independently, at others they collaborated closely, in particular, on the production of Archigram, a mettlesome broadsheet that has stirred the interest of architect throughout the world.”³⁹ Production of them as a core group of six has been mostly a post-facto effort on the part of Cook, who always positioned himself as the spokesperson, and Crompton who manages the archive [figure 6]. In fact, the six were rarely together in London and the projects most commonly associated with the Archigram name were not jointly produced.

The surviving members do not always agree on the narrative that has been produced by Cook and Crompton. There is a sense that those who were more prolific about drawing have received more credit than those who supplied the driving ideas. As a result, David Greene and Mike Webb (for whom this feeling was only compounded by geographical distance after his immigration to the US in 1963) felt themselves on the group’s periphery; Warren Chalk had a temperamental relationship with the group. Greene recently described Archigram as “not so much a group as a collection of exposed nerves/ firecrackers...jumping and occasionally colliding to form even larger bangs.”⁴⁰

The Publication

In 1968, Cook described the *Archigram* as “the mouthpiece of a group of architects, designers, environmental researchers...(what’s in a name...?), based in London

³⁸‘Zoom Wave Hits Architecture’, *New Society*, 3 March 1966.

³⁹As the official biography of the group read in the pamphlet for the ‘International Dialogue of Experimental Architecture’ conference held in Folkestone in June 1966, as it had in the November 1965 issue of *Architectural Design*.

⁴⁰*op.cit.*, pp. 3-4.

and the United States. The first issue was produced in 1961 as a protest sheet, and all issues have been manifestos. They have always been based on proposition as well as discussion since the Archigram group believe in trying to sort things out and do something about it.”⁴¹ As a mode of communication to extend the public realm, the sphere of influence for these ideas was intended to be broad: the group mailed the newsletter to anyone they could think of. But contrary to its message of global distribution, the *Archigram* relied on a system of vehicles, roads and pneumatic tubes for dispersal which was also predetermined. The *Archigram* was dependent on the trajectories and restrictions of postal distribution and the contours of the audience were defined by the mailing list and publication quantity. There was also the random way in which they continued to travel through the architectural community, as Hans Hollein’s (1934-) anecdote of receiving his first copy by chance through Philip Johnson illustrates.⁴²

The Archigram brought projects from abroad, like the tensile structures of Frei Otto and Schultze-Fielitz, to the attention of the British scene and familiarized architects outside Britain with the work of Cedric Price (1934-), judged to employ state-of-the-art technology in his work, of Arthur Quarmby, Britain’s foremost champion of the architectural use of plastics and inflatables, as well as the work of students and recent graduates. The group sought role models, as in Yona Friedman (1923-) for whom the rigidity of the built environment was the greatest hindrance to a contemporary society, and Frei Otto (1925-), for his expertise on tensile structures:⁴³ “The greatest value of these Opping-Popping mags is their insistence that even ‘designing up to the minute’ is barely good enough...Hence the constant preoccupation of the Movement with far-out figures like Buckminster Fuller, Yona Friedman or (in Britain) Cedric Price, men who propose not only a more up-to-the-minute environment, but wild technological methods for getting it built quicker and in quantities more nearly commensurate with human needs.” The publication built a sense of a community for a group of people with whom their images resonated and may have even changed some attitudes as Peter Blake testified (“Everything, absolutely everything, suddenly became architecture”). Mostly it spread ideas and familiarized them, whether to be accepted or not: “While other architects may

⁴¹*Archigram* 8, unpaginated.

⁴²*Archigram*, Basel: Birkhäuser Verlag, 1991, p. 6.

⁴³Friedman’s “general theory” of a mobile society extended beyond the limits of architectural practice. Institutions, for example, would be subject to periodic renewal: marriage every five years, property rights every ten. (see Ockman, Eigen, *Architecture Culture 1943-1968*, NY: Rizzoli, 1993, pp. 273-275)

have had similar ideas and methods of working... Archigram were a kind of 'seismograph', documenting and processing new developments, then introducing them to a wider architectural scene."⁴⁴

The theme of *Archigram 3* (1963) was expendability [figure 7]. The issue was composed of seven sheets of low-grade gold paper (8"x13") bound with staples. Like the *Archigrams* before and after it, production was labor intensive, assembled by hand and reproduced by offset lithography. With its crude cut-and-paste technique and grainy reproductions, the newsletter had the appearance of a group effort carried out in someone's basement, which of course it was. While the second issue had been partly typeset, from here on the layout was done completely by typewriter. Peter Taylor's cover design included a plastic structure and a geodesic dome being delivered by helicopter. The issue dealt with the disparity in people's minds between architectural and other consumer objects, even though, the Archigram boomed: IT'S ALL THE SAME [figure 8]. While small-scale products were bought off the shelf and their limited lifespan accepted, the expendable environment was still "regarded as akin to anarchy". Playing on Rauchenberg's description of 'the gap between art and life', the issue declared 'There is a gap between idea and image' [figure 9]. Instead of having an off-the-shelf aesthetic, for example, housing ordered from a catalogue was dressed to conform to an extant architectural standard. While promising, "We shall not bulldoze Westminster Abbey", the issue promoted an analogy between molded bathrooms and kitchens, off-the-shelf housing, domes and Dymaxions and consumer goods like frozen peas and tissues. Besides the work of Fuller, the issue included projects by Friedman, Quarmby, George Nelson, Ionel Schein and even Renzo Piano who was still a student at the Milan Polytechnic.

After expendability, the group addressed the issue of speed in *Amazing Archigram 4* (1964), 'Zoom Issue'. Promotional effort and publication quantity increased with this issue which together with the provocative nature of its comic book format (8.5"x6.5") and content made this the most familiar of the *Archigrams*.⁴⁵ The cover was modeled on the *Amazing Stories* and *Astounding Science Fiction* series, right down to font and visual sound effects [figure 10]. A superhero dressed in Superman red and blue leapt over a futuristic skyline against a yellow background. Inside, four pages of doctored comic book frames had speech bubbles expressing (misspelled and ungrammatical) architectural

⁴⁴Toni Stooss, 'Foreword', *A Guide to Archigram 1961-74*, London: Academy Editions, 1994, p. 13.

⁴⁵Banham even distributed copies of *Archigram 4* while in America.

opinions, such as “A bold intuitive gesture that eludes rationalisation the strip cartoon kick provides a visual jump-off point---a mental boost-----enables us to push aside architectural waste-matter so that reality may emerge” [figures 11 & 12]. There was also a ‘Pop-Up’ centerfold of communication towers, each of which had to be cut by hand [figure 13]. With the aid of the comic book imagery, they joined space program structures to the spatial gestures of Bruno Taut and Price among others. Also included was hardware for the extreme conditions of outerspace (bubbles, capsules, tubes, wheels and suits) and underwater [figure 14], a theme that would continue in the next issue. The comicbook frame that was individually pasted on the ‘Underwater Zoom’ page further emphasized the handcrafted nature of the *Archigram*. The iconic image of Cook’s Plug-In City with its reflective superheros [figure 15] brought the issue to a close.

By *Archigram 5: ‘Metropolis’* (1964), Archigram group work was being published in other magazines, both in and out of England [figure 16]. After the digressions of *Archigrams 3* and *4*, the group returned to the experience of the city as a whole. This issue was an 8.5"x6" pamphlet, its 23 pages of cityscapes collaged with text in blue printed stapled along the narrower side. The editorial pages reinforced the contrasts of the ‘Living City’ exhibition: Sant’Elia’s ‘Breakthrough Into a New World’ was juxtaposed with Ebenezer Howard’s diagram for the “suitably degraded” Garden City, captioned ‘Grand Design For a Better Life (with overtones of sweetness and light)’. These opposites of technological futurism and the conventions of satellite towns summed up the relationship of the Archigram group to the modernist position at large, as well as their specific frustrations with the architecture being produced in Britain. On the one hand, the futurist model neglected by mainstream modernism; on the other, the model of bland suburbanization. This issue contained the much-reproduced images of Walking and Computer City [figures 17 & 18]. *Archigram 5* also included plenty of outside work alongside their own: that of Constant, Ralph Erskine, Friedman, Arata Isozaki, the Metabolists, Richard Neutra, Otto, Martin Pawley, Eckhard Schulze-Fielitz, Paolo Soleri and Kenzo Tange among others [figures 19 & 20]. Hugh Ferriss, Tony Garnier and even Jean-Baptiste Piranesi were also called upon to illustrate a scope of vision.⁴⁶

Aptly, the publication of *Archigram 6* (1965) at the center of the decade reflected a moment of historical contextualization of contemporary themes. It advertised the press Archigram was getting alongside a ‘Directory of Experimental Architects’, including:

⁴⁶Some of the images were borrowed from Ulrich Conrads and Hans G Sperlich’s *The Architecture of Fantasy: Utopian Building & Planning in Modern Times*, tr. C Crasemann Collins & GR Collins, NY: Frederick A. Praeger, 1962. Fuller, despite his being the exemplar for capsule components, was not part of *Metropolis*.

Eckhardt Schultze-Felitz (Germany), Otto (Germany), Joseph Weber (Holland), Continualism Group (Czechoslovakia), Pascal Hausermann (France), Ionel Schein (France), Webb and Greene (USA), Paolo Soleri (USA), Friedman (France), Group Architecture-Principe (c/o Claude Parent, France), Price and Archigram (England), Metabolism Group (Japan), Frederic Keisler (USA), Jerzy Soltan (Poland) and Constant (Holland) The double-sided booklet had LP-like dimensions (12"x12") and could be read starting from either cover. The side, on which 'Archigram no6(0)' was silk-screened in green and red psychedelic typeface [figure 21], began with an insert of eleven long and narrow pages (appr. 5"x12") entitled 'Current Scene'. The section included inflatables by Victor Lundy, Birdair and Price, followed by a hodge-podge of module-based urban schemes by Weber, John Outram and Nicholas Grimshaw, and then some 'Plug-In' capsules by Chalk and Herron. The substance of the issue was Chalk's collection of images from 'The 40's', laid out in five pages of contact sheets, which began on the flip side [figure 22]. The images included: Spitfire aircraft, views of the Thames forts, kitchen and bathroom units, plumbing details, the ARCON mass-produced, temporary houses, fashion images, Betty Grable, Jane Russell, Bird, Sinatra, stream-lined toasters and radios, Minnie Mouse and the double-decker bus.

Archigram 7: 'Beyond Architecture' (1966) introduced "the ARCHIGRAM NETWORK. THE PRINTED PAGE IS NO LONGER ENOUGH: Ideas and situations now involve movement and sequences that need film, colour, magnification and explanation in length; Magazines will dissolve into hybrid networks of all media at once." The issue consisted of fifteen loose pages of varying sizes printed in red, green, blue, brown or black that came sheathed in plastic.⁴⁷ Besides the title words running along the top, the cover page (8"x10") was an intricately woven black and white pattern of circuitry [figure 23]. The contents were variations on Cook's Plug-In, including a model for Paddington; Herron and Barry Snowden's Free Time Node; Webb's Rent-A-Wall, a three page essay by Price; two sheets of a cut-out puzzle [figure 24]; Chalk's 'Ghosts' collage and letter to David Greene [figure 25 & 26]; and a few pages of editorial comment. It also came with the promise that there may be no buildings at all in *Archigram 8*.

Cook wrote in the editorial of *Archigram 8*, 'Popular Pak Issue' (1968): "In seven years the discussion has shifted: first from a search for form to the throwaway building. From this to the notion of the all-happening city and from this, inevitably to the future of the 'building' as such. In *Archigram seven* the notion of programmed or designed

⁴⁷There was also an exhibition, 'Beyond Architecture: a Projection of 640 Images', at the Museum of Modern Art, Oxford, which opened on 22 February, 1967.

objects was beginning to loosen-up so that it is no surprise to us that *Archigram* eight is entirely concerned with the problem of direct personal provision: of comfort, facility, satisfaction, enquiry, and above all the effect of all kind of phenomena upon each other.” Like *Archigram* 7, *Archigram* 8 was a loose bundle of pages, this time of a consistent size (8.25"x5.875") contained in a mailing envelope made of yellow card (8.375"x6.25") [figure 27]. A plan of the ‘Moment-Village’ (1968), was printed on the inside of the envelope [figure 28]. The issue was organized around the Archigram group’s definitions of eight themes: metamorphosis, nomad, indeterminacy, hard/soft, emancipation, exchange, response and comfort [figures 29, 30, 31 & 32]. Each of the nineteen double-sided pages had a legend along the left margin that indicated which of the themes it emphasized. It also indicated whether the page belonged to the category of the popular pak, theory or project, or whether it was part of their plans for the 1968 Milan *Triennale*. Work from outside the group included an essay by Gordon Pask, the local authority on cybernetics, for the ‘aesthetically potent social environment’; three pages of notes and doodles by Price [figures 33 & 34]; and the design for a mobile exhibition hall by Alain Stinco, an activist with the Archigram group’s French counterpart, *Utopie* (1966-70) [figure 35].⁴⁸

In the final issue, *Archigram* 9 (1970) which declared itself the ‘fruitiest yet’ there was a move from an altered notion of building to the idea of the invisible. The issue (8.75"x7") was stapled along its left margin and was composed of a sheath of papers folded down their middle so it opens to the centerfold which is the editorial page: “In this Archigram we are following our dreams yet further and seeing now a gentler softer and more tantalising environment.” Tony Rickaby’s cover, entitled ‘Outgrowth’, was printed in red and black ink on bright, light green paper which wrapped around the front and back [figure 36]. A garden gnome honed in on a dog’s thought bubble, wires and microphones sprung from plants, a basket of vegetables and electronics lay at the feet of a gardener with an electrified shovel standing on his garden path. The garden shed is a mainframe. The ground is cut away to reveal carrots growing in protective casing and a sprinkler shoots up mushrooms and other vegetables along with water. The issue was colorful, printed with violet, pink, deep blue, light blue, brown, green, purple, bright red and orange inks on pale and bright yellow, peach, light green, white, pink, light blue paper. Contents included a questionnaire to help “gauge where our readers interests lie and to promote interchange of ideas”, Mike Webb’s ‘Dream’s Come True’ letter from America which was a catalogue of all possible environments resulting from people’s

⁴⁸For more on *Utopie*, see *The Inflatable Moment: Pneumatics and Protest in '68*, ed. M Dessauce, NY: Princeton Architectural Press, 1999.

choices, Greene's Gardener's Notebook for a fully serviced natural landscape [figures 37 & 38] with a packet of seeds attached. Also included was some architecture for the head: Herron's Holographic Scene Setter (1969) and Enviropill (1969). Chalk's Washamatic brought up the rear.

The 'Archizone' section brought the news that a community had been established. Firstly, a network connected the architectural schools across the United Kingdom. Then, in Japan, where Archigram were planning to send a capsule for the Osaka Expo (1970), "younger groups than the Metabolists who are nevertheless highly influenced by them" were springing up, not to mention of the "weird darned Austrians" like Hollein, Pichler, Haus Rucker Co, Zindup and Coop Himmelblau who hung inflatable rooms off the face of office blocks. There was even word of cynicism towards the architectural establishment growing in 'Australasia' and Latin America. With the publication in its final throes, here was proof that Archigram and its agitations had left a mark. A new legacy of 'hip-subculture' was now in the making, and groups like ARSE, Ant Farm and the Whole Earth Catalogue would take over.

Criticism

Scholarly material on Archigram has remained thin.⁴⁹ The available literature in which the Archigram group has appeared tended to employ it mostly by way of illustration is inclined to dismiss their efforts as impractical and ineffective. Typically, the group served as an example of technocentricity. Peter Eisenman's remarks of 1976 are such an instance:

...for the past fifty years, architects have understood design as the product of some oversimplified form-follows-function formula. The situation even persisted during the years immediately following World War II, when one might have expected it would be radically altered. And as late as the end of the 1960s, it was still thought that the polemics and theories of the early Modern Movement could sustain architecture. The major thesis of this attitude was articulated in what could be called the English Revisionist Functionalism of Reyner Banham, Cedric Price, and Archigram. This neo-functionalist attitude, with its idealization of technology, was invested with the same ethical positivism and aesthetic neutrality of the prewar polemic.⁵⁰

⁴⁹Recent interest, however, is sure to translate shortly into publications.

⁵⁰Peter Eisenman, 'Post-Functionalism' (1976), reprinted in *Architecture Theory Since 1968*, ed. K. Michael Hays, Cambridge, MA: MIT Press, 1998, p. 237.

There are much more disapproving articulations, such as Karsten Harries' evaluation of their work as a 'hyper-active distraction' from 'real issues'.⁵¹ Archigram has also been given a negative evaluation from a political perspective:

Advocacy planning and the self-help projects of the 1960s were one response to modernism's apparent failure, but the collapse of those efforts only contributed further to the architect's sense of political impotence. What both the activists of the 1960s and the first postmodern critics of the early 1970s were reacting to was, in fact, the evolution of modernism in the postwar decades into a routinized corporate modernism that seemed headed in two equally unpromising directions: the expressionistic excesses of a Stone or a Saarinen, on the one hand, and the "scientific" determinism epitomized by the researches of Christopher Alexander or the technological fantasies of Archigram, on the other.⁵²

The group was aware that their emphasis on individual freedoms was viewed as immoral and apolitical. Hollein would address that criticism in his introduction to the first catalogue in 1972: "For a while it seemed that their work was lacking in social and political conscience, disregarding the single individual in favour of a technologically supremacy. I trust this proves incorrect...Their idea are always for *people*, for a better *life* for people."

The idea of the city as an enormous machine was also found frightening, by Siegfried Giedion among others. As Banham in his inimitable style put it: "Architects are frightened of machinery, and have been so ever since engineering broke loose from the back pages of Vitruvius and set up on its own."⁵³ Also commonplace was the criticism that they didn't develop a sustained program: "the members of the Archigram group have established virtually no theoretical or philosophical premises for their design programme. Nor have they tried to coordinate their projected constructions by placing them in specified settings."⁵⁴ Hollein resolved this too, calling the Archigram's strategy intuitive but consistent.

Retrospective

Hollein's rebuttals were, together with the remarks of Arata Isozaki, Reyner Banham and Peter Blake, an introduction to the first Archigram catalogue and as such

⁵¹'Time, Death, and Building', *Constancy and Change in Architecture*, ed. M Quantrill & B Webb, College Station: Texas A&M University Press, 1991.

⁵²Mary McLeod, 'Architecture and Politics in the Reagan Era: From Postmodernism to Deconstructivism', reprinted in *Architecture Theory 1968*, ed. K. Michael Hays, Cambridge, MA: MIT Press, 1998, p. 683.

⁵³'The Machine Aesthetic', *Design By Choice*, ed. P Sparke, London: Academy Editions, 1981, p. 44.

⁵⁴Justus Dahinden, *Urban Structures for the Future*, London: Pall Mall Press, 1972, p. 70.

part of the group effort to control its representation. In fact, most of the Archigram literature is composed of catalogues for self-produced retrospectives and the journalism the shows engender. The first accompanied a retrospective at the ICA in 1972 where Peter Cook had a brief stint as director. Already in the early seventies, Cook was packaging the not-quite past. His marketing of the group from the very beginning codified to a great extent how the Archigram group was to be remembered: as part of Sixties popular culture, like the Beatles, miniskirts, drugs and space travel; as part of the counterculture that saw architecture is a medium of communication; and as a strategy that forced architects to break away from out of the “establishment fashion of the 1950s”.⁵⁵

A second retrospective orchestrated by Dennis Crompton traveled from the Kunsthalle in Vienna to the Centre Pompidou, Paris in 1994. Two separate and quite different catalogues were published for this show: CD sized one for Vienna and a much glossier affair by the Pompidou center. Vienna version contains has a foreword by Toni Stooss and an afterword entitled, ‘ARCHIGRAM: The Final Avant-Garde of an Ageing Modernism?’ by Herbert Lachmayer. The proceedings of a symposium held in tandem with the exhibition in Vienna have also been published.⁵⁶ Pompidou contains beautiful, fetishized images, which often make the originals look more polished than they are, translations of Archigram and Banham texts into French, and critical essays by François Barré, Alain Guiheaux, Dominique Rouillard and Jean-Claude Garcias. A thinner catalogue on the same format as the Vienna catalogue was produced for the reduced version of the show that were held in the Cornerhouse Gallery, Manchester, UK, Thread Waxing Space in New York, San Francisco Museum of Modern Art and the Henry Art Gallery, Seattle. That catalogue was introduced by David Greene and Michael Sorkin, and also contains commentaries by Barry Curtis and William Menking.

This organized hindsight tends to promote the activities of the group at the expense of the *Archigram* publication. The picture of a movement is emphasized in the exhibitions over the crafting of an idea emphasized by this study. The dissertation shares most with the view expressed in the less pervasive and more theoretical reflections of David Greene:

If when it is raining on Oxford Street the buildings are no more important than the rain, why draw the buildings and not the rain? Well, I can only ask you to concentrate on the question whilst enjoying the picture--sorry, the drawing--and perhaps see the buildings as advertisements, part

⁵⁵Peter Blake, *Archigram*, *op.cit.*, p. 7.

⁵⁶Participants included Peter Cook, Karin Wilhelm, Barry Curtis, Coop Himmelb(l)au, Günther Feuerstein, Helmut Richter, Adolf Krsichanitz, Christoph Langhof, Peter Wilson and William Menking.

normative architectural rendering, part provocation, and then reconsider the fact that a building is a sort of residue, a ghostly reminder of all the ongoing processes--economic, technical and social--that make up the environment...This is a new terrain in which information becomes almost a substance, a new material with the power to reshape social arrangement, in which the city becomes a continuous building site in a very literal sense, in which things and people vibrate and oscillate around the globe in an ecstatic consumption of energy, in which the modernist search for the authentic is an anachronism, in which restlessness is the current cultural condition. This is the landscape inhabited by Archigram.⁵⁷

A terrain, after Heraclitus, in which information was almost a substance; a city in which things and people were in constant motion; a place in which restlessness was the cultural condition. This is also the landscape of this study.

The first chapter sets the Archigram agenda within British modernism as it was exhibited in the architecturally experimental context of the London Zoo and elsewhere with an eye particularly directed towards the technological attitudes of the building industry. The politics of the postwar era is investigated in order to situate the Archigram agenda within the avant-garde context of the nineteen fifties, leading up to the consolidation of the group in 1963.

The second chapter contextualizes the first Archigram group collaboration, the 'Living City' exhibition, in terms of the other major exhibitions which set the milieu in and against which the Archigram members formed their ideas. The reformulation of modernist urbanism by Team X and, in turn by the Archigram group, is part of this discussion. The structure and themes of the 'Living City' introduce the theoretical concerns that will be elaborated in the newsletters to follow and in this study.

The third deals with the form of the newsletter, its graphic strategies and the creation of an architecture of information through a process of representation and dissemination. The section is an investigation of the creation of a graphic syntax to express the technological panorama.

Having prepared the historical and theoretical ground, the last three chapters concentrate on the informational content of the *Archigram*, from autonomous units to reflexive environments and the structural expressions of mobility, disposability, transience and invisibility. 'Bathrooms' focuses on rigid prefabricated cores, infrastructure and the problem of using conduits as a model for a smart architecture. 'Bubbles' is about the inflatable skin and how the introduction of time into the spatial model was led, through organic metaphors for technology, to the isolation of virtual reality.

⁵⁷David Greene, *op.cit.*, pp. 1-2.

‘Systems’ looks at the strategies that the group used to combine the isolated units into dynamic, social environments. The chapter looks at the gradual lightening of the megastructure into an urban experience free of the infrastructural anchor, leading to the point where architecture would lose all its hardware metaphors, even that of the conduit. There would be no difference between the architectural domain and that of information.

In that case, the study asks in conclusion, why did this integrative terrain lead to the disintegration of architectural objects into a technologically driven, post-industrial version of the picturesque landscape?

Chapter 1: Modern Architecture in England

The International Exhibition of Modern Architecture held at the Museum of Modern Art five years ago consisted in the main of buildings in France, Holland, Germany and America...Today, it is not altogether an exaggeration to say that England leads the world in modern architectural activity.

H.R. Hitchcock, *Modern Architecture in England*

The trajectory of modern architecture in England had a touch of the surreal. The first exhibition dedicated to British modernism, 'Modern Architecture in England' (1937), was held abroad, at the MoMA. In the introductory essay to the catalogue, Henry Russell Hitchcock attributed the sudden interest in the British scene to what he called the first building fully representative of the International Style: Tecton's 1934 Penguin Pool designed for the London Zoo [figure 39].¹ "It was that unique monument", wrote Hitchcock, "which first dramatically attracted the attention of the world to developments in England."²

The Zoological Society of London, founded 1826, had always employed high-profile architects to set the zoo within John Nash's Regent's Park. Indeed, a walk through the zoo provides an informal tour of local architectural developments from the Neo-classical East Tunnel (1829-30) by Decimus Burton, to the 'naturalistic', reinforced concrete slopes for the wild animals of the Mappin Terraces (1913-4),³ and onward to the

¹As the promotional publication, *The Buildings of the London Zoo*, described, this building made people consider the implications of modern architecture: "Well received by the architectural profession for its elegance and technical virtuosity, the Penguin Pool has also captured the imagination of a wide public. It can be appreciated simply, as a deliberately contrasting backdrop for the dumpy penguins, or, with a greater and perhaps tendentious regard to the birds' more active moments, as a pointer to the liberating possibilities of modernist architecture. 'How many citizens of London have brooded over the railings of that pool, envying the penguins as they streak through the blue water or plod up the exquisite incline of the ramp--and have wondered sadly why human beings cannot be provided, like penguins, with an environment so adapted to their needs?' Professor Sir Charles Reilly hoped to 'live long enough to have a small town house, I suppose with one ramp for my wife and another for myself as circumscribed, and complete for my needs, and with no possible addition or alteration--indeed the perfect unity. No doubt I shall have to simplify my habits before I am worthy to live in such a thing of beauty, but that would be very good for me as for most of us.'" Reilly's quote was taken from the *Architect's Journal*, 10 January 1935, p. 70.

²*Modern Architecture in England*, NY: MoMA, 1937, p.25.

³"Warren Chalk acknowledges the inspiration of the Mappin Terraces at London Zoo for the casual build-up of the South Bank Scheme." (*Archigram*, Basel: Birkhäuser Verlag, 1991, p. 120)

hand-hacked, irregularly formed rugged concrete substantiality of the Elephant and Rhino Pavilion (1962-5) by Hugh Casson, to the dramatic birdlike tension structure of the Northern Aviary (1962-4) by Cedric Price. Moreover, Sir Hugh Casson, the architectural coordinator for the much-feted Festival of Britain of 1951, was commissioned in 1956 to draft a plan for modernizing the zoo.

Before the Penguin Pool, it was common wisdom that England was devoid of modernist interest. Only one British example, Joseph Emberton's Royal Corinthian Yacht Club of 1931, was included in Hitchcock and Johnson's *International Style* exhibition. But with the Pool, Hitchcock wrote, "it became evident that England was not only accepting modern architecture as the logical contemporary way of building, but was providing opportunities for architectural talent of the highest technical and esthetic ingenuity." Anticipating the criticism that "the Penguin Pond was not in the fullest sense architecture, but rather a large object of abstract sculpture or a permanent stage setting", he replied: "anyone who has seen the penguins performing elaborate music hall turns upon its inclined planes soon realizes that this is no objection: to provide a perfect setting for these incredible creatures, in the London Zoo with its enormous popular audience, was the essential functional problem."⁴ Of reinforced concrete throughout, the pool demonstrated the potentialities of that construction technique, particularly in the interlocking ramps that were cantilevered without intermediate supports.⁵ Ove Arup and Felix Samuely, major figures in innovative structural engineering of the time, collaborated with the Tecton group to provide this structural spectacle.⁶ The pool "though diminutive, gained an international reputation as the quintessential statement of the new architectural aesthetic."⁷ In fact, the Museum of Modern of Art, in collaboration with Harvard's Department of Architecture, commissioned Moholy-Nagy, then residing in Hampstead Garden Suburbs,⁸ to film *The New Architecture of the London Zoo* (1936),

⁴*op.cit.*

⁵For this the architects had to petition for an exemption from LCC building code.

⁶Berthold Lubetkin (1901-1990) founded the Tecton partnership upon his arrival in London from Paris. The original members of Tecton, along with Lubetkin, were Godfrey Samuel, Lindsey Drake, RTF Skinner, Anthony Chitty, Michael Dugdale and Valentine Harding. Though Summerson considered their buildings to be among the "most original projects of the thirties...the impact they made was not of the kind which sparks off invention in others. They were perhaps over-sophisticated for their time and even had the war not intervened, it is doubtful if the Tecton creations would have helped to form an English 'school'." (Trevor Dannatt, *Modern Architecture in Britain*, London: BT Batsford Ltd., 1959, p. 17)

⁷As described by Anthony Jackson, *The Politics of Architecture: A History of Modern Architecture in Britain*, Toronto: University of Toronto Press, 1970, p.44.

⁸from 1935 to 1937. Hampstead Garden Suburb has the distinction of being one of England's first Garden Cities.

“a record of the extraordinary new buildings done by the Tecton architects”.⁹ The appeal of the spiraling arcs continued into the sixties, reinforced by Ulrich Conrad and Hans G. Sperlich’s inclusion of the pool in *The Architecture of Fantasy* under “the ancient, mysterious motif of the labyrinth”.¹⁰

Alongside the progressive architectural policies of the zoo, the state of the profession in Britain goes a long way towards explaining why it took a commission for an animal habitat to draw attention to the modern cause. It took a letter from Siegfried Giedion (1888-1968) to Wells Coates (1893-1958) in 1933 to prompt the foundation of a British contingent for *Congres Internationaux d’Architecture Moderne* (CIAM), known as the Modern Architectural Research Group (MARS).¹¹ External perception was reinforced by organizational apathy, compounded by uninspired schooling. Starting with an apprentice style architectural training, as opposed to a Beaux-Arts attitude, British architectural schools were, in Robert Maxwell’s words, “dominated by the self-help attitudes and the demands of article assistants.”¹² Even in the sixties, Arthur Quarmby would describe the consequences of a British architectural education:

⁹The Penguin Pool had been preceded by the Gorilla House (opened 1933) which had the distinction of being Tecton’s first commission. This film was among three on which Moholy-Nagy collaborated on during his brief stay in Britain: *The Life of the Lobster*, a record of the community life of Sussex fisherman, made for John Mathias, a “wealthy young Englishman who in the best amateur tradition had switched from polo to movies”, and with H.G. Wells, *The Shape of Things to Come*. Moholy-Nagy accepted the latter task because, Sybil Moholy Nagy remembers, “it offered an almost unlimited chance for experimentation with new plastic materials...The fantastic technology of Utopian city of the future would, so Moholy dreamed, eliminate solid form.” (*Moholy-Nagy: Experiment in Totality*, Cambridge: MIT Press, 1969, pp. 116-138)

¹⁰NY: Frederick A. Praeger, 1962, p. 72. The publication of Conrad and Sperlich’s *Fantastic Architecture* in English brought with it “news of the dreams and disappointments of the early moderns”. (*The Sixties: Britain and France, 1962-1973*, ed. DA Mellor & L Gervereau, London: Philip Wilson Publishers, Ltd, 1997, p. 126)

¹¹The letter, published in the *Architects’ Journal* (LXXX, 1934, p. 425) inquired whether the response to the new architecture was so lukewarm in England so as not to warrant a delegation to the Congress. Of the response, John Summerson wrote: “The MARS Group started off very solemnly, very ideologically with both hands gripping the wheel in a determination to drive straight. Wells Coates was the first chairman. Elaborate agendas were circulated for the early meetings, every member having his allotted share in the production of some kind of manifesto which, I think, never quite came out. I used to be reminded of what the meetings of the Cambridge Camden Society must have been like when ‘Early Middle Pointed’ was adopted as the only true style for Christian Englishmen. But I also think that the MARS Group had a certain fear of its own priggishness; it is no use pretending that there was any deep sense of brotherhood or dedication among the rank and file. And as time went on and as the MARS members felt real solid work growing on their drawing boards, such discipline as there ever was fell into casualness.” (Dannatt, *op.cit.*, pp. 14-5)

¹²*New British Architecture*, NY: Praeger, 1993, p. 19.

We design out of habit, we do not think, we do not question. Many of us graduate with a set of ideas which have been planted in us at college and which we can then use, virtually unchanged throughout our careers. For this one can perhaps blame architectural education which, even more than other forms of education, is aimed at the situation as it exists now, rather than at what it could be or what it will be in twenty years time, when the students are at mid-career. The real purpose of architectural education is as concealed by the academic course, no matter how liberal, every bit as much as the doctrine of Christianity is obscured by the teachings of the Church... A student attends an architectural college in order to obtain the blessing of society which will then permit him to practice as an architect and earn a modest living.¹³

In any event, there were only seven RIBA-approved schools of architecture in 1927.¹⁴ The most progressive schools were Liverpool, under Charles Reilly, and the Architectural Association, where president Gilbert H. Jenkins reviewed the *Weissenhofsiedlung* to the general meeting as: "A French exponent of modernism has built a plate glass box to form one of these new abodes--one could not conceive it as a home for anyone save a vegetarian bacteriologist."¹⁵

Modern Architects in Britain

It was symptomatic of the internal conditions in the 1930s that little of the modern leadership was homegrown and that the first acknowledged modern structure was to be designed by an immigrant. "Interesting characters suddenly appeared", John Summerson wrote, "as if from nowhere: on enquiry it was found that (like Otto Silenus) they had worked abroad or in the dominions and had probably done something which was not quite architecture. Thus Wells Coates, born in Tokyo, had lived in Canada and British Columbia and had an engineering degree. Amyas Connell and Basil Ward had worked their passage from New Zealand, bashed their ways to academic honours and descended on us from the high eminence of Rome. Raymond McGrath, with his idiosyncratic talent for drawing and calligraphy, was also from New Zealand. While Serge Chermayeff, born in the Caucasus, had seen something of the Argentine and designed for a firm of furnishers."¹⁶ The modernist cause was boosted by the immigration of prominent architects like Walter Gropius (1882-1969), Marcel Breuer (1902-1981s) and Erich Mendelsohn (1887-1953) to England as the political situation in Germany worsened. They all lived for a time in Wells Coates' modern Isokon flats (1934) in Lawn Road,

¹³*Plastics and Architecture*, NY: Praeger, p. 9-10.

¹⁴Despite this, Maxwell wrote about the disproportionate number of architects per capita: "Today in Britain we find no less than 20,000 registered architects in a total population of 56 million, with as many again of architectural assistants. That means an architect to every 1,500 people." (*op.cit.*)

¹⁵Jackson, *op.cit.*, pp. 20-1.

¹⁶Dannatt, *op.cit.*, pp. 12-4.

Hampstead,¹⁷ but they did not stay. Mendelsohn transferred the body of his practice to Palestine. Others, encouraged by offers from educational institutions, left for the United States. Moholy-Nagy went to Chicago with Georgy Kepes. After Gropius failed to secure a teaching position at Cambridge University, he left for Harvard in 1937, soon to be followed by Breuer. Lubetkin was among the few high-profile architects to remain.

Slow to gain institutional support, the proponents of modern form struggled against bureaucratic motions set in place to preserve rural traditions. Coinciding with the promotion of modernism was the fear that construction was proliferating without any legal safeguards or controls. Cheap development was springing up along the newly paved roads, regulated only by safety codes.¹⁸ Although substantial legislative activity to combat such commercial enterprises would have to wait until after WWII, the RIBA became officially concerned with the environmental dimension of this development in the thirties. "Preservationists argued", writes David Matless, "that in the nineteenth century an attitude of *laissez faire* had destroyed the town, and in the twentieth century was destroying the country."¹⁹ With Ebenezer Howard's model for the Garden City--a hybrid of individualism, socialism and municipalism which was influential in theory, but in

¹⁷The design of the Lawn Road Flats was meant for up-to-date inhabitants who traveled light, wanted minimum space with maximum service, ideal in every sense for refugees. Gropius lived there from 18th of October 1936 to March 1937, Breuer around the New Year of 1935, Moholy-Nagy for a few weeks around May 1935, as well as Agatha Christie and Henry Moore. The Isokon flats were a prototype for a community of affordable, modernly furnished flats, complete with a canteen and a laundry, that its developer, Jack Pritchard, hoped (in vain) to replicate in Manchester and Birmingham. Pritchard also established a furniture division of Isokon to which all three Bauhaus masters contributed designs. In fact, Summerson found these flats themselves (apart from their eminent occupants) to be the most memorable building of the thirties because both the client, Pritchard, and the architect "felt themselves to be an agency of a new force in English architecture." (Dannatt, *op.cit.*, p. 17) For detailed information on Pritchard and Isokon, see Alastair Grieve, 'Isokon', *Modern Britain 1929-1939*, ed. J. Peto & D. Loveday, London: Design Museum, 1999, pp. 79-94.

¹⁸Commercial development provoked much of the debate over the need for planning. David Matless writes: "[J.B.] Priestly considered the processes of urban growth: 'very soon the road that was specially made to escape the town has now become a sort of town itself...This is called *Ribbon Development*, and it is going on all over England. It is no good to anybody.' Ribbon development made the city an 'octopus', growing in a 'Natural' rather than 'Controlled' style...The octopus image was popularized by Williams-Ellis's *England and the Octopus*, but had been originally deployed in 1915 by Abercrombie...Abercrombie proclaimed 'the power of great ideas, fearlessly advocated, in order to lead the energies of the city into the right channels...all the energy is there--it only lacks direction'. The octopus image captured this sense of expansive vigour, ribbon development being presented as an appalling lively town-country hybrid; 'a vigorous hybrid growth', a 'hectic Saturnalia of ugliness'...Combating the octopus thus demanded not nostalgia or escapism but 'a live, growing sense of order, decency and beauty', with a sense of necessarily modern response heightened by the aerial view of the octopus image. Here was a plan view, a mappable disorder." (*Landscape and Englishness*, London: Reaktion Books, 1998, pp. 37-8)

¹⁹*ibid.*, p. 28.

practice appealed mostly to ecologically-minded minority groups--close to hand, officials had an extant model which already balanced planning, the environment and social idealism.²⁰ The play of town against country, the layering of greenbelt, industry, services and housing, were all given a more sophisticated turn in the theories of Patrick Geddes, a botanist by trade, regarding the organic interdependence of all parts of the environment, including the social, which, in turn, greatly influenced one of the most prominent Town and Country planners, Patrick Abercrombie.²¹ First instituted in its crudest form in 1932, the Town and Country Planning Act granted local authorities the power to veto any building that it felt would 'injure the amenity of the locality'. Inevitably this accusation was directed at many a modern proposal. Modern architects also found themselves battling the committee set in place by the RIBA in conjunction with the Council for the Preservation of Rural England, an organization set up in 1926 largely through Abercrombie's initiative, to assist local authorities in making such decisions.²² The nationalist rhetoric that was involved in the discussions of landscape would eventually lead, as we shall later see, to the contested postwar compromise of Picturesque planning, a strategy which was argued to embody Englishness.²³

In dialectic with strong myths about the countryside was the fact that Britain had long been an urban centered society. At the same time, ardent defense of private land ownership left Britain administered predominantly by local authorities, rather than under the centralized control of a capital city.²⁴ Alison Ravetz explains how the role of these provincial authorities evolved: "For long, public authority, in the shape of local councils acting often under the orders of central government, was almost exclusively concerned with infrastructure, or that part of the built environment that private enterprise did not provide, yet found essential to its own functioning. The intervention of local corporations in such matters as highways, drains, industrial pollution and fire control date back to pre-industrial times: in London, to the Middle Ages, and in large towns to 1800 or earlier. They came more and more to intervene in the provision of the super-structure by private builders, through building regulations... But in the main, the provision of new

²⁰Robert Fishman, 'Ebenezer Howard', *Urban Utopias in the Twentieth Century*, NY: Basic Books, 1977, pp. 23-88.

²¹Abercrombie even published a book under that title in 1933.

²²Jackson, *op.cit.*, p. 26.

²³see N Pevsner, *The Englishness of English Art*, London: Architectural Press, 1956; Erwin Panofsky, 'The Ideological Antecedents of the Rolls-Royce Radiator', *Three Essays on Style*, ed. I Lavin, Cambridge, MA: MIT Press, 1995, pp. 127-64.

²⁴The obvious contrast is the distribution of power between the public and private sectors in 19th century France, as well as the relationship between the capitol city and the provinces.

building by local councils waited for the high Victorian period, when such things as town halls, law courts, markets, public baths and libraries reflected the new urban culture and government.” She further elaborates why, in contradistinction to France for example, there was a resistance in Britain to the centralized control of building: “In Victorian society there were immense barriers to public intervention in town development. One was a general unpreparedness for the scale of the new urban problems, which were on a level for which there were no administrative systems or relevant professions. The other was the sanctity of private property. There was also an unquestioning faith in the workings of the free market, or the principles of *laissez-faire*. Eventually, it was the health of towns that prompted physical measures and brought in their train a system of local government which has since become so all-embracing that it is aptly called ‘the local state’.”²⁵ Thus the logics of sewage essentially created the legislative structure for building by forcing coordination and reform on the “scores of uncoordinated parish vestries, boards, trusts and private companies that were in the hands of landowners or gentleman amateurs”.²⁶ The ideal of a sanitary urban environment would remain crucial to British models for effective social reform, right up to the welfare state.

Using technology to improve on urban conditions had been implemented in a succession of model communities designed by entrepreneurs, such as Robert Owen’s New Lanark (1817), Titus Salt’s Saltaire (1853-63) or George Cadbury’s Bournville (1878),²⁷ as well as public policy directed at social improvement and the relief of urban poverty. By the time the 1949 Housing Act made local authorities responsible for housing all their residents and restricted building permits and materials for private enterprise, any official reference to the ‘working class’ as a distinct social body had become legally unacceptable.²⁸ Together with the strategic distribution of industry to offset economic decline, the vision of ideal communities led to a comprehensive system of land use, as well as to controls in building and property development. With the acceptance of urban planning as a tool for social reform, the role of the British architect, long associated with commissions for commercial, civic, ecclesiastical structures, or homes for wealthy clients was expanded to the coordination and integration of design at

²⁵*The Government of Space: Town Planning in Modern Society*, London: Faber & Faber, 1986, pp. 14-5. Indeed, the LCC was formed in great part to provide a unifying body for the local authorities.

²⁶*ibid.*, p. 16.

²⁷Each of these communities was centered on a factory. Every detail of the worker-tenants lives was catered for, right down, in Cadbury’s case, to the correct way to brew tea.

²⁸Jackson, *op.cit.*, p. 166

all scales. “As creative architects”, wrote Wells Coates in 1934, “we are concerned with a Future which must be *planned*, rather than a Past which must be *patched up*”.²⁹

This professional role may have already been established in the CIAM discourse for some time, but within the British context modernist strategies of planning from the top down were at odds with the tendency within British politics towards devolution. And though utopianism had a well-entrenched tradition in the British imagination from Francis Bacon to HG Wells, this utopianism was in the pragmatic, hands-on tradition of the eccentric inventor. Modernism’s account of a collective utopianism struggled to co-exist with the segregated political structure inherited by the Welfare State, along with the high value placed on individualism in the cultural imagination that was only bolstered throughout the fifties by the politically endorsed images of an imported ‘aesthetic of plenty’. Even in the sixties, when the socialist version of utopianism competed with its rival lore, that of the fantastical vision, the hallucinations remained those of solitary poets working into the night. In this sense, the visions of the *Archigram* fit into a long-standing British tradition of technological Utopianism, where visions of what engineering could produce were combined with the ideals of social progress.³⁰ Pride in this tradition is also evident in the local histories of the components from which the Archigram group built its projects. The development of the computer is told as a tale of obsessive tinkering on British soil, from Babbage to Turing. Similarly, British histories narrate the development of plastics in the tradition of the speculative amateur. Arthur Quarmby wrote that back in 1664 the English experimental philosopher, prolific inventor and curator of the Royal Society, Robert Hooke had speculated: “I have often thought that probably there might be a way found out to make an artificial glutinous composition much resembling that excrement out of which the silk worm wire-draws his clew.” The “real birth of the plastics industry”, however, “was delayed until the second Great Exhibition in 1862 at which Alexander Parkes exhibited his new material which he called Parkesine.”³¹ And, Quarmby continued, in “what we think of as a typical British way, the discovery [of polyethylene in 1933] was made by chance, and in its final stages was the result of a

²⁹*Unit One: The Modern Movement in English Architecture, Painting and Sculpture*, ed. H Read, London, 1934. (italics original)

³⁰The projects contained in the *Archigram* were rarely collaborative. Most of the projects ‘belonged’ to various members of the group. In a conversation with David Greene (4 March, 1999), he spoke of the tensions within the Archigram Group over the authorship of ideas: Ron Herron drawing Warren Chalk’s ideas, Peter Cook expressing David’s, etc.

³¹American record cites John Wesley Hyatt as developing an early version of celluloid in Albany, New York (1863),

small leak in the apparatus which admitted just enough oxygen to complete the material.”³²

Banham, loyal in some sense to his mentor’s nationalistic characterizations of art,³³ reinforced this by emphasizing the Britishness of the Archigram group’s minute attention to detail that distinguished them from other manifestations of technological fantasies, such as Futurism or Expressionism.³⁴ Being understood against the background of myth of the amateur was very important to the Archigram group’s self-identity. Cook’s *Experimental Architecture* presented the Archigram group in the tradition of the ‘Boffin’:³⁵

A fascinating shift in recent years...is the rise of the ‘boffin’-designer at the expense of the ‘artist’-designer. The boffin works methodically, accruing and inventing when necessary, and by almost myopic devotion he frequently arrives at his objective. He acknowledges only what he wants to as relevant or important. Sometimes he may have forgotten the original context of his pursuit, but he arrives at his goal nevertheless. His intuitions are channelled. To see him as the product of the technological age is not enough. In his working method he owes more to the tradition that has run alongside that of architecture, and has at least as respectable a history. His is the tradition of Invention or, more precisely, of the attitude of mind that solves problems by inventing ways out of them.³⁶

The Archigram group worked by the ‘boffin’ analogy rather by playing the card of technological *savoir-faire*. In fact technical expertise was virtually absent from their engagement with advanced technology.

This was so despite the fact that the centrality of theoretical knowledge to postindustrial technology was what Daniel Bell called its ‘axial principle’. “Nineteenth-century inventing was trial-and-error empiricism,” Bell wrote, “often guided by brilliant intuitions. But the nature of advanced technology is its intimate relation with science, where the primary interest is not the product itself but in the diverse properties of materials together with the underlying principles of order that allow for combination, substitution, or transmutation.”³⁷ Thus emerging complex technologies were not often

³²Quarmby, *op.cit.*

³³see *The Englishness of English Art, op.cit.*

³⁴*Megastructure: Urban Futures of the Recent Past*, London: Thames & Hudson, 1976, p. 84. “The reasons why the British alone seemed prone to finick over detailing are diverse and often personal, but do seem somewhat connected to a national tendency to take refuge from ideology in pragmatics.” Banham maintained that after Price’s Fun Palace, which had gotten as far as satisfying fire regulations, “any project which hoped to be taken seriously had to be detailed down to the window corners and the jointing gaskets.” (*ibid.*, p. 96-7)

³⁵British usage which someone who is technologically innovative without the ideological burdens of the professional

³⁶London: Studio Vista Ltd., 1970, pp. 11-2.

³⁷Daniel Bell, ‘The Information Society’, *The Computer Age*, ed. ML Dertouzos, J Moses, Cambridge, MA: MIT Press, 1980, p. 165.

understood outside of the specialist community. The terms ‘hardware’ and ‘software’, for example, remained outside of the popular, or the *Archigram*, lexicon until 1968.

To be sure, there was no clean break, neither chronological nor conceptual, between what has been characterized as industrial and postindustrial technology. Neoteric advanced technology might be groundbreaking, Bell observed, but “the industries that still dominate society--steel, auto, electricity, telephone, aviation--are all ‘nineteenth-century’ industries.”³⁸ When Crompton recounted the history which led to the Archigram’s conception of the reflexive environment, he saw it as having descended from “Bell, Baird, Faraday, and the rest...What they did was to discover the facilities”.³⁹ Alexander Bell, the Baird family and Michael Faraday were prime examples of the “‘talented tinkerers’ who worked independently of or were ignorant of contemporary science” in Daniel Bell’s definition. The Archigram group’s view of themselves as carrying on the ‘boffin’ heritage fit the industrial model. At the same time, the process-based agenda of postindustrial technology perfectly suited the Archigram one.

Industrial Housing

The industrial model only had a proper entry into the British construction industry after the slump in building that accompanied WWII. Most of Britain’s urban centers suffered moderate to severe damage during the war, urgent rebuilding was needed in its aftermath. Unlike its European allies that had come under direct German occupation and were suffering from political disarray as well as physical devastation, Britain was able to begin immediately with the concrete process of restoration.

The housing shortage had already been a predicament before the German bombing campaigns, and was only more acute by the time that Atlee won the general election of 1945. Given these urgent conditions, the relative speed of modernist construction did much more than any dogma for its general application. The necessity for new homes provided plenty of employment opportunities for architects with fourteen New Towns being built from scratch. Additionally, the Education Act of 1944 guaranteed all students equal access to schooling, requiring seven hundred facilities to be built in six years. By 1948, 40% of architects were working for government departments rather than private offices and most others got their work from government commissions as well.⁴⁰ “[H]ere, at last, in the ‘welfare state’”, Summerson reflected, “was the

³⁸*ibid.* 164.

³⁹‘The Piped Environment’, *A Guide to Archigram 1961-74*, London: Academy Editions, p. 254.

⁴⁰Jackson, *op.cit.*, p.172.

opportunity of the big official department to demonstrate architecture as a public service; here was the chance to bring industrial production into building on a realistic scale; here, in the larger housing projects and in the new towns, were occasions to study the dwelling in relation to the street, the street in relation to the town itself.”⁴¹

The instatement of a Labour government meant that the relation of central to local jurisdiction became more complex. Service industries such as electricity, gas and water were nationalized and the building program, though executed at the local level, was regulated and financially controlled from the center to ensure a more equitable distribution of funds amongst richer and poorer districts. The government took control of large sectors of construction and instituted the Compulsory Purchase Law that granted the state the power to buy any land needed for the construction of roads and housing. The most influential system for a rapid-assembly was developed in Hertfordshire at the district level for a standardized kit of parts for school buildings, to be followed by the Consortium of Local Authorities Special Programme (CLASP). These collaborative programs epitomized the group practice of architecture which became commonplace in Britain during these years. However, in addition to austerity, the gap between scientific and technical knowledge on the one hand, and governmental function and industrial activity on the other, hindered the modernization of the British building industry. It wasn't the avant-garde, but a governmentally appointed Committee for the Industrial and Scientific Provision of Housing which first wondered in 1943 why the home remained an exception to the “industrial magic” applied to the production of clothing, furniture, textiles, household equipment and motor cars.⁴² Despite this observation, none of the committee's suggestions produced any palpable results, perhaps because of coordination problems within the loose structure of the building industry. Additionally, public resistance to non-traditional forms of housing dictated policy. In short, developments in prefabrication tended to be driven by necessity rather than preference.⁴³

Because of the severity of the shortage, the White Paper on Housing (March 1945, Cmd. 6609) permitted specified firms and the local authorities to employ technically approved non-traditional methods of construction. One later criticism of the

⁴¹Dannatt, *op.cit.*, p. 19.

⁴²R.B. White, *Prefabrication: A History of its Development in Great Britain*, London: HMSO, 1965, p. 126.

⁴³“In Great Britain, prefabrication for its own sake has seldom been consciously aimed at. Although never fostered in the interest of a long-term housing policy, it was given its greatest impetus through the accidents of two major wars when almost any house at almost any cost was acceptable so long as it was a functional proposition and could provide a reasonable substitute for traditional materials and labour that were temporarily scarce.” (R.B. White, *op.cit.*, p. 4)

governmental policy was its failure to account for the “long-term industrial, social and planning problems associated with large-scale prefabrication; it virtually confined ‘prefabrication’ from the start to a miscellany of short-term, unrelated experimental houses”.⁴⁴ The government’s approval of the Temporary Housing Programme in 1945 has been criticized since for its “under-estimated costs and over-estimated potentialities”,⁴⁵ but without doubt heightened prefabricated construction despite the general public’s resistance to non-traditional homes and produced one model that was still admired by the younger architects of the sixties: the Aluminium Bungalow. While aluminum had not been the material of choice, shortages of steel and plywood, together with idle aircraft factories and scrap, seemed to address a myriad of national problems: austerity, unemployment, homelessness.⁴⁶ And though its lifespan was short due to unanticipated expense and the prevalence of corrosion (White Paper, Cmd. 7304), the bungalow’s entire construction, with the exception of nailing down the floorboards, was mechanized. Because of the lightness of the aluminum and the air-entrained cement grout used to fill the external panels, each bungalow, complete with its prefabricated kitchen-bathroom unit, did not exceed transportable weight. Each bungalow arrived fully wired and with its entire plumbing system so that no joints had to be made onsite. After the production of the components, final assembly was carried out on a moving-belt system at the rate of one per every twelve minutes.⁴⁷ But the massive governmental interventions and subsidies for ‘alternative’ building methods ceased around 1953, and, apart from the well-known cases of the Hertfordshire schools and the subsequent CLASP method, experiments with prefabrication, especially of this mobile kind, declined dramatically within the LCC.

Warren Chalk summarized this postwar history:

...the first half of the Forties saw a great inventive leap made out of necessity for survival, advancing technology and mass production techniques and demonstrating man’s ingenuity, courage, effort and investment under the stress and pressure of war. Out of this period came too a strange social idealism. The idealism was to fade but the technology, the laminated timber or geodesic framework of an aircraft, the welded tubular construction of a bridge, the air-structure of a barrage balloon, and much more, filtered through to colour our attitudes and disciplines today. During the final stages of World War II several prefabricated house types emerged, as part of the “clip-on”/“plug-in” heritage...However soon the market was flooded with prefabricated systems, destroying the very basis of mass production, and the social stigma attached to the word “Prefab”

⁴⁴*ibid.*, pp. 122-3.

⁴⁵*ibid.*

⁴⁶Compare this with the Smithson’s ideological insistence on steel in the construction in the Hunstanton school. As a result, the project, which was supposed to demonstrate off-the-shelf principles, was under construction from 1951 until 1954.

⁴⁷White, *op.cit.*, pp. 141-148.

proved fatal...Meanwhile the straight-up-and-down architectural situation had seen an end to the “white boxes” of the thirties and the Modern Movement became acceptable to all except the most reactionary. The standard of architecture was poor and little of it worth recording here, only Lubetkin struggled manfully on, until the Peterlee New Town fiasco proved too much. The socialist idealist camp looked towards Sweden and the copper clad mono-pitch was born, and a Mies type factory (Frankel) went up quietly in Wales...At the end of the war...the war heads were removed and replaced with electronic equipment and fired off into space heralding the beginning of the space programme. Events such as this, too many to enumerate here, occurring in the forties, have shaped the pattern and attitudes we subscribe to today. The contributions made in so many disparate disciplines should be important to us in our search for a way out from current stagnation and misdirection.”

In the housing sector of the 1950s, systems of mass production only accounted for 15% of construction because of resistance on the part of the public and private industry despite the efforts of the Ministry of Works, the Ministry of Health and the Building Research Station among others.⁴⁸ The aesthetic of what the Architectural Review would call People’s Detailing or the New Humanism dominated the domestic scale. The bedroom communities of the New Towns were built in a style that mixed Garden City planning with suburban picturesque styling--Derived from ‘neutral’ Swedish adaptations of modernism, it meant to provide an antidote to the jagged landscape left by the war. New Humanism was essentially a compromise of modernist principle, ‘all mod cons’ with brick walls, sloped roofs and flowerpots. The folksy style was, to put it mildly, not well received by the younger generation.⁴⁹ As the critic Reyner Banham described it, “Those of my generation who interrupted their architectural training in order to fight a war to make the world safe for the Modern Movement, tended to resume their studies after demobilization with sentiments of betrayal and abandonment.”⁵⁰ Maxwell described the atmosphere in which the conflict between the older generation of teachers and the younger, more idealistic generation of students was waged:

It was no longer possible [after WWII] to believe in a rational architecture without symbolic content. But the functionalist tradition, which had stressed the social contingency of architecture along with its theoretical rationalism, left architects with a bad conscience when it came to a conscious manipulation of symbolic form. Throughout the fifties in England there reigned an uneasy truce between the empiricists and the ideologues. The Architectural Review...provided a rationale for the Picturesque style which, for all its scholarship and its cultivated sense of appropriate character, had been accompanied by a general feeling of drift and of missed purpose. Labels were invented to identify new movements which might resolve the moral dilemma posed by the recognition that form is willful and ambiguous--the New Eclecticism, the New Humanism, the New Empiricism, finally the New Brutalism.⁵¹

⁴⁸Jackson, *op.cit.*, p. 169

⁴⁹This conflict is much discussed, perhaps disproportionately so, in the extant literature.

⁵⁰Revenge of the Picturesque’, *Concerning Architecture*, ed. J Summerson, London: Allen Lane, 1968, p. 265.

⁵¹Maxwell, *op.cit.*, pp. 10-2

Mainstreaming Counterculture

The New Brutalism, the last of Maxwell's 'labels', was the tag fastened to what Peter and Alison Smithson proposed as an alternative to the unacceptable faces of modernism which surrounded them; it was their version of 'truth to materials', what they called the 'as found'.⁵² They asked that architects let the properties of materials, including manufactured ones, stand unadorned. In the realm of 'authentic' expression, the Smithsons promoted the use of structural elements 'as found' off the factory shelf. The structure on which they rose to prominence, the Hunstanton School (1950), was the first modern building David Greene remembers to have seen.⁵³ The younger generation found its most vocal expression in the writings of the prolific Smithsons and, from a cultural point of view, in the criticism of Reyner Banham. Banham, a key figure in any narrative concerning the architectural scene of fifties and sixties London, was responsible for the popularization of 'The New Brutalism' label with his article of the same name in the *Architectural Review* (1955) where he worked while completing his dissertation under Nikolaus Pevsner at the Courtauld Institute, University of London. The significant change that the Smithsons, with the help of Banham, imposed on the direction of British architecture was reflected again in the London Zoo by its new Elephant and Rhinoceros Pavilion (1958-64), as well as the description of that structure by its architect Hugh Casson as "zoomorphic New Brutalism".⁵⁴

From a distance, the building looked like a cluster of animal pens. The reinforced concrete ribbed walls were hacked on the outside to expose the aggregate. The internal surfaces were faced with gray-blue tiles and a brick skin. The central space had a webbed roof with laminated wood beams that met in the cluster around the flue and air intake. "Casson's 1958 scheme", explains the official zoo literature, "revived the exhibition aesthetic that Tecton had introduced to the London Zoo in the 1930s, transmuted through the spirit of the Festival of Britain. Spectacular modernism was again applied to animal display...The Elephant and Rhino Pavilion is a bold and apposite

⁵²For an explanation of the 'as found', see 'The 'As Found' and the 'Found'', *The Independent Group: Postwar Britain and the Aesthetics of Plenty*, ed. D. Robbins, Cambridge, MA: MIT Press, 1990, pp. 201-2.

⁵³in conversation (Marylebone, 1 June 1998).

⁵⁴*The Buildings of the London Zoo, op.cit.*, p. 43.

exercise in New Brutalism; its bulky massing and wrinkled surfaces speak of its inhabitants.”⁵⁵

Now the Festival of Britain, under Casson’s directorship, crystallized the diluted state of modernism for the Smithsons. By the time of Casson’s pavilion, the influence of the Smithsons was such that his roughly hewn concrete structure was seen unproblematically from the perspective of the trend initiated in opposition to the style associated with its author. In fact, as proof of its agreeability, the building won an RIBA award in 1966. These mainstream manipulations of Brutalism made its weaknesses clear, forcing Banham ultimately to reject its agenda in 1966, claiming that, “For all its brave talk of ‘an ethic, not an aesthetic’, Brutalism never quite broke out of the aesthetic frame of reference.” His main critique was directed at the Smithsons’ application of contemporary technology, or, more accurately, lack thereof: “the house itself is still the same kind of shelter as a primitive wattle hut, makes no attempt to put these new household powers to work to create a human environment in a radically new way.”⁵⁶

Technology for the Birds

While the Elephant and Rhino Pavilion reflected the mainstreaming of a technological aesthetic going on outside the zoo, the next landmark to break with consensus and set a new direction for avant-garde thinking in materials and engineering was again a birdcage within it.⁵⁷ One of the byproducts of WWII was to restore British faith in its own engineering which had been a source of national pride since the Industrial Revolution, but had been destroyed by the depression following the Great War. The aftermath of the second, Britain promoted itself as one of the few countries with atomic knowledge, as well as innovating with synthetics and pharmaceuticals. Experiments in transportation were undertaken into supersonic flight, hovercraft travel and automotive speed. The Jaguar E-type car (1960-1) could reach the speed of 150 mph on the few extant motorways,⁵⁸ while at the Mini later represented general accessibility of private transport. Turing’s experiments at the Government Code and Cipher School in Bletchley

⁵⁵*ibid.*, p. 21

⁵⁶“For a short period...it looked as if an ‘other architecture’ might indeed emerge, entirely free of the professional preconceptions and prejudices that have encrusted architecture since it became ‘an art’. It looked for a moment as if we might be on the threshold of an utterly uninhibited functionalism, free, even, of the machine aesthetic that had trapped the white architecture of the 30s”. (*The New Brutalism: Ethic or Aesthetic*, London: The Architectural Press, 1966, p. 134)

⁵⁷As Archigram put it alongside an illustration of the aviary: “Many will say: this zoom stuff is all very well, but you could never build it...its for the birds...” (*Archigram 4*, 1964, p. 13)

⁵⁸The first motorway, the M1, opened in 1959.

Park where he worked from 1939 as a cryptanalyst to crack Germany's 'Enigma' and 'Fish' codes were much celebrated and led to the development of what are seen as the first electronic digital stored-program computers.⁵⁹ In the face of such propaganda, the relative lack of advances in the construction industry angered the young avant-garde interest in such technological development: the pneumatics which powered the hovercraft, the connectivity of computers, accelerated modes of air travel and as in the case of the Northern Aviary (1961-3), London Zoo, the structural potentials of new materials. Engineering, these architects believed, could liberate people and animals from the traditional constraints of shelter.

In 1960, the Zoological Society commissioned Lord Snowdon to design a large aviary for free-flight and an internal public viewing route. Snowdon asked Cedric Price, a crucial role model for the Archigram group, to collaborate with him on the project. The two invited Frank Newby, a student and employee of Samuely's, to act as consultant. The result was an aluminum framed, computer modeled, tension structure forming a four-peaked, crystalline volume for maximum volume on a very awkward site running the Regent's canal to Prince Albert Road [figure 40]. The steep slope of the site was used to make a garden at two different levels to accommodate different types of bird. The public path zigzagged through the rectangular plan, crossing the middle as a cantilevered bridge. Wire mesh supported by tension cables produced a large, unobstructed volume. Cables of tensile steel sheathed in black plastic, were, in turn, stretched over a series of triangulated frames. As well as using state-of-the-art materials and design tools,⁶⁰ the frames were carried by wires on shearlegs at either end, thus creating a tensegrity structure in the Buckminster Fuller tradition.

In 1961 *Architectural Design* (AD) dedicated its July issue to Buckminster Fuller. Guest edited by John McHale (1922-78), the Independent Group activist who would later write the first biography of Fuller, the AD issue opened with a response Fuller had sent McHale in 1955. In this letter, Fuller insisted on the remoteness of Bauhaus principles from his own. "Do any of them publish what their structures weigh", Fuller asked of the Bauhaus masters, or "what their original minimum performance requirements must be, and later prove to be, in respect to velocities of winds, heights of floods, severity of

⁵⁹The type we use today. For more on this subject, see George B. Dyson, 'On Computable Numbers', *Darwin Amongst the Machines*, Reading, MA: Perseus Books, 1997, pp. 53-73.

⁶⁰"Aluminium castings, stainless steel forging, welded aluminium mesh and long-life cable anchorages were high technology in 1962." (*Cedric Price: Works II*, London: Architectural Association, 1984, p. 33)

earthquakes, fires, pestilence, epidemics, etc., and what the shipping weights and volumes will be, and what man hours of work are totally involved?"⁶¹ In addition to Fuller who rejected and was rejected by mainstream modernism, Banham's dissertation thesis, published as *Theory and Design in the Second Machine Age* during the previous year, argued that avant-garde trends such as Expressionism and Futurism, trends crucial to the development of modernism, had been written out of the official narrative. The obliteration, Banham argued, resulted in a kind of institutional schizophrenia. Banham restored the discarded interventions, especially those that championed technology, to the chronicle, thus forging a respectable lineage for Fuller and preparing the way the alternative student magazine.

Zealousness for Fuller and fullerisms was mostly reserved for the rebellious generation of the sixties; Fuller's embodiment of the connection between the new technology and the military establishment made him a complicated bedfellow for the British brand of fifties Pop. The influence of Fuller's Dymaxion bathroom unit, however, on the Smithsons' 'House of the Future' (1956) was obvious [figures 41 & 42]. Designed for a general public visiting the Ideal Home Exhibition, the *Daily Mail* further advertised the house to the 'average citizen' in a feature including images of a set of futuristic inhabitants surrounded by gadgets, dressed from top-to-toe in vinyl leaf cloches, garments and shoes [figure 43]. Suffice it to say that there was some precedent even within the rather staid fortress of modernist severity for some eccentricity.

Poetry of the Countdown

Following the lead of role models like Fuller, the initial decision to establish the *Archigram* newsletter was motivated by the desire to give air time to projects that were not approved by either mainstream or avant-garde consensus, but were truly modern right down to their nuts and bolts. The first two issues of *Archigram* emphasized the work of students and recent graduates. The first *Archigram* was just two sheets of low-grade paper, a long and narrow cover sheet with type- and handwritten text attached to a folded sheet of reproductions of architectural projects, each encircled by editorial text, with three staples on the left side [figure 5].⁶² The text on the cover sheet included: A brief

⁶¹July 1961, p.295.

⁶²The first issue is now the most rare. Images included on page 2 in a clockwise order from upper-left spiraling inward are: plan of John Outram's Concert Hall at Westminster (1959), elevation of Edward Reynold's Concert Hall at Trafalgar Square (1958), model of Peter Cook and GP Sainsbury's Complex of Hotels and Offices at Piccadilly Circus (1961), model of David Greene's Mosque at Baghdad (1960), model of Steve Osgood's Teignmouth Seaside Development (1960), axonometric of Timothy Tinker's Cinema at Westminster (1959), elevation of Michael

introduction to the newsletter in a spiky script, a list of the projects which appeared on the next pages in typed form, intermingled with handwritten words floating in bubbles of outline and a longish poem, complete with spelling errors and typos, by David Greene in both handwriting and type which began:

The love is gone.
 The poetry in bricks is lost.
 We want to drag into building
 som [sic] of the poetry of the countdown,
 orbital helmets, Discord of
 mechanical body transportation methods
 and leg walking
 LOVE GONE

The ‘poetry of the countdown’ and ‘mechanical body transportation methods’ succinctly encapsulated the concerns to follow in later issues. The editorial of the second *Archigram* grappled with how the architecture chosen for the issue related to the Modern, while confirming the visual statement of the first. Responding to criticisms directed at the projects included in *Archigram* 1, Cook wrote:

Because we are the generation after the generation after the generation that made it with modern we can't just tack along... One's mind naturally associates the forms of Bowellism with Gaudi and Mendelsohn, and the blame does lie, to some extent, with the inability of the designers to discover an aesthetic original to the mood... But the forty years between had given the new work indefinitely more to build with. Technology was ready. The ‘Dan Dare’ quality these buildings have springs from their common involvement with Dan Dare's psychology--with that of Superman. Lunar architecture and shredded wheat, and in physical terms, with that of the radiator grille and the launching pad...The situation today, this year, could not be the same without these occurrences. Form, space, enclosure, and complete involvement with our packaged environment is already ceasing to be selfconscious. Modern architecture is coming to include these things. If we are involved in all this, the public image of modern architecture seems terribly irrelevant. Flat roofs, a lot of glass and blank walls... The emergence of ‘expendability’ as a topic in several schemes is coincidental but significant. It is a symptom that may well grow into the basis of a zeitgeist.⁶³

Though again the seeds for the *Archigrams* to come--science fiction, expendability--were planted, the second issue was a relatively subdued affair of ten pages stapled along the

Webb's Furniture Manufacturer's Association Offices, High Wycombe (1959) and model of Robert Manley's Seafront Prototype Complex (1959).

⁶³*Archigram* 2, p. 1. Bowellism, as Cook explained, referred to “the appearance and complexity of the human bowels and was used as a term of reference to work done by students at the Regent Street Polytechnic School of Architecture in London during the year 1956-9...It was a heady and beautiful thing” (*Experimental Architecture, op.cit.* p. 43). Mike Webb was one of those students and as Crompton related the story, Nikolaus Pevsner coined the term during his Reith Lectures, ‘The Englishness of English Art’, delivered on BBC radio in 1955 when he referred to these students’ work as ‘stomachs on a plate’. (*‘Archigram Revisted’*, Bartlett School of Architecture, 23 February, 1998)

narrow edge in a booklet format. Design statements accompanied drawings and photographs. The cover was a collage of the featured projects, composed by Peter Taylor. Among others,⁶⁴ the London County Council (LCC) contingent of the future Archigram group was solicited to submit their competition entries for Halesowen Housing (1960) and Westminster Housing (1961). Many beginning architects, including Warren Chalk, Dennis Crompton and Ron Herron, were funneled straight from professional training into the LCC, the looming bureaucratic body that controlled most of the architectural output. In the 1950s, it was difficult to attain an individual license; one went to the local authorities in search of work. Many students from the politically charged milieu of the Architectural Association, where an atmosphere of anti-establishment and opposition to the oppressive RIBA curriculum reigned, were attracted to the LCC anyway because of its Leftist politics.⁶⁵ The last page of this *Archigram* was, in fact, an LCC advertisement that asked: “Have you thought of joining the LCC?”

Despite this early association, Archigram’s politics did not fit the familiar leftist patterns of the discipline and much of the criticism leveled at the group over the course of a decade was based in a disdain for their social position, characterized as libertarian, or even anarchic.⁶⁶ Because architectural agendas, particularly in the British case, were taken to be a socio-ethical stance, the emphasis on communications and consumption in the ‘global village’ did not sit easily with the raw materiality of Marx’s mode of production. Cook defended the group’s position in 1970. “The recent history of architecture”, he wrote, “has been a mirror to the realization of socialism. The majority of experimentalists have been socialist, and their choice has been of the degree to which the fabric of their work need give symbolic expression to their beliefs...Even those who would regard themselves as pure researchers or experimenters are made to feel increasingly aware of the social and moral (and therefore political) implications of their work...The experimenter (particularly the boffin) often finds it necessary to maintain an ambivalent stance against this in order to keep the operational objective in mind at all: this is an argument for the occasional dynamic myopia--and it depends upon the total

⁶⁴The other projects included were: Ken Martin’s thesis project for the Maritime Museum, Pierhead (1961); Andrew Anderson’s Farm Buildings (1961); Anthony Gwilliam’s Library (1960); Peter Cook’s Young People’s Housing--car body type units on precast guts (1962); Adrian Sansom’s East End Housing (1961); Peter Stead and David Lewis’ House Built from Industrial Units, Huddersfield; and Timothy Tinker’s Moldgreen Housing (1960).

⁶⁵I cannot but simplify the LCC context here. The political history of the LCC is as complex as can be expected from any unwieldy, bureaucratic body. See A. Saint, ed., *Politics and the People of London: The London County Council, 1889-1965*, London: Hambledon Press, 1989; W.E. Jackson, *Achievement: A Short History of the London County Council*, London: Longmans, 1965.

⁶⁶Justus Dahinden, *Urban Structures for the Future*, London: Pall Mall Press, 1972.

politics of the situation. The experimentalist may come to be some kind of special force in the wake of social change, but not necessarily part of *its* avant-garde.”⁶⁷

Like the Independent Group before them, part of the predicament lay in being fascinated with American design in the face of Cold War politics. The turn towards a visual propagation of consumer culture was a peculiar form of avant-garde response to the predicament that the socially minded ideologies of mass production encountered in the postwar era. In continental Europe, as Thomas Crow wrote, “where more powerful Marxian traditions engendered uncompromising suspicion of the promises lodged in capitalist commodities. Those traditions also had the effect--in the realms of both politics and art--of generating a continual parade of minuscule radical groupings, announcing themselves with grandiose manifestos and anathematizing rival rivals for the slightest doctrinal differences.”⁶⁸ Not only was a championing of consumer culture distinct from contemporary European movements, this celebration of Americana went against the socialist grain of the architects in control of Britain’s building agenda who wanted nothing to do with the capitalist excesses of consumer ‘anti-culture’. Additionally, many admired avant-garde artists had fled to America and the definition of what constituted American art was in itself confused. “How to reconcile”, asked Banham, “unavoidable admiration for the immense competence, resourcefulness and creative power of American commercial design with the equally unavoidable disgust at the system that was producing it...how to maintain this discriminating admiration in the face of the conditioned reflex atomic sabre-rattling of the Eisenhower regime?”⁶⁹

The ‘sabre-rattling’ extended into the cultural sphere where the American government was involved in promotion of certain representational practices abroad, like abstract expressionism, as propaganda. Though Read was suspicious of the support of American big business, the ICA was a private institution in a constant search for funding and the roster of exhibitions and lectures at the Institute reveals the influence of American support on the ICA’s independence. For fear of losing such donors, Soviet artists and speakers were rarely welcomed at the ICA after 1952. Shows of American art, on the other hand, abounded: “In July-August 1950, for example, a show called ‘American Symbolic Realism’ was mounted, accompanied by a catalogue paid for by the American impresario and ballet director, Lincoln Kirstein. A series of shows of

⁶⁷Experimental Architecture, *op.cit.*, pp. 21-22.

⁶⁸*The Rise of the Sixties: American and European Art in the Era of Dissent, 1955-69*, London: Weidenfeld & Nicolson, 1996, p. 47.

⁶⁹Arts in Society: Representations in Protest’, *New Society*, vol. 13, no. 345, (8 May, 1969), pp. 717-8.

American art followed: drawings by Saul Steinberg; photos from Life magazine funded by Time-Life; painting by Jackson Pollock and Sam Francis featured in the 1953 show, 'Opposing Forces'; a Mark Tobey retrospective in 1955. American speakers such as Alfred H. Barr, Thomas B. Hess, Phillip Johnson, Ben Shahn and Meyer Shapiro were also invited to deliver lectures."⁷⁰ In short, as Jean-Louis Cohen has summarized, the "Marshall Plan and the Cold War transformed the nature of Americanism, which henceforth involved the direct introduction of American consumption patterns and suburban organization. The Americanization of European space replaced earlier accumulations of ideal references; America was now an ever-present factor in politics and consumer society."⁷¹

Because the familiarity of most British artists with America was not based on personal experience, they relied on such intentionally exported--and imported--imagery, as well as on media images relayed via the mass media.⁷² McHale was among the first to travel to the US, having received a fellowship to study colour theory with Joseph Albers at Yale. As the story goes, he returned with a trunk of glossy magazines that became the fodder for many an Independent Group collage. Read's dislike for most things American might have endeared those very things to the Independent Group, but even amongst the Pop artists there was a resentment of the economic domination made painfully manifest by the Marshall Plan. Richard Hamilton, for example, was torn between his CND affiliated left-wing politics and his visual preoccupations. Hamilton hoped that by understanding the processes of production and consumption, artists would contribute as producers, not consumers. The critical distance discernible in Hamilton's familiar collages of consumer imagery from the 1950s was not apparent in the 1960s projects of the Archigram group. Ultimately, Archigram's insistence on an apolitical agenda in a time when art and politics were intensely fused put them at odds, not only with the establishment, but with other avant-garde groups who shared their structural affinities in

⁷⁰see John A. Walker, 'The ICA, the IG and America During the 1950s', *Cultural Offensive: America's Impact on British Art Since 1945*, London: Pluto Press, 1998, p. 17.

⁷¹*Scenes of the World to Come: European Architecture & the American Challenge 1893-1960*, Paris: Flammarion, 1995, p. 183.

⁷²Original documents which describe the interest in American mass culture: Lawrence Alloway, 'The Arts and the Mass Media', *Architectural Design*, no.28, Feb. 1958, pp.84-5; *Architectural Review*, 'Man Made America', December 1950, & 'Machine Made America', vol.121, no.724, May 1957; A.&P. Smithson, 'But Today We Collect Ads', *Ark*, November 1956, n.18, pp.49-53. For critical writing on Americanism: Jean-Louis Cohen, *Scenes of the World to Come: European Architecture and the American Challenge 1893-1960*, Paris: Flammarion, 1995; Robbins, D., *The Independent Group: Postwar Britain and the Aesthetics of Plenty*, Cambridge: MIT Press, 1990; John A. Walker, *Cultural Offensive: America's Impact of British Art Since 1945*, London: Pluto Press, 1998.

France (Utopie), Italy (Archizoom) and Austria (Haus Rucker CO) in particular. While a fragment of Situationist map appeared in the Living City exhibition, as well as a collage with an astronaut declaring, “I’m happy because I have learned how to be creatively non productive” [figure 44],⁷³ the introductory statement for Timothy Tinker’s Moldgreen Housing (1960) in *Archigram 2*, makes the individualist attitude clear: “does a planning ideal, and administrative theory, an advertiser’s merchandising policy, a technocrat’s computer, or an architect’s ego, justify trammeling an individual into a pattern against his will?”

In the analysis of Ian Jeffries, such libertarianism resulted from the fact that, despite their beliefs in technological inevitability, these architects took the possibility of personal choice for granted. The Archigram group viewed society, Jeffries writes, as energetic, creative and economically mobile, able to fight itself free “of impersonal economic determinants, in which individuals would henceforth decide for themselves on the kind of matters that had previously been decided for them by the authorities--of whatever sort.” This was quite a different view of class than that held by those before them who conceived of the architect as a subtle director of the theater of life, creating spaces that would encourage, and discourage, behavioral tendencies. “The doctrine of free choice”, Jeffries continues, “lay behind their preoccupations with indeterminacy in building; for if every citizen was forever at liberty to make up his or her mind then there could be no determinate solution to any building problem.”⁷⁴

The issue of choice, of course, was not new to the sixties. The Smithsons’ ‘patterns of association’ also allowed for individual freedoms: “We should say that the form of the house groups should be such that an individual can choose his degree of contact...or protection...and thereby pleasure...in the machine-served society.”⁷⁵ But Jeffries compared the Smithsons’ view on choice, *i.e.* that which should be exercised in the face of an overbearing culture at large, with that of the Archigram group. The Smithsons, he writes, believed “in architecture which would compensate for the ills of the social moment.” By contrast, for the Archigram group, “the ability to make choices was the hall mark of the new epoch--about to be revealed.” Crucial to the formation of the Archigram group’s view of architecture as an enabler of free choice was the thematic of inhabitant directed change apparent in the work of Cedric Price. Alongside Mike Webb’s Sin Centre (1962) and David Greene’s Spray Plastic House (1962), *Archigram 2*

⁷³*Living Arts*, 1963, no. 2, pp. 84-5.

⁷⁴*The Sixties*, *op.cit.*, p. 127.

⁷⁵*Without Rhetoric: An Architectural Aesthetic, 1955-1974*, Cambridge, MA: MIT Press, 1974, p. 14.

exhibited Cedric Price's plans for his 'Change and Movement' project (1958-60). Price's structures were designed to be quickly adaptive to the changing needs of the users. One of Price's better known projects, the 'Fun Palace' (1961), featured in a later *Archigram*, clearly illustrated the ideals which the Archigram members admired [figure 45].

To investigate the first articulation of the concern with freedom and change, the study turns to the first group gesture of the soon-to-be Archigram members: the 'Living City' exhibition.⁷⁶ Held at the ICA from 19 June to 2 August 1963 on the recommendation of Theo Crosby, the exhibition contained the kernels of the preoccupations to come. Texts and image from 'Living City' were reproduced in *Archigram* newsletters and, later, in the retrospective Archigram catalogues. Indeed the exhibition was reconstructed for the recent retrospectives in Vienna and Paris.

⁷⁶funded with the aid of the Gulbenkian Foundation. Organizers also included Ben Fether and Peter Taylor. (Peter Taylor also designed cover of I 3 & Rae and Ben Fether designed the cover of *Archigram* 5).

Chapter 2: The Constancy of Change

The modern city dweller living in house like tents (the Maison Domino), houses like cars (the Maison Citrohan), or more radically, houses like airplanes (the Maison Voisin), was the leitmotiv of a society (as envisaged by Le Corbusier, following the futurists) literally constituted by mobility.

Anthony Vidler, *The Architectural Uncanny*

“What the new generation of architects wants”, declared the ‘Living City’ organizers, “is an exciting city; one howling with electronics, pulsating with the rumble of great motors, filled with the imagery of science fiction.”¹ Of course, the Futurists had already been expounding these mechanical ideals back in 1914, declaring: “[W]e must invent and rebuild the *Futurist* city: it must be like an immense, tumultuous, lively, noble worksite, dynamic in all its parts”.² From beginning to end, the group set out to update that Futurist hubbub. Set within the ICA gallery space, the exhibition provided its own shell [figure 46]. The framework for the show was based on a “system of triangles as the structural and formal basis” that a visitor had to enter and that dominated the experience [figure 47]. As opposed to a Safdie-esque crystalline form, the exhibition’s contours resembled the Sydney opera house gone askew. The triangle was chosen, Cook claimed, purely for its ability to “twist itself around spaces” and the simplicity of prefabricating the panels. The structural potential of what the Archigram group saw as the under-utilized diagonal was concrete: “Nothing more should be read into the fact that we have used triangles, nothing more was intended.” Intended or not, the triangular shape had strong resonances. “The triangle, throughout the ages”, Buckminster Fuller wrote in *Nine Chains to the Moon*, “has been the symbol of the architecture of motion, first in tents, then in the rigging of sailing ships, thereafter in trestles, and most recently in airplane wings and radio masts.”³ In the build up of triangles that was the structure of the ‘Living City’, the shift of habitation from mobility to fixity was reversed.

¹‘Living City’, *Living Arts*, London: ICA, no. 2, 1963, p. 66.

²Antonio Sant’Elia, Filippo Tommaso Marinetti, ‘Futurist Architecture’, *Programs & Manifestoes on 20th-Century Architecture*, ed. U Conrads, Cambridge, MA: MIT Press, 1999, p. 36.

³*Nine Chains to the Moon* (1938) was republished in 1963. This quotation is from the chapter entitled ‘Dogmatic Toll Takers: Detours Via the North West Spiral: Triangles and Squares’. (NY: Anchor Books, 1971, pp. 120-1)

The catalogue to accompany the “exhibition-experience, Described and expanded by its designers” appeared in the ICA journal, *Living Arts*.⁴ The issue juxtaposed the newcomers with the art and theory of the previous generation: alongside ‘Living City’, the issue included an essay by Lawrence Alloway, ‘Urbane Image’ by Richard Hamilton and an interview with David Sylvester. The cover illustrations, front and back, were photographs by Robert Freeman of arrangements by Hamilton. They featured Hamilton as a fully-padded, American-style football player, a woman in underwear, a space capsule borrowed from the set of a James Bond movie, a fully stocked refrigerator, a telephone, a toaster, a Hoover Constellation vacuum cleaner, a combined record player and radio-- ‘The Wondergram--playing a Gene Vincent LP, and a 1963 Ford Thunderbird convertible.⁵ Freeman described London as “a shifting complex of visual experiences” focusing his lens on the arrows which directed traffic along the new fast moving inner-city routes such as Park Lane or the Hammersmith flyover, “interrupted by the passing smears of Renault Dauphin minicabs”. Indeed, Freeman’s photograph of a blurred man’s head in front of a defocused street map was included in ‘Living City’ and considered a bit of a cult image.

When explaining the exhibition’s experiential qualities in the introduction to the catalogue, Cook acknowledged two formal devices. The first was the aforementioned triangulated spaceframe. The second was the division of the overall exhibition space into seven intersecting alcoves, or ‘Gloops’ as they were called [figure 48]. The Gloops were crude structural translations of overlapping cybernetic loops. Cook later wrote vaguely that the term “derived from the idea of a loop-enclosure of a soft profile and was one aspect of the original intention to build the exhibition structure from spray plastic.”⁶ Each of the exhibition Gloops was dedicated to a theme deemed central to the dynamic urban experience: Man, Survival, Crowd, Movement, Communication, Place and Situation. Each theme, as in life, was meant to interact with the others, creating unexpected connections. Mobility and transience, of crowds and of situations, was a central to all seven themes that the Archigram group considered endemic to the ‘Living City’. City life is lived in short bursts, after all. Why should the form of the city not reflect, even contradict, this lived experience?

⁴Warren Chalk, Peter Cook, Dennis Crompton, Ben Fether, David Greene, Ron Herron, Peter Taylor and Michael Webb. Though *Living Arts* was a more polished affair than was the self-published *Archigram*, the attention to Pop and Op art distinguished *Living Arts* from other art magazines

⁵John A. Walker, *Cultural Offensive: America’s Impact on British Art Since 1945*, London: Pluto Press, 1998, p. 88.

⁶*Archigram*, Basel: Birkhäuser Verlag, 1991, p. 20

Collaged on the panels of the structure were a jumble of images central to Archigram's future concerns, including a section of Guy Debord's *Guide psychogéographique de Paris*, the stilt-legged structures of the Thames Estuary,⁷ Sci-Fi characters including Superman, a Jaques Costeau underwater structure and a geodesic dome. Interspersed with Archigram's own images were magazine advertisements and consumer products. Surrounded by the images, sounds and lights of the exhibition, the visitors were as disconnected from the gallery space as from the "predictable and accepted relationships" of the everyday.⁸ The logic had clear affinities with the anti-art practices of the fifties and sixties, most obviously, the *Dérive*, the Happening, and the 'Fluxus' event.

'Living City' displayed an urban environment composed primarily of the comings and goings of its inhabitants in place of the usual arrays of low income housing and schools: "the fluctuating come and go of people and things over time scale...the happening within spaces in cities, the transient throw-away objects, the passing presence of cars and people are as important, possibly more important than the built demarcation of space...Archigram's 'Living City' addressed the future through photomontage of models of de-materialised architecture drawn from science fiction and the molecular structure of the polio virus... Superimposing a model metal net, (decked out with transistors) upon derelict industrial space, their utopian technology was made to share strange company, juxtaposed with the depths of a nuclear explosion. But this lapse into catastrophism apart, Archigram essentially imagined an urban space of drifting pockets of subjectivity."⁹

Robert Maxwell's contemporary review described the show as "an assault on the senses which would jolt the participant into a receptive frame of mind and release him from conventional defenses and responses. To the randomised juxtaposition of a variety of photographic stills was added the flicker of lights and a continual discontinuous sound track; and in the original intention movement and smell would have played a part. Two periscopes arranged in bright metal ducting gave fleeting glimpses of girls in Dover Street or faces in the bar." He noted a weakness in that "the entrance to the spaceframe, coming as it did in the middle of the sausage, split the experience into two halves, so that there was not enough development of the message along a conditioning route leading

⁷a visual source for Walking City.

⁸*Archigram, op.cit.*

⁹David Mellor, *The Sixties Art Scene in London*, London: Phaidon, 1993, pp. 50-9.

away from the point where the normal world re-asserted itself.” Still, he concluded, “the graphic material, through its stylised language, did most to confuse the concrete experience, removing us from the immediate world into the mediated world.”¹⁰

Exhibition Context

Peter Cook’s introduction to the catalogue distinguished ‘Living City’ from the standard type of architectural exhibition in England that tended to take the form of a review rather than demonstration of a theme.¹¹ Cook also situated the group within the historic scheme of things, in relation to three hallmarks exhibitions which had shaped the physical and intellectual landscape: the MARS exhibition of 1938, the ‘Festival of Britain’ of 1951 and ‘This is Tomorrow’ of 1956. Like the buildings of the zoo, these exhibitions traced the irregular path of the acceptance of the modern avant-garde in Britain to the popularization of the modern as a style to the point where out of frustration a new avant-garde emerged. In citing these three examples, the Archigram group was positioning itself at the onset in relation to the exhibitions significant for modern British architecture and staking their claim for being closest to the spirit of rebellion represented by ‘This is Tomorrow’ over the detested status quo embodied by the Festival.

The ‘New Architecture’ exhibition of 1938, organized by the MARS group at the New Burlington Galleries a year after the MoMA’s *Modern Architecture in England*, was, as Cook called it, the “Coming-out Ball” for local modernism on its home turf. “Le Corbusier came”, remembered Summerson in 1959. “As he entered I did just hear him emit a faint ‘pénible’. He was very nice after that, but indeed the show must have seemed to him--as to anyone of the continental vanguard--a terribly belated and derivative affair.”¹² Intended for the knowledgeable observer, the exhibition of 1938 attracted a crowd and signified the imprint of modernism in Britain at long last. While the ‘New Architecture’ was about the popularizations of modernism, the populist ‘Festival of Britain’ (1951), on the other hand, dated to commemorate the exhibition of one hundred years earlier, was designed to force an atmosphere of optimism for the future on a national audience following years of economic hardship.¹³ Atlee’s welfare

¹⁰*Living Arts*, London: ICA, no 3, 1963, pp. 99-100.

¹¹Here they were referring to exhibitions that had influence in Britain, such as the Stockholm Exhibition of 1930 and International Exhibition of Modern Architecture at the MoMA, 1932.

¹²cited in Trevor Dannatt, *Modern Architecture in Britain*, London: BT Batsford Ltd., 1959, p. 15.

¹³This in contrast to the ‘Britain Can Make It’ exhibition at the Victoria and Albert Museum (1946) which featured products that were not readily available or inaccessible due to expense to an audience of 1,432,369. The press renamed the show, ‘Britain Can’t Have It’. (Jonathan M. Woodham, ‘The Post-War Consumer: Design Propaganda and Awareness, 1945-1965’, *From*

state had been marked by every sort of economic crisis, from the continued rationing of clothes, milk and petrol to the dearth of crude materials. The difficulty of daily life cost Labour the election in the festival year, which was also the final year of the Marshall Plan.¹⁴

In the time that passed between the Mars exhibition and the Festival of Britain, modernism had become the dominant style. “There was hardly any modern architecture in England before 1939”, wrote Robert Maxwell. “Since 1945 it has become the accepted style. The penalty of this smooth conversion has been that the new architecture was acceptable because it was seen as humdrum. And humdrum it usually was.”¹⁵ The mediocrity of the contributions made to the festival by the central figures of British modernism, such as Wells Coates, Maxwell Fry, Frank Gibberd and the firm of Yorke, Rosenberg and Mardall, summed up the overall watering down, the making acceptable, the compromise of principle and sentimentality practiced at this point by the modernist establishment.

The formation of the Independent Group at the Institute for Contemporary Art was inspired by the desire to present an alternative to the offerings of the Festival of Britain. ‘This is Tomorrow’ (1956) was one of the best-attended events, and the most publicly accessible one, in which the Independent Group activists, including Crosby, participated. The exhibition which was held at the Whitechapel Gallery consisted of 12 pavilions on which small groups of artists and architects collaborated, manifesting in Tom Crow’s words “the Independent Group’s impatience with divisions between the creative media and the professional forms of visual knowledge: painting, sculpture, architecture, and design. The installation of the show was broken down into twelve groups within which there was no hierarchy of artist, designer, and even critic. The task of the visitor was to sort out a mass of competing signs in his or her physical passage through the environment (this two years in advance of Kaprow’s first Happening installation in New York).”¹⁶ There was quite a range within the exhibits from a number

Spitfire to Microchip: Studies in the History of Design from 1945, ed. N. Hamilton, London: Design Council, 1985, p. 6.)

¹⁴Labour remained in the minority until 1964 until economic growth was well in place.

¹⁵*New British Architecture*, NY: Praeger, 1993, p. 8.

¹⁶*The Rise of the Sixties*, London: George Weidenfeld & Nicholson Ltd., 1996, p. 44. Hamilton remembered the collaborative effort thus: “Nothing breaks friendship like collaboration but *This is Tomorrow* was more like civil war. The tougher the aggro the more productive the enterprise seems to become. With some thirty-six artists and architects divided into twelve three-man teams, all screaming for self-expression, it took a genial genius like Theo Crosby to maintain the flow of oil on the troubled water. Inter-group rivalry was no less bitter than the battles within each group.” (*Collected Words*, London: Thames & Hudson, 1982, p. 22)

strongly influenced by Constructivism, to the ‘As Found’ aesthetic of the Smithsons, Nigel Henderson, Eduardo Paolozzi and the distinct touch of pop in that of Richard Hamilton, John McHale and John Voelcker [figures 49 & 50].¹⁷ Each group designed its own advertisement and, in Hamilton’s case, ‘Just What Makes Today’s Homes So Different, So Appealing’ (1956) had an image-life long after the exhibition was forgotten [figure 51].

While Archigram’s imagery approximated the pop of the Hamilton, McHale and Voelcker collaboration, the extravagant language of the notes for the eighth pavilion, designed by James Stirling, Richard Matthews and Michael Pine was very much in its spirit.¹⁸ Stirling’s text for the catalogue claimed that architecture had consumed all the other arts: “the painting is as obsolete as the picture rail...The ego maniac in the attic has at last starved himself to death.” Stirling claimed architecture to be everything; the Archigram mantra inverted the order to ‘everything is architecture’. This linguistic transposition highlights an important difference between the Independent and Archigram groups. The reaction of the 50s avant-garde to the ‘humdrum’ quality of modernism tended to be reformist in character while the 60 avant-garde assumed a weathered pose. Boredom was claimed to be Archigram’s primary motivator: “The Archigram group”, Cook would explain, “came about through a succession of reactions to the boredom and obviousness of post-war English office blocks and local authority housing.”¹⁹

When the organizers of ‘Living City’ reflected on the state of the discipline, their articulations were prescient of Daniel Bell’s definition of the sixties in *The Cultural Contradictions of Capitalism*, “as a reaction to the sensibility of the 1950s, and as a reversion to, yet also extension of an earlier sensibility which had reached its apogee in the modernism of the years before World War I.”²⁰ “The statement in Archigram 1”, wrote Cook in Archigram 2, “was that the architecture of our generation can be closer in basics to the first modern architecture than most of the postwar building”. This was consistent with Banham’s promotion of the pre-WWI, technologically savvy avant-gardes as the truly modern. Still their reaction also came in a very particular political context that hatched ideas for suburban London by altering Green-belt oriented development in the US to suit the emerging welfare state. The Archigram group distinguished

¹⁷see David Hopkins, *After Modern Art*, Oxford: Oxford University Press, 2000, pp. 100-01.

¹⁸This relationship will be explored in the fifth chapter when the bubble as an accepted standard for topological analysis will be discussed. The central feature of this pavilion was a bubble sculpture, surrounded by photographs of bubbles.

¹⁹*Experimental Architecture*, London: Studio Vista Ltd., 1970, p. 90.

²⁰New York: Basic Books Inc, 1978, p. 120.

themselves from mainstream modernism by aligning themselves with the early avant-gardes and the generation of 'This is Tomorrow' were allies in their quest because they too had "rid themselves of the morality of 'people's architecture'" and exerted "positive influences upon hip architecture-culture of the 1950s".²¹ They even acknowledged that "at least two" of the Independent Group members had greatly influenced them. Additionally, the combination of images, objects and structure in an exhibition provided an eloquent example of the inclusiveness to which Archigram aspired. Thus Archigram's dissent from the contemporary Modernist agenda emerged from the shadows of the Independent Group in more ways than that of Crosby's patronage, picking up where the Independent Group had left off.

The analogy to Independent Group endeavors was furthered by the offbeat hanging of 'Living City similar in spirit to 'The Parallel of Life and Art' (1953), organized by the Smithsons, Eduardo Paolozzi and Nigel Henderson at the ICA. In 'Parallel', photographic images carpeted every surface from ceiling to floor [figure 52].²² But any sense of randomness was illusory: the Smithsons inked a highly articulated perspectival drawing instructing precisely how the show was to be hung [figure 53]. In contrast, the introduction to the 'Living City' declared: "We have begun to cherish disorder."²³ "In this show", wrote Maxwell in his review, "there was no coherent programme, no offer of a policy, no statistics, no rationalisation. Captions were fragmentary, and all the reproductions, whether photographs of real places and things or photographs of photographs of advertising, science, science-fiction or pop-art material, were presented in a deliberately disjointed or random fashion." As such, the exhibition did not present concrete solutions to the problem of the urban environment, but rather celebrated the changeable aspects of the city that in itself was treated as an organism constantly in flux. It meant to evoke the experience of living in a vibrant city, not provide a blueprint.

Another feature shared by 'Living City' and 'Parallel' was the manipulation of scale to defamiliarize and equate things of different natures and sizes. This dominant feature of the jumble photographic images--scientific, artistic, documentary, from cells to primitive masks--selected for 'Parallel' was again deployed in "Living City", "from trivia to valued drawings, and monster versions to minuscule versions of everyday things",²⁴

²¹Specified as Brutalism and Americana. (*A Guide to Archigram 1961-74*, London: Academy Editions, 1994, p 74).

²² It is difficult to tell which is the ceiling and which the floor in reproductions.

²³*Living Arts*, no. 2, *op.cit.*, p. 66.

²⁴*ibid.*, p. 71.

albeit of very different objects and for a different message. ‘Parallel of Life and Art’ intended to demonstrate the proximity of natural and synthetic form: “‘Parallel of Life and Art’...consisted of dramatic non-hierarchical juxtapositions of photographs from sources as diverse as photo-journalism and microscopy. Although Fine Art images were included (Pollock, Dubuffet, Klee), they were clearly reproductions, submitted to a form of cultural levelling by means of a common grainy texture.”²⁵ The second time around, the grain and manipulation of scale served to emphasize the claim that everything, from Big Ben to Wonder Bread, is architecture; that, as they would proclaim in Archigram 3, “IT’S ALL THE SAME!” In fact, on account of all these similarities in style and spirit to the ICA avant-garde of the previous generation, Maxwell pointed out in his review that the ICA was not the most effective venue: “mounted in a setting less familiar to devotees of the far-out and the unfamiliar, perhaps in a church hall or an LCC school... it would have shown up as shockingly different from the do-good propaganda which usually passes for an architectural exhibition.”²⁶

This observation about alternative London venues also points to a preoccupation of 1960s Britain with the provinciality of the provinces, a condition highlighted by the stark contrast of ‘Swinging London’ and the rest of England. Indeed, after its ICA debut, ‘Living City’ traveled to venues in Manchester, Cambridge and Folkestone where its message would have more shock effect. A student at the School of Architecture, Canterbury College of Art remembers Peter Cook coming to give a talk “in a smoky upstairs room in a local pub” in the early sixties. Describing Cook as “very avant-garde” and “a breath of fresh air...especially for ‘provincial’ students”, he concludes, “London was of course further away from Canterbury in those days, in years as well as miles!”²⁷ The Archigram group exploited this division, as well as the nature of the provincial thrill with the urban throng; the four members who were not born in London were, and still are, at pains to represent themselves as boys from the sticks.²⁸ In particular, the mixture of aesthetic tackiness and crude sexuality represented by the Seaside resorts in other cultural manifestations like the ‘Carry-On’ films served as a faithful backdrop for Archigram

²⁵David Hopkins, *op.cit.*, p. 97.

²⁶ *Living Arts*, no. 3, *op.cit.*, p. 99.

²⁷John Streeter remembers his first encounter with the Archigram group through a copy of *Living Arts* he bought during his year out. (letter, November 1998)

²⁸Bournemouth, Blackpool, Henley-on-Thames and Nottingham.

projects such as ‘Bournemouth Steps’ (1970), the Folkestone conference (1966) and ‘Instant City at Bournemouth’ (1969).²⁹

In addition to the acknowledged precedents, the motifs that the Archigram group would transform into mottoes were alive in the cultural air around them. In fact, the two of the exhibitions ‘gloops’, ‘Place’ and ‘Situation’, had been the titles of recent London collaborative and experimental exhibitions on the model of *This is Tomorrow*. Ralph Rumney, the British founding member of the Situationist International, discussed his idea for an exhibition with Lawrence Alloway that would examine choice, feedback and the urban environment.³⁰ The result, ‘Place’, held at the ICA in the September 1959, exhibited the paintings of Richard Smith, Robyn Denny and Rumney. The paintings were large, abstract and joined in a freestanding, diagonal structure resembling a small maze. The configuration fostered a game-like relationship between the paintings ‘hanging’ from the floor and the perambulating viewer.³¹ Roger Coleman explained in the accompanying text:

A significant development in post war art in this country (it appears to be exclusively English) is the acceptance on the part of some of the younger artists of the mass media as a legitimate body of reference. This can be seen, for instance, in the allusions to Science Fiction and monster lore in the sculpture of Paolozzi, in McHale’s ikons on consumption and in Blake’s collages of pop heroes. In the work of the three painters of PLACE, the influence of the mass media is present but not generally detectable without the aid of outside cues... The mass media for Denny, Rumney and Smith is not a source of imagery, as it is for Blake, but a source of ideas that act as stimuli and as orientation in a cultural continuum. They are concerned with the environment--mental and physical--that the media makes up... The idea of spectator participation stemming from the mass media on the one hand, and fine art sources, like an American painting, on the other, has lead the painters of PLACE to an interest in ludic or game participation.³²

In ‘Living City’, the Archigram members began their decade-long experiment with these hitherto separated attitudes towards “mass media as a legitimate body of reference”, to combine allusions to Science Fiction and monster lore, ikons of consumption and

²⁹Cook trained at the Bournemouth Polytechnic under Ron Simms who encouraged his students to go to London and the AA on scholarships.

³⁰Mellor, *op.cit.*, p. 64

³¹Walker, *op.cit.*, p.76.

³²Mellor, *op.cit.*, p. 72. Mazes as a symbol of playfulness, versus the Lettrist’s observation of their neighborhood garden: “One can discover at a single glance the Cartesian organization of the so-called ‘labyrinth’ of the Jardin des Plantes and the inscription that announces it: GAMES ARE FORBIDDEN IN THE LABYRINTH. One could not seek a clearer summary of the spirit of a whole civilization.” (Anon., ‘Ariane en chômage’, *Potlach*, no. 9-10-11 (Paris, August 1954) reprinted *Potlach 1954-1957*, p. 63, quoted in *The Situationist City*, Cambridge, MA: MIT Press, 1998, p. 51)

collages of pop heroes with mass media as a source of stimuli and participation. Coleman's interpolation of Huizinga's notion of the human ludic instinct was colloquially translated into leisure, or fun. At this early point, the Archigram group was still including socio-political fragments like, as noted earlier, a bit of the *Guide psychogéographique de Paris*, in their collage and Warren Chalk wrote about the concept of 'Situation' in distinctly Situationist ways in the 'Living City' catalogue.³³

The artists of the Situation Group continued the large scale abstraction exhibited in Rumney's 'Place' in the three 'Situation' exhibits:³⁴ 'Situation' at the RIBA Galleries in September 1961, 'New London Situation' at the Marlborough New London Gallery in August 1961 and 'Situation', organized by the Arts Council toured Britain during 1962 and 1963. Indeed the organizing principle of these exhibitions was that the paintings must be abstract, with no 'natural' references, and that they be no smaller than thirty square feet. Sheer size was argued to engage more intimately with human experience. As in 'Place', the influence of American imagery was contained in large-scale abstraction, taken even further by the Situation artists participating in the rebellion against the image of the bohemian artist embodied in the uniform of the Abstract Expressionist: formal dress of suits, shirts and ties. Another salient feature of the Situation group was that a number of the artists worked in the electronics, plastics or pharmaceutical sectors and they mixed alien materials from their day jobs in with traditional art materials,³⁵ just as the Archigram group would come to mix alien objects with traditional architectural ones.

³³ As Simon Sadler has noted, however, situationism was "conspicuous in its absence" from *Experimental Architecture*, the retrospective account Peter Cook published in 1970. (*The Situationist City, ibid.*, pp. 132-137.) Cook and Webb acknowledge going to hear Constant lecture at the ICA in London in 1964 and invited him to contribute to Archigram 5, the Metropolis issue and yet currently maintain complete ignorance of the Situationists agenda. (Columbia symposium, 13 March, 1998).

³⁴ Lawrence Alloway, Gillian Ayres, Bernard Cohen, Harold Cohen, Roger Coleman, Peter Coviello, Robyn Denny, John Epstein, Peter Hobbs, Gordon House, John Hoyland, Gwyther Irwin, Robert Law, Henry Mundy, John Plumb, Richard Smith, Peter Stroud, William Turnbull, Marc Vaux, Brian Young.

³⁵ Mellor, *op.cit.*, p. 82.

The Reality of Plenty

So life was never better than
 In nineteen sixty-three
 (Though just too late for me)-
 Between the end of the *Chatterly* ban
 And the Beatles' first LP.

(Philip Larkin)

Despite certain similarities, the fifties and sixties were quite different times in England. An upswing in prosperity marked the decade between 1953, the year of the 'Parallel of Life and Art', and 1963, the era of the 'Living City'. Disposable income increased due to lower taxes, easier credit and more than 50% of married women working as compared with the 18% of 1947.³⁶ In October 1963, the first issue of *Private Eye* was published and the satire industry boomed: 'The Week That Was' was on TV, and 'Beyond the Fringe' played in the West End. 1963 was also a big year for British-US relations. It was the beginning of Beatlemania and the year that the US granted Churchill honorary citizenship. Big events such as the Kennedy assassination, the Birmingham riots, the Great Train Robbery and the first woman in space dominated the news reports. On the architectural scene, James Stirling, whose Leicester Laboratories (1964) were under construction, was all the rage.³⁷ The Smithsons' Economist Building (1964) was joining their Iraqi House in the middle of the West End. Yorke, Rosenberg and Mardal completed the Keddies Department Store at Southend that was touted as 'a simple and elegant solution to the problem of the modern shop'.³⁸ It was also the publication year of the Buchanan report, 'Traffic in Towns', which contained a proposal for turning a section of London's West End, measuring one half of a mile from north to south, into a single

³⁶By 1961, 1/3 of British households owned a car, 2/3 a television set, 2/3 a vacuum cleaner and 1/5 a refrigerator.

³⁷As Charles Jencks wrote grandiosely, "The influence of Rowe, Brutalism, Corbusier and Liverpool, incommensurable as they were, nevertheless combined in the psyche of James Stirling into a powerful rhetoric of building, uncommon to the British sense of restraint. The compromise which has often characterized English architecture from St. Paul's Cathedral to the Festival of Britain, was piqued if not routed. For the first time since the Palm House at Kew or the Crystal Palace, Britain had a designer who could handle glass with virility; for the first time since Mackintosh, an architect who could combine glass with moulded masonry and send them rebounding around the façade; and for the first time since Hawksmoor an architect who could pile masonry on top itself, one masterful conceit following another into the clouds." (*Modern Movements in Architecture*, London: Penguin Books, 1985, p. 261)

³⁸D. Stephen, K. Frampton, M. Carapetian, *British Buildings 1960-1964*, London: A&C Black, 1965, p. 53.

multi-level complex.³⁹ Such projects were actually planned, like the New Town of Hook,⁴⁰ and sometimes partially implemented, as in Cumbernauld City Centre. These practical projects were not unrelated to the megastructural dreams of the Archigram Group, who from early on in their collaboration were considering the proposition that the whole city might be contained in a single building.

Notably, the initial effort in which the whole group participated was a consideration of the city as a whole, rather than as a conglomerate of individual projects as had been showcased in *Archigrams* 1 and 2. Despite the tendency of architects to found their reputations on self-contained projects, the city was well established by this point as a laboratory for modernist prognosis. Progressively, CIAM's concerns had increased in urban scale over time, from housing to the city core. Tony Garnier and Sant'Elia had already focused on the city as the key architectural element, but CIAM officially made the squalor of the slum, blocked arteries of traffic, pollution of industry the business of the contemporary architect. The Smithsons made sure that these concerns remained fundamental to British discourse: "Architecture's most significant recent transition, transcending even the emergence of any "new style" has been the acceptance of a new scale."⁴¹ The Smithsons believed that the urban scale brought architects "into meaningful alliance with other groups--politicians, planners, conversationists, social scientists--whose view of the environment is quite different, but no less valid, than their own. And it is revealing some severe limitations in the process of architecture when faced with problems of the complexity which those of the city present."⁴²

The Smithsons took their British education and local concerns to CIAM and then brought them back again, working to inflect the provincial British scene, as they saw it, with some international sophistication. CIAM's scale had grown to the point of becoming unwieldy by 1953 when the Smithson's set off to the largest meeting of roughly 500 members at Aix-en-Provence prepared to rail against that organization's urban planning strategies. Defined by Le Corbusier, the work, dwelling, recreation,

³⁹Reyner Banham, *Megastructure: Urban Futures of the Recent Past*, London: Thames & Hudson, 1976, p.74.

⁴⁰With reference to the Buchanan report and Hook New Town, Banham writes about the small world of London architectural ideas: "Today's student 'raver' could become tomorrow's civil servant: in the case of the Buchanan report, for example, the team who made the proposals for London's West End had gone to Buchanan's staff from the fifth year at the Architectural Association School, where they had been working on an even more megastructural version of the Hook plan." (*ibid.*, p. 74)

⁴¹*Ordinariness and Light*, London: Faber, 1970, p. 171.

⁴²*ibid.*

transportation model had been set down as the basis for any solution to problems at the city scale. The Smithsons took issue with what they saw as the narrowing of vision reinforced by the congresses and formed alliances with some of the other younger members including Aldo van Eyck and Jacob Bakema who would become known as Team X. The most vocal of the Team X constituency, the criticisms of the Smithsons were complicated inter-weavings of their own beliefs about structure and society with the extant institutional modernist philosophy. In place of CIAM's isolation of universal functions into parcels of work and pleasure, they argued for a city built up of local human associations on the ascending scale of dwelling, neighborhood, district, and city.

The street was the thread that bound the urban fabric by enabling the transition from one level of association to the next. Whether on the ground or in the air, the street was essential to participatory urbanism. As the place of circulation, of traffic, of people, the street was a social indicator: "The street is like a new coastline and the dwelling a sea-port from which one can measure the magnitude of the social flow, predict its overflowings."⁴³ Indeed Team X's plans look like maps of routes, a feature that they had admired in Louis Kahn's 'Stop and Go' diagrams for Philadelphia of urban flux and flow published in *Perspecta*.⁴⁴

Amongst other things, the Archigram members were contesting the rule the Smithsons had held for some time over all things considered avant-garde. Peter Smithson had a loyal student following at the Architectural Association in Bedford Square where he taught. Michaelangelo Antonioni chose the courtyard of their Economist Building in St. James (1964) as the set for the opening sequence of his film, *Blow-Up* (1966).⁴⁵ Their rebel credentials were also intact as members of two significant splinter groups: of the Independent Group contingent at the Institute of Contemporary Art at home, and abroad, of Team X. While the Archigram group inherited the avant-garde scene from the Smithsons, complete with its close relationship to the Architectural Association (AA),

⁴³Paul Virilio, *Speed & Politics: An Essay on Dromology*, tr. M Polizzotti, New York: Semiotext(e), 1986, p. 7.

⁴⁴Mike Webb has described his thesis project, the Sin Centre (1959-62) as having been inspired by a parking structure on the periphery of Kahn's plan for Philadelphia that seemed to him like a street wound around a building. (MIT lecture, 18 April 1996)

⁴⁵Based on the life of the photographer David Bailey and a short story by Julio Cortázar, Antonioni's 'Grand Prix International du Festival de Cannes' winning film starred David Hemmings as a society photographer who may--or may not--have witnessed a murder and Vanessa Redgrave. Set in the fashionable milieu of sixties London, the film interrogated the masculine identity of the photographer as cultural hero and the elusiveness of media representations. Hemmings would also star with Jane Fonda in *Barbarella*.

this once radical voice of the fifties had come to reflect the dominant voice within the progressive environments of the architectural schools and, by the standards of the *Archigram*, the refrain was too demure--in fact, too dull. Archigram preferred to associate themselves with more fantastical company, a crowd who images were extreme and extravagant, as far back as Piranesi, as well as with contemporaries like Hans Hollein. They listed the 'Fantastic Architecture' issue of *L'Architecture d'Aujourd'hui*,⁴⁶ as well as Ulrich Conrad and Hans G. Sperlich's "less exciting" *Architecture of Fantasy*⁴⁷, *Paris Match* and *Galaxy Science Fiction* in the bibliography of publications relevant to the *Archigram* endeavor.⁴⁸

Concern with the city as a responsive environment broke with the approach to urban geography and the role of the architect as conditioning or enabling social behavior that the Smithsons exemplified.⁴⁹ Cook stated, "The problem facing our cities is not just of their regeneration, but of their right to existence." The exhibition, however, did not reject the urban environment outright; "belief in the city as a unique organism" was the declared foundation for the whole project. While this belief wasn't rejected, however, it *was* questioned. The point was to find a solution that would break the cycle that condemned each generation to build its predecessor's vision, giving the dream "a second-hand, second-rate actuality." Besides contending with the old European city full of precedents, the organizers reflected upon the failure of building from scratch, whether in the wishy-washy New Towns or in high modernist style. As they noted: "The Edwardian garden city has been realised, suitably degraded in our New Towns; Le Corbusier's Ville Radieuse is encamped around Richmond Park, and in many tiny fragments can be seen shouldering aside the slums of south London."⁵⁰ "There is no comfort", Cook

⁴⁶June-July 1962. The images were drawn from the Visionary Architecture exhibition (1960) at MoMA.

⁴⁷The German edition of *The Architecture of Fantasy* was published in 1960 (Stuttgart: Verlag Gerd Hatje). The English translation by Christiane Crasemann Collins and George R. Collins was published in 1962 (NY: Frederick A. Praeger).

⁴⁸'A Zoom Bibliography', *Archigram* 4, 1964, pp. 18-19. The residual conviction in do-it-yourself environments that architecture had a social function led the theorists of the seventies who reverted to the autonomy of the object to reject Archigram.

⁴⁹indebted to JM Richards. Anthony Jackson summed up Richards beliefs as follows: "a social environment comes into being, it is experienced and portrayed by men of insight who are more sensitive than their contemporaries, and then as it becomes more familiar through both its existence and its artistic manifestations, it is absorbed into the bloodstream of everyday activity." (*The Politics of Architecture: A History of Modern Architecture in Britain*, Toronto: University of Toronto Press, 1970, p. 51)

⁵⁰*Living Arts*, no. 2, *op.cit.*, p. 66.

concluded, “from the dusts of Brasilia or Chandigarh”.⁵¹ The fear was that the city’s ‘life-blood’ was being drained, leaving only the endless uniformity of the suburb.

Motion

The main struggle implicit in the exhibition was how the architecture of the city could reflect a chain of events, continuous or disjointed, rather representing buildings as foregone, manufactured conclusions. What the themes of the ‘Living City’--Man, Survival, Crowd, Movement, Communication, Place and Situation--illustrated was the understanding of emerging technologies in the transitional period that lead to the developmental trajectory of electronic architecture. As the variables of the exhibition themes, Situation, Place and Movement, make clear, the Archigram group was struggling with how to give form to events, dependent on time, location and circumstance, as they occurred. The themes of Man, Crowd and Survival were contingencies dependent on those variables. Communication acted as the stimulant, enabling the social conditions for activity [figure 54], not unlike the contemporaneous attitudes towards psychoactive drugs.

The Movement Gloop was most obviously about transition. It was dedicated to the entire scope of movement types--directed, multi-directional, purposeful, slow, fast, ‘Stop & Go’, even psychological. Significant city movement was not just vehicular; the scope of individual human movement, walking, running, jumping, climbing, was as important in determining the patterns of activity in the city. These transient activities, whose traces are lost in the passage of seconds, were built upon by further challenging the categories normally included in the domain of city planning and including items of ephemeral nature within the scope of architecture. Disposable objects, also transient, were the theme of the Survival Gloop in particular. But at least they were objects and therefore more quantifiable in an architectural context than a spontaneous happening of undetermined duration. A sliced Wonderloaf, a packet of Puffed Wheat, tissues and Daz detergent (‘Washes So White You Can See the Difference’), a tube of toothpaste and lipstick, cans of shaving foam and deodorant, bottles of Alka-Seltzer, Coca-Cola, whiskey and freeze-dried coffee, packs of Bird’s Eye frozen peas and cigarettes, matchbooks and candy bars, an issue of *Playboy*, a copy of *The Deer Park*, albums by John Coltrane and Ornette Coleman, sunglasses, a toy race car, money and a gun: all these were included as a sample of the material life of London in the ‘Living City’ survival kit.⁵² “Resolutely banal items of metropolitan existence”, Mellor analyzed,

⁵¹*ibid.*, p. 70

⁵²Some would reappear in *Archigram 3*.

“such as Daz and Wonderloaf were spread out next to arcane objects such as Ornette Coleman and John Coltrane jazz LPs. This spread of products followed the generic women’s magazine special features on gifts... The city and the culture were defined by their special commodities, but for Archigram the trivia constituting the metropolis was accorded a new weight. In the Living City all are important: the triviality of lighting a cigarette, or the hard fact of moving 2 million commuters a day. In fact they are equal--as facts of the shared experience of the city”.⁵³

Good Technology

“We are in pursuit”, wrote Warren Chalk in the introduction to the Situation Gloop, “of an idea, a new vernacular, something to stand alongside the space capsules, computers and throw-away packages of an atomic/electronic age.” Towards this end, a completely expendable city, a prototype for the Plug-In city, with components of varying duration was proposed. In addition to throwaway items, environmental change, such as weather, were included in the theme of the Situation Gloop. As the group would continue to repeat: “When it is raining in Oxford Street”, London’s Main Street, “the architecture is no more important than the rain”.⁵⁴ “Situation”, Chalk continued, “the happenings within spaces in the city, the transient throw-away objects, the passing presence of cars and people are as important, possibly more important, than the built demarcation of space...This time/movement/situation thing is important in determining our whole future attitude to the visualization and realization of city”. This editorial appeared alongside ‘The Passing Presence’--a picture of a woman shot from behind, wearing a knee-length dress of shiny fabric and a wide stole which obscures her mouth [figure 55]. She looks over her shoulder as she bends down in the middle of a wet London street lined with dull, high-rise office blocks to touch her stocking-seamed calf. The text adjacent to another generic image of high street office blocks stated: “This sort of environment can never be the answer and it isn’t even good technology” [figure 56].

As Alan Colquhoun has speculated, early experiments with an architecture of the machine were representations of technical and material possibility; once the techniques and 4x4s were commonplace, the compositions grew stale.⁵⁵ Though Gropius had protested that standardization would not produce tedium, the strongest claim against standardization, fully fledged by the fifties, was its brittle, unimaginative repetitive forms

⁵³Mellor, *op.cit.*, pp. 58-9.

⁵⁴The motto, shortened to ‘Architecture or Rain’, still appears in Archigram retrospectives.

⁵⁵Alan Colquhoun makes this point in ‘Symbollic and Literal Aspects of Technology’, *Architectural Design*, no. 32, Nov. 1962, pp. 508-9.

that required absolutely no design input. The Smithsons, ever loyal to Mies, had wanted to salvage those standardized building parts for the avant garde architect. With plans for extendible modular design for flexible usage, as well as for unimpeded circulation inside and out, the Smithsons made the term 'Mobility' a catchword of the fervent architectural debates in Britain. But for the Archigram group, 'Good Technology' lay at the heart of the Living City. The key to making the city more flexible, reactive and mobile was the application of up-to-date technology, quite different from the technological symbolism of the curtain wall. It was on this basis that they criticized the architecture going up around them, including the more avant-garde projects like the Economist Building. Herron and Chalk's 'City Interchange' treated the transmission and circulation of electronic information as equally important to the familiar pedestrian and mass transit zones [figure 57].

Though the Archigram members meant to encompass the transmittal of information of all kinds, at this stage, in 1963, the designers were restricted in their comprehension of complex technology and tended to model their understanding after the electricity grid which dates back to Victorian times. Still, their understanding of technology was rooted in flow, even if it was of electric current. In the exhibition context, they transmitted electronically controlled sensory information, such as sound, motion and light.⁵⁶ All the electrical elements, including things that moved as well as flashed, or did both as in the case of the rotating flicker machine which splashed patterns of light against the panels of the Movement Gloop, were controlled by a low voltage device which operated through a bank of solenoids to effect mains voltage devices on a one minute cycle with 10 micro-switches.⁵⁷ The flicker machine was meant to address the visual perception of movement alongside physical transition through space. This machine was far from sophisticated, just a "slotted cardboard cylinder rotating on a

⁵⁶Maxwell's review noted that the group originally considered using smells as well. I asked Dennis Crompton what sort of smells they might have contemplated and about the composition of the soundtrack. In an email (3 December, 1998), Crompton wrote: "I don't recall anything very positive, but city smells come to mind. You must have noticed the different characteristic smells of Paris, Milan, London and New York just for a start. Bob also refers to "discontinuous sound track" - cannot be much help with this either except to suggest that you should first check on the availability of tape recorders in 1963 as I'm not sure that we had them at that time. The earliest 1/4" tape that I have on my shelves is the Beatles "Revolver" dated 1966. We did have records and Coltrane/Coleman would have been high on the hit list. But it could just have easily been the ICA barman's radio!"

⁵⁷Crompton email, *ibid.*

turntable with a light suspended inside” as a way of “stimulating interest in the possibilities and nature of moving light.”⁵⁸

The device which controlled electrical input for the exhibition was originally designed by Dennis Crompton to operate the moving parts and the lighting for the ‘City Synthesis’ model, which itself was at the heart of the Communications Gloop [figure 58]. Crompton, the only technically adept member of the group, adapted the machine, or synthesizer as it was called, to animate the electrical elements, not only of the communications model, but of the entire exhibition. The centrality of communications technology in the Archigram group’s urban vision was thus reflected in the exhibition’s wiring. The synthesizer would in fact become the basis for Crompton’s Computer City project of the following year. As the mechanism that enabled the mobility of parts, Crompton described the synthesizer as a conditioning chamber, “like the corner of some giant brain or analogic computer”.⁵⁹ The comparison of a computer to a brain was standard by this time in the language of artificial intelligence. Whether mechanical operations could mimic human ones was a focus of debates regarding artificial intelligence from much earlier on. Indeed, the mechanical nature of animate matter, or automata, was central to metaphysical discussions of the human mind and body in the seventeenth century.⁶⁰ But Crompton’s city synthesizer was not meant just to replicate humans more efficiently, as did Robbie the Robot featured at ‘This is Tomorrow’, but to be functionally intertwined, exceeding the limits of individuals. The Superhero, not the replicant, was the ideal inhabitant of Archigram’s near-future cities.

The extent to which brain merges with computer is significant for understanding the role of the individual--and the crowd--in an urban environment based in complex technology. Much as these technologies rely on collective processes of machines and programs, Archigram’s model of planning was based on a conglomeration of interacting individual desires and sensations. Thus the sensationalist model of the city essentially reflects an Enlightenment model of the individual that characterized humans by their ability to organize sensations. Individuals were constructed of a flow of sensations that

⁵⁸*Living Arts*, no. 2, *op.cit.*, p.109.

⁵⁹*Archigram*, *op.cit.*, p. 20

⁶⁰As Hobbes wrote famously in 1655: “*Per ratiocinationem autem intelligo computationem*”. If rationality is essentially computation, if humans (and even God, in Hobbes’ case) were essentially matter, then human and machine intelligence are not dissimilar, thus leading to the predictions that machines will develop intelligence independently of human input, much as biological life evolved from the mineral, as Samuel Butler predicted in *Erewhon* (1872). See George B. Dyson, *Darwin Among the Machines: the Evolution of Global Intelligence*, Reading, MA: Perseus Books, 1997.

translated into ideas and actions, and society was a composite of these individual translations. This view was linked to a dynamic perception of nature which suited the postwar understanding of the environment. But the 'Living City' inverted the priority of the sensing subject: in the Picturesque garden, a landscape which reflected the eighteenth century sensationalist view of individual experience and knowledge, the spectator was provided with a guided sequence of prefabricated sensations. The landscape was manufactured to produce experience. In 'Living City', by contrast, the environment changed to suit the spectator's desires. "[Social man] creates the City Scene at conscious and subconscious reaction levels by his own complexity", wrote Crompton. "He is identified with the natural computer and is an integral part of its data-processing operation...the city is ascendant when they are in unison, in decay when they divide." Picturesque constructed nature met its match in the "natural computer", which was "at once digital and biological".⁶¹

The balance of Man and Machine in Crompton's description of the synthesizer mechanism as producing "rational and random actions, reactions and counter-reaction"⁶² acknowledged that communities of machines were subject, like humans, to 'fuzzy' logic. That the shape of the city would be formed with allowance for trial and error and by a grouping of the desires and interactions of the individuals of which it was composed, was quite a different organizing principle to the master plan in which the subservient components conform. All around Britain, people were adapting to the conditions of their new, highly planned environments. In the 'Living City', by contrast, "Social man" was positioned as the "trigger to the computer programme". The raising of the specter of 'Social Man', with its enduring distinction between public and private, modernized the balance of the natural and artificial that defined the social contract. The 'carnival' of sixties London meant to break down the hierarchies and create a society of individuals. The Archigram group's view of technology took the view the maxim that society is defined as a place where pleasure is maximized and pain is avoided to an extreme.

The kaleidoscope of 'Living City' initiated the discussion of what a city molded human desires would look like. The catalogue began the cut and paste style that would characterize the *Archigrams*. But it was with the publication that the group found an audience, first in the student communities at the various schools of architecture in Britain, and then far beyond those boundaries. After the 'Living City', ambitions for the

⁶¹'City Synthesis', *A Guide to Archigram, 1961-74*, London: Academy Editions, 1994, p. 86.

⁶²*ibid.*

publication had grown from a mouthpiece for student work to a tool for galvanizing the discipline. To establish the premise from which all their urban conceptions would spring, they turned their hand to the infinite processes that shaped their vision of a technologically enabled freedom: impermanence in geography and of materials. With the newsletter, the Archigram group's ongoing concerns were subjected to sustained image making that ultimately led to the development of a high-tech aesthetic. To explore the latitude of this appeal, the next chapter turns to the graphic strategies of, as Banham called them, "the underground architectural protest magazines".⁶³

⁶³'Zoom Wave Hits Architecture', *New Society*, 3 March 1966.

Chapter 3: Idea and Image

Our new electric technology that extends our senses and nerves in a global embrace has large implications for the future of language. Electric technology does not need words any more than the digital computer needs numbers...the condition of 'weightlessness', the biologists say promises a physical immortality may be paralleled by the condition of speechlessness that could confer a perpetuity of collective harmony and peace.

Marshall McLuhan, *Understanding Media*

Form

The *Archigram* fit into the established counterculture of the small magazine--the broadsheet, the manifesto, the *samizdat*, the zine--a venue considered to be a seed-bed for new ideas and measure of things to come. This cultural form was easily recognizable in 20th century Britain where precarious and unprofitable publications were aplenty, with the period of WWII and its aftermath being a notable anomaly. A severe paper shortage had resulted in a 1940 governmental ban on all new publications and as a result, impromptu magazines were virtually nonexistent.¹ Once the restrictions were lifted, however, the experimental magazine resurged. The field of architecture was no exception: over 30 little magazines debuted from 1955 to 1970 to challenge the status quo. The proliferation was indeed so remarkable that Reyner Banham deemed the trend a movement.²

Despite its authors' claim of institutional neutrality,³ the *Archigram* was part of this phenomenon that began at the architectural schools in the late thirties.⁴ There were only four such magazines started before the war. The first, the AA's *Focus*, was shut down by paper restrictions and other austerities. *Plan* which had been started by the consortium of the Architectural Student's Association survived by shifting base from school to school.⁵ Both of these championed modernist solutions. But by 1955,

¹Robert Hewison, *In Anger: British Culture in the Cold War 1945-60*, NY: Oxford UP, 1981, pp. 18-9.

²'Zoom Wave Hits Architecture', *New Society*, 3 March 1966.

³Disclaimer in *Archigram* 5, for example: "This magazine is completely independent of any organization, school of architecture, etc. It is registered as a business name."

⁴see Neil Steedman, 'Student Magazines in British Architectural Schools', *Architectural Association Quarterly*, Summer 1971, pp. 36-40.

⁵It moved from Cheshire to Liverpool, then to the AA, and finally to Birmingham. Scott Brown described *Plan* as "a socially concerned publication whose main focus was the problem of housing and rebuilding in Britain after the war. Its student-authors were a group who later

modernism's dominance in the professional publications had been established, as the contents of the *Architectural Review* well illustrate, and the authors of the early alternative magazines had become the establishment.⁶ Student communities, on the other hand, grew vocal in their criticism of what was now old.

The postwar alternative publications continued, like those which preceded them, to deviate from what was being taught in the schools and to promote a sense of professional crisis. New to the postwar 'small mag' was the mutation of the small journal into a radical project in which information about architecture merged, self-referentially, with an architecture of information.

Extremity of statement varied from publication to publication. *Polygon* from the Regent Street Polytechnic was more successful than the Bartlett's *Outlet* at establishing itself as radical; Manchester's *244* was known for controversial articles and was also the first student magazine to publish a piece by Banham.⁷ And as Banham's 1966 piece, 'Zoom Wave Meets Architecture', determined "the reigning champion of protest mags" was clearly the *Archigram* that sustained its agenda for the entire decade. Banham's emphatic attitude towards the little magazines would have much to do with their impact. The publications he identified as the core of the 'Zoom Wave', *Polygon*, *Archigram*, *Megascop*e and *Clip-Kit*, have remained within the historical narrative.⁸ These choices clearly reflected a particular sensibility: that of *Archigram*. Not only was Banham's article accompanied by *Archigram* images, but the other three publications reproduced *Archigram* projects and interests: Fuller and geodesics, plug-ins and megastructures, plastics and inflatables.

entered county architecture and planning office in London, Bedfordshire, and Hertfordshire, and set the stamp for what was experimental, exciting, and socially minded in the postwar British public housing and schools programs." ('Little Magazines in Architecture and Urbanism', *Journal of the American Institute of Planners*, July 1968, vol. XXXIV, no. 4, p. 223)

⁶As always, there are a few of exceptions to this rule. Monica Pidgeon's supportive editorial policies made *Architectural Design* a unique ally of the younger generation. Also, Steedman, *op.cit.*, p. 38: "The Architectural Students' Association had died along with *Plan* at the beginning of the decade but was resurrected as BASA (British Architectural Students' Association) in 1957. The *Architects' Journal* offered to publish any contributions from them in a special Student Section, the first appearing on 19 March, 1959...Some 150 sections have been published over the last 12 years at varying frequency and quality, the majority, as with *Plan*, covering architectural education, school work & conference reports, but only with reference to Britain."

⁷'The Lotus and the Gilded Lily' appeared in the eighth issue. For more details, see Steedman, *ibid.*

⁸These titles that were collected by school libraries and on which authors on the subject of the little magazines to follow would focus. Both Bristol's *Megascop*e & the AA's *Clip-Kit* were started by Peter Murray who would later be the art editor for *Architectural Design*.

In tone, these magazines resembled the avant-gardes of the tens and twenties that Banham had struggled to rehabilitate from the inception of his career as a critic. For Banham, the 'Zoom Wave' revived the vital spirit of early modern trends excluded from the derivative modernist aesthetic and continued to express an avant-garde attitude towards technological development. Denise Scott Brown's compared the beliefs of this cluster with Marinetti's ideology of the "union of the psyche with horse power"; here, now, is its union with rocketry--via Buckminster Fuller, Detroit, industrial gadgetry of the space program, package technology, computers, science fiction, and the science fiction comic...Their areas of investigation are those space-enclosing or conditioning gadgets not normally considered by architects to be architecture--space capsules, space suits, air-conditioning units, trailer houses, and, of course, automobiles."⁹

Like all grammars, the architectural one was a product of its time. The question was how permeable it was to new cultural realities. In the little magazines, content relied heavily on visual trends from outside the architectural discipline that suited their message, from technology to a fashion. Technology was already an acceptable inspiration, as Banham put it: "All the breakthroughs towards an architecture of technology have been, in a literal sense, revelations--of how to make architecture, that pure creation of the human spirit, out of concrete, or steel, or glass, or whatever. And each revelation that has comprehended or uncovered an essence--the Villa Savoye, the Farnsworth House, just as much as the Pantheon or La Sainte Chapelle--has been a truth out of which architects can make architecture."¹⁰ The infiltration of popular culture into architecture, however, as was true in other spheres, was perceived by the older generation to be particularly threatening to the discipline's sphere of control. Banham again: "We architectural pedagogues are prone to build architecture up into a higher discipline of abstractly ordering the masses about for their own good. But the Movement is right in insisting that architecture also touch the ground occasionally, and must be relevant to what this week's dolly-girls are wearing, to ergonomic, inflatable air-houses, the voice of God as revealed by his one true prophet Bob Dylan, what's going on in Bradford and Hammersmith, the side elevation of the Ford GT-40, napalm down the neck, the Royal College of Art, caravan homes, Sealab, and like that."

Much of the technology that fascinated the 'Zoom Wave' was also controversial because it had evolved outside of the discipline's domain for places, like the seabed, as

⁹'Little Magazines', *op.cit.*, pp. 225-6

¹⁰*The Visions of Ron Herron*, London: Academy Editions, 1994, pp. 14-5.

yet untouched by architects and planners.¹¹ The underwater villages of Costeau, the Aluminaut submarine, the Alvin ocean explorer, Buckminster Fuller's Undersea Island: extreme conditions demanded structural solutions that were (in theory) pure technology.¹² Then there were the structures generated by space travel, such as the Apollo crafts and the complex of Cape Canaveral, and the romantic associations of the limitless field of outer space. "We want to drag into building some of the poetry of the countdown", Greene scrawled across the first *Archigram* broadsheet.¹³ In the premiere issue of *Megascope*, the students of Bristol wrote, "We must rocket ourselves so high that even when the paralysing missiles of regulation are shot at us our satellite is still orbiting, transmitting data of potential workable solutions...count down for Utopia."¹⁴ By exploring the limits of technological invention, these architects were struggling to convey a mobility as functionally intrinsic to shelter as it was to the spaceship, the submarine, or even the trailer home.

More controversial than spacesuits or puffed wheat being architecture, was the treatment of the *image* of spacesuits and puffed wheat as architecture. The architectural drawing was to be understood as something other than a set of directions to get things built; even the conception was a valid architectural practice in and of itself: "Ideas alone

¹¹"Oceanographers have long realised the untapped sources of wealth to be found in the sea and under the sea bed. Underwater resources appear fantastic, a storehouse for harvesting petroleum, natural gas, minerals and sulphates; even gold and diamonds are to be found, and commercial fish-farming is a theoretical possibility. These activities will give rise, eventually, to on-surface and undersea marine settlements as unexceptional communities...besides the great commercial implications of marine cities there might also be an equal leisure potential--a potential that may make the line, "We all live in a yellow submarine", more prophetic than even the Beatles might have imagined." (Warren Chalk, *FORUM*, October 1966)

¹² "Even a cursory look shows that in the conventional environment, that is, in the field of gravity, certain difficulties exist in space occupation which, in the case of space travel, are eliminated by a single enormous expenditure of energy. However, achieving the conditions for human life--climate control, suitable pressure, and the other requirements--outside the earth's atmosphere, underwater, or underground will, in the foreseeable future, involve such colossal difficulties and costs and such extreme modifications of our basic life pattern that these environments can probably not be considered as living spaces for large numbers of people for extended period in the near future, and so are irrelevant to present-day urban planning. I am therefore resisting the temptation to sketch an utopian ideal which depends on conceivable but not presently available inventions and techniques or which disregards biological and psychological obstacles, such as, for example, space occupancy based on the manipulation of gravity, telekinesis, tele-delivery (without conductors), food-waste recycling, total climate control...and all the other attractive ideas which presently fall in the realm of science fiction." (Eckhard Schulze-Fielitz, *Stadtsysteme I*, Stuttgart: Karl Kramer Verlag, 1971, p. 19)

¹³Excerpt from 'The Love Is Gone', a poem by David Greene which kaleidoscoped across the cover sheet of the two paged *Archigram* 1 (1961); the first two issues of *Archigram* were edited by Peter Cook and Greene, only two of the six who were to form the group's core in 1963.

¹⁴original ellipsis, 1964. (quoted in Scott Brown, *op.cit.*, p. 225)

can be works of art; they are in a chain of development that may eventually find some form. All ideas need not be made physical.”¹⁵ If architecture was truly to be understood as a means of communication, it followed that built form was only one form of architectural expression. As Greene put it: “...somebody once said to me, ‘Don’t you want to see it built, don’t you want to be an architect?’ To my mind, the assumptions behind these questions betray a misunderstanding as to what the work of Archigram represents. A misreading of it as a set of proposals, a set of windows through which to see a ‘new world’, is only a rather pathetic regurgitation of the dogma which asserts that architectural drawings are representations of something that wishes to become.”

The recasting of the professional publication as an informational leaflet reflected a larger cultural shift in focus--from production to communication. And content followed form, becoming more sensorial and visually oriented as goes the generality about the digital age: “Early twentieth-century modernism was characterized by printed manifestos, by a conceptual abstraction, by painted word games, by alphabetic and numbered collages and calligrams...Conversely, the late twentieth century is the media age of vocal, aural and, above all, optical rhetoric.”¹⁶ Thus Banham’s insistence that the Archigram group was in the “image business”:¹⁷ the power of the group was in its graphics, Banham repeatedly reminded his audience, combining between them the most drawing talent ‘since Wren was in charge of the Royal Works’.¹⁸ His statement, “Archigram is short on theory, long on draftsmanship” even became a kind of motto.¹⁹

This content presented an attack on the discipline’s most publicly oriented face, the newsstand magazine, and as such was an important aspect of the small magazine project. As Banham’s piece on the small mags, itself published in *New Society* rather than a trade magazine, began: “Architecture, staid queen-mother of the arts, is no longer courted by plush glossies and cool scientific journals alone but is having her skirts blown up and her bodice unzipped by irregular newcomers, which are--typically--rhetorical,

¹⁵Sol LeWitt, ‘Sentences on Conceptual Art’, *Art Language*, vol. 1, no. 1, May 1969.

¹⁶Barbara M. Stafford, *Good Looking: Essays on the Virtue of Images*, Cambridge: MIT P, 1996, p. 22.

¹⁷“Archigram is short on theory, long on draughtsmanship and craftsmanship. They are in the image business...” (*Archigram*, Basel: Birkhäuser Verlag, 1991, p. 5)

¹⁸This comparison is made in a film by Dennis Postle about the design of the Pompidou Centre, Paris (*Four Films*, Tatoonist International Production, Arts Council Film, 1980), in which the Archigram group travel to Paris.

¹⁹Quoted by Sutherland Lyall in a review of the Pompidou exhibition (‘Bubble Writing on the Wall’, *Building Design*, 8 July, 1994) it has also been repeated by group members in lectures accompanying recent retrospectives.

with-it, funny-format, cliquey, art-oriented but stoned out of their minds with science-fiction images of an alternative architecture that would be perfectly possible tomorrow if only the Universe (and especially the Law of Gravity) were differently organized...a one-glance comparison will show that the underground mags are in touch with the places where currently communicative conventions are being manufactured, and the Architectural Association's *Journal* is not."²⁰

With a less expansive tone, as well as an awareness of the gender dynamics at play, Scott Brown described how these magazines made an agenda of reflecting the logic of their production as vehicles for extreme ideas:

Little Magazines are one-track--led by a guiding spirit, trying to make one point, the vehicle of a single school of thought, and usually representing that school at its most iconoclastic. Little magazines are often scurrilous, irresponsible and subversive of the existing order. They are written by young men and often emanate from the schools...hand-made and usually ill-kempt in appearance, but with a certain flair. They may attempt to follow in layout and graphics the same style that they preach in content, or the style of an art movement sympathetic to their cause. They are badly distributed and marketed and difficult to obtain even by direct approach to their authors. And they are short-lived.²¹

A poorly wrapped, often inaccessible commodity was the point of the exercise. Difficulty in obtaining copies turned the issues into coveted objects, thus reinforcing the elitism of iconoclasm with a limited run.

Ideally the irreverent themes were mirrored in the overall form of the journal itself, "making the medium echo the message", which also reflected a minimal budget and speedy assembly. *Polygon*, the earliest of the four, was noted by Banham only for its cover "adorned with genuine lipstick kisses by a real living bird." *Clip-Kit*, on the other hand, lost points for polish: the "crafty plastic binder into which later installments of the kit can be clipped is a shade professional and smooth by the standards which the Movement has established" even though the toggles of the pink binder interfered with its function, as Scott Brown complained. The *Archigram* was designed to be distributed by mail. It had no specific format however; each issue had its own dimensions. Some were unpaginated, some unbound; one was enclosed in its own envelope, another posted in a plastic sleeve. These permutations did more than evade predictability. The journal didn't retain its shape any more than did the architecture for which the *Archigram* was developing representational conventions. Variation kept alive that which would have

²⁰*op.cit.*, p. 65

²¹*op.cit.*, pp. 223-232.

been absorbed by a standardized format: the task of questioning the nature of communication. The vehicle was bound to its contents.²²

Content

The city, as goes the archeologist's saw, had always been integrally related to the development of language. When CIAM had expanded the scope of the architect to encompass the urban scale the members agreed that they lacked a shared language through which to communicate their revised responsibilities. Though the organization recessed from 1930 to 1933 as Cor van Eesteren's Dutch contingent devised a preliminary system, it wasn't until after the Second World War that Le Corbusier, driven to distraction by the clutter of rubble and paper, announced "I am going to talk to you about a sort of poetry--the poetry of classification".²³ The resulting verse of the *Grille* format was the culmination of CIAM's obsession with order, systems and strategy [figure 59]. The grid simplified the presentation of complex problems and forced the chaotic strains of the city into the tidy categories of the work-leisure-transportation-home model, ridding the planner of 'extraneous' diversions.

But the carefully constrained urban map did more than uninspire: it sparked resistance. Architects had found that solutions that had snugly fit into the grid were, alas, lamentable when built. Members of CIAM scrutinized Britain's suburban Garden Cities and lackluster New Towns during the Hoddesdon conference (1951); those urban developments brought out the weaknesses of the Athens charter better than any theoretical debate. While obeying Le Corbusier's plea, "Improve the grid, but do not smash it",²⁴ the Smithsons subverted the standard *Grille* when presenting their Golden Lane project to the conference at Aix-en-Provence (1953). To contrast the fluid nature of the urban fabric with the diagrammatic purity of the grid's divisions, they included Nigel Henderson's 'nitty-gritty' photographs of children playing in the streets of Bethnal Green in their presentation [figure 60].²⁵ Though the use of photographs in CIAM presentation boards was not unusual, the harsh photo-reportage, 'as found' aesthetic of these slum

²²This has become obvious today with magazines like Wallpaper and Nest.

²³Le Corbusier's 'Description of the CIAM Grid, Bergamo 1949' appeared as an appendix to *The Heart of the City: Towards the Humanisation of Urban Life*, ed. J. Tyrwhitt, J.L. Sert, E.N. Rogers, London: Lund Humpheries, 1952, pp. 171-175.

²⁴*op.cit.*

²⁵Bethnal Green was familiar to the CIAM members from JL Sert's study of the urban slum in *Can Our Cities Survive?*, Cambridge, MA: Harvard University Press, 1941. CIAM, as Sert's analysis of that slum made clear to the Smithsons, would have no effect unless it took into account how people interact with each other and the spaces in which they live.

images certainly was. They replaced the four functional urban zones with their own 'patterns of association'.²⁶ To base the city plan on the indeterminate action of human associations reflected the conviction that culture was a register of a plurality of social practices, not a mastery of technique.

The work, dwelling, recreation, transportation model had its many critics, as diverse as Camillo Sitte, Jane Jacobs and Paul Virilio. Indeed, much of postwar theory and practice was determined by the conceptual dominance of these divisions of urban life, whether as conformity to them or as a reaction against what almost instantly had become the traditional modernist urban solution. Ultimately, it was the very complexities of the urban crisis that had defined and occupied CIAM that destroyed it and ended the uniformity of modernism as it was known. Given the consistent failure of any architect to employ the work, dwelling, recreation, transportation model successfully, it is no surprise that criticism of it came not only from without, but from amongst the ranks of the institution itself. Despite its rebel stance, what the generation of youthful CIAM members proposed was not a revolution: it evolved from initial CIAM principles, employed the standardized format of the organization, and maintained a four-part urban model. As illustrated by the Smithsons remaining within the graphic framework of CIAM, albeit with a twist, they did not abandon the conventions of Le Corbusier and Mies van der Rohe.

Robin Evans has discussed how the essentials of modern architectural graphics--plan, section and elevation--had been mapped during a period dominated by academicism.²⁷ The hard line dictated by Durand in his *Précis des Leçons d'Architecture*, as well as the rejection of perspective, color wash and atmospheric rendering, easily metamorphosed into Corbusian code:²⁸

...a modern city lives by the straight line, inevitably; for the construction of buildings, sewers and tunnels, highways, pavement. The circulation of traffic demands the straight line; it is the proper thing for the heart of a city. The curve is ruinous, difficult and dangerous; it is a paralyzing thing. The straight line enters into all human history, into all human aim, into every human act...The winding road is the Pack-Donkey's way, the straight road is man's way.²⁹

²⁶For the Smithsons' theories of Urban Re-Identification, including the four levels of human association, see *Ordinariness and Light*, Cambridge, MA: MIT Press, 1970.

²⁷'Architectural Projections', *Architecture & Its Image*, p. 33.

²⁸for a phenomenological evaluation of Durand's revolution in the field of architectural graphics, see Perez-Gomez, *Architecture and the Crisis of Modern Science*, Cambridge, MA: MIT Press, 1983.

²⁹*City of Tomorrow and Its Planning*, tr. F Etchells, Cambridge, MA: MIT Press, pp. 16-18.

It wasn't that mainstream modernism ignored the issue of graphics; it just treated it as a transparent tool for communicating a philosophy of design. Thus communicative conventions escaped reform even in the face of what was posited as a revolution in theoretical underpinnings. The difficulty was that the use of the established conventions of architectural notation threatened to reiterate received wisdoms about the urban environment and justify Henri Lefebvre's critique that planners can see only what can be translated by the nib of a pen.³⁰

That was what Archigram wanted to avoid from the start with the 'Living City'.

It was in keeping with the spirit of the times that reform from within was suspect. It was crucial to interrogate the whole notion of city from without, not just to tinker with its parts.³¹ Thus there was an urgency to broaden the architectural domain and the compulsion to raid from other disciplines. The framework for cultural control popular in the fifties was found to be problematic in the sixties. "To hell with all that. Social corsetry is not the architect's job", Price wrote in his contribution to the seventh *Archigram*.³² As Price put it, "the major fault in current thinking and the resultant proposals for future physical urban concentration is the inability to let go of the concept of the City and Town and their fast multiplying incumbents".³³ An interrogation from the outside required a mode of representation from without. 'Mathematical modernism', Price assessed, only continued the tradition of 'puerile pattern-making' from within:

For centuries now it has been both convenient and at times practical to represent existing or proposed urban settlements (cities, towns, camps) in two-dimensional, diagrammatic form. Where for instance, defence was of prime importance, such diagrams could, with little alteration, serve as a scaled blue print for the real thing. While Ebenezer Howard was still prepared to put a physical scale to his theoretical Garden City, succeeding though less successful folk-utopians have produced diagrams (plans) purporting a two-dimensional validity while avoiding both measurable physical commitment and in doing so avoiding a degree of integrity in their chosen genre.

From Filarete's *Sforzinda* (c.1464) to Howard's *Peaceful Path to Real Reform* (1898), cities had been rendered and built as diagrams. Even Fuller and Friedman stuck with the

³⁰"What interferes with the general tendencies of those involved with planning is understanding only what they can translate in terms of graphic operations: seeing, feeling at the end of a pencil, drawing." ('Industrialization and Urbanization', *Writings on Cities*, tr. E. Kofman, E. Lebas, Oxford: Blackwell, 1996, p. 83)

³¹"The problem facing our cities is not just that of their regeneration, but of their right to existence." (Peter Cook, 'Living City', *Living Arts Magazine*, London: ICA, 1963, no. 2, p. 70)

³²*op.cit.*

³³Archigram 7.

schema. The problem, Price continued, was that analytical techniques were then mistaken for working drawings:

There is no particular objection to suggesting an operational design shorthand but the distinction must be drawn between one which merely clarifies or reinforces one's thought processes in relation to the necessary interaction, and one which is literally taken too far and starts to become an over-simplified indicator of desirable physical planning or form.

In short, the manner in which an idea was expressed set the tone for the way in which it was to be received.

A Medium for the Message

Le Corbusier understood the relationship between message and medium--thus his insistence on orthography. Indeed, once his message was suspect his medium was attacked: "The straight line of modern architecture was in for some twisting".³⁴ The Archigram group wanted to free itself from what it called "constraint of the single layer, two dimensional urban plan".³⁵ Having done so, the group would need a replacement to represent what was conceivable. If the architectural language did not bridge what *Archigram 3* called "the gap between idea and image" [figure 9], the system of representation would dictate what was imaginable.³⁶ The emerging system would need to be flexible enough for a lumbering 'Walking City' or an ephemeral 'Instant Village'. The images of a new architecture expressed a passion for the liberating potential of structural mobility that the empirical formulae used by the modernists obstructed.

Some of the makeover took place as new equipment became available, from popular utensils such as Zip-a-Tone and felt pens to the more scarce and coveted 'Banjo' stencil.³⁷ As ever, new techniques begot possibility. Color was an important factor in broadening the visual context in which drawings were seen. Now that vivid colors could easily applied to the page, it possible to emulate the vivid colors around them in advertisements, magazines, television, Technicolor, plastics, even the dramatic contrast seen in the photographs from the moon.³⁸ This agenda was shared with art school

³⁴*Archigram 2* (1962)

³⁵from the 'Statement of Intention and Aim' for the *International Dialogue in Experimental Architecture* (IDEA) conference, Folkestone (1966), paraphrased in *Clip-Kit*, 1966.

³⁶*Archigram 3*

³⁷Banjo stencils were initially available only in France and acquired a cult status.

³⁸The photographs appearing from space were particularly powerful in suggesting the previous limits of human imagination. Hamilton's 'Just What Is It has a partial view of the earth taken from out of space (cut from *Look* magazine, picture entitled 'A 100 Mile High Portrait of the Earth') instead of a ceiling (John A. Walker, *Cultural Offensive*, Sterling, VA: Pluto Press, 1998, p.

students and was stressed to explain their experiments with color, drawing strategies and newly available tools.³⁹ The mediocrity of the schools was described, as by *Megascope*, in colorless terms: “When faced with dreary projects and obsolete problems, it is no wonder that students are unable to produce anything but dreary solutions, balsa models and grey, grey drawings.” The opposite was true of everything good: “The rounded corners, the hip, gay, synthetic colours, pop-culture props all combine to suggest an architecture of plastic, steel and aluminium, the juke box and the neon-lit street, the way a city environment should be.”⁴⁰

Bright color evoked the sensibility of the science fiction genre, complete with its associations to new technologies. Space comics seemed an obvious starting point to explore the architectural conditions of the future. They full of fantastic backdrops for topographies which, like utopias, were remote in time and place.⁴¹ The Archigram group, after all, was looking for “something to stand alongside the space capsules”.⁴² They asked: “Is it possible for the space-comic’s future to relate once again with buildings-as-built? Can the near-reality of the rocket-object and hovercraft-object, which are virtually ceasing to be cartoons, carry the dynamic (but also non-cartoon) building

32). The more famous Earthrise series was taken by Apollo 10 (18 May, 1969) but the first view of earth from the moon came from the Orbiter spacecraft: “At 16:35 GMT on August 23, 1966, the versatile manmade lunar Orbiter spacecraft responded to a series of commands sent to it from Earth, across a quarter-million miles of space, and made this over-the-shoulder view of its home planet from a vantage point 730 miles above the far side of the Moon. At that moment the Sun was setting along an arc extending from England to Antarctica. Above that line, the world with the east coast of the United States at the top, was still bathed in afternoon sunlight. Below, the major portion of the African Continent and the Indian Ocean were shrouded in the darkness of evening. By this reversal of viewpoint, we here on the Earth have been provided a sobering glimpse of the spectacle of our own planet...We have achieved the ability to contemplate ourselves from afar and thus, in a measure accomplish the wish expressed by Robert Burns: ‘To see ourself as ithers see us!’” (*Exploring Space with a Camera*, Washington DC: NASA, 1968, pp. 84-5)

³⁹Conversation with Gordon Sainsbury (27 April, 1998), an architecture student who went, as did Peter Cook, from studying with Ron Simms at Bournemouth to the Architectural Association, London. He collaborated with Cook on the project for Picadilly Circus featured in *Archigram 1*.

⁴⁰quoted by Banham in ‘Zoom Wave’, *op.cit.*

⁴¹Whereas classic comics were architecturally reactionary: “The classic comic draws almost exclusively upon the imagery of the ‘20s and ‘30s for its visual backing. Spiderman, Mighty Avengers and Batman explore the fantastic from the relative security of New York’s stone canyons. Captain Marvel does battle with Cyberex against a background of McKim Meade [sic] and White, rather than Rudolph, Kahn or Johnson...It’s the baddies that live in the shiny new office block.”

⁴²Written for the ‘Living City’ exhibition (1963), this statement was reprinted in *Archigram 4* (1964, p.6). Intro to Clip-Kit: “The restrictive parameters of most architectural thought today...is making the design of our environment an anacronism in an era of unprecedented technological advance.”

with them into life as it is? Or shall we be riding in these crafts amongst an environment made of CLASP?" This was among "the greatest weaknesses of our immediate urban architecture...the inability to contain the fast-moving object".⁴³

There were lots of reasons for Archigram to adopt the space comic image of technological complexity: science fiction popularized complex science; it assimilated emergent disciplines and most advanced developments into the cultural spectrum; it identified social attitudes towards change and placed new ideas in traditional contexts; and, significantly for a visually driven discipline, science fiction made a memorable image out of something new. It provided a visual where the architectural landscape provided none. Counter-cultural associations also came along with this literature. The importation of American comics had been banned since 1955 by the Children and Young Persons (Harmful Publications) Act as they were argued to be harmful to 'impressionable minds'. This fear was perpetuated by the publication of Frederic Wertham's *The Seduction of the Innocent* of 1964.⁴⁴ Thus despite their ambivalence towards things American, Utopie used comics in their architectural satire. Though they tended to reiterate all the familiar social hierarchies, the comic removed the reader from the mainstream, physically and culturally. This subversive characteristic had made such as magazines like *Astounding Science Fiction*, books like *The World of Null-A*, and films like *Forbidden Planet* key for a segment of the Independent Group.⁴⁵

And so the borrowed imagery of futuristic cities was transported into the present-continuous of the architectural proposal. Never mind that these were not documentaries on technologically advanced environments, the prominent author of science fiction, Ray Bradbury, thought the inspiration of such imaginary representations of space for architects was a foregone conclusion:

Is there a relationship between art history, daily and Sunday comic strips, the great illustrators, and the evolution of science fiction? Does science fiction and its unreal mirror image, fantasy, have wild roots in the art metaphors of the nineteenth century?

...We might as well ask: Are houses haunted?

...The meadowlands of Cape Canaveral are strewn with grown-up kids who swam after the grand concourse of submarines...[Science fiction] is the history of towns and cities yet unbuilt,

⁴³Peter Cook, 'Zoom and Real Architecture', *Archigram* 4, p. 18. He continued, "comic imagery has always been strongest here", reiterating the truism that science fiction is the literature of 'change'.

⁴⁴Martin Barker, *A Haunt of Fears: the Strange History of the British Horror Comics Campaign*, London: Pluto Press, 1984.

⁴⁵'Science Fiction', *The Independent Group*, ed. D Robbins, Cambridge, MA: MIT Press, 1990, pp. 61-2.

ghosting our imaginations and lifting us to rise up and find hammers and nails to build our dreams before they blow away. I dare suggest some architects who, if you asked, would say the same: that a Frank R. Paul cover painting on an October 1929 issue of *Amazing Stories* caused them to buy pens, pencils, rulers, and drawing boards to paper up a concept and create a living world. If you bombarded an audience with three minutes' worth of covers from the old science fiction magazines, each screened for just two or three seconds, the effect would be stunning. For city after city, wall after wall, avenue after avenue, would strike the retina and stimulate the brain.

...The combination of all these metaphorical art forms, comic strips, magazine covers, magical films of the early twentieth century, and the World's Fairs in between, have produced the architectural science fiction films of the last twenty years...Not all of our teachers, our intellectuals, our movers and shakers, have yet discovered that this is the greatest age of metaphor, because the metaphors have peeled off the canvases, marched out of the haunted World's Fair grounds, leaped out of the comic strips, and unreeled themselves from cinema screens and computer tapes to become our whole existences, our lives, our further dreams.

...Science fiction remains the architecture of our dreams, and science fiction illustration will continue to inspire our next generation of dreamers.⁴⁶

Cape Canaveral, imagined skylines, uncomprehending teachers, inspiring magazine covers: it was as if Bradbury was describing the imaginations of the Archigram members. "Our document is the Space Comic", was the point blank statement of *Amazing Archigram 4*.

The Composite

The interest was not just in finding imagery ready for the taking, as in a Paolozzi collage or an *Archigram 4*, or in borrowing the format as did *Utopie* [figure 61]. The true relevance of sci-fi lay not just in its look but in its sensibility. Alloway's string of modifiers--"solar, delta, galactic, amorphous, ulterior, fused, far out, viscous, skinned, visceral, variable, flux, nebular, iridescence, hyper-space, free fall"--to describe the primitivist paintings of women by Magda Cordell (1921-) well illustrates this point [figure 62].⁴⁷ The space comic had the tools to turn the static page into a vital surface built right into its medium. There were the visual cues for invisible things, such as sounds, and for unrepresentable things, like speed. Speech balloon demarcated the subjective worlds of thought and speech. A continuous narrative was generated through a series of discrete frames: a process of time that unfolds in space. Everything was bound together through the conventions by which the comic combines text and image. Words had no position in space; they were not within the picture or outside of it. Yet the balloon functioned as part of the image and the image could not be separated from the text. Two modes of representation were intimately connected.

⁴⁶ Art and Science Fiction: Unbuilt Cities/Realized Dreams' (1987), *Yesterday: Obvious Answers to Impossible Futures*, Santa Barbara, CA: Joshua Odell Editions/Capra Press, 1991, pp. 18-29.

⁴⁷ *Magda Cordell Paintings*, Hanover Gallery 1956, unpaginated.

The comic unified a panoply of parts into unified narrative while maintaining a sense of speed and dynamism. Another hand-held popular format that created a sense of coherence out of its non-sequiturs was the newspaper, which McLuhan called a 'Symbolist map': "To achieve coverage from China to Peru, and also simultaneity of focus, can you imagine anything more effective than this front page cubism? ...Orchestration permits discontinuity and endless variety without the universal imposition of any one social or economic system."⁴⁸ There was also a 'high-art' counterpart that was already an avant-garde staple. The collage, photomontage, ready-made and assemblage were all about incorporation of disjunctive sources into a single object. For Duchamp, art incorporated the dominant modes of social production by definition; Rauchenberg extended the picture plane to any surface that tabulated information. The Archigram group consciously drew on these strategies, from single images to the overall layout of the journal. 'Found' imagery--what McLuhan called "extensions of situations elsewhere"⁴⁹--was placed side by side with architectural patois.

Though the layering of advertising imagery was already familiar from the collages of the Independent Group, images of consumer culture were a rare sight within the realm of architectural drawings, not least because an affiliation with American culture might render one's social leanings suspect in the eyes of the architectural bureaucracy. Even Peter and Alison Smithson who wrote that ads had replaced monuments were been sensitive to this sort of criticism. Their inclusion of Marilyn Monroe and Joe DiMaggio, veritable icons of America, in the perspective illustration for their Golden Lane project was a strategic exception within their oeuvre [figure 63]. In the case of the *Archigram*, the this kind of collage had the status of a presentation drawing. Manfredo Tafuri described this blend as a compromise of the 'materials of communication':

To degrade the materials of communication by compromising them with the commonplace, by forcing them to be reflected in the agonizing swamp of the world of merchandise, by reducing them to emptied and mute signs: this is the process that leads from the tragic buffoonery of the Cabaret Voltaire to the *Merzbau* of Kurt Schwitters, to the constructivist pictures of László Moholy-Nagy, and to the false constructions of Sol LeWitt.

Despite this, Tafuri recognized the unexpected yield of degradation:

Yet the result is surprising. The desecrating immersion into chaos permits these artists to reemerge with instruments that, by having absorbed the logic of that chaos, are prepared to

⁴⁸Marshall McLuhan, *The Mechanical Bride: Folklore of Industrial Man*, NY: Vanguard Press, 1951, p. 3. Moholy-Nagy had also pointed out that the "modern newspaper...tries to organize the many events of the day similarly as the futurists: the reader should read all the news almost at once." (*op.cit.*, p. 307, note to figure 398)

⁴⁹McLuhan, 'Comics', *Understanding Media*, NY: McGraw-Hill, 1964, p. 169.

dominate it from within. Thus we have the form of formlessness as both conquest and project. On the one side, the manipulation of pure signs as the foundations of an architectural constructivism; on the other, the acceptance of the indefinite, of dissolution.⁵⁰

The outcome, the form of formlessness, *was* the Archigram conquest and project. Grounded in the indefinite, dissolution was sure to follow.

Vision in Motion

“The next step in the development of cubism”, Moholy-Nagy wrote, was the view from above.⁵¹ The elevated vantage point was the logical extension of the multiple view points of cubism because it was associated with technological velocity: “In our age of airplanes, architecture is viewed not only frontally and from the sides, but also from above--vision in motion.”⁵² In contrast to the perspective, Charles Jencks and Moholy-Nagy agreed, the bird’s eye axonometric allowed architects “to work out the space, structure, geometry, function and detail altogether without distortion.”⁵³ Like a perspective illustration, the vantage point for an axonometric drawing is chosen strategically; when the view is taken from above, Jencks argued, the axonometric can “analyse and dissect the whole project showing its underlying anatomy”.⁵⁴ Cook’s bird’s-eye axonometric of Plug-In City portraying a 144 ft², 12 story piece of plug-in housing was that project’s definitive image [figure 15]. He described the drawing as capable of containing opposites: “It is ‘heroic’, apparently an alternative to known city form, containing ‘futurist’ but recognisable hierarchies and elements. Craggy but directional. Mechanistic but scaleable ...whatever else it was to be, it was not going to be a deadly piece of built mathematics.” Because it combines three orthogonal drawings into one, the axonometric is the projection most confined by its geometric definition.

The axonometric puts even right angles on the diagonal, and diagonals were to the postwar avant-garde what right angles had been to the high modernists: “Whereas the orthogonal is a perceptible sign of the permanent, the oblique is a sign of the unstable and variable”, wrote Amédée Ozenfant and Le Corbusier in ‘The Right Angle’. “If the orthogonal gives the sense of the structural law of things, the oblique is only the sign of a

⁵⁰Manfredo Tafuri, *L’Architecture dans le Boudoir: The Language of Criticism and the Criticism of Language* (1974), reprinted in *Architecture Theory Since 1968*, ed. K. Michael Hays, Cambridge, MA: MIT Press, 1998, p. 163.

⁵¹*ibid.*, p. 117.

⁵²*Vision In Motion*, Chicago: Paul Theobald & Co., 1947, p. 244.

⁵³*Modern Movements in Architecture*, London: Penguin, 1985, p. 263.

⁵⁴*ibid.*

passing instant.”⁵⁵ For the same reason, the Archigram group declared that the diagonal “is not only a product of current engineering experimental preference, but implies a purpose of the structure that is new to buildings: TO PROVIDE AN UMBRELLA WITHIN WHICH GROWTH AND CHANGE (of the smaller functioning parts) CAN TAKE PLACE.”⁵⁶ They learnt this lesson from Fuller and the Futurist resolution “that oblique and elliptical lines are dynamic by their very nature, have an emotive power a thousand times greater than that of perpendiculars and horizontals, and that there can be no dynamically integral architecture without them.”⁵⁷ The diagonal had suited the articulation of the communication node in the ‘Living City’. When the group returned to the non-centralized systems planning of the ‘Metropolis’ in *Archigram 5*, the diagonal would again be emphasized as essential [figures 64 & 65]. By then they had worked out the affiliation of ‘Diagonals and Connections’, illustrating how Piranesi’s ‘Imaginary Prisons’ and Garnier’s ‘Cite Industrielle’ had anticipated city studies by Friedman, Walter Pichler, Hans Hollein and Chalk and Herron’s ‘City Interchange’ [figure 57]. The diagonal as connector would be dominant in all three urban projects of 1964: Walking [figure 66], Plug-In [figure 67] and Computer City [figure 18].

In what was a critique of CIAM orthography, Paul Virilio and Claude Parent explained the importance of what they called the ‘Oblique Function’: “we are now confronted by the overriding necessity to accept as a historical fact the end of the vertical axis of elevation, the end of the horizontal as permanent plane, in order to defer to the oblique axis and the inclined plan, which realise all the necessary conditions for the creation of a new urban order and permit as well a total reinvention of the architectural vocabulary. This tipping of the plane must be understood for what it is: the third spatial possibility of architecture.”⁵⁸ As for the ‘Zoom Wave’, the new spatiality was linked to an evasion of gravity. Overcoming gravity had great imaginative power for a discipline that had always to accommodate downward force. Conrads and Sperlich described the conquest of gravity in *The Architecture of Fantasy* as “one of the great utopian dreams of architecture in our century.”⁵⁹ The Purists even defined art as the diametrical pressure: “The Law of gravity governs all thing on earth, as much man as the objects he creates.

⁵⁵translation by N. Lahijii in *Plumbing, op. cit.*, p. 29.

⁵⁶‘Living City’, *Living Arts*, no 3, 1963.

⁵⁷from Banham’s translation of the Manifesto, *Journal of the Royal Institute of British Architects*, vol. LXIV, no. 4 (February, 1957), pp. 129-39.

⁵⁸*Architecture Principe*, 1966, translated in *Sites & Stations: Provisional Utopias*, NY: Lusitania, 1995, p. 174.

⁵⁹*The Architecture of Fantasy*, tr. C Crasemann Collins & GR Collins, NY: Frederick A. Praeger, 1962, p. 19.

Instinct protests against instability, and even the appearance of instability worries him...Art can only enter into opposition to this interior need of nature.”⁶⁰ Virilio explained that the “notion of up and down linked to the earth’s gravity is just one element of perspective...As soon as one starts to incline planes and to get rid of the vertical, the relationship with the horizon changes. Gravity does not come into play in the perception of space in the same way at all...The idea is that as soon as a third spatial dimension (the oblique) is brought into the relationship with regard to space and weight changes, the individual will always be in a state of resistance--whether accelerating as he is going down, or slowing as he is climbing up. The idea was to work with gravity in a new way; to create a vision of instability while the perspective is stable.”⁶¹ The perception of instability generated forms free of anticipated relationships. Freed from gravity, modernist graphics could segue into CAD, a technological space in which the viewer can be suspended over buildings, and projected through the picture plane into the world of the photon.

The oblique function tipped the horizon itself. The axonometric on the other hand kept the horizon intact, tipping the object to it. What the axonometric will reveal depends on how it is angled to the horizon. Yve-Alain Bois has described how El Lissitzky (1890-1941) and Theo van Doesburg (1883-1931) used the axonometric to exploit the ambiguity of spatial registration and enable a view of all six surfaces of a cubic room.⁶² The axonometric could, as it did in the case of Plug-In City, sprawl out in a series of outlines and shapes that did as much to obscure as to clarify [figure 15]. The diagonals piled up in “this enormous and much wrought axonometric” like the building up of

⁶⁰Amédée Ozenfant and Pierre Jeanneret, ‘The Right Angle’, *L’Esprit Nouveau*, (no. 18).

⁶¹pp. 178-9. To the question, “How would you situate your work during this period amongst the work of other radical groups of the time such as Constant’s ‘New Babylon,’ the ‘plug-in cities of Archigram, the unitary urbanism of the Situationist International, influenced by Henri Lefebvre? And did you have any connection to the work of Yona Friedman in Paris?, posed by Enriqe Limon in an interview, Virilio replied: “We were very much interested in Constant’s ‘New Babylon.’ We invited Archigram to exhibit for the first time in France at the Claude-Nicolas Ledoux salt mines. So we had exchanges with Archigram, they invited us to Folkestone. We read the Situationists a lot. I have many issues of the International Situationist review and of course the idea of the ‘urban dérive’ interested us very much. In fact my architecture was called ‘des sites de dérivation’... We worked with Henri Lefebvre. I had less contact with Yona Friedman, although I invited him to the Ecole Speciale d’Architecture to teach as a visiting professor.” (‘Paul Virilio & the Oblique’, *Sites & Stations*, *op.cit.*, pp. 182-3)

⁶²‘Metamorphosis of Axonometry’, *Daidalos*, vol. 1, 1981, pp. 40-58. (cited R Evans, *Architecture and its Image*, ed. E Blau & E Kaufman, Cambridge, MA: MIT Press, 1989)

conduits as more systems stream through the city.⁶³ The diagonals of the projection emphasized the connections between the parts. Contrary to the verbiage of the ephemeral and dematerialized, Saskia Sassen has described the build up of materiality that accompanies the development of communications technology.⁶⁴ Far from doing away with place, virtuality creates dependency on specific locales, like Silicon Valley.

The appearance of the proliferating systems in these drawings had an affinity the elaborate comic devices of mad inventors. While computer programmers were working to simplify the representation of increasingly complicated building systems, the hand produced drawing of an architecture as an information network was becoming increasingly overwrought, burdened by an opaque syntax and obfuscating viewpoints. Meanwhile drawings were manufactured to look like what it was imagined a computer might generate. In turn, the imaginary would play an important role in creating a computer-aided graphics that merely substituted the mouse for the hand.⁶⁵ Architects extended this further by using the computer as a time saving, rather than form breaking, device. Again, this registered at the level of city design way before the prevalence of the personal computer. Price could already see that computers were merely replicating what modernist graphics had already instituted for urbanism. “It is disturbing”, he wrote, “that a large proportion of work being undertaken on computer and other models still uses elements of the city as the ‘base-line’. Thus much of this work may well result in little more than accurately tabulating the weakness of existing cities, and thereby increasing the attractiveness of propositions for the urban band-aid. The immense value to planners of computer simulation is likely to be under-exploited for as long as the demands made are based on forms and functions of existing cities and metropolises.”⁶⁶

There was only the one drawing of the “Synthesised Metropolis With Electronic Changeability”, or Computer City: an axonometric of an area for a population of one hundred thousand. Hardware, even hardware with a limited life span, could be frozen in a series of snapshots; an urban environment with no physical presence, however, was harder to depict. In the drawing, Crompton accented his red sensory net with blue transistor nodes and had purple arteries supplying feed, while the return was transported

⁶³Banham in *Megastructure*

⁶⁴*Globalization and Its Discontents: Essays on the New Mobility of People & Money*, NY: New Press, 1998.

⁶⁵see Robert Bruegmann, ‘The Pencil and the Electronic Sketchboard: Architectural Representation and the Computer’, *Architecture and its Image*, op.cit.

⁶⁶*Archigram 8*, unpaginated.

in yellow conduits.⁶⁷ Like Kahn's movement patterns, the contours of Computer City were not of information but an outline of how information proceeded from one place to another. The bundles of cables out of which the axonometric was made rendered information as material; the system hardened into the city.

The sensitized net was made up of local zones. Known in the terminology of systems theory as 'suboptimization', the city as a whole was a composite of its many sub-networks that combined to form a comprehensive system.⁶⁸ Each of the local networks--sewage, electricity, telephone, computer--was also complete in itself. Each system generated a map of its own information as encyclopedic in its description of its locality as a panorama.⁶⁹ Where systems overlap, one map obscures others; the dialectic between gain and loss remains constant, just as Tafuri perceived.

With the next chapter, the study turns to the contents of these panoramic maps and their portrayal of the architectural materials of communication.

⁶⁷The *Archigram 5* reproduction lacked the color code.

⁶⁸"Suboptimization is the attempt to optimize the performance of a particular subsystem without regard to the effects of this optimizing action upon the larger whole of which the sub-system is but a constituent part." (Francis Ferguson, *Architecture, Cities and the Systems Approach*, NY: George Braziller, 1975, p. 6)

⁶⁹This is what Bruno Latour has called the 'ogliopticon'.

Chapter 4: Bathrooms

...the State needs to subordinate hydraulic forces to conduits, pipes, embankments, which prevent turbulence which constrain movement to go from one point to another, and space itself to be striated and measured, which makes the fluid depart on the solid, and flows proceed by parallel, laminar layers.

Deleuze & Guattari, *A Thousand Plateaus*

The first newsletter on which all six members collaborated, *Archigram 3: Expendability, towards throwaway architecture* (1963), read like a manifesto right from the evocation of Le Corbusier's. Like 'Living City', it was replete with echoes of the Futurist one before it which read: "the fundamental characteristics of Futurist architecture will be expendability and transience. Our house will last less time than we do, every generation must make its own city."¹ More than acceptance of a status quo, the editorial expressed the necessity of disposable consumer products for a robust society:

Almost without realising it, we have absorbed into our lives the first generation of expendables..... foodbags, paper tissues, polythene wrappers, ballpens, e.p's..... We throw them away almost as soon as we acquire them. [...] Every level of society and with every level of commodity, the unchanging scene is being replaced by the increase in change of our user-habits--and thereby, eventually, our user-habitats.

...The attitude of mind that accepts such a situation is creeping into our society at about the rate that expendable goods become available. We must recognise this as a healthy and altogether positive sign. It is the product of a sophisticated consumer society, rather than a stagnant (and in the end, declining) society.

The whole-hearted approval of consumer culture expressed by this editorial provoked the dominant criticism to be consistently leveled at the group. Unlike the artists of the Independent Group whose enthusiasm had been tempered by a suspicion for market economics [figure 68], the *Archigram* view extended the programming of user habits for disposables such as tissues, pens, even cars, to the more encompassing realm of the built environment. As the editorial acknowledged, people would not make the leap from paper plates to disposable habitats of their own accord. While there might be no qualms about planned obsolescence in an automobile, a kitchen that would be technically archaic within twenty years was another matter:

¹'Manifesto', tr. R Banham, *Journal of the Royal Institute of British Architects*, vol. LXIV, no. 4 (February, 1957), pp. 129-39.

Our collective mental blockage occurs between the land of the small-scale consumer-products and the objects which make up our environment. Perhaps it will not be until such things as housing, amenity-place and workplace become recognised as consumer products that can be ‘bought off the peg’--with all that this implies in terms of expendability (foremost), industrialisation, up-to-date-ness, consumer-choice, and basic product-design--that we can begin to make an environment that is really part of a developing human culture. [...]

The idea of an expendable environment is still somehow regarded as akin to anarchy.....as if, in order to make it work, we would bulldoze Westminster Abbey.....
 WE SHALL NOT BULLDOZE WESTMINSTER ABBEY
 Added to this, the idea of a non-permanent building has overtones of economy, austerity, economy. Architects are the first to belie the great potential of expendability as the built reflection of the second half of the twentieth century. Most of the buildings that exist that are technically expendable, have the fact skillfully hidden..... they masquerade as permanent buildings--monuments to the past.

The point, then, was not to rid the city of its extant monuments as Le Corbusier had suggested, but to abandon future construction geared towards, or designed to grant the appearance of, durability.

Most contemporary buildings contained expendable elements, yet continued to be expressions of perpetuity. On the second page, under the caption “Problem: Is This Expendable Architecture?”, the *Archigram* illustrated the breach between the idea that “the home, the whole city, and the frozen pea pack are all the same” and the image projected by prefabricated architecture. Even mail order housing, an architecture already ‘bought off the peg’, marketed its structures of replaceable, interchangeable parts in familiar disguise. The masquerade of the expendable in the guise of the monumental, or merely the durable, exemplified the disjuncture between the capacity to conceive of disposable architecture and the ability to grant this conception visual expression.

Bathrooms, Bubbles and Systems

*Roam home to a dome
 Where Georgian and Gothic once stood
 Now chemical bonds alone guard our blondes
 And even the plumbing looks good.*

Buckminster Fuller, The Cardboard House²

As the bathroom was the first unit of the house to be treated as expendable in a mainstream context, it was the place to begin in issue dedicated to that theme. On the page entitled ‘Groundwork’ and containing the bolded words ‘Bathrooms, Bubbles,

²Sung to the tune of ‘Home on the range’. This ditty appeared in *Perspecta*, no. 2, 1953, p.28, the same issue which brought Kahn’s ‘Midtown Philadelphia, Stop-and-Go’ to Britain.

Systems and So On', the group featured the toilets of the most daring experiments with housing produced in a mold: Ionel Schein's plastic house (1955), the Monsanto house (1954-7) and the Dymaxion house (model, 1937) [figure 69]. The fiberglass Monsanto house designed by Albert G. H. Dietz with Richard W. Hamilton and Marvin Goody at MIT, final destination Disneyland, was the most high profile of these.³ European texts emphasized the house exhibited by Ionel Schein, R.A. Coulon and Yves Magnant at the *Salon des Arts Ménagers*, Paris 1956, as the "great landmark in the development of plastic structures".⁴ The category of 'Bubbles' was illustrated by photographs of a dome under construction and after completion, alongside a model and plan for a Quarmby British Rail relay station that had also cropped up on the cover. 'Systems' featured the roof plan, ground plan and model for George Nelson's Unit House for the Homestyle Center (1957), a trussed-shell warehouse made of hyperboids in Fort Worth, Texas, by William R. Orr, and a construction sequence for a Terrapin structure.

³"Final plans for the Monsanto House specified a square foundation of reinforced concrete sixteen feet on a side and about six feet off the ground. The foundation enclosed a storage room and mechanical equipment; its upper surface became the floor of a kitchen and two small bathrooms. Cantilevered from each of the central core's four sides--jutting into space, in other words--was an identical modular room, also sixteen feet on a side, defined by a C-shaped structure of Fiberglas-reinforced polyester. The outer structural surface of each C-shaped module consisted of four L-shaped Fiberglas "bents," each eight feet wide. Two upper bents, placed side by side, projected out sixteen feet to form the roof of a module and then curved down about four feet at the outer wall, where they met two corresponding floor bents curving upward. Where roof and floor L's met at the horizontal center line of the outer wall, they were joined seamlessly with bolts and epoxy cement. Four smaller Fiberglas panels formed the roof of the utility core and tied the eight roof bents together above. The two nonstructural sides of each room or wing could be filled with any combination of glass or siding. The designers intended the finishing-out of these open sides as an antidote to the boredom of identical mass-produced houses. Personal selection of materials would express an owner's individuality and afford "the male of the family" an outlet for "do-it-yourself creativity.'" (Jeffrey L. Meikle, *American Plastic*, NJ: Rutgers University Press, 1995, p. 208)

⁴"The concept of the house was based upon the growth of a snail's shell, so that the house consists of a basic circular living space with a cooking area, sanitary block and warm-air heater, to which a number of bedroom units may be attached at will...The planning was advanced for its time, although perhaps not outstandingly so, and the rather thin and flat curvature of the exterior was rapidly superseded in the designers' later work. However the successful reconsideration of the elements of housing--clip-on heating, moulded sculptural doors, moulded in equipment in bedrooms and kitchen, the evolution of a true structural skin, and above all a most revolutionary bathroom core--were the features which made the house remarkable and truly worthy foundation of the evolution of plastics in architecture." (Arthur Quarmby, *Plastics and Architecture*, NY: Praeger, 1973, p. 46)

Fuller's bathroom, repeated from the previous page, reiterated the significance of the Dymaxion project for structural obsolescence.⁵ Not only was the Dymaxion House the first 'House of the Future', but it was entirely transportable [figure 70].⁶ Fuller first included it in his broadside on the housing industry, 4D (1927), which he sent to a range of prominent figures, from Henry Ford (who introduced the Model A that same year) to Bertrand Russell.⁷ A model was first exhibited at the Chicago department store, Marshall Field's, in 1929, introducing manufacturers directly to the consumers who would buy the housing off the shelf. The house consisted of a central mast that contained the services from which the glass and casein walls and inflated rubber flooring were suspended by wires. The core contained two bathrooms with electric vacuum hair clippers and toothbrushes, a self-activating laundry unit that washed, dried and folded, disposal tanks, a generator, an air compressor, a humidifier, and a kitchen equipped with every conceivable appliance. Such technological domesticity (as well as the naked dolls Fuller included in the display) startled the public and focused media attention on Fuller's view of mass production as a redemptive force. Fuller's technological allegiances shone through his slogan for 'Houses Like Fords'.⁸

As Fuller's fordism applied to the home makes clear, the mechanical core played an important role in the translation from factory to domestic values. The core had its roots firmly planted in the technology of the assembly line and it was among the first components to be completely fabricated off-site.⁹ Moreover, it was also the unit to incorporate synthetic materials consistently.¹⁰ It also made access to hygiene more egalitarian, thereby increasing social mobility.¹¹ Thus the development of pre-cast bathrooms of limited lifespan conflated many aspects of circulation in modern life

⁵The bathroom appeared twice on the few pages of *Archigram 3* and Moholy-Nagy cited it as a source of inspiration for young designers. (*Vision In Motion*, Chicago: Paul Theobald & Co., 1947, caption to figure 36)

⁶See Brian Horrigan, 'The Home of Tomorrow, 1927-1945', in *Imagining Tomorrow*, ed. JJ Korn, Cambridge, MA: MIT Press, 1986, pp. 137-63.

⁷1927 was a busy year for technological spectacle. Besides the Model A, Lindbergh's flight, first talking movie, public demonstration of television, transatlantic radio-telephone service, Holland Tunnel.

⁸Douglas Haskell, 'Houses Like Fords', *Harper's*, 168, February 1934, pp. 280-298.

⁹as it was in the Temporary Housing Programme's Aluminum Bungalow of the late forties.

¹⁰Examples: GRP units by Alberto Rosselli with the Montecatini Plastic Research Institute at Castellanza (1957); mid-60s molded plastic unit by Société PLASBA, Paris; revolving Bathroom by R. Bucher; GRP Bathing Cabinet by Mario Scheichenbauer; and Moeller Sanitar unit by HG Müller Kunststoffwer, Munich Olympic Village.

¹¹For a discussion of this, see Adrian Forty's essay on 'Hygiene and Cleanliness', in *Objects of Desire: Design and Society 1750-1980*, London: Thames & Hudson, 1986, pp. 156-170.

beyond the fluids within their pipes. It was this aim, the objective of an architecture as transient in the cultural mind as a paper cup, that was aspired to by the Archigram group when they began to draft what they would call ‘The Piped Environment’. Thus the cacophonous grid of pipework with its coursing fluids suggested an almost over-determined metaphor for circulation.

Though the depiction of bathroom hardware by the Archigram group as laying the groundwork towards an urban network as it does in ‘Bathrooms, Bubbles, and Systems’ might appear whimsical, it was grounded in historical circumstance. From the Roman *Cloaca Maxima*¹² to the British local authorities, urban configurations had often been dictated by the need for sewage removal. Once water could be channeled into the house, plumbing supplied the means to satisfy the modern obsession with personal hygiene.¹³ Services even came to replace the hearth as the symbolic center and organizing principle of domesticity.¹⁴ The prominence of plumbing had reached the point that in 1937 Lewis Mumford could conclude that infrastructure bore the characteristics, including substantial investment and an omnipresent nature, which had formerly been reserved for the monumental.¹⁵ Louis Kahn’s elevation of infrastructure to the status of structure, where the aspects of the city that catered to mobility generated urban form, illustrated

¹²The communities overlooking the Tiber united in the 7th century BC to dig the sewer that now lies under the Forum.

¹³Alexander Kira’s *The Bathroom*, published 1966, illustrates the hygiene/plumbing obsession as does Adrian Forty’s previously noted ‘Hygiene and Cleanliness’. A recent publication on this theme is *Plumbing: Sounding Modern Architecture*, ed. N Lahiji & DS Friedman, NY: Princeton Architectural Press, 1997.

¹⁴Usonia, Frank Lloyd Wright’s version of Utopia named after Samuel Butler’s term for the United States, was to be an aggregate of ‘do-it-yourself’ houses, the components of which were to be designed by Wright, each centered around its mechanical core. For Wright, who had famously centered the domestic space around the hearth in his prairie houses, the placement of the plumbing in the central position illustrates the significance granted to the core in his move towards the use of mass production. Broadacre City expanded on Usonia.

¹⁵‘The Death of the Monument’, *Circle*, 1937, p. 64. Giedion’s choice for the monument, also crucial for the Archigram group, was the dramatic--and transient--spectacle. Successful urban centers would “be a site for collective emotional events,” he wrote, “where the people play as important a role as the spectacle itself, and where a unity of the architectural background, the people, and the symbols conveyed by spectacles, will be achieved.” “Anyone who had the occasion during the Paris Exhibition of 1937 to observe the hundreds of thousands lined up in the summer evenings along the banks of the Seine and on the Trocadero bridge, quietly waiting for the spectacles of fountains, light, sound, and fireworks, knows that the persistent predisposition for dramatic representation, even in the form of abstract elements, has not been lost...In 1939, at the New York World’s Fair, when aerial plays of water, light, sound, and fireworks were thrown into the sky, a sudden spontaneous applause arose.” (*Architecture You and Me*, Cambridge, MA: Harvard University Press, 1958, pp. 38-39)

Mumford's position. The Team X *Primer* would call the services the "main strategic tool of the urban designer": "The structural order of a new urban growth can be said to rely upon a 'backbone'...composed of such facilities as the general network of utilities (water, sewage, power) and the circulation-transportation systems".¹⁶

From the beginning, architects characterized plumbing as an Anglo-Saxon sophistication. Adolf Loos (1870-1933) described the English and American plumber as "the state's chief craftsman, the quartermaster of culture" and every washbasin "a marvel of progress."¹⁷ The bathroom benefited in both England and America from having cultural significance; there were, however, substantial differences in attitude. The British fascination with pipes was as much a visual fascination as with an hydraulic one. In fact, a London ordinance of 1891 legally required pipes to climb the façades of buildings.¹⁸ This practice spread with alacrity to other cities with no such formal regulations. The picturesque quality continued on the spacious interior, furnished with the luxury of a sitting room: the bathroom provided the panorama for the sensual aspects of grooming [figure 71]. In America, by contrast, facilities were treated as utilitarian, ideally packed into the minimum possible area so as not to reduce the area of the living quarters any more than strictly necessary. As a result of its economy, the bathroom was a standard feature in the average American home long before it would be in British ones. Loos, the 'father of all European platitudes about the superiority of US plumbing',¹⁹ observed that even the idea of a home without a bathroom was unthinkable in turn-of-the-century America.

Additionally, British plumbing technically lagged behind its American counterpart. Because of its superiority, Marcel Duchamp regarded American plumbing as one of the nations only two contributions to art.²⁰ Thus, in 1963, the admiration for

¹⁶Jersey Soltan, *Team X Primer*, ed. A. Smithson, Cambridge, MA: MIT Press, 1974, p. 9. Kahn's 'Stop and Go' diagrams were familiar from their publication in *Perspecta* on the basis of which Team X invited him to give the keynote lecture at the tenth CIAM conference.

¹⁷'Plumbers' (Neue Freie Presse, 17 July, 1898), *Spoken Into the Void: Collected Essays 1897-1900*, *op. cit.*

¹⁸"Ever since this regulation came into existence one has seen a strange assemblage of waste-pipes on the faces of houses...These pipes are now universally attached to external walls, even those houses that do not come under the jurisdiction of municipal building acts." (Hermann Muthesius, *The English House*, ed. D. Sharp, tr. J. Seligman, London: Crosby Lockwood Staples, 1979, p. 76)

¹⁹Reyner Banham, 'A Home Is Not a House', *Design by Choice*, ed. P. Sparke, London: Academy Editions, 1981.

²⁰The second was bridges. Duchamp said this in response to the rejection of his urinal as an exhibit on the basis that it was something from a plumber's window. (Tony Godfrey, *Conceptual Art*, London: Phaidon, 1998, p.30)

advanced bathroom design was a kind of *Americanisme* at the same time as it had long been a vernacular preoccupation. Together with the technological advances contained in the mechanical core, that naturalized *Americanisme* made it possible for British plumbing, so far from cutting-edge, to become the model for complex information technology, and by extension for high-tech. This goes some way towards explaining how a technological model, the house-as-machine, that was rejected as primitive was replaced by another image of technological sophistication that was in fact as primitive. Conduits, after all, weren't even good models for the older technology of mass production. For one thing, threading pipes was not a process that could easily be automated,²¹ and while pipes were particularly suited to the extrusion and heat fusion techniques of plastics,²² metalworkers were hostile to the elimination of their craft. The resistance of that sector ensured that by mid-century plumbing remained one of the few large-scale handicrafts of the building industry. Given the cliché of British architectural culture as eminently practical and disinclined towards theoretical exegesis in the manner of the amateur inventor, the question of how the shift from a paradigm of mass-production to complex technology resulted in the highly symbolic hardware of High-Tech becomes more acute.²³ For this one must explore the context into which Fuller's lightweight structures were received in Britain, from the culture of plumbing to attitudes towards technology and motion.

Circulation

The proliferation of pipes in the modern house attracted much theoretical attention in the British context. Already at the turn of the century, Hermann Muthesius had compared the bathroom of *Das Englische Haus* (1904-5) to a piece of scientific equipment. "Water pipes and wastepipes, pipes of the most varied sort for hot water, for heating, for electric light, for communication", he reflected, "are beginning to weave their way through the house and give it the character of a refined organism, with as many arteries, veins and nerves as the human body has."²⁴ Pipes were being compared not

²¹see David F. Noble, *Forces of Production: A Social History of Industrial Automation*, New York: Knopf, 1984.

²²'A new look at plastics pipe', 'Why plastics' future looks good in plumbing', in *Plastics in Building*, ed. I Skeist, NY: Reinhold, 1966, pp.102-118 & 'Acrylic for tubs--high style, low cost', *ibid.*, pp. 128-130.

²³"The Englishman", wrote Bruno Zevi with certitude, is "skeptical about theories, detests the monumental and prefers to discuss 'a decent way of life'." *Towards an Organic Architecture*, London: Faber & Faber, 1950, p. 54.

²⁴*op.cit.*, p. 35.

only to circulatory systems but, as in Muthesius' pre-cybernetic language of information transmittal, to the nervous system. The analogy between the nervous system and the conduits of the house was already to be found in the earliest instances of the use of the term circulation as an architectural metaphor--also, as it happens, a foreigner's view of British building: in 1857 César Daly described the Reform Club (1839-41), London, by Sir Charles Barry (1795-1860) as "no inert mass of stone, brick and iron; it is almost a living body with its own nervous system and cardiovascular circulation system."²⁵ Unlike veins, which require the constant pressure of the heartbeat to circulate fluid, the nervous system is a self-regulating, closed loop of information--in fact, the very definition of a cybernetic system.²⁶ Through comparison to nerves, pipes were portrayed as more technologically advanced than a hollow conduit even before their exhibitionist display in the aesthetic of high-tech.

Not only were the pipes coming to embody the home, but Muthesius went on to say, the "aesthetic beauty of earlier ideals has had to take a back seat for the moment; but perhaps in time a completely new sort of beauty will take its place, the beauty of the refined practical purpose... Here we have a really new art which needs no creation or atmosphere to succeed, an art based on actual modern conditions and modern achievements and which, when all contemporary fashions purporting to be modern artistic movements have passed away, will be seen as the most eloquent expression of our age."²⁷ That naked plumbing might reveal modernism in its purest form encapsulated the spirit of what was to follow half a century later when the services really multiplied [figure 72]: "When your house", asked Banham, "contains such a complex of piping, flues, ducts, wires, lights, inlets, outlets, ovens, sinks, refuse disposers, hi-fi reverberators, antennae, conduits, freezers, heaters--when it contains so many services that the hardware could stand up by itself without any assistance from the house, why have a house to hold it up?"²⁸

²⁵see Adrian Forty, "'Spatial Mechanics': Scientific Metaphors in Architecture", *The Architecture of Science*, ed. P Galison, E Thompson, Cambridge, MA: MIT Press, 1999, pp. 213-232.

²⁶The analogy between the nervous system and the computer was explicit in Norbert Wiener's defining text, *Cybernetics, or Control and Communication in the Animal and the Machine*: "The synapse is nothing but a mechanism for determining whether a certain combination of outputs from other selected elements will or will not act as an adequate stimulus for the discharge of the next element, and must have its precise analogue in the in the computing machine. The problem of interpreting the nature and varieties of memory in the animal has its parallel in the problem of constructing artificial memories in the machine." (Cambridge, MA: MIT Press, 1948, p14)

²⁷*ibid.*

²⁸'A Home Is Not a House', *op.cit.*, p.57.

Le Corbusier had already made what he called the “outrageous fundamental proposition” that “architecture is circulation” in 1930.²⁹ “Think it over,” Le Corbusier implored. Circulation “condemns academic methods and consecrates the principle of ‘pilotis’.” But Le Corbusier’s position was never as far from the academic method as he imagined.³⁰ Indeed, Julien Guadet’s classic text of Beaux Arts education, *Eléments et théories de l’Architecture* (1901-04), contained an entire chapter dealing with ‘*Les Circulations*’.³¹ Circulation, then, was a significant aspect of both avant-garde and academic architectural practice; Le Corbusier, though, strengthened the claim to “circulation is everything.”³² In academic discourse, circulation existed as a category of architectural composition independent of, but internal to, structure. For Le Corbusier, architects were required to free the ground plane for cars and striate modes of transportation, from the underground layer of the subway to the airplane routes overhead.

Le Corbusier had defined architecture as the “function by which useful vases are built to contain different human undertakings”.³³ By 1945, however, the autonomous vessel represented the failure of Modernism’s social agenda. Resumption of architectural practice following the war was replete with open-ended designs for a society, it was felt, whose needs could not be anticipated from one day to the next. In Britain, the Smithsons’ methodology embodied this sense most clearly. Thomas Crow defined the Smithsons’ responsive agenda, for example, as “integrating the clarity of modern industrial design with the unpredictability of human accident.”³⁴ The open-ended planning the Smithsons promoted with the other members of Team X offered flexibility by expanding the category of circulation from transportation between zones of work, leisure and home to mobility of bodies of all kinds in, around, and even of, buildings which easily lent themselves to extension.

Mechanization Takes Command was a book dedicated to just such attitudes towards flexibility and permanence. To Giedion, movement was the ‘spring of

²⁹*Precisions*, tr. E. Schreiber Aujame, Cambridge: MIT Press, 1991, p. 47.

³⁰As Banham argued in ‘Predisposing Causes: Academic and Rationalist Writers, 1900-1914’, *Theory and Design in the First Machine Age*, London: Architectural Press, pp. 14-97.

³¹see Adrian Forty, *op.cit.*, 1999. Forty points out that though circulation is fundamental to the way we have come to think about architecture, the term was not current in architectural discourse until the mid-19th century despite its presence in biology since William Harvey defined it in 1628.

³²*op.cit.*, p. 230.

³³*ibid.*

³⁴*The Rise of the Sixties*, London: George Weidenfeld & Nicholson Ltd., 1996, p. 43.

mechanization' and the key to modern thought in every discipline, including math, physics, philosophy, literature, and, of course, art. Written from 1941 to 1945 while he was engaged in the debates over the 'New Monumentality', Giedion acknowledged the introspection required by architects given the change from inter-war conditions:³⁵

The coming period has to reinstate basic human values. It must be a time of organization in the broadest sense, a time that must find its way to universalism. The coming period must bring order to our minds, our production, our feeling, our economic and social development. It has to bridge the gap that, since the onset of mechanization has split our modes of thinking from our modes of feeling...The process leading up to the present role of mechanization can nowhere be observed better than in the United States, where the new methods of production were first applied, and where mechanization is inextricably woven into the pattern of thought and customs.³⁶

In the final segment, Giedion illustrated how the bathroom had both physical, even metaphorical, implications for the conception of mobility. Resuming the interests of his 1935 exhibition 'The Bath of Today and Yesterday' (*Das Bad von Heute und Gestern*),³⁷ Giedion outlined the geographical march and typological transformation of the bath from pre-historic times to the inter-war period, when the bathroom was finally "unquestioningly accepted...as an adjunct to the bedroom".³⁸ The necessity of water running within a fixed system of pipes required, in Giedion's words, a transition "From the Nomadic to the Stable", or put otherwise, the possibilities of plumbing transformed bathing from a peripatetic activity to a fixed one: the bathroom did away with the nomadisms of the collapsible bath and with the pilgrimage to the bath-house.

The last bathroom discussed by Giedion was Buckminster Fuller's Dymaxion lavatory, patented 1938 [figure 41]. The novelty of Fuller's scheme, wrote Giedion, was that, as "all the components [were] pressed simultaneously with the metal skin", the "bathrooms could be stamped out by the million at minimal cost".³⁹ Giedion concluded that Fuller's easily transportable model was unsatisfactory because, as he put it, "Houses do not move".⁴⁰ He could not foresee that his own analysis would contribute to the

³⁵Jean-Louis Cohen, *Scenes of the World to Come*, Paris: Flammarion, 1995, p. 183.

³⁶'Foreword', *Mechanization Takes Command: A Contribution to Anonymous History*, Oxford: Oxford University Press, 1948, p. v.

³⁷Though I am not focusing on the politicization of hygiene here, see Paul Weindling, *Health, Race and German Politics Between National Unification and Nazism 1870-1945*, Cambridge University Press, 1989.

³⁸*op. cit.*, p.628. Also see Adolf Loos' description of Otto Wagner's bed and bath on display at the Secession exhibition during the Vienna Jubilee of 1898, 'Interiors in the Rotunda', (Neue Freie Presse, 12 June, 1898), *Spoken Into the Void: Collected Essays 1897-1900*, Cambridge, MA: MIT Press, 1982.

³⁹*op. cit.*, p.707.

⁴⁰*ibid.*, p. 711.

dreams for adaptive houses of all kinds and that the bathroom would come full circle, becoming once again an archetype for the nomadic life-style.

What makes Giedion's assertion of architectural stasis more than a truism is that, while the technological innovation of circulating water within the house spoke of and enabled flow, it also established a fixed system which rooted architecture even more firmly to the ground, to the permanent infrastructures of supply and waste. On the one hand, the reference to pipes as the model for the basic conduit conveniently lent itself to the network analogy; on the other, it brought the inherent contradiction of 'structural mobility' to the fore. Thus the same ready-made service core promoted by progressive architects would cause the most conceptual trouble for a competing ideal of the modern nomad. On these grounds, Buckminster Fuller determined that truly modern innovators were those who experimented with the lessening of dependence on extant infrastructure. He wanted his buildings to be unbound by any predetermined infrastructure. Without less dependence on infrastructure, Fuller thought, architecture would continue to occupy the abstract spheres of classical mechanics rather than be grounded in the contemporary physics of space-time. When John McHale asked whether he saw his work as participating in the modernist project, Fuller responded that the "International Bauhaus never went back of the wall surface to look at the plumbing, never dared to venture into 'printed' circuits of manifoldly stamped plumbings. They never inquired into the over-all problem of sanitary functions themselves. They settled upon the real estaters' sewers like hens on glass eggs."⁴¹ Fuller experimented with gadgets that bypassed the need for water supply and waste removal: a tank that filled itself with moisture from the air and soap that cleaned without water are two examples. RB White, in his classic text on the history of British prefabrication of 1964, characterized these experiments, not without a touch of hind-garde contempt: "To Buckminster Fuller, famed inventor of a bathroom stamped from sheet metal, [prefabrication] offers an overnight route to a technological millennium when every house will come equipped with a color-television set, an automatic laundry that returns ironed sheets in three minutes, and a wonderful contraption that emits a soapy mist in which you can bathe from head to foot while standing in a dishpan on the living-room rug."⁴²

⁴¹McHale published this letter in his guest edited Fuller issue of *Architectural Design*, July 1961, p.295-6.

⁴²*Prefabrication--a History of its Development in Great Britain*, London: HMSO, 1965, p.4.

Fuller's criticism of the founders of the modern movement for doing nothing really modern sat well with the vocal student bodies of the British art and architectural schools of the late fifties and sixties. The 'small mags', *Archigram* included, brimmed with Fuller's work. From the start, the Archigram group shared Fuller's distaste for "THE DECAYING BAUHAUS IMAGE WHICH IS AN INSULT TO FUNCTIONALISM".⁴³ Fuller's influence was so pervasive that RB White could divide theorists of prefabrication into two broad classes: "those who espoused the teachings epitomized in the Bauhaus (architect-industry partnership, which have to some extent been put into practice, e.g., in the post-war schools in Britain, and those who adopted a more romantic, individual or even roguish approach...One of [the latter's] favourite arguments (in the present writer's opinion a fallacious one) has been based on an attempted comparison between houses and certain industrial products such as motor cars, refrigerators and the like."⁴⁴ The Archigram group certainly fit the "roguish", Fulleresque portrait, aspiring to develop housing that approximated the iconic ideals of the Jaguar Mark X and the Frigidaire™. Warren Chalk designed a variant on the exposed environment of the living room rug: the Bathmatic (1969) [figure 73]. The Bathmatic, a washing machine resembling a bulky sleeping bag culminating in a space helmet, provided televised entertainment while the bather underwent "dry powdered stimulation" and "spay'n scent steam".

Motor Cars and Houses (of the Future)

"We are all familiar", listed Warren Chalk in 1963, with the "Dymaxion bathroom and the Dymaxion deployment unit, Alison and Peter Smithson's House of the Future at the Ideal Home Exhibition of 1955, Ionel Schein's prefabricated hotel units and the Monsanto Plastic House in Disneyland".⁴⁵ All Chalk's post-Dymaxion examples had learnt their lessons from it. They were commercially driven enterprises, striving to style housing more like other consumer products: lightweight, futuristic, self-contained. The Monsanto house, named after the corporation that funded it, was the most overt effort in corporate strategizing [figure 74]. The Dymaxion bathroom was a blatant commercial failure, but that did not deter the like-minded from seeing its potential as a model for prefabricated architecture. As Cook would write in *Experimental Architecture*, the "Dymaxion bathroom, which failed only as a result of the politics of the construction industry, is the famous example of large-scale building components being produced and

⁴³*Archigram* 1

⁴⁴*Prefabrication: A History of its Development in Great Britain*, London: HMSO, 1965, p. 301.

⁴⁵'Housing as a Consumer Product' (1963), (*Archigram*, Basel: Birkhäuser, 1991, p17) Chalk mis-dates the year that the Smithsons' house was featured in the Daily Mail Ideal Homes exhibition.

marketed in the way that a car is. Fuller's actual technique by-passed the trap of the universal part and, consequently, the implications of his structures are much wider. They imply the possibility of treating buildings as durables that can be bought (and expended) because of their features. Still more important in this context is the fact that the components require each other to be produced industrially because it is actually more efficient and not just a nice idea."⁴⁶

Chalk had his own proposal for housing as a consumer commodity, complete with built in services and replaceable molded plastic parts. The 'Capsule Home' (1964) [figure 75] was inspired by the Dymaxion package, the space capsule, custom design in the automotive industry, and, closest to home, the Smithsons' plastic cast 'House of the Future' [figure 42]. This house, which Chalk's capsule homes reiterated to a great degree, was the most fanciful project to be designed by the Smithsons. An expression of innovative engineering through the idiom of Pop Art, the house did not merely abstract Fuller's celebrated Dymaxion principles of some thirty years earlier; it brought its predecessor's image to mind. But the Smithsons did not choose the Dymaxion house, with its mast and suspension cables, as a model. They chose its bathroom. The choice of the mechanical core with its rounded, streamlined corners as a model for a living unit itself full of consumer-oriented plastic gadgets, exhibited the influence of their Independent Group activities more than any other project designed by the pair. Besides approximating the Archigram group ideals, this project came closest to the Smithsons own observations elsewhere that the proliferation of services demanded new forms: "Into our houses is brought light, heat, water, entertainment, information, food, etc. We are no longer forced by our physical needs into the old patterns of association. Surely we must be mad to keep on building forms evolved in previous cultures with their own unique association patterns, and expect them to work"⁴⁷

When Fuller had marketed his bathroom prototype stamped from copper sheet, he had apologized for its heftiness, promising that the final model would weigh half of the original. In the 'House of the Future', the Smithsons sought to fulfill that pledge by using newly available materials to reduce the overall mass of the unit.⁴⁸ The Smithsons collaborated with manufacturers, projecting the commercial availability of a molded resin-bonded plaster for the shell and the development of reinforced plastics for sinks and baths. The shortages of materials during and after WWII provided an impetus for

⁴⁶London: Studio Vista, 1970, pp. 37-8.

⁴⁷*Ordinariness and Light: Urban Theories, 1952-70*, London: Faber, 1970.

⁴⁸The analyses of plastics construe it as a development in the history of technology. I am contextualizing it in terms of the search for lightness and mobility.

research into substitute materials: the third of the governmentally sponsored Postwar Building Studies was dedicated to *Plastics* (1944).

The Smithson's use of the plastic here was far from routine in the architectural community in which they traveled. For one, insufficient experience in plastic fabrication resulted in repeated technical failure. But more importantly, cultural attitudes in Britain did not welcome plastic goods.⁴⁹ Plastics were seen as part of the feared 'spectre of Americanisation' that accompanied the decline of Britain's military and economic independence in the postwar era.⁵⁰ The popular press focused its resentment on the American GIs, who were, "Over Paid, Over Sexed, and Over Here"; the design establishment directed its hostility towards mass-culture and mass-production--the very things showcased by the Smithsons' 'House of the Future': streamlined design and industrial possibility. From the other end, the group known as the 'Angry Young Men' saw the blandness of commercial culture as a threat to authentic working class values. Plagued by its origin as a substitute for absent materials, plastic developed a reputation for counterfeit.⁵¹ All in all, the synthetic and brash qualities of plastic were associated with the culturally uncouth American. As a result of cultural discrimination, plastic products designed in Britain lacked the innovative quality of products designed in Italy, Germany or Sweden.

Arthur Quarmby, the most vocal English proponent for the architectural exploitation of plastics, suggested that the amorphousness that made plastics ideal for a multiplicity of usages posed a problem for those who used the properties of materials as a guideline for design.⁵² On the other hand, the lament of the architects who did experiment with plastics would not be its imitative nature, but the purely imitative exploitation of this diverse material. Even the 'Imagineers' at Disney insisted that the Monsanto house be given a modernist white-wash; despite the fact that the fiberglass exterior required no protective finish, the joints were caulked so that the surface could be sprayed a continuous eggshell white.⁵³ Down to the minutest level of detail,

⁴⁹see Claire Catterall, 'Perceptions of Plastics: a Study of Plastics in Britain', 1945-1956', *The Plastics Age: From Bakelite to Beanbags and Beyond*, ed. P. Sparke, Woodstock, NY: Overlook Press, 1993, pp. 67-73.

⁵⁰This phrase was coined by Dick Hebdige in 'Towards a Cartography of Taste 1935-62', *Block*, 4, 1981.

⁵¹John Vale, 'Designing for Moulded Plastics in the Post-War Period', *From Spitfire to Microchip: Studies in the History of Design from 1945*, London: Design Council, 1985, p. 67.

⁵²*op.cit.*, p. 7.

⁵³As the Monsanto House was an exercise in corporate promotion, the appearance of the house was of utmost importance.

reconsideration of the design process was rare: Quarmby marveled at the carry-over of such details as the built-in toilet paper holder in most of these plastic house experiments, “the whole concept of which”, he believed, was “so incredibly crude and unhygienic--hardly better than the monastic wisp of hay or the goose head of the later Middle Ages”.⁵⁴

Quarmby wanted to encourage designers to see the blank slate and variegated range of plastics as a distinct advantage. He described the expanded palette of materials in musical terms, and, like his chosen material, his musical choice, jazz, was redolent with American association. Designing with plastic was “like the difference between traditional jazz with its rigid framework around which one can improvise, and certain types of more modern jazz where the framework is removed and the musician is faced with the task of creating from nothing. Or put more simply in normal building terms, the difference between designing a building on a difficult site where the difficulties tend to create the solution, and that of designing on a flat, featureless site where everything has to come from within.”⁵⁵ The ‘jamming’ of radical jazz musicians was a design analogy subscribed to by the Archigram group through Chalk who was an avid enthusiast of the genre. Chalk added the albums of John Coltrane (*LOOK UP WHICH*) and Ornette Coleman (*Tomorrow is the Question*) to the ‘Survival Kit’ for the *Living City* [figure 54]. His letter and accompanying collage inspired by Albert Ayler’s piece, ‘Ghosts’ (1964), were tucked in to Archigram 7 (1966).⁵⁶ Chalk wrote:

Architecture is probably a hoax, a fantasy world brought about through a desire to locate, absorb and integrate into an overall obsession a self-interpretation of the every-day world around us. An impossible attempt to rationalise the irrational. It is difficult to be exact about influences, but those influences that enter our unconscious consciousness are what I call ghosts...Ghosts help reinforce and establish attitudes, build a very personal language, a complex labyrinth of ideals, constraints, theories, half-remembered rules, symbols, words that ultimately digested affect our concepts. It is unpopular, but essential, that existing attitudes come in for constant and rigorous renewal or reappraisal. We are confronted with a dynamic shifting pattern of events at both popular and intellectual levels, both stimulating and confusing. In this ever-changing climate, old ghosts may be cast out and replaced by new; it is right that influences should last only as long as they are useful to us, and our architecture should reflect this. At a general level it is becoming increasingly apparent that due to historical circumstances the more tangible ghosts of the past--those grim, humourless, static, literary or visual images--will succumb to the onslaught of the invisible media; the psychedelic vision; the insight accompanying a joke; the phantoms of the future.

⁵⁴*op.cit.*, p.141.

⁵⁵*ibid.*, p.7.

⁵⁶‘Ghosts’ was first recorded on the album *Spiritual Unity* (1964). Ayler, a radical saxophonist, heralded the ‘free jazz’ of the sort that had its roots in Coleman’s music through his meltdown of themes, genres, and technique.

Chalk's 'Ghosts' collage covered both sides of a 15.5"x12.5" sheet of paper, its images printed in white against a black background [figures 25 & 26]. While the 'B'-side featured some 'Phantoms of the Future',⁵⁷ the 'A' side was dedicated to the 'Ghosts'. Centered on a picture of Ailey with his saxophone were the ghosts of modernism's improvisations on a framework, including sections of Breuer chairs, a compass, the variant on a grid plan by Mies and the roving plan of Ronchamp. Most meticulously rendered were the diagrams of Modernism's Parthenon: the four doored sedan. The automobile was definitively one of modernism most enduring ghosts. The product of the automotive industry had not only made getting around easier, but had also become one of the most powerful emblems of consumer mobility.⁵⁸

The Smithsons were fully aware of the homage to the car that their House continued, drawing as it did on production techniques borrowed from the automotive trade. Banham celebrated the association, claiming that with this house the Smithsons offered the public, "new aesthetic and planning trends and new equipment, as inextricably tangled together as the styling and engineering novelties on a new car."⁵⁹ By referring to the automobile, the Smithsons hoped to blend their futuristic look with a dose of middle-class desire, as if to sweep some of the seductive nature of car advertisements into the architect's less glamorous domain of domestic space. The twist was that the Smithsons drew upon just what Le Corbusier had ignored in the automotive industry, focusing their admiration on the potentials of plurality rather than the polish of the end product. They realized that, as in cars, a diversity of standard parts might be used in a single unit, so long as enough similar units made production cost-effective. More in the way of car manufacture--and quite unlike the recurring panels of a skyscraper's curtain wall--the various panels of this prototypical house were meant to be shared amongst other units of its likeness but not repeated within itself. They also discovered that it was no less economical to design a part for mass production than to buy what was already on the shelf. "This situation, long since accepted in the production of industrially produced shells (such as car-bodies, aircraft fuselages, etc.)", Banham pointed out, ran "exactly counter to ideas current in architectural circles on prefabrication (e.g. all the various prefabrication projects associated with the name of Gropius and Wachsmann)

⁵⁷including geometric crystallography diagrams, a television aerial, some Op Art type patterns, a photo of a model with a leopard pattern projected on her body, two satellite dishes, a strip of punched code, a Marey diagram, rocket diagrams, a telephone cable, speech-bubbles exclaiming 'OWW!', 'OOOH!', 'OUCH!', and 'HELP', among other things.

⁵⁸The price of the Model T sunk from \$590 in October 1908 to \$260 in 1925.

⁵⁹'Things To Come', *Design*, no. 90, p25.

where the attempt has always been to work towards a single universal element that can fulfill any role the structure requires.”⁶⁰ They envisioned that the variety of combinations possible from a set of prefabricated elements would result in a harmonious diversity at the neighborhood level; the same parts could equal quite different wholes while still maintaining coherence as a group.

The plastic capsule suggested quite a different architectural use of mass production. Yet plastic continued to intersect poorly with the assembly line in the cultural imagination. In November 1940, Henry Ford sought to demonstrate that the techniques of the assembly line and of the extruder could be joined. During those metal-lean years, Ford had developed a hard plastic out of soybeans and phenolic resin and, before an assembly of journalists, he took an ax to the rear panel of a two-door sedan made of this material to demonstrate its toughness [figure 76].⁶¹ Despite such highly publicized efforts, plastic and the prefabrication of structural parts had a troubled relationship, especially in the building industry where the material was used primarily for cosmetic items like cladding panels and window frames.⁶² But while the automotive industry continued to increase in efficiency, the housing industry was being left behind.⁶³ Quarmby pointed out that “at the time of the First World War, when both houses and cars were built by hand, one could buy two modest houses for the price of one cheap car...However although cars have long since been mass-produced for a standardized market, houses are still largely made by hand. As a result one can now buy twelve cheap cars for the price of one modest house. And yet the car of today is vastly superior to its counterpart of fifty years ago in terms of comfort, performance and economy.” This was true even with austerity as the primary mover of fifties Britain. The point of the House of

⁶⁰*The New Brutalism: Ethic or Aesthetic?*, London: Architectural Press, 1966, p. 63.

⁶¹As Sylvia Katz describes, “[Ford] had previously laid waste to thousand of bushels of watermelons, carrots, cabbages and onions, macerating them in his search for an agricultural plastic from which he could mould an entire car...The new car body was made of fourteen plastic panels fitted to a tubular steel frame, with windows and windshield of plastic ‘safety glass’. The panels of soya protein fibre were hardened with phenol-formaldehyde resin and formed in a press. Heat and pressure thermoset the panels into their unalterable shape. Ford used the salvaged oil from the soya bean in the enamel on his cars.” (*Plastics: Design and Materials*, London: Studio Vista, 1978, pp. 21-2) Meikle describes the production and reception of this car in more detail, including the media event which Ford arranged in November 1940 for the axe test: “The *St. Louis Globe-Democrat* described the new car as “part salad and part automobile,” while the *Cleveland Press* thought Ford should “strengthen his plastic by adding spinach.”

⁶²A high profile example of the use of cladding panels by the Architecture Department of the Greater London Council can be found in the façades of the Walterton Road Housing Estate, London (1968).

⁶³In 1908, the price of a Model T was \$590. By 1925, the price had sunk to \$260.

the Future was to make housing more economical and more technological--in fact, more like a car.

The problem with the automotive analogy, acknowledged by Chalk in his article 'Housing as Consumer Product': "We are conscious that any analogy between say the motor car industry and the building industry is suspect, and a dangerous one..."⁶⁴ But the Smithsons' capsule, set in a community of its type, as if unaware of this danger, picked up on the fordist aspect of the Dymaxion, not the spirit of the mechanical core which it physically resembled.⁶⁵ As the servicing would cause the most conceptual trouble for a competing ideal of the modern nomad, the lessening of dependence on infrastructure was an essential aspect of the Dymaxion project. Fuller experimented with gadgets that bypassed the need for water supply and waste removal: a tank that filled itself with moisture from the air, pressurized taps and soap that cleansed without water are some examples. The Smithsons did not reevaluate infrastructure here or elsewhere. Juggling sequences of parts, their building industry remained stuck in the mechanical mode of production. Banham, who initially promoted the Smithsons, criticized them for not abandoning conventional notions of circulation in favor of a truly flexible and radically different model.⁶⁶ It was not enough to call for building design that would accommodate extension and multiple use. A real re-thinking of urban form, Banham believed, would require a whole-hearted engagement with the technological realm and an abandoning of accepted notions of structure. The Smithsons' admiration for the high modernist aesthetic trapped them between the mechanical and the complex conceptions of technology.

The Independent Group as a whole was less constricted by the interpolations of modernist ideology that preoccupied the architectural front. Despite the complicated institutional politics of embracing Americana in this period, McHale would become Fuller's disciple. It was his collage of a human head composed of mechanical images that enclosed the celebratory 'Machine-Made America' issue of the *Architectural Review* in 1957 [figure 77]. The 'Machine-Made America' issue celebrated mass-production and

⁶⁴*Architectural Association Journal*, March 1966, p. 230.

⁶⁵Even taking the on-site disposal of organic waste into account. (see John McHale, 'Technology and the Home', *Ark*, no. 19, pp. 25-7)

⁶⁶Banham's initial promotion appeared in the *Architectural Review*, X, 195X. His reevaluation was published X years later as a book, *The New Brutalism: Ethic or Aesthetic?*, London: Architectural Press, 1966. The question mark in the subtitle is answered on p. 134, where Banham writes, "For all its brave talk of 'an ethic, not an aesthetic', Brutalism never quite broke out of the aesthetic frame of reference".

marked a reconsideration of the party-line rejection within the British architectural community of all things American. In December of 1950, the 'Man-Made America' issue had spoken with disdain of the "sprawl and the visual squalor" of American cities. 'Machine Made America' wrote of a "success story--the story of how America is adding sheer quantity to the preexisting qualities of modern architecture." The Smithsons, on the other hand, despite well-publicized articles such as 'But Today We Collect Ads',⁶⁷ even in this one example where their work captured the visual quality of Pop and plastic, remained spiritually closer to the ghosts of Mies van der Rohe and Le Corbusier than the spirit of Fuller's experiments.⁶⁸ By the pair's own admission they were still at the stage of "trying more confidently to think servicing, think air-systems, think lifts and other mechanisms: think them into the matrix of ordering decisions from the beginning".⁶⁹ While the 'House of the Future' contributed to making Fuller's lavatory part of the standard visual repertoire, it was not an architecture centered on its pipes. Thus not unlike the machine aesthetic, the House of the Future did not rise above the level of appearances.

The House and the Blast-Off

Despite its Dymaxion pedigree, the homegrown House of the Future never appeared in an *Archigram*, perhaps because it was merely a clever interpolation of the industrial model. "The rocket reaches the moon while one brick is still laboriously laid upon another", wrote Christopher Gotch in *Ark*, the student publication of the Royal Academy of Art.⁷⁰ The visionary goal was to develop an architecture worthy of advanced technology. In *Archigram's* pursuit of a "new vernacular" for an atomic/electronic age, the weightlessness of both space and electrons would prove essential. Fuller's experiments and such personal oddities as 'signing off' his letters from

⁶⁷'But Today We Collect Ads' was published in *Ark*, no. 18, November 1956, pp. 49-53. The free-verse opening lines read:

"Gropius wrote a book on grain silos,
Le Corbusier one on aeroplanes,
And Charlotte Perriand brought a new object to the office every morning;
But today we collect ads."

⁶⁸Even taking the on-site disposal of organic waste into account. (see John McHale, *op.cit.*)

⁶⁹*Without Rhetoric: An Architectural Aesthetic 1955-1972*, London: Latimer New Dimensions Ltd., 1973, p.60. Historically speaking, it is a bit late for this kind of timidity. The Futurists had made bold declarations regarding such matters back in 1914, writing that the "lifts must no longer be hidden away like tapeworms in the stairwells; but the stairs--which have become useless--must be abolished, and the lifts must clambour up the façades like snakes of glass and iron".

⁷⁰Christopher Gotch, 'Architecture 1960', *Ark* (#26, summer 1960, pp.29-32)

“Aboard Spaceship EARTH within the outer reaches of the cosmically spiraling and expanding ‘MILKYWAY (the Galactic Nebula)”,⁷¹ played into the wonder of ‘blast-off’ technology, but it did not follow that the transliteration of his projects from the thirties would provide formal solutions. There was a point, a point illustrated by the House of the Future, where the Dymaxion curve brought out the paradox of streamlining objects that, while they might thematize transience, in fact do not move. The artificiality of aerodynamic cosmetics highlighted the conceptual tension of the conduit analogy.

The Archigram group wanted to preserve the spirit of the Dymaxion, if not its appearance. As their lack of engagement with the mechanics of the core reinforced the Smithsons want to be aware how “a thing works, but not necessarily to see it work”.⁷² The Archigram group excavated the urban machine and turned it into the substance of their architecture. Through the lens of systems technology, the mechanical core was lent a sophistication that transcended its roots in the technologies of mass production. The group had its own House of the Future: the ‘House For the Year 1990’ [figure 78]. Like the Smithsons’ house, it was derived from the mobile home and prefabricated elements, but more than it, the house was geared to satisfy needs through adaptive design.⁷³ A collection of various inter-changeable and expendable gizmos, the house included inflatable beds and chairs that doubled as hovercrafts and multi-purpose robots that could distinguish between cans of ‘Cream of Mushroom’ and ‘Cream of Tomato’ soup. Every ceiling, floor and wall was adjustable. The transformation of the city from a composite of concrete, steel and glass to the networks of situations, servicing and reflexivity rooted architecture in physiological and psychological need. Technology came to be depicted, not as the machine-for-living cliché, but as a process of adaptation to the biological exigencies of life. The move was from the collective to the individual, to the level of desire and satisfaction, an architecture endlessly adapting to shifting local requirements, producing a city of interconnected, complex shapes.

Thus the desire for ever-increasing mobility, flexibility and adaptability directly affected the architecture. As the walls of the capsules and domes thinned to accommodate the quest for lightness, they reached the point where they were mere skins. As skins, however, they required a means of support. The turn in *Archigram 4* from the rigid plastic of *Archigram 3* to air-supported skins addressed the requirements for this process of diminution. In addition to their unprecedented lightness, the distinct shape of

⁷¹The signature of a letter published in *Architectural Design*, May 1967.

⁷²*Without Rhetoric, op. cit.*, p. 14.

⁷³The house was commissioned in 1967 by the *Weekend Telegraph* and displayed at Harrods.

inflatable forms, the literature suggested, offered a way out of the dead end modernism had reached. Banham wrote in *Monumental Windbags* that “taste that has been turned off by the regular rectangular format of official modern architecture” was “turned right on by the apparent do-it-yourself potentialities of low pressure inflatable technology.”⁷⁴ So abundant were the alternative experiments with inflatable DIY that the ICA held a discussion on ‘The Unstable Environment: the Use of Pneumatics in Art and the Environment’ in March 1967. In addition to the formal and technical rejections, the architectural revolt of the sixties saw pneumatics as an antidote to the legacy of pollution, suburban sprawl and bleak estates. The political aspect was most blatant in the work of the French group, *Utopie*, which was active in Paris during a time of student unrest that never developed in London.⁷⁵

Utopie, like the Archigram group, subverted the text of comic books to present their pneumatic plans [figure 61]. “Close examination of SPACE COMIC material”, read a speech balloon in *Archigram 4*, “reveals a two-way exchange between space comic imagery and the more advanced “real” concepts and prophesies-----Geodesic nets, pneumatic tubes, plastic domes and bubbles-----the world of the thinks-balloon and the inventors pad overlap” [figure 12].⁷⁶ With the introduction of science fiction the air became thick with bubbles. Banham’s portrait of the environment of the cult film *Barbarella* portrays this pervasiveness: “inflatable bolsters bumble loosely about the interiors; bodies are trapped, or rescued, through transparent flexible plastic tubes; the Black Queen manifests herself out of an explodable plastic bubble, and her dream-chamber is a bubble furnished with smaller bubbles...from which she and *Barbarella* escape...in a bubble of innocence.” So *Archigram 4* made the move from the mechanical core--the bathroom--to pneumatic techniques of the bubble. As one of the earliest uses of pneumatic techniques on a large scale was to ensure the removal of sewage without

⁷⁴‘Monumental Windbags’, *New Society*, 18 April, 1968.

⁷⁵*Utopie* actively engaged in the design of inflatables and presented their projects in a notable exhibition, *Structures Gonflables* (March 1968), at the Musée d’Art Moderne de la Ville de Paris. *Utopie* saw pneumatics in explicit political terms of the kind from which Archigram distanced itself. Jean Aubert recalls: “We pushed the research rather far on the permanence of materials. Working as architects and not as stylists, we controlled the limits of the ephemeral and mobile aspect of those constructions, whereas others--some with real graphic talent, like Archigram in London--turned it into a flag for theoretical discourses and advertising movements...Our inflatable structures, accurate instruments of technology and aesthetic in the service of daily life, appeared to us as an exercise set back from the social and political context, cultivated in order to perpetuate an art and a knowledge that would have otherwise disappeared under “normal” living conditions.” (*The Inflatable Moment, op.cit.*, p. 65)

⁷⁶p.4.

tainting the water supply,⁷⁷ both conduits and pneumatics had their first intersection with architecture through the sewer. Another brush of pneumatics with the system was their use by the postal service. Pneumatic tubes stretched for miles under London, constituting a crude system of information distribution--the very system that distributed the *Archigram*, for all the talk of sophisticated technology. Unsurprisingly, the overlap between fact and fiction, the real zone of sophisticated technology, was particularly abundant in the gravity-free zone of space. The paradigmatic study, *Tensile Structures* (1962), by Frei Otto, "the world's leading theorist and exponent in the fields of inflatable and tented structure",⁷⁸ dedicated a section to the premise that "pneumatic structures will be the only feasible... extraterrestrial building."⁷⁹ Not only did the space-race further the development of lightweight synthetics,⁸⁰ the ephemera produced by NASA for space exploration were rapidly catching up with the imaginary of the space-comic.⁸¹ Monsanto's rigid plastic house had only led to Disneyland; inflatables were headed for the moon.

⁷⁷see *The Handbook on Pneumatic Equipment* published by the British Compressed Air Society (James Cond Ltd 1947) p150). Elaborate schemes for the efficient removal of sewage can be seen in the drawings and calculations of Isaac Shone, 'The Main Drainage of the Houses of Parliament, Westminster, On the Shone Hydro-Pneumatic System, with drawings and hydraulic sewerage table (for office reference for architects and engineers) explanatory of the scientific and sanitary drainage', London: E&FN Spon, 1887. Another compilation of sewage papers collected in a volume of collected tracts from the 1880s (from Baltimore, Nottingham etc). Not least, Marco Frascari's 'Pneumatic Bathroom', in *Plumbing, op.cit.*.

⁷⁸as he was described in the IDEA catalogue.

⁷⁹Frei Otto's *Tensile Structures* was perhaps the most influential work on minimal structures. Otto was an avid promoter of structural obsolescence, objecting to the clutter of the earth with long-lasting buildings.

⁸⁰Materials were developed for spacesuits and lightweight structures easily assembled in space. See R. Sziland, 'Structures for the Moon', *Civil Engineering*, October 1959, or Frei Otto, *Tensile Structures, vol. 1*, Cambridge, MA: MIT Press, 1967, pp. 26-29.

⁸¹Space exploration, right down to the pneumatic spacesuit, relied on high performance synthetics and was rapidly producing these fabrics, as well as the high-frequency welding processes for joining them and the miniaturization of technology necessary.

Chapter 5: Bubbles

And to me too, who loves life, it seems that butterflies and soap-bubbles,
and whatever is like them among men, know most about happiness.

Nietzsche, Thus Spake Zarathustra

Pneumatic structures had the advantage of being particularly light and transportable. What made them unique, however, was that they were modeled on a form that reversed gravitational constraints. Emboldened by technological fantasy and McLuhan's "condition of 'weightlessness', the biologist's say promises a physical immortality",¹ the Zoom Wave architects, were looking for an "alternative architecture that would be perfectly possible tomorrow if only the Universe (and especially the Law of Gravity) were differently organized."² That was the condition the bubble was said to approach.

The study of bubbles had long been a feature of the inventor's pad, and it was widespread within the British scientific tradition including the work of Newton, Brewster, Maxwell and Faraday.³ The soap bubble even had a sub-history in Britain as a theme of the popular lecture designed to introduce the general public to scientific principles.⁴ The lecturers evoked representations of bubbles in art from an illustration on an Etruscan urn in the Louvre,⁵ to the shimmering surfaces in *Vanitas* illustrations.⁶ Scientists were fascinated with bubbles because, given the boundary conditions, they always enclosed the maximum volume with the minimum surface area. This was also what came to fascinate architects, especially those interested in pneumatic structures:

¹*Understanding Media: the Extensions of Man*, NY: McGraw-Hill, 1964, p. 80.

²Reyner Banham, 'Zoom Wave Meets Architecture', *New Society* (3 March 1966).

³The classic study is J. Plateau's *Statique Experimentale et Theorique des Liquides soumis aux Seules Forces Moleculaires*, Paris: Gauthier-Villars, 1873.

⁴Two examples are CV Boys' much cited *Soap-Bubbles, Their Colours and the Forces which Mould Them*, Romance of Science series, lectures delivered to juvenile and popular audiences under the auspices of the Society For Promoting Christian Knowledge, London, 1890 and *Soap Bubbles, A Lecture*, delivered in Hulme Town Hall, Manchester, Wednesday, November 3, 1875, by Professor Rücker as part of Science Lectures for the People, Manchester (Manchester: John Heywood).

⁵Boys reported hunting for this vase in vain. (*ibid.* p. 14)

⁶of Millais or Chardin for example. "Delightful optical demonstrations with soap bubbles and flimsy cards--such as those stocking Chardin's paintings of the 1730s and 1740s--were invented to conjure up concretely the realm of the invisible." (Barbara M Stafford, *Good Looking*, Cambridge, MA: MIT Press, 1996 p. 180.)

“With regard to their surface all shapes produced with soap bubbles can be thought of as “ideal” pneumatic forms... Within the prescribed boundary conditions the largest possible volumes and the smallest possible surface area always form.... Thus an optimisation of form in relation to use of material takes place.”⁷ Under ‘A Plan Proceeds From Within to Without’, Le Corbusier wrote the bubble into modernist code: “A building is like a soap bubble. This bubble is perfect and harmonious if the breath has been evenly distributed and regulated from the inside. The exterior is the result of an interior.”⁸ In *Notes on the Synthesis of Form* (1964), Christopher Alexander cited the bubble as the ideal instance where form and function are one and the same.⁹

The handbook of the British Compressed Air Society (1947) traced pneumatics back to the magical technologies of Hero in the 2nd century BC where air pressure was used to make statues moan and to open temple doors mysteriously.¹⁰ The roots of pneumatics in such theatric architecture embedded it, after Vitruvius, in a structural type that was notoriously subject to alteration and illusion. More recently, the term endorsed the mundane, such as the tire, the drill, the hovercraft and the sewage system. In 1917, a British engineer first patented the idea of capturing the unusual structural principles of the bubble in the shell of an enclosure [figure 79].¹¹ The Second World War saw the development of components necessary for the successful realization of pneumatic structures, spurred on by the need for barrage balloons, temporary shelters, dummy buildings and compactable life boats. It wasn’t until after Walter Bird’s Radomes of the fifties that shielded fragile radar equipment from extreme weather that pneumatic designs

⁷Thomas Herzog, *Pneumatic Structures: A Handbook of Inflatable Architecture*, NY: Oxford University Press, 1976, p. 8.

⁸*Towards a New Architecture*, tr. F. Etchells, London: Architectural Press, 1946, p.167.

⁹Cambridge, MA: Harvard University Press, p. 90.

¹⁰*Handbook on Pneumatic Equipment*, James Cond Ltd, 1947. Primary source: Hero of Alexandria, *The Pneumatics of Hero of Alexandria*, London: Macdonald & Co, 1971. Giedion also mentions Hero in the introduction to *Mechanization Takes Command* to illustrate the ancient use of technology for magical purposes.

¹¹Frederick William Lanchester submitted his patent (#119,339) for ‘An Unproved Construction of Tent for Field Hospitals, Depots and like purposes’ in 1917: “The present invention has for its object to provide a means of constructing and erecting a tent of large size without the use of poles or supports of any kind. The present invention consists in brief in a construction of tent in which balloon fabric or other material of low air permeability is employed and maintained in an erected state by air pressure and in which ingress and egress is provided for by one or more air locks...” (quoted in Roger N. Dent, *Principles of Pneumatic Architecture*, London: Architectural Press, 1971, p.27).

were extended into commercial usage by engineers [figure 80].¹² When architects finally began to use pneumatic design in the late fifties, those structures were, because of their novelty and suggestion of transience, exiled to the arena of the Exposition [figure 81].¹³

In some quarters the pneumatic peculiarities architecture were met with enthusiasm: “I believe that pneumatics are the most important discovery ever made in architecture; that they can free the living environment from the constraints which have bound it since history began and that they can in consequence play an immeasurable part in the development of our society”, Quarmby proclaimed.¹⁴ To most, however, inflatables exhibited a disturbing lack of rigidity.¹⁵ Thus, despite the cost-effectiveness of the solution and the proliferation of simple inflatables during the fifties,¹⁶ pneumatic architecture was rarely seen on the urban street. As an genre, pneumatics remained in the domain of visionary sorts, and it was in that domain where it flourished. Pneumatics were present in the utopian narrative from its inception: the storyteller, “fueled by wind and the myth of transcendence”, would be carried to the remote shores of Utopia.¹⁷ In keeping with the Greek origin of the term, Mark Dessauce has described pneumatics as the logical extreme of the Enlightenment’s obsession with ventilation.¹⁸ Banham, in *The Architecture of the Well Tempered Environment*, saw pneumatics as promoting conditioned air to the role of the most basic structural element. The connection between the problem of ambient air and architectural designs for social improvement got an early start in Britain with John Evelyn’s environmental tract about industrial pollution in London, *Fumifigium* (1661), and accompanying program for a city cased in glass.

¹²The first of Bird’s Radomes was built in Canada in 1955. Dent lists Carl Koch and Margaret Ross’ Boston Arts Center Theater (Woods Hole, MA) of 1959, designed with Paul Weidhinger of Birdair, as the first pneumatic construction by an architect.

¹³Victor Lundy’s hybrid pneumatic exhibition hall for the US Atomic Energy Commission (with Walter Bird) is noted for its particular innovation at the architectural level.

¹⁴*Plastics and Architecture*, NY: Praeger, 1974, p. 114

¹⁵“Surely you can’t bring up a family in a polythene bag? This can never replace the time-honoured ranch-style tri-level standing proudly in a landscape of five defeated shrubs, flanked on one side by a ranch-style tri-level with six shrubs and on the other by a ranch-style tri-level with four small boys and a private dust bowl.” (Banham, ‘A Home is Not a House’, *Design By Choice*, ed. P Sparke, NY: Rizzoli, 1981)

¹⁶By 1957, there were about 50 manufacturers in the US making portable air structures: Birdair, Schjeldall, Irving, US Rubber, Goodyear, Texair, Stromeyer, Krupp, Seattle Tent and Awning and CID Air Structures, to name a few.

¹⁷Mark Dessauce, ‘On Pneumatic Apparitions’, *The Inflatable Moment: Pneumatics and Protest in ‘68*, NY: Princeton Architectural Press, 1999, p. 13.

¹⁸*ibid.*

London's air remained notoriously deadly for centuries: in one week of December 1952, around 5000 people were left dead by a poisonous mist that settled on the city.

On Growth and Form

It was the biologist D'arcy Wentworth Thompson's *On Growth and Form* (1917) that introduced British architects to the utility of a form "so pure and simple that we come to look on it as wellnigh a mathematical abstraction" [figure 82].¹⁹ The sphere was already a staple of utopian architecture: some examples are Laurent Vaudoyer's Design for a Spherical House (1784), Bouleé's Cenotaph for Newton, J.J. Leonidov's Design for the Lenin Library (1927-8). Hemispheres, such as Ralph Tubbs Dome of Discovery (1951) for the Commonwealth Exposition or Geodesic, were a subset of this category.²⁰ But the bubble added the extra dimension of approximating weightlessness. Thompson's text which discussed the development of all forms in nature according to mathematical principle often called upon the bubble to serve as the ideal case scenario: "The particular beauty of the soap bubble, solitary or in collocation," wrote Thompson, "depends on the absence (to all intents and purposes) of these alien forces [of gravity, mechanical pressure, osmosis] from the field."²¹ What was combined, in other words, in the bubble was the key for overcoming the conventional physical limitations of building, combined with the perfection of mathematical purity.

Although bubbles are ideal pneumatic forms in the abstract space of science, on the ground there are all sorts of forces that destabilize the fragile skin held in place by air. The tension between the formal perfection encapsulated in the suspended bubble and the appealing formlessness of the pneumatic structure remained a pervasive feature of the translation from bubble to building. Broadly speaking, there are two types of Air Stabilized architectures that are sometimes used as hybrids and often mixed with conventional building techniques. The less innovative, and more common, of these, the Air Inflated Structure, functions much like other building systems, using inflatable ribs or vertical supports [figure 83]. In the other, as in the bubble, a membrane is supported only

¹⁹Cambridge: Cambridge University Press, 1948, pp. 350-351. Thompson is repeatedly cited in the pneumatic literature.

²⁰for example, see U Conrads & H Sperlich, *The Architecture of Fantasy*, tr. C Crasemann Collins & GR Collins, NY: Frederick A. Praeger, 1962, pp. 88-93.

²¹*op.cit.*, pp. 350-351.

by air pressure. Far from exerting force on the ground, the Air Supported structure, if not anchored, floats away [figure 84].²²

The dilemma of how a building might be moored was new; it was creating the illusion that a building hovered above ground that had inspired the cantilever and piloti. In fact, the ramps, “floating like ribbons”, of Tecton’s penguin pool called English modernism to HR Hitchcock’s attention [figure 39]. If the reinforced concrete penguin pool appeared to rest gingerly on the ground, the postwar availability of far lighter materials enabled architects to strive to an architecture as light as a suitcase, and in the case of Archigram, as a suit. What made a bubble, and by extension the inflatable, unique is that it always enclosed a space with the minimum of material, with no need for columns or beams. “What makes the air structure so outstanding? What are its special features which it makes possible for us to satisfy requirements which can be provided with no other type of structure?”²³ Bird answered:

1. The air structure is the most efficient structural form available to date. It combines the inherent strength and reliability of materials used in tension with the structural efficiency of the shell. There are no problems of bending or buckling. All material is placed at the extreme fiber, where it is utilized to maximum advantage. There is no need for columns, beams, or other supports. The structural envelope is simply supported by air.
2. No other type of structure has the potential of providing free-span coverage for so large an area. Supported by air, requiring no columns or beams, great roof heights can be provided at virtually no cost premium. The Telstar dome will enclose a 16-story building.
3. As the air structure is constructed of lightweight, flexible materials, it can be made easily portable and lends itself readily to the design of demountable or removable structures.

What other type of structure offers these outstanding advantages?

Because of the dynamic thinness of its envelope, the soap bubble pushed materiality to its limits. At the same time, the fragile skin spoke to the transience of those very limits. Inflatables were accompanied by the “comfortable and reassuring notion of a solid elastic limit. Thus a cabinet member or businessman who speaks of expansion is like someone who blows a soap bubble with a careful breath in search of its ultimate volume; if the

²²“Unlike conventional structures which exert a positive loading on the ground, the pressure differential across the membrane of an air supported structure causes up-lift forces, and these must be resisted by firmly anchoring the air supported structure to the ground.” (Dent, *op.cit.*, p.19)

²³quoted Quarmby, *op.cit.*, p.255.

bubble bursts, his breath control is useless.”²⁴ Brought together in this lightweight enclosure, a resilience prone to transience tread the same territory as the desire for structural impermanence faced with the need for shelter and embodied the tension of a world of static objects versus one in a state of constant flux, of form and formlessness. The tension between the merits of this formlessness and the formal perfection encapsulated in the bubble remained a pervasive feature of this structural solution.

This was a twist in the familiar trope of the lightness of materials and the related revelation of structure that had come to imply moral transparency, particularly in Britain where architecture was increasingly asked to bear the weight of sociological scrutiny.²⁵ But the building wrapped in glass was still an object as the public--and the architects--understood it, with a defined parameter and constant dimensions. It had dismayed Buckminster Fuller that most modern architecture made nothing of new building materials and techniques. Still plans to abandon the old technology of the generic office block for the increasing transparency and less material conceptions of structure made possible by new technologies were scarce. Partly it was a question of what the public imagination could absorb. While an architecture made of air would take the ideal of transparency to its logical conclusion, Moholy-Nagy expected people to be aghast at the plans for houses with walls of compressed air.²⁶ By removing the slender supports of the steel frame, a hemisphere of transparent mylar, where the boundary between inside and outside was as thin as possible but still palpable, more realistically approximated the ideal.²⁷

By the time of Thompson’s influence on architects some forty years after the publication of his treatise, Fuller was described as extending a combination of Thompson’s lessons from biology and Einstein’s from physics into the business of architecture.²⁸ In turn, Fuller’s conviction that evolution obeys the laws of mathematics,

²⁴Claude & Léon Gaignebet’s ‘Untimely Considerations on Inflatables’ from *Structures Gonflables*. (trans. *Inflatable Moment, op.cit.*, p. 30)

²⁵As Barry Curtis described, the “meaning of modern architecture was over-determined by notions of participation, equality and access; it was a style and a morality suitable for the ‘sunlit uplands’ of a new Britain. Modernism suggested an openness to the gaze, a metaphorical ‘looking’ which revealed structure and re-positioned the citizen at the centre of things... [Architects in postwar Britain] were expected to invest more concern in sociological issues and to have a better understanding of new materials and building techniques.” (‘Archigram-’A Necessary Irritant’, *Concerning Archigram*, London: Archigram Archives, 1998, pp. 25-27)

²⁶*Vision In Motion*, Chicago: Paul Theobald & Co., 1947, p.257-8.

²⁷The language of invisibility borrowed heavily from Fuller’s aspiration to do “vastly more with vastly and invisibly less.” (*Utopia or Oblivion*, London: Allen Lane, 1970, 184-5)

²⁸see for example the ‘Cosmorama’ section of *Architectural Design* for April 1970.

sparked a trend of curious texts written in quasi-mystical language that linked geometric design to the improvement of the human condition and cited the soap film as the ‘limit of aspiration’. Matila Ghyka’s *The Geometry of Art and Life* achieved cult status amongst those who made connections between geometrical form as found in nature, art and mysticism.²⁹ “In the soap film, the material achieves its ‘moment of truth’”, wrote Michael Burt in *Spatial Arrangement and Polyhedra With Curved Surfaces*, another paradigmatic example of these texts.³⁰

Another gateway for Thompson’s ideas were the activities organized by the Independent Group, most obviously in Richard Hamilton’s minimally attended ‘On Growth and Form’ exhibition of 1951 at the ICA.³¹ Hamilton was introduced to Thompson’s *On Growth and Form* by fellow Slade student, Nigel Henderson, and the book left quite an impression.³² The much larger ‘This is Tomorrow’ exhibition held at the Whitechapel Gallery in 1956 featured, among twelve pavilions, one by James Stirling, Richard Matthews and Michael Pine.³³ Though Stirling later claimed ignorance of both Thompson’s and Hamilton’s ‘On Growth and Form’s,³⁴ this pavilion was dominated by a sculpture which was extrapolated from photographic studies of soap bubbles, also exhibited, undertaken by the group [figure 85 & 86].³⁵ The standard of the

²⁹New York: Sheed&Ward 1946.

³⁰Other examples would be MA Guran’s *Change in Space Defining Systems*, RK Thomas’ *Three Dimensional Design*, J Borrego’s *Space Grid Structure*, DG Wood’s *Space Enclosure System*, Steve Baer’s *Dome Cook Book* and M Safdie’s *New Environmental Requirements for Urban Building*.

³¹Attendance figures are for 1,140 visitors. The political history of how this exhibition came to be part of the ICA’s contribution to the Festival of Britain is described by Anne Massey (*The Independent Group*, Manchester: Manchester University Press, 1995, pp. 42-44).

³²*Collected Words 1953-1982*, London: Thames & Hudson, 1982, p.10.

³³Note the contrast to the ‘Pop’ contribution of McHale, Hamilton and Voelker or the “junkyard Brut” of the Smithsons, Henderson and Paolozzi alongside which it stood. Stirling was all the rage by the time that ‘Living City’, Archigram’s intended answer to ‘This Is Tomorrow’ was going up at the ICA in 1963. Stirling had claimed in the exhibition notes that ‘architecture is everything’; in their own show, Archigram inverted the claim, claiming ‘everything is architecture’.

³⁴Graham Whitham, *The Independent Group: Postwar Britain & the Aesthetics of Plenty*, ed. D Robbins, Cambridge, MA: MIT Press, 1990, p 143.

³⁵Whitham cites from a letter that Pine wrote to Jacquelyn Baas on the 20th of August, 1988: “An enlarger was focused through an aspirin bottle containing soapy water onto photosensitive paper on the wall. This was all set up using a red filter, and when we had a good bubble image, the red filter was removed for about four seconds, and the paper immediately developed. The problem with this was the tendency of the bubbles to burst during the four seconds of exposure. However, we got enough prints for our purpose.” (*ibid.*)

bubble for topological analysis was brought into experimentation with architectural form in the manner, as Stirling described it, of the “research artists of the 20s”.³⁶

While these exhibitions emphasized form, the main lesson of Thompson for the Independent Group went beyond the geometries of life to the methodology of his whole approach.³⁷ Thompson criticized the tendency to explain the natural world exclusively “by the teleological concept of end, of purpose or of ‘design’”:³⁸ “In Aristotle’s parable”, Thompson explained, “the house is there so that men may live in it; but it is also there”, Thompson observed, “because the builders have laid one stone upon another.”³⁹ Aristotle believed that while things appeared to change as they grew, from child to adult for example, they stayed the same in essence. Thompson, on the other hand, was looking at the process of that growth, of that change, not the outcome of the process. It was in Thompson’s drive to study the local relations between things rather than from the perspective of an ideal final cause that the Independent Group saw its reflection. Underlying Thompson’s vision of nature was a conception that viewed change and motion as the essential element for understanding the world.

Moreover, Thompson dealt “with the ephemeral and the accidental, not eternal or universal things”.⁴⁰ Thompson’s philosophy informed Siegfried Giedion’s *Mechanization Takes Command* and the art historical approach of Ernst Gombrich.⁴¹ Together with Alfred Korzybski’s *Science and Sanity* (1933) that was translated into popular terms by AE van Vogt’s sci-fi *World of Null-A* (1948), these texts constituted a theoretical basis for Independent Group artistic practice.⁴² Korzybski strove to eliminate the legacy of Aristotelian logic, the ‘either-or’ construction of language--day or night,

³⁶from Stirling’s notes for ‘This is Tomorrow;’ (*ibid.*, p. 156)

³⁷I am indebted to Anne Massey for this observation: “The crucial link between Thompson’s thesis and the Independent Group was the rejection of teleological, universal explanations of the environment.” (*op.cit.*, p.44)

³⁸*op.cit.*, p. 4. (quoted in Massey, *ibid.*)

³⁹*ibid.*, p. 6.

⁴⁰*ibid.*, p. 4. (quoted in Massey, *op.cit.*)

⁴¹Massey, *ibid.*

⁴²Independent Group members received Korzybski’s weighty ideas through AE van Vogt’s *World of Null-A* (1948), a science-fiction translation of *Science and Sanity*, which imagined a society in which no rules of Aristotelian logic applied. Each chapter of the book (which originally appeared as a series in *Astounding Science Fiction*) began with a quote from Korzybski. In Frank Cordell’s view, none of the IG members had read Korzybski in the original. (Massey, *ibid.*, pp. 85-9; Robbins, *op.cit.*, p. 61.) Meetings and debates were held at the ICA, such as ‘Were the Dadaists Non-Aristotelian?’

land or water, life or death, etc.--in favor of a dynamic, process oriented model.⁴³ Using these concepts, the Independent Group criticized the modernism of Herbert Read's ICA as summed up by Ozenfant in the Purist manifesto: "But what strikes me", Ozenfant had written, "is not how ephemeral all this is, but particularly how prodigiously stable...These vast 'constants'."⁴⁴ In short, the struggle of the ICA with the Independent Group was the struggle of the Universal with the Ephemeral, the teleological view of a world versus a world of constant, random change. All this raises the question of how something that had been the icon of perfection, a 'limit of aspiration' like the soap bubble, could, in the hands of the Archigram group, transform into a model for exactly the opposite ideal, that of formlessness, in a non-teleological model.

Any Shape

Thompson's approach to form in general and the bubble in particular had its precedent in the work of the experimental scientist, Michael Faraday. Faraday, who isolated the isoprene molecule in 1826,⁴⁵ saw similarities between the nature of the bubble and his experiments with rubber, the forerunner of plastic. Far from treating soap film as fragile, Faraday had pondered its phenomenal resilience. As he wrote in 'On the Various Forces of Matter', "[s]o great is the attraction of particle for particle in the water composing the soap bubble, that it gives it the very power of an India-rubber ball."⁴⁶ Experiments with synthetic rubber eventually led to the materials that would enable balloons the size of buildings. The fixation on structural impermanence was located just on this cusp from where both the strength and fragility of materials could be calibrated, especially as material limits expanded with the imagination. As the poetry of the first *Archigram* expressed it:

You can blow up a balloon	any size
You can mould plastic	any shape

The shape-shifting of plastic made it, more than in the case of cast iron, "a constant source of delight as a whole range of fascinating man-made materials with every colour from transparency right through the spectrum both translucent and opaque, with

⁴³Korzybski's resistance to Aristotelian logic was rooted in the study of language and in his view that "semantic adherence to an Aristotelian view--an either-or logic--inevitably led to unlogic, then illogic". (Robbins, *ibid.*)

⁴⁴quoted by Massey, *op.cit.*, p. 87

⁴⁵Isoprene is a flammable, liquid, unsaturated hydrocarbon C₅H₈, used to make synthetic rubber.

⁴⁶quoted in *Soap Bubbles* by Thomas Williams, FCS, (Liverpool, 1890).

unlimited choice of texture from jewel-like smoothness through velvety-flock to a harshness equalling exposed aggregate concrete, and with tensile strengths from rubbery glue right through to a glassy brittleness.”⁴⁷ There was magic in the manufacture of this diverse material, with the transformation, through heat, of the constituent ingredients into something completely else. Roland Barthes, upon witnessing this process in 1957, marveled at it, writing that plastic “is in essence the stuff of alchemy.”⁴⁸

What distinguished plastic from the traditional products of alchemy, according to Barthes, was that it was the first magical substance that consented to be prosaic. The novelty of the process of transformation and the workaday nature of its product was not quick to lose its fascination: at the Milan *Triennale* of 1968, Hans Hollein had an extruder excreting sunglasses in his installation. Hollein’s extruder impressed David Greene, who then, in what Paul Davies and Sean Griffiths would call “a spectacular excursion into his aesthetics of the shoddy”, included a mobile bikini-making machine in the Archigram plan for the entertainment center in Monte Carlo (1970).⁴⁹ The indeterminacy of the extruded object resulted in, Barthes wrote, a view of plastic as “more than a substance”. “[P]lastic is the very idea of its infinite transformation...it is less a thing than the trace of a movement.”⁵⁰ As such, whereas plastic products did not suit the old technological model of the assembly line, new synthetics were conducive to the technique of pneumatics which itself had descended from association with esoteric magic to the inner tube.⁵¹

Components cast in rigid plastic and foam domes molded on inflatable scaffolding, like the early renditions of bubbles in *Archigram 3*, froze the ‘trace of movement’ into the fabric of the building. But the relationship between container and contents in the rigid and non-rigid case was totally different. As Claude & Léon Gaignebet wrote in the catalogue for Utopie’s *Structures Gonflables* exhibition, “At each instant every non-rigid container exemplifies, in its form, the dialectic relationship between container and contents. On the contrary, the rigid container is indifferent to its

⁴⁷Quarmby, *op.cit.*, p.141

⁴⁸*Mythologies*, tr. A Lavers, NY: Hill & Wang, 1972, pp. 97-8.

⁴⁹‘Archigram: Experimental Architecture’, *AA Files*, no. 28, 1994, p. 71-2.

⁵⁰*op.cit.*

⁵¹In Claude & Léon Gaignebet reflections on the history of ideas which underpin pneumatics: “In the Middle Ages the bellows-workers (alchemists), hunched over their furnaces in search of deep secrets.” (*The Inflatable Moment*, *op.cit.*, p. 30)

state of repletion.”⁵² Less abstractly, Banham reported on the experience of a pneumatic structure:

Every slight change of state inside or out--even a heated conversation--brought compensating movement in the skin, not through the expensive intervention of a computer, but by direct variation of curvature under balance of pressures. For the human occupant it was a kind of partnership relationship with the enclosing membrane, each going independently but sympathetically about its business. Quite unlike the relationship with the static shell of a traditional building where you can beat your fists on the walls and scream and get no more than an echo for response: here a blow directed at the enclosing skin would produce a flurry of reproachful quivering and creaking, quickly dying away as the even tenor of its normal breathing ways was resumed. *I like that.*⁵³

Inflatable architectures made even domes seem permanent in the way that domes had made experiments with streamlined plastic capsules, even Dymaxions ones, look heavy. This was in a large part due to the use of air as the primary structural component, but more than that, it was the introduction of time into the finished product. The Air-Supported structure was in a constant process of actively enclosing--the fans continuously churned to maintain the pressure supporting the building's form and changes arose from variations in this artificial breath. In themselves, the buildings were also subject to ambient forces, sensitive and visibly responding to “minute variations in climactic parameters and loading conditions.”⁵⁴ Again the tension between form and formlessness was manifest, this time with the added component of never reaching a point where architecture never reached the point of being a finished object; it was always in a stage of adaptation, from its inception to its dissolution. It was in this intrinsic ephemerability, this thematization of transience, that the virtues of pneumatics lay. Everything about Air-Supported structures spoke of continuous change.

Enclosure and Time

Amongst its zooming images from sci-fi comics, *Archigram 4* dedicated a page to ‘Zooming Price’ who represented the actualization of this sort of architecture. Two more pages of ‘architectural gestures’, including Bruno Taut, Carl Krayl and Hans Luckhardt, followed Price to show that architects could be “as wild, and as dynamic as the cartoonists.” But when compared with the examples of Price’s work--a haudraulic dome, the fun palace, mobile theatre and tensegrity birdcage--the other projects, including Hans

⁵²*ibid*, p. 29.

⁵³*ibid*.

⁵⁴Dent, *op.cit.*, p. 21.

Hollein's 'Architectural Form', were more like backdrops for whizzing things rather than flexible in themselves.

Price began to use inflatables in the early sixties to express this change over formal idealization. Price's association with pneumatics was thorough: he collaborated with the engineer Frank Newby on handbooks for the British Standards Institution and for the Department of Environment,⁵⁵ lectured at the 'First International Colloquium on Pneumatic Structures' in Stuttgart (1967) and delivered the keynote address at the 'National Conference of Air Structures in Education' held in an inflatable at Antioch College, Maryland (1973). Significantly, Price's survey of pneumatic structures did not include the bubble analogy. While Thompson used the bubble's perfection to explain other less pure forms, Price avoided concepts that connoted finitude. His low-pressure environments took advantage of the capacity of pneumatic structures to adapt rapidly to change, introducing a "precise time factor into the process of enclosure."⁵⁶

Learning their lessons from Price, the Archigram group wanted an environment where duration really mattered, where things were not necessarily the same in the evening as when you had left for your day. With the architectural object subject directly to the contingencies of time, there was the potential for a model of becoming, of passage, that would not merely be an inversion of the stable: a science in which the fluid is not a special case of a theory of solids, as Deleuze and Guattari described their nomadology: "From turba to turbo: in other words, from bands or packs of atoms to the great vortical organizations. The model is a vortical one; it operates in an open space throughout which things-flows are distributed, rather than plotting out a closed space for linear and solid things."⁵⁷ The whorls of flow rather than magnitude and direction are the ideal measurements of movement in the nomadic universe. The nomad reaches each juncture in order to leave it behind: "every point is a relay and exists only as a relay...the in-between has taken on all the consistency and enjoys both an autonomy and a direction of

⁵⁵*Air Structure Research Report*, Department of the Environment, London: HMSO, 1971, and *Air Supported Structures: Draft for Development*, London: British Standards Institution, 1976.

⁵⁶'Pneumatics--a key to variable hybrid structuring', in *Cedric Price, Works II*, London: Architectural Association, 1984. This concept of temporality also took on the flip-side of the bubble's structural properties: the tendency for collapse. Quarmby tells a precautionary tale of his three dramatic mishaps with inflatables. (*op.cit.*, pp. 98-100) As Banham put it, "an airdome is not the sort of thing that the kids, or a distracted Pumpkin-eater could run in and out of when the fit took them--believe me, fighting your way out of an airdome can be worse than trying to get out of a collapsed rain-soaked tent if you make the wrong first move." ('A Home is not a House', *op.cit.*, p. 59)

⁵⁷'Treatise on Nomadology--The War Machine', *A Thousand Plateaus: Capitalism & Schizophrenia*, tr. B Massumi, Minneapolis: University of Minnesota Press, 1987, p. 361.

its own.”⁵⁸ The process, not the end-point, is value-laden. Space is marked only by traits that are effaced and displaced with the trajectory. Further, Deleuze and Guattari made a necessary distinction between speed and movement: “a movement may be very fast, but that does not give it speed; a speed may be very slow, or even immobile, yet it is still speed.”⁵⁹

The mobility slogan of the Smithsons illustrated that things that move do not necessarily have speed. Based as it was on the industrial model, it had only amounted to the potentialities of physical extension; Price’s designs relied on the emerging technology of electronics and computerization to integrate time, thus speed, into the building process at the expense of place. “Time is a factor” was stated in Archigram’s discussion of ‘Nomadism’.⁶⁰ But the language they used to speak about the issues of time and nomadism was borrowed from popular computer terminology, right up to the ‘World’s last hardware event’ (1970). Greene’s ‘Electric Aborigine’ (1970) was a classic example: “Our architectures are the residue of a desire to secure ourselves to the surface of our planet, if only they were on wheels, or if some slippery substance could be injected under them, our anchors to the planet, like the aborigine’s, should be software, like songs or dreams, or myths. Abandon hardware, earth’s-surface anchors.”⁶¹

The raw materials of industrial modernism, bare steel, concrete and glass were referred to as ‘hardware’. Following this, the newer, flexible membranes would be dubbed ‘software’. A conceptual fuzziness about the interwoven aspects of the new technology lead to a confusion in image and text over the domain of information and materials; hard things were turning up unexpectedly soft, like an Oldenburg ‘Bathtub’ (1966).⁶² At this point in the development of information technology, computers were sold bundled with programs that could not be purchased separately. Such hardwiring made it difficult for the public to grasp the distinction between hard and soft technology.

⁵⁸*ibid.*, p. 380

⁵⁹*ibid.*, p. 381

⁶⁰*Archigram 7*, unpaginated.

⁶¹‘Video Notebook’, *Archigram*, Basel: Birkhäuser Verlag, 1991, p. 118.

⁶²“One of the ways in which Pop expressed itself was through the mass-produced material culture of the day and, in this context, it presented the possibility of things incorporating ‘expendable’ values, whether literally or metaphorically. This was in line with what had come to be called the ‘throwaway’ culture. In physical terms the new soft plastics--PVC and polyurethane foam--were ideal exponents of this new system of values and they were used extensively as signs of a new relationship between consumer/user and the physical environment.” Penny Sparke, ed., *The Plastics Age: From Bakelite to Beanbags and Beyond*, Woodstock, NY: Overlook Press, 1993, p. 88.

It wasn't until Archigram 8 (1968), published the same year that IBM sold its first independent packets of software, that the ephemerality of software was understood in sensory terms: "'Hardware' refers to any tangible [*sic*], touchable object. 'Software' is the system, message or programme that can be transmitted but not touched" [figure 30].⁶³ The availability of computer terminology enabled the Archigram to group to define its agenda more clearly, using the term hardware to speak of that which had traditionally defined architecture, such as the monument and the city, but also of contemporary metals and plastics. Programs, wires and information stood on the software side of the equation. In a structure which was essentially an aggregate body of all these components, the receivers of the software were attuned to the subtleties of indeterminate use patterns, enabling the hardware of the entire unit to adapt as need be without the aid of an architect. The classical hardware of monuments and pipes resurfaced as the infrastructure for the software of programs and mood. The view of Computer City as the animating shadow of the Plug-In one exemplified this kind of understanding.⁶⁴ As Banham noted in 'The Triumph of Software' (1968), "If we *needed* the concept of a fur-lined spaceship (and we did, even if we didn't know it), we have it now" [figure 87].⁶⁵

"Hardware has its limitations", *Archigram 8* concluded. "Software is being pitched against it in order to expose architects' continued complete hang up on hardware." 'Software' came to designate any vehicle for change and adaptation. Banham exemplified this when he contrasted the hardware imagery of *Space Odyssey 2001* (1968) [figure 88] with the inflatables of *Barbarella* (1967) [figure 89]. Banham compared Kubrick's constructions to a 'Pompeii re-excavated': "All that grey plastic and crackle-finish metal, and knobs and switches, all that ...yech... *hardware!*" By contrast, he wrote, the bubbles of *Barbarella* were "responsive environments...curved, pliable, continuous, breathing, adaptable surfaces." The classic dichotomy set up by Banham's comparison of the containers of 2001, chock-full of scientists, with the pliable surfaces enclosing Jane Fonda followed the lines of the mind versus artificial intelligence, depth versus surface, the novel and science fiction, scientific management versus the electronic cottage, the modern and the post-modern. The architectural difficulties of the movie stem from the contradiction that "a lump of hardware like the city of Sogo could co-exist with

⁶³The themes of *Archigram 8* were introduced on 30 November, 1967 in the Terry Hamilton Memorial Lecture, 'Current Archigram Preoccupations: Eight Non-Fictions', at the ICA. Cook's lecture notes, 'Preliminary Workout for the Eight Notional Titles: Metamorphosis, the Nomad, Indeterminacy, Emancipation, Exchange, Comfort, Response', remark under 'Hard-Soft', "These terms aren't yet in the Oxford dictionary".

⁶⁴*Archigram, op.cit.*, p. 41.

⁶⁵'The Triumph of Software', *Design by Choice, op. cit.*

the living, breathing vision of a friendly... adaptable personal environment.” In other words, inflatable furniture does nothing to combat the model of a nineteenth century urbanism which, even mediated through the lens of the megastructure, is essentially an unyielding “piece of hardware”. Again the contradiction of permanence and instability is raised in the form of the givens of hardware and the adaptables of ever-changing flow of software. The way out of a lingering archetype was exemplified by a vision, as in *Barbarella*, where “hardware is fallible, and software (animate or otherwise) usually wins. *Barbarella*’s spaceship is more often broken down than not. The electronic gadgetry in David Hemmings’ revolutionary HQ always goes on the blink when he needs it.” Software, it seemed, was bringing about the destruction of artifacts; during the first exhibition dedicated to software (1970), John Baldessari announced his decision to cremate his entire lifetime of artworks--all of his hardware--in a mortuary.⁶⁶

Because these terms gave a way to describe architecture’s primary constituents, the biological language was uncharacteristically quick to assume the vocabulary of the technological field. In the pneumatic literature, hardness assumed a negative, almost technologically backward, connotation. For example, Thomas Herzog deviated from his technical voice to explain in his handbook on pneumatics how architecture, to its detriment, had been dominated by “orthogonal forms with hard, cold, machine-produced surfaces.”⁶⁷ On the other hand, softness connoted the contemporary climate. Soft was about “flexible, movable, roundly spanned, “organic” shapes, which can be of great sensuous beauty.”⁶⁸ As such it was not the vocabulary of anthropomorphism that dressed the human body with architectural theory, rather the language of biological form argued by D’Arcy Thompson in *On Growth and Form*, the kind that enabled computers to be compared to brains.

Until the point where the hard shell dissolved into pliant fabric, the literature relied on the language of industrial production to negotiate the properties of the capsule. With the malleability of the inflatable, the language of the organism took over. As Banham wrote of the Nova dome, it carried on

like a neurotic bullfrog puffing itself up, straining, creaking, wrinkling along the seams, trying to lift itself off the floor... Unlike conventional architecture which stands rigidly to attention and deteriorates (like a guardsman with moths in the busby) inflatables (and tents, to a lesser extent)

⁶⁶at the Jewish Museum, NY. AD mentions Baldessari’s decision in its November 1970 issue, p.548.

⁶⁷*op.cit.*, p7.

⁶⁸*ibid.* Also see Jeffrey L. Meikle, *American Plastic*, NJ: Rutgers University Press, 1995, pp. 217-8.

move and are so nearly living and breathing that it is no surprise that they have to be fed (with amps, if not oats)...As an adjustable and largely self-regulating membrane it is more truly like the skin of a living creature than the metaphorical 'skin' of, say, a glass-walled office block.⁶⁹

As structures that seemed alive, Herzog wrote, pneumatics offered a unique alloy of the organic world and built form that did not negate the structural dimension of architecture: "previous attempts to oppose this with a sensuous plastic world have meant a negation of the technical/structural dimension of architecture, building with pneumatic structures offers the possibility of synthesis."⁷⁰ Fuller went so far as to call the PVC from which these structures were made "inherently natural" as it was based on "complex structural behaviors permitted by Nature."⁷¹

Herzog's organicism was a predominantly formal, not to mention gendered, metaphor. Frei Otto was more concerned with how pneumatic architecture emulated plant and animal life: "We find [pneumatic principles] not only in fruits, air bubbles, and blood vessels, but also in the skin kept taut by muscle tissue and blood pressure, and largely supported, in addition, by a skeleton resistant to bending and compression. Animal and man exhibit the essential features of a lightweight structure...Pneumatic structures, developed along lines dictated by purely technical considerations, are meeting the justified and growing demand that technology abandon its abstract, antiorganic-mathematical conception, though not its scientific basis, in favor of a conception nearer to organic life."⁷² Otto's biologically based, technologically sophisticated pneumatics indicated why architects abandoned the bubble as a paradigm of static form in favor of a paradigm of a dynamic system--looking at the dynamics of the skin rather than the mathematics of structure and how the bubble--the model of formal perfection in physics--came to symbolize its opposite in organic evolution.

⁶⁹'Monumental Windbags', *The Inflatable Moment op.cit.*, pp.31-33. This dome was designed by Peter Murray and Tony Gwilliam in 1967 for a four page spread in *Nova* magazine.

⁷⁰*op.cit.*, p7.

⁷¹Meikle, *op.cit.*, pp. 215-6. Baudrillard explained this understanding of synthetic materials: "In the contemporary environment, all the organic or natural materials have, in practice, found their functional equivalents in plastic or compound substances...Objectively speaking, materials are what they are: there are no true or false one, natural or artificial ones. Why should concrete be less 'authentic' than stone? We experience old synthetic materials, such as paper, as completely natural, and glass is one of the richest materials in existence. In essence, the inherent nobility of materials forms part of a cultural ideology which is analogous to that of the aristocratic myth in the human domain, and even this cultural prejudice evaporates with time." ('Natural Wood, Cultural Wood', *The System of Objects*, Editions Gallimard, 1968, in Sparke, *op.cit.*, 1993, pp. 112-3)

⁷²*Tensile Structures, vol. 1*, Cambridge, MA: MIT Press, 1967, p. 10.

Banham had his breathing surfaces; Oldenburg described the softness of his ineffectual vinyl appliances as akin to flesh.⁷³ Once the characteristics of skin were attained, the aspiration was for the absolute limit of that thinness. “There is a strong link between [Otto’s] work”, Cook wrote, “and the notion of an ultimate in skins: a membrane which is not there. The skin which can be seen through; the skin which can be parent to all within; the skin which can be regularized; the skin which can be treated as an environmental totality.”⁷⁴ Marshall McLuhan described the ideal of architecture as skin as the logical outcome of the experimentation with space capsules, air jets walls, and buildings with walls and floors that can be moved at will. “Such flexibility”, McLuhan wrote, “naturally tends towards the organic. Human sensitivity seems once more to be attuned to the universal currents that made of tribal man a cosmic skin-diver.”⁷⁵

The Cosmic Wet Suit

Sure enough, an Archigram project wrapped architecture tight around the body; in Otto’s terms, the organic principles of the body were applied to enclose it. When Otto drew a detail of the pneumatic spacesuit, he included human skin as a layer of the outfit [figure 90]. The idea of the spacesuit as a form of minimal housing informed Mike Webb’s design for the ‘Suitaloon’ (1967).⁷⁶ But while a spacesuit was still a suit, the ‘Suitaloon’ blurred the boundaries between different kinds of bodily enclosures, of buildings and clothes, of inside and outside. It was “clothing for living in--or if it wasn’t for my Suitaloon I would have to buy a house.”⁷⁷ When you wanted to be home, your suit inflated to enclose you. *Archigram* 8 (1968) featured an illustration of how two people could share the interior space of the inflated Suitaloon [figure 91]. Webb attached a fitting to each individual outfit that would connect it with others.⁷⁸ In fact, this shelter formed from a single suit that inflated and deflated evaded simple distinctions of the ‘Envirobubble’, the suburban inflatable home proposed by Banham [figure 92]. Banham’s

⁷³Oldenburg cited in Meikle, *op.cit.*, p. 237.

⁷⁴Peter Cook, *Experimental Architecture*, London: Studio Vista Ltd., 1970, pp. 51-5.

⁷⁵Marshall McLuhan, ‘Housing: New Look and New Outlook’, *Understanding Media, op.cit.*, p. 128.

⁷⁶*A Guide to Archigram 1961-74*, London: Academy Editions, 1994, p. 207.

⁷⁷*ibid.*

⁷⁸“Each suit has a plug serving a similar function to the key to your front door. You can plug into your friend and you will both be in one envelope, or you can plug into any envelope, stepping out of your suit which is left clipped on to the outside ready to step into when you leave. The plug also serves as a means of connecting envelopes together to form larger spaces.” (‘Comfort For Two’, 1967, *ibid.*, p. 207.)

hemisphere of mylar sat alone in the landscape, the transparent barrier turning the world outside into “a spectacular ringside views of the wind felling trees, snow swirling through the glade, the forest fire coming over the hill”.⁷⁹ The wearer of the Suitaloon, on the other hand, could control the degree of connection to the public domain.

The project experimented with the McLuhanesque view of clothing as achieving the same end as housing.⁸⁰ With the possibilities of lightweight materials, Archigram produced an enclosure that was fully transportable, exploited the speed of expansion and deflation, constituted and reconstituted itself at will, like a lung. Here was shelter that was only as durable as clothing and as natural as a second skin. As for the services, they were “refined down to a system of pipes worn around the body that heat and protect it” [figure 93].⁸¹ At the heart of the system, protected by an inflatable shelter, the body meshed with the core. In Muthesius’ description of pipes as arteries in the English house, technology had taken on a human metaphor; by the 50’s the human body was seen as the hodge-podge of machinery depicted in John McHale’s cover of the *Architectural Review* [figure 77].⁸² In the first instance the technology was hidden within, an infrastructure sustaining the life of the house, just as the blood courses through the veins to the cells; in the end the roles were reversed: technology as the superstructure with a neurologically perceptive infrastructure. Throughout the text of *Vision in Motion*, Moholy-Nagy had evoked the body, using the terms ‘biological’ and ‘organic’ to describe machine-made form. Technology, he thought, had “become as much a part of life as metabolism”.⁸³ With the model of the Suitaloon, biology was not technology’s unifying principle as Moholy-Nagy conceived, but rather its primary motivator. The Suitaloon offered a glimpse at technology, not as the machine-for-living cliché, but as adapting to the biological exigencies of life.

The biological model had made the unity of the body and machine more complete than it had been in scientific management where the worker became a ‘cog-in-the-wheel’. Rather than human motion conforming to that of the machine, the machine melded with the body. The centrality of human-machine integration was essential in the development of complex technologies to the point where Paul Edwards could make the argument that

⁷⁹Banham, ‘A Home is not a House’, *op.cit.*, p. 59.

⁸⁰‘Housing: New Look and New Outlook’, *op.cit.*

⁸¹Cook, *Experimental Architecture*, *op.cit.*, p. 117.

⁸²For McHale’s view on this subject, see ‘The Expendable Ikon’, *Architectural Design*, Feb. 1959, pp. 82-3.

⁸³*op.cit.*, p. 64.

the engineering and the politics of cold war were centered on how to make this integration as seamless as possible. As Edwards pointed out, this goal informed the influential theory of cybernetics, as Wiener's subtitle made explicit: *Control and Communication in the Animal and the Machine*.⁸⁴ The goal was a system able to adjust automatically to fluctuating conditions through a inter-connected system of loops, resulting in the optimum solution for any final result. Through the filter of disciplinary boundaries, Cybernetic concepts seeped into thinking about architectural design. The picture of architecture in a complex environment that emerged was one where structural form was contingent upon varying input and easily adaptable throughout its lifetime.

In addition, two more new disciplines based on computer based conceptions of the psychological process: artificial intelligence and cognitive psychology. Artificial intelligence was dedicated to software that simulated complex symbolic thought. Cognitive psychology preferred internal process models based on metaphors of computers and information processing to any theories of external conditioning.⁸⁵ As by-products of WWII, these meshings of human and complex technology had their roots in the technology of war as much as Fuller, the military engineer, and industrial production did. In fact, the term 'cyborg', a cybernetic organism that was part animal, part machine, was coined in 1960 to describe an integration of human and machine systems for the purposes of the space race.⁸⁶ Such were the techno-causes of a smart spacesuit, like the 'Suitaloon'.

The relationship of the body, the home and the outside world in the Suitaloon dramatized the change in the dialectic of privacy and publicity in the technological environment. The difference between how individuals related to the technology in the industrial and cyborg models was dramatized by the presentations of people inhabiting the Suitaloon [figure 94] and of its precedent, the Smithsons' capsule House of the Future that appeared in the *Daily Mail*. The highly performative images staged by the Smithsons of a human couple dressed in 'futuristic' outfits were quite different from the naked dolls Fuller had inserted in the Dymaxion model [figure 43]. The *Daily Mail* images showed the two models amongst the gadgets and appliances installed in the house

⁸⁴Cybernetic theory, developed in the late 40's by Nobert Wiener at the Massachusetts Institute of Technology was much elaborated by thinkers in fields right across the academic map, from computing to sociology. As is the fate of any successful model, the terms of this theory were often bandied about without an understanding--or even a reading--of the original text, *Cybernetics*, New York, Paris: Technology Press, 1948.

⁸⁵Paul N. Edwards, *The Closed World*, Cambridge, MA: MIT Press, 1996.

⁸⁶Manfred Clynes, Nathan S. Cline, 'Cyborgs and Space', *Astronautics* (September 1960)

participating in completely conventional, stereotypically gendered domestic roles like putting on make-up or reading the newspaper.

For reasons that have all to do with gender, the apparent ease with which the home absorbed machines and techniques that had become theoretically suspect suggested that the human-machine relation was different in the domestic space than it was in the factory.⁸⁷ Richard Hamilton brought out the falsity of this seamless, fordist operation in the image, ‘Just what is it that makes today’s homes so different, so appealing?’ [figure 51], the same year of the Smithsons’ Ideal Home.⁸⁸ “Hamilton’s collage”, Crow writes of the plasticized bodies, domestic appliances and mass media, “offered itself as a parody of the Smithsons’ attempt [in the same exhibition] to integrate “found” culture into an unimpeded rationalization of urban housing on the principles of structural and economic efficiency. The question that forms its title... sneers at the idea that mass-produced possessions and manufactured dreams under the Ford insignia can provide adequate subjective furniture for postwar life: inflation--of muscles, breasts, the impossible extension of a vacuum cleaner hose--is the ruling order”.⁸⁹

In contrast, the only gadget inside the trial Suitaloon were the Info-Gonk spectacles worn by the reclining David Greene. High-tech sunglasses crossed with informational and video technology, the Info-Gonks were a virtual reality headset prototype. Reduction of spatial experience on the outside was all about opening up the world of subjectivity, like the contemporaneous promise of drug culture. No other appliances vied with the activity of introspective exploration in the Suitaloon. On offer was an alternative domestic experience, or model of the private sphere, mediated through the mind via a bodily appendage. This architecture for the inside of the head more completely meshed perception and technology, presenting virtual space as technology’s inevitable destination: “If developed, the extension of personality might become the central reason for the environment.”⁹⁰ Starting with the radio, “the first real mass transmission of the Piped Environment”, as Crompton called it, technology had moved in

⁸⁷as Helen Molesworth described in a discussion of Duchamp’s urinal

⁸⁸Hamilton wrote about *Mechanization*’s general and direct influence on his work: “It was particularly significant to 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. Agricultural machinery was seen by Giedion to be at a crucial interface, the boundary at which technology meets nature. The initial stimulus for a series of about twenty *Reaper* engravings, made at the Slade, undoubtedly came from Giedion’s chapter on this farm implement.” (*Collected Words*, op.cit, p. 12)

⁸⁹*The Rise of the Sixties*, London: George Weidenfeld & Nicholson Ltd., 1996, pp. 44-5.

⁹⁰*Nomad*, *Archigram* 7, unpaginated.

a cycle from privacy to publicity and back: “The radio and telephone were originally highly personalised; for technical reasons playback was through headphones giving an extended individual environment which did not impose itself on others who were not plugged-in. As loudspeakers and amplifiers developed, this individual quality declined until we were all involved in the hi-fi nut’s world of 100 watt Vortexions and Tannoy drive units, whether or not this was the form of extension of our experience we were after. The earphone (cans) returned with the pocket transistor radio and the astronaut cult so that the high-fi man can now sit in oblivion extending himself in full frequency stereo sound without including the block in his experience.”⁹¹ The transistor, of course, also enabled the world of the computer to grow intensely personal by dramatically reducing its size.

Privacy, subjectivity, bodies: the Suitaloon and the Info-Gonks appeared in *Archigram* 8, the same issue which began to grapple explicitly with terms such as feedback and cybernetics, on the one hand, and emancipation on the other. Though the *Archigram* imagery has most often and rightly been noted for its sixties mores on gender, the introduction of the language of computers and of liberation began, albeit unwittingly, to feel its way towards a resolution for what Hamilton only offered a parody. On a page entitled ‘Emancipation’, and alongside the by-line of “Freedom for Women”, images of a woman wearing Info-Gonks and a man sporting Walter Pichler’s Audio-Visual Helmet (1966-90) linked social emancipation to expanding the limits of the imagination made possible through technology [figure 31]. On the ‘Exchange and Response’ page, a suited woman is linked via dotted line to a vaguely insect-like mechanical organism [figure 32]. The bolded words “WOMAN---INTERFACE---MACHINE” bring to mind the politically engaged, theoretical articulations of Donna J. Haraway’s ‘Cyborg Manifesto’ which hopes that cyborg culture to reveal true emancipatory potential in the ultimate integration of human and machine.⁹²

The themes of hard, soft and emancipation pushed the discussion ahead to the terminology of the later sixties. The *Archigram*’s vision of the liberating home deflected architectural strategy away from the social ideals of communal kitchens and washrooms present in earlier modernist housing schemes. Since robots did most of the work, *Archigram*’s ‘House For the Year 1990’ eliminated the drudgery of chores at the flick of

⁹¹A *Guide to Archigram 1961-74, op.cit.*, p. 254.

⁹²‘A Cyborg Manifest: Science, Technology, and Socialist-Feminism in the Late Twentieth Century’, *Simians, Cyborgs, and Women: the Reinvention of Nature*, NY: Routledge, 1991, pp. 149-81.

a switch in contrast to the communal kitchens and washrooms of earlier utopias.⁹³ This house [figure 78], on display at Harrod's, was featured in a special issue of the *Weekend Telegraph* magazine which was "presented as if written 23 years from today": "The enclosures of the living-area are no longer rigid rectilinear fixtures but adjustable, programmed to move up and down, in and out. It is envisaged that owners will invest in as many living-areas as they need. They can also enlarge the living-areas they have, by means of inflatable sections of the outer skin. The floor state, too, is variable. At particular points, the floor can be made hard enough to dance on or soft enough to sit on. Textures and colours depend on the user's taste at any moment of time." The whole system is based on individual desire and privacy is a form of virtual reality created through the head.

Before they could face the outcome of such subjective interiors, the group had to negotiate the interface between the outside and the inside. How would the conglomeration of individual capsules with their scenic views of the unconscious amount to the social interactions that engendered an Archigram city? Dealing with the connection was critical: "I have nothing against discontinuous domes", Philip Johnson quipped, "but for goodness sake, let's not call it architecture".⁹⁴ The Archigram group had an answer for this: "Coming together and independence are compatible if we use time. The effect of hybrid assemblies that are at once mass-produced and private world already exist."⁹⁵ But to connect these structures was complicated, at times geometrically, but more significantly by the shift in the nature of the boundary between outside and inside: "composite materials in which every layer has its own particular specialized function creates the problem--in the design area--of what particular quality the outermost layer should have, the skin making nonsense of the 'frank image of the material' concept

⁹³The house was commissioned in 1967 by the *Weekend Telegraph* and displayed at Harrods. The house included such things as inflatable beds and chairs that doubled as hovercrafts to be used indoors and out, multi-purpose robots to inflate the furnishings, serve meals and act as entertainment centers. Every ceiling, floor and wall adjusted on demand and 'personal' robots attended to the needs of 'the great indoors'. For the discussion of wacky personalized robots who can distinguish between tins of Cream of Mushroom and Cream of Tomato soup, see 'Electronic Tomato', by Ron Herron, Warren Chalk, David Greene, reprinted in *A Guide to Archigram 1961-74*, *op.cit.*

⁹⁴'Where We Are At', *Architectural Review*, Sept. 1960 (*Architecture Culture 1943-1968*, NY: Rizzoli, 1993, p.191)

⁹⁵'Nomad', *Archigram 7*, unpaginated.

in the sense that the Modern Movement understood it.”⁹⁶ Moreover, the organic analogy of pneumatics systems was sustained in the language of urban planning.

So it is to the system that we must turn.

⁹⁶Ezio Manzini, 'Objects and Their Skin', *The Plastics Age*, ed. P. Sparke, Woodstock, NY: Overlook Press, 1993, p. 117-119.

Chapter 6: Systems

For this was a city in which all authority was to be dissolved, all convention superseded; in which change was to be continuous and order, simultaneously, complete; in which the public realm, become superfluous, was to disappear and where the private realm, without further reason to excuse itself, was to emerge undisguised by the protection of façade.

Collage City, C Rowe & F Koetter

It was one thing to propose houses for the future, quite another to assemble the curved enclosures of the pods and bubbles of *Archigrams* 3 and 4 into a viable urban form. Even given the logistics of building additions to inflatables and domes, the problematic with this model of urbanism was more than the complexity of connecting cocoons at the larger scale. As the model of private life as a virtual one has revealed, the difficulty was philosophical as well as physical. The physical dynamics of the inflatable rendered it a closed system, and at this time the distinctions between open and closed methodologies had a particularly keen socio-political blush. The arena of the Cold War was self-referential and closed, an ideological version of the fortified city.¹ It was in this context that Karl Popper described Nazism, in Charles Jencks' paraphrase, as a "tribal, closed mythology grafted on to the most advanced technological state" in *The Open Society and its Enemies*.² Popperian suspicion of grand gestures was *au courant* amongst British intellectuals and the belief that any real change was an incremental process was passed, through the Smithsons, on to Team X. Like Popper's 'open society', open-ended planning was composed of formal systems always in the making, that accepted change without waste, imposed no limit on functional adaptation and were not reminiscent of a defunct social order [figure 95].³ The lack of authoritative program fit Popper's sentiment that hegemony was immoral and dishonest like a glove.

For the post-Team X generation, the "complete planning of a city [was] neither possible nor desirable in a free society".⁴ The conviction that the spirit of 'kit-of-part' architecture upheld individual emancipation prevailed: "freedom is retained in the

¹For the definition of a closed world, see Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America*, Cambridge, MA: MIT Press, 1996, pp. 12-5.

²'The Closed and Open Society', *Modern Movements in Architecture*, NY: Penguin, 1985, p. 333.

³see Jencks, *ibid.*, pp. 332-9

⁴Eckhard Schulze-Fielitz, *Stadtssysteme I*, Stuttgart: Karl Krämer Verlag, 1971, p.9.

limitless possibilities of combination.”⁵ Indeed, some of these combinations resulted in the massive projects for which the Archigram group is best remembered. The structures in *Archigram 5* were not lightweight bubbles of buildings but massive architectural interventions. Banham noted this shift and said the effect created “the illusion of the existence of some kind of ‘Megastructure International’.”⁶

Having established the concept of the expendable and the mobile at the scale of the unit, *Archigram 5* returned to the city. The ‘Metropolis’ issue included plenty of outside work alongside the group’s own Walking, Plug-In and Computer cities: from that of contemporaries like Constant, Ralph Erskine, Martin Pawley, Eckhard Schulze-Fielitz, Paolo Soleri and Kenzo Tange to precedents as far back as Hugh Ferriss, Tony Garnier and even Jean-Baptiste Piranese.⁷ These were chosen as examples of “SCHEMES WITH GUTS”, these were designs “in which decisions have been made, in which principles of operation have been evolved, and results have been arrived”.⁸ Cook’s editorial explained that this body of work shared a distinctive feature that “can usefully be fed into our methodology of metropolitan regeneration”.

The range, in time as well as type, exhibited that the impetus for a technologically infused design system had been some time in the making. As Colin Rowe put it, “if the combination of fantasies about science--with its objectivity--and fantasies about freedom--with its humanity--comprised one of the most appealing and pathetic of late nineteenth century doctrines, then the decisive twentieth century embodiment of these themes in the form of building could not fail to stimulate; and the more the conception of a scientific, progressive and historically relevant architecture could only serve as a focus for a still further concentration of fantasy”.⁹ In the language of post-industrial times, fantasies of science and freedom were expressed as reveries of leisure and technology. It must be noted the borrowed concepts, pilfered as they were from scientific models, were not fully understood by the architectural community at large, and certainly not by the Archigram members who, despite rhetorical stance and imagery, understood little in the way of actual implementation. Indeed it is exactly this feature that liberated their schemes and

⁵*ibid.*

⁶‘Fun and Flexibility’, *Megastructure: Urban Futures of the Recent Past*, London: Thames & Hudson, 1976, p. 89.

⁷Some of the images were the same ones featured in Conrad and Sperlich’s *Fantastic Architecture*. Fuller, despite his being the exemplar for capsule components, was not part of *Metropolis*.

⁸*Archigram 5*, 1964, p.2.

⁹Rowe, Fred Koetter, *Collage City*, Cambridge, MA: MIT Press, 1978, p.4.

imaginations from all practical constraint. Thus despite the reputation of the systems approach as lacking in imagination and creativity, shared goals attracted the Archigram group to the work of architects engaging in systems-based planning methods.

A Tale of Some Cities

The need for a system by which to organize community building only became more pronounced as a decade revealed the two-dimensional planning strategies of the stem and web, the *modus operandi* of Team X urbanism, to be weak on complexity. In his study of the systems approach to building, Herbert C. Auerbach claimed the first formal steps (though he didn't identify them) had taken place in Britain around 1939; application of the approach, however, really took off in the late fifties and sixties after its success in the aerospace industry.¹⁰ Christopher Alexander articulated the need for systems in his doctoral dissertation, published in 1964 as *Notes on the Synthesis of Form*. In an increasingly intricate field, Alexander reasoned, planners could no longer rely on intuition to solve any design problem, no matter how small. This was true “not only of moon bases, factories and radio receivers, whose complexity is internal, but even of villages and tea-kettles.”¹¹ As problems arose and mutated more quickly than any designer could manage, there was an acute need for a tool. Alexander argued for a hierarchical system that would present an objective and unified description of formal phenomena, thus ensuring the correspondence of physical solutions to the pattern of the problem they set about to solve. Cook applauded Alexander's proposal for its “constant provision within the city structure for random and multi-directional interaction.”¹²

Generally, systems planning addressed the city as would *Archigram 5*: an “accumulation of a series of parts”. A major benefit of the systems approach was that it brought functional harmony to vast quantities of resources and data while organizing everything into a theoretical model that quantified the results. Moreover, the systems approach established a means of feed-back so that the model continued to account for change. Building Systems--prefabricated parts organized into a construction method--were part of the overall System of Building, a term that encompassed the broader physical, political, social and technical scope. Computers were essential to the systems approach: the managing system was to be a universal piece of software with varying hardware choices. Systems theorists, in short, were, like the small publications, calling

¹⁰The Systems Approach to Building: What is it?, *A Systems Approach to Building*, Ottawa, Canada: Department of Industry, Trade and Commerce, 1969, pp. 9-21

¹¹Cambridge, MA: Harvard University Press, p. 3.

¹²*Experimental Architecture*, London: Studio Vista, 1970, p. 101.

for the major overhaul of a lagging building industry: “The concept of the ‘construction industry must be broadened...The development of a variety of management tools to serve this purpose is essential. Such tools would include the use of computerized reporting, data manipulation, communication system network, information collection, storage, retrieval and dissemination, and demands that a new discipline of operation and standardization be incorporated into the building industry.”¹³ Despite its employment as a provider of formal clarity, however, systems theory was accompanied by its own array of ambiguities.¹⁴ Some of these fed and reinforced the pervasive confusions of computer technology such as the reliance on organic analogies and the elusive definition of soft systems. Others were unique, such as the concept of the ‘black box’, where input into the system was transformed into output via concealed operations.

While making the architectural discipline so permeable to an external discourse made many practitioners uneasy, the fashioning of cybernetic and other information systems as an architectural network in the sixties had a receptive audience in the already established kinetic arts community of Britain as a means to make the work more responsive to its environment: Roy Ascott, Stephen Willats and the Group 14 collective (founded 1964) are prominent examples. Gordon Pask was a welcome guest at the Architectural Association and was solicited by the vocational press, including *Archigram* 8. By August 1968, *Cybernetic Serendipity, the Computer and the Arts*, would open at the ICA to much brouhaha.¹⁵

Cybernetics was more than a management system for quantities of multifarious data. Norbert Wiener and Arturo Rosenbleuth, the field’s pioneers, consciously sought to draw the independent fields of information and communications theory together with computers in order to create a system with an all-encompassing range. In popular conception, this range extended beyond the laboratory to the quotidian: “cybernetics is not only a scientific tool, for each of us it is an essential part of life, of the way we live it and the way the world in which we live behaves.”¹⁶ To constantly assess the total environment, the cybernetic system had to translate every condition into its own vocabulary: bits of information. This translation, like any other, had its conversion costs.

¹³see *ibid.* pp. 16-19.

¹⁴For example, see Francis Ferguson’s *Architecture, Cities and the Systems Approach*, NY: George Braziller, 1975.

¹⁵The Computer Arts Society (CAS) was founded in Britain as a result of this exhibition. From 1969 onwards, CAS published a bulletin entitled *Page*.

¹⁶Maurice Trask, *The Story of Cybernetics*, London: Studio Vista (for the ICA), 1971, p. 129.

The transformation of all “language into an exchange of news”, as Heidegger understood, rendered the arts “regulated-regulating instruments of information.”¹⁷ But even more to the point from the point-of-view of planning for adaptability, though cybernetic systems were flexible in their adjustments to changing conditions, the very point of the system’s flexibility is to maintain stability. Cybernetics works just at the point where the systems are stable, ever guarding against oscillation. It was, after all, the closed loop that enabled the continual process of feedback.

The last element of the ‘Bathrooms, Bubbles, and Systems’ continuum, then, would prove no more ‘open’ than inflatables or sewers. As foreshadowed by the overlapping ‘Gloops’ that made up the ‘Living City’, the number of local loops could theoretically be infinite, but the tradeoff was that to function, the system as a whole had to be closed. When Alexander refined his philosophy in ‘A City Is Not a Tree’ (1965-6), for example, he exposed the weaknesses of the closed system and of his hierarchical categorizations. Acknowledging that spaces regularly accommodate overlapping activities, Alexander superimposed a semi-lattice over his earlier tree diagrams so as to include hierarchical and lateral criteria.¹⁸ Once the *grille* was elevated to latticework, there was no going back to the directional grids of, for example, the Buchanan Report.¹⁹

Alexander’s operational method reduced data to sets and then combined the sets into structure.²⁰ The use of mathematical criteria to test urban design was part of a trend that sought a scientific basis for the determination of form.²¹ Alexander’s use of empirical data and set theory participated from the design end in the scientization of design, just as Rudolf Wittkower’s *Architectural Principles in the Age of Humanism* (1962) approached it from the theoretical side. Alexander’s computational method and diagrams assigned values to input. As such, his system was generative. Once again, the mathematical description of soap film was called upon, this time for its rigor to be emulated when formulating a design system. Alexander embraced the bubble as a formal

¹⁷‘The End of Philosophy and the Task of Thinking’, *Basic Writings*, ed. David F. Krell, NY: Harper & Row, 1977, p. 374.

¹⁸‘A City is Not a Tree’ appeared in *Architectural Forum* in two parts: May 1965, pp. 58-61, and April 1966, pp. 58-62. For a discussion of how the tree and the semi-lattice conceptualize the interaction of small systems within the larger, complex one, see Kojin Karatani, *Architecture as Metaphor*, tr. S. Kohso, ed. M. Speaks, Cambridge, MA: MIT Press, 1995, pp. 29-47.

¹⁹see Jencks, *op.cit.*, pp. 339-351, for a brief survey of the shift from the directional grid to the spatial infrastructure.

²⁰Karatani, *op.cit*

²¹This drive can be seen in a range of disciplines, especially those that engaged structuralist theory, such as sociology, anthropology and linguistics.

instance in which the exact nature of all external forces acting upon it could be determined. Any distortion from how a soap bubble would assume shape in a vacuum could be ascertained. Alexander saw the description of soap bubbles as the standard by which to compare other design equations:

The behavior of soap films is so thoroughly understood that we know the functional properties of any given physical arrangement, and we know what shapes and sizes of bubbles different external conditions lead to. In this case, the formal descriptions and the functional descriptions are just different ways of saying the same things; we can say, if we like, that we have a unified description of a soap bubble. The unified description is the abstract equivalent of a constructive diagram. It is the aim of science to give such a unified description for every object and phenomenon we know...The solution of a design problem is really only another effort to find a unified description.²²

Alexander cited D'Arcy Thompson's description of form as a diagram of the multitudes of forces that act upon a thing in the world.²³ Tribulations of set theory aside, the distinction here lies in the difference between the exact mathematics of classical physics and the inexact ones of flow: gravity is calculable at any point; the forces in a tensile structure are calculated by approaching limits. That is why Frei Otto, who thought in calculus and modeling, described the architect as more of a manager of energy than a setter of parameters.²⁴

Alexander shared the spatial grid with Yona Friedman. Alexander's motivation, however, was to calculate an ideal solution to a given problem while Friedman was sociologically driven. Friedman believed rigidity, including that of social institutions such as marriage and property, to be the greatest hindrance to a fully contemporary society. Friedman had critiqued the Smithsons' moderate radicalism even whilst they introduced their conception of urban mobility at the tenth CIAM in Dubrovnik (1956). The Smithsons' call for increased circulation was never radical enough for Friedman, whether or not it had terminated modernism's main institution. For Friedman, the raised streets and open-ended planning of the Smithsons' Golden Lane project confused extension with flexibility, as if the natural expansion of the plan was consistent with the changes in the desires and lifestyles of people [figure 63]. Friedman called for structures and institutions that changed as rapidly as fashion--an even stronger commitment to flux

²²*Notes on the Synthesis of Form, op.cit.*, p. 90.

²³*ibid.*, p. 15.

²⁴see Ludwig Glaeser, *The Work of Frei Otto*, NY: MoMA, 1972, p. 10.

than the Futurists had made with their demands for houses that changed with each generation. Mobility, Friedman believed, was a basic human need.²⁵

Reiterating his ideas later in *Toward a Scientific Architecture* (1975), Friedman's language was to be inflected by the language of the computer industry, referring to the city as a mechanism and to infrastructure as hardware.²⁶ His multi-leveled spaceframes--which would become the structural strategy of choice--were based on a six meter module, ten meters above ground level, supported by columns at intervals of forty to sixty meters. On the ground level, unlike the Futurists, or Le Corbusier, the extant city remained intact as shown in the Paris version (1959) [figure 96].²⁷ As no architect could anticipate the needs of all users, present or future, Friedman's philosophy required that occupants be able to implement change. All elements with which the occupant would come into contact, walls and floors included, were to be mobile, and anything which served collective usage, fixed. With a tool that Friedman called a 'flatwriter', individuals in his Spatial City entered the specifications for their residential quarters; the machine then computed the best possible fit between available resources, private wants and communal needs.²⁸

Friedman established the *Groupe d'Etudes d'Architecture Mobile* (GEAM) to work on the urban problems raised by mobility and communications. A document signed in Paris on the 5th of April 1960 outlined six factors that lead to catastrophic town planning, six phenomena that brought daily suffering to the general population, seven principles for general improvement and three techniques that needed to be developed to implement the seven principles.²⁹ The GEAM charter echoed Friedman's ten point manifesto '*L'Architecture Mobile*' of 1956 that had laid out the basic requirements for urban design. Along with the necessity to reflect "the extent of advancements in modern technology", was that of an infrastructure permitting "the grouping of not only juxtaposed but also superimposed districts."³⁰ These two documents, together with Konrad Wachsmann's 'Seven Theses' (1957), laid out the premises for experiments with

²⁵As Banham put it in *Megastructure, op.cit.*, p. 60.

²⁶*Toward a Scientific Architecture*, Cambridge: MIT Press, 1975, pp. 113-4.

²⁷ This project was included in *Archigram 5* and in the IDEA conference catalogue.

²⁸Friedman repeatedly expressed these ideals. For a summary of this particular issue, see 'A Research Programme for a Scientific Method of Planning', *AD*, August 1967, pp. 379-381.

²⁹signees: David George Emmerich, Camille Frieden, Yona Friedman, Günter Günshel, Jean Pierre Pecquet, Werner Ruhnau. (Ulrich Conrads, tr. M Bullock, *Programs and Manifestoes on 20th-Century Architecture*, Cambridge, MA: MIT Press, 1971, p. 168)

³⁰'Manifesto: *L'Architecture Mobile*', *Yona Friedman: Structures Serving the Unpredictable*, Amsterdam: NAI, 1999, pp. 21-22.

spatial building systems.³¹ Along with his GEAM colleagues, Friedman sought, in the words of Wachsmann's fifth thesis, "Modular systems of co-ordination, scientific experimental methods, the laws of automation, and precision influence creative thought."

Then came Eckhard Schulze-Fielitz's *'Raumstadt'* (1960), positioned as a stopgap measure until Friedman's thoroughly mobile infrastructure was attainable [figure 97].³² With the Space City, which made its Archigram debut in the 'Living City', an element essential for megastructural gardening was introduced. Where Friedman's *Ville Spatiale* hovered in the air, Schulze-Fielitz's megastructures were grounded in the landscape. Schulze-Fielitz described the forms of his city as if they were surface features: "The Space City accompanies the profile of the terrain as a crystalline layer; it is itself a landscape, comparable to geological formations, with peaks and valleys, plateaus and ravines, similar to the foliage layer of a forest, with all its leaves and branches."³³ *Archigram 5* continued this geotectonic voice, dividing the featured projects into the categories of Crust, Molehill and Cluster and describing massive concrete aggregates as if they were earthy outcrops. The city-crust could erupt in peaks as in Paul Maymont's high-rise project for Paris, or accumulate into clusters of mounds and molehills, like the ziggurats of Henri Sauvage's housing project (1926). As opposed to the burrowing into the earth that would come with the Monte Carlo project, *Archigram 5*'s molehills rose up high, like Isozaki's 'Cluster in the Air' (1963) or Friedman's Spatial City [figure 98]. Plug-in City was also described as being "quite deliberately mound-like in profile."

The city might coat the earth like a forest floor, but to understand Schulze-Fielitz's approach as organic would be to confuse the issue. Nature's geometries, as D'Arcy Thompson demonstrated, remained comfortably--and emphatically--within the realm of formal abstraction. Schulze-Fielitz claimed that the same structure he compared to leaves and branches encompassed "all regular and semi-regular two- and three-dimensional networks and therefore also all platonic and archimedean solids."³⁴ It follows from Schulze-Fielitz's claims that if a structure embodies the technologies of change, it also contains the most immutable and monumental of forms. While an obvious paradox, this conclusion was not a quirk restricted to Schulze-Fielitz's design philosophy.

³¹Wachsmann was a student of Hans Poelzig, collaborated with Gropius in the 1940's, and taught Advanced Building Research at IIT.

³²As he put it, his proposals were "simply a set of technical, production, and organizational improvements on present conditions, with their various social implications." (*Stadtsysteme I*, *op.cit.*, p. 19)

³³*ibid.*, p. 9.

³⁴*ibid.*, p. 7.

Tension of this kind between self-containment and indeterminism would contribute to the reconceptualization of sophisticated technology as lightweight, rather than mega, structure.

The Paradox of Mechanization

The diametrical impulses of unlimited flexibility and archetypal rationalization were prevalent enough to require an explanatory principle. “[T]he paradox of mechanization”, McLuhan wrote, “is that although it is itself the cause of maximal growth and change, the principle of mechanization excludes the very possibility of growth or the understanding of change. For mechanization is achieved by fragmentation of any process and by putting the fragmented parts in a series.”³⁵ The pitfalls of serialization began with monotony and ended the arresting of the very flexibility that had initiated it in the first place. The resistance of Norbert Wiener to total automation at the expense of the easy adaptation of the system recognized this dilemma. In his view, the cost of indeterminacy was preferable to over-rationalization. In architecture, the ramifications of over-rationalized serialization were profoundly obvious in the built results, requiring the Archigram group to qualify that its use of the systems approach would not diminish technologically enabled change and produce a “deadly piece of built mathematics”.³⁶

The first means used in the *Archigram* proposals to guarantee the freedom of “deliberate varietousness” over the restraint of “built mathematics” was the placement of the system at the service of leisure. In the grim postwar era, leisure was heavily theorized. Play was granted significant philosophical standing, from Johan Huizinga’s *Homo Ludens* (1949) to John Cage’s definition of music as ‘purposeless play’.³⁷ Huizinga, the major theorist of this subject, saw leisure as emancipatory, even recuperative, under the right conditions. “Play to order is no longer play”, he wrote. “By this quality of freedom alone, play marks itself off from the course of the natural process.”³⁸ Towards this end of spontaneous play, the Situationists combined the Marxist view of the liberating potential of technology with a theory of redemption

³⁵Marshall McLuhan, *Understanding Media: the Extensions of Man*, Cambridge, MA: MIT Press, 1994, p. 11.

³⁶Peter Cook, ‘Plug-In City’, *Archigram*, Basel: Birkhäuser Verlag, 1991, p. 36.

³⁷see Tony Godfrey, *Conceptual Art*, p. 63: “At the root of [Cage’s] attitude was a Utopian belief that people could be free, could ‘have their own lines rather than the lines that society has given them second hand.’”

³⁸*Homo Ludens: A Study of the Play-Element in Culture*, Boston: Beacon Press, 1955, p. 7.

through leisure. The possibility of technological change represented freedom through play, or, less ideologically in the case of Archigram, fun.³⁹

While the Situationist debt to Huizinga was overt, it was rare to see his name evoked in the work of the group that Banham called the ‘Megastructuralists’.⁴⁰ Still, leisure was a crucial element. “Not only was leisure hopefully identified as a prime feature of life in a post-industrial culture”, wrote Banham, “but the concept labels a very large category of megastructure attitudes from Friedman to Archigram--even if the reasons why Archigram appears so preoccupied with leisure prove, in the last analysis, to be trivial. Friedman, however, asserted the existence of a *nécessité biologique de l’amusement* which claims a *liberté de choix sans aucune opposition* that in turn can be delivered only by his architecture/*urbanisme mobile*.”⁴¹ Friedman’s analysis of play as a basic human need to which the architectural environment must cater was perfectly in keeping with Huizinga’s belief in play as a very solemn activity indeed. Huizinga’s assessment of an *Archigram* favored mode was not far off that of Banham’s despairing historian: “The comic comes under the category of non-seriousness and has certain affinities with laughter--it provokes to laughter. But its relation to play is subsidiary. In itself play is not comical either for player or public.”⁴²

It was the potential for non-seriousness that Mies opposed in positioning of architecture as participating in this kind of work: “[architecture] is not a playground for children, young or old. Architecture is the real battleground of the spirit.”⁴³ As opposed to this heroic view, a playground was exactly what New Babylon was for Constant [figure 99].⁴⁴ Even more, Price’s portrait of his Fun Palace, a theater center for Joan

³⁹In a collage for Living City, a space man first laments from behind a grid of bars: “industrialization’s great. But I feel I am missing out on the creativity bit.” Then, on the far right as he exits the collage: “I’m happy because I have learned how to be creatively non productive.” Additionally, the *Dérive* map of Paris was used as one of the myriad of images that lined the triangulated spaceframe of the exhibition. Though the members maintain ignorance of the SI, Cook and Webb went to hear Constant lecture in London on New Babylon. (Kenneth Frampton prepared the lecture for publication in AD, June 1964, p.304)

⁴⁰Banham cited Friedman as “the first of megastructuralists to invoke the name”. (Megastructure, *op.cit.*, p. 60)

⁴¹Banham, *Megastructure, ibid.*, p.80.

⁴²*Homo Ludens, op.cit.* p. 6. For Huizinga, play was the root of religious concepts, as a civilizing force, as a philosophical tool, as part of war, law, poetry and art.

⁴³‘Technology and Architecture’, *Programs and Manifestoes, op.cit.*, p. 154.

⁴⁴AD, June 1964, p. 304.

Littlewood's experimental art community, was as 'a short-term plaything' [figure 100].⁴⁵ The Fun Palace epitomized adaptability at the service of amusement--frivolous, deluded, or otherwise. Price used the flexibility of the spaceframe to design a structure in which every element was susceptible to change as soon as the program demanded it. Moreover, the entire center was not meant to outlast its usefulness and could be rapidly disassembled. On terms of versatility, Banham judged the Fun Palace superior to its peers: "The range of variability envisaged by the Fun Palace team went spectacularly beyond what had been proposed by Constant for *Neo-Babylone*, where there were at least fixed floors, even if everything else was provisional. The Fun Palace was seen as an adaptable volume, to be floored, roofed, walled and serviced at will with the minimum of restraints in any of its three dimensions.... Whereas the Japanese, for example, do not seem to have imagined the transient accommodations lasting for much less than the duration of a fashion in entertainment or the span of a human generation, those in the Fun Palace were envisaged as being assembled and broken up more than once a day."⁴⁶ The hitch with the adaptability from an Archigram point-of-view was that the Fun Palace relied on professionals for structural adjustments. As Banham noted further: "Whether any strolling *Homo ludens* could have rearranged any but the smallest of Price's proposed units at individual, unaided whim seems extremely doubtful. The rapid creation of a six-hundred-seat auditorium, say, with entrances at the 37' 6" datum, reached by escalators from street level, clearly implies the collaboration of a sizeable force of technical assistants."⁴⁷

While Situationist opposition to expertise was motivated by their political beliefs regarding individual participation in and control over the environment, the main issue for the Archigram group was the satisfaction of spur-of-the-moment desires. The Archigram innovation was to use the responsiveness of the system to make 'smart' walls, floors and ceilings. In Otto's *Tensile Structures* (and other handbooks) this lesson had been learned from bubble clusters. In the cluster, each individual bubble, a closed system in itself, adapted to the conditions of the neighborhood. Meticulous renderings of the 120-degree angle at which bubbles converge and the curvature of their shared walls showed the collective responsiveness of bubbles in groups [figure 101]. The automatic adjustments made by the whole each time a bubble joined the collocation displaced the emphasis from

⁴⁵A flyer advertising the project read: "Joan Littlewood presents...a short-term plaything in which all of us can realise the possibilities and delights that a 20th Century city environment owes us."

⁴⁶Megastructure, *op.cit.*, p. 88

⁴⁷*ibid.*

the introverted realm of the individual bubble to the interaction of these self-contained units in a responsive system. More than the ordered cluster of bubbles, an agglomeration made up of a multitude of compressed bubble sizes and shapes, as in a foam, was an even better example of what emerged when competing forces were at work. Add a dose of artificial intelligence to the adaptive ways of the cluster and the results couldn't be more compliant.

Software

A notable consequence of using the material limit as an energy interface was that the surface plane assumed an importance belied by its negligible width. Modern architectural tenets had proscribed thinness to de-emphasize the perimeter in keeping with its diminished structural role. The ultra-thin membrane, however, resumed structural significance and commanded the attention that was its due. Even the simplest of inflatables has a skin in dynamic equilibrium. "All architecture has to mediate between an outer and an inner environment in some way," wrote Banham, "but if you can sense a rigid structure actually doing it (dripping sounds, tiles flying off, windows rattling) it usually means a malfunction. An inflatable, on the other hand, in its state of active homeostasis, trimming, adjusting and taking up strains, is malfunctioning if it doesn't *squirm* and creak."⁴⁸

Compounded by the status of the surface in the realm of complex technology, attitudes towards surface and volume hung in the balance. The celebration of that which had been associated with superficiality became a bromide of the "new" technology and post-modernism:

In this new environment, the surface is no longer constrained to pretend that it just doesn't exist, and almost as if in vindication of the obscurity to which it was relegated for so long it is now taking on a dramatic role that upstages the third dimension. Indeed, the emblematic images of the present-day world reveal an environment tendentially dematerialized, as fluid as the flow of information that passes across and through it, flattened down into the two-dimensionality of printed paper and the television screen.⁴⁹

"And that's not all", Ezio Manzini theorized further:

This prevalence of the two-dimensional (and the dematerialization that it implies) seems to go much further than just the boundaries of the world of information and information science. Physical objects seem to have come under the same influence, as if by some strange drag effect; its

⁴⁸'Monumental Windbags', *The Inflatable Moment: Pneumatics and Protest in '68*, ed. M Dessauce, NY: Princeton Architectural Press, pp. 31-33.

⁴⁹'Objects and Their Skin', *The Plastics Age*, ed. P. Sparke, Woodstock, NY: Overlook Press, 1993, p. 115-116.

not just the numerous family of objects that have been transformed by electronics and miniaturisation in the normal course of their evolution, but also those object that by necessity and by their nature keep to their 3-dimensional character that are now entrusting a greater part of their expressive capacity and their performance to their surface area.⁵⁰

The move from the celebration of the two-dimensional to the disintegration of the three-dimensional has obvious importance for a discipline concerned primarily with the design and construction of objects. With the tension between physicality and dematerialization, the set of contradictions introduced by the tension between mobile and the fixed had reached full capacity. The inside/outside tension of the individual bubble, which was already a stand-in for the hard/soft divide, itself a substitute for structure/infrastructure, shifted to a tension between the surface and the frame at the urban scale with the added conflict of conviction over open and closed systems.

Progression in the realm of architectural theory was inevitably to be accompanied by material and visual transpositions. Systems planning offered a suggestion of how the framing hardware could become more integrated with soft materials, but the relationship between the two modes continued to resist easy synthesis. The city machines in *Archigram 5* walked, adapted and transmitted, running the gambit of mobility as they shifted from a focus on circulatory concerns to those of sensory input. As one would expect, the range of hard and soft systems strategies used in the cities of 1964 reflected the disjunctive understanding of complex technology in program and infrastructure. Computer City was entirely a software backdrop; Walking and Plug-In cities were massive, solid pieces of urban hardware. In Herron's 'Seaside Bubbles' (1966), a scoop of blue, green and yellow spheroids touched with white, purple, orange and red, hung from a dark blue frame [figure 102]. The components bobbed against each other, contrasting with the orthogonals from which they were suspended. Cluster was tethered to infrastructure. A playful or leisurely program notwithstanding, all the contradictions of the megastructural solution remained intact.

It wasn't until *Archigrams 7* and *8* that hardware, in other words architecture, is really taken to task. Instant City, a package of soft interventions that temporarily meshed with extant hardware in suburban situations would come along in 1968, to be followed by the even more rustic technology of cybernetic meadows and forests of *Archigram 9*.

What sort of antecedent, then, were the megastructures for the technological picturesque to come?

⁵⁰*ibid.*

Hardware

The hardest of the hardware, Walking City, was just what its name implied: an environment that went where you wanted it to go. It resembled a mammoth mechanical insect with a spherical body sprouting telescopic legs for locomotion and tubes to link it with other mobile cities [figure 103].⁵¹ It could meander from one hemisphere to another in search of a temperate climate or relocate in the case of disaster. Schulze-Fielitz argued that self-mobilizing cities were economically viable and of utilitarian virtue. The very possibility, he wrote, “could lead to the migration of the city with seasonal cycles, to the spreading-out in the summer and contracting in the winter--possibly to the year-round tourism of a future leisure society.”⁵² In good utopian tradition, inclement weather would not be allowed to interfere with crucial pleasures.⁵³ The twist here was that instead of a municipality-wide umbrella, the city just followed the sun. Banham wrote that the “only thing that can have made it fearsome was the proposition that it should move--after all the period envisaged far vaster fixed projects, such as Tange’s proposal to build all over Tokyo bay...One or two even got built, as at Cumbernauld in Scotland. Clearly it was felt that something the size of a city centre should know its place, in the townscape, in history, and in Western culture, and not offer to amble off in the night and show up in Philadelphia in the morning.”⁵⁴

As the critics of Walking City were quick to notice, this technological potential was first realized in nationally funded endeavors. Peter Blake soon saw migrating structures up to 40 stories high moving “serenely across the flat landscape” at Cape Kennedy.⁵⁵ Blake witnessed:

...‘walking buildings’ easily the size of Seagram were, in fact, a reality: that plug-in capsules containing highly sophisticated workshops, and unpluggable at any time, were, in fact a daily reality in the huge gantries that service the Saturn rockets; that mega-structures with floors that slide up and down and sideways were not something that Harvard students did when they wanted to cop out, but were, in fact, a stunning reality in the largest building on earth--the Vehicles

⁵¹Many found Walking City to be frightening. As Herron wrote: “A description in the *International Times* in the late 1960s or early 1970s likened the Walking City to a war machine. The paper had made its own collage which had these vehicles crushing houses and tanks and so on. I must admit that I’d always seen it differently; as an object which moved slowly across the earth like a giant hovercraft, only using its legs as a levelling device when it settled on its site. To me, it was a rather friendly-looking machine.” (R Banham, *The Visions of Ron Herron*, London: Academy Editions, 1994, p. 75)

⁵²*op.cit.*, p. 25.

⁵³As did Boston in Edward Bellamy’s *Looking Backward* (1887), Fuller’s dome for Manhattan, or even the sealed office block.

⁵⁴*The Visions of Ron Herron, op.cit.*, p. 76.

⁵⁵*Architectural Forum*, November 1967.

Assembly Building, a structure so vast that it could have something like eight Seagrams wheeled into it, and plug those Seagrams into capsules and mobile floors and all the rest; a structure so vast that, under certain weather conditions, clouds sometimes form near its ceiling, 500ft-plus above sea-level; and sometimes it rains inside.”⁵⁶

A wrinkle, perhaps, that Walking City did not account for in its weather calculations.

As Banham pointed out in his book on the subject, the Vehicles Assembly Building was not a megastructure despite its size.⁵⁷ Neither for that matter was Walking City. They were both simple, if vast, containers not unlike the ocean liner.⁵⁸ The metaphorical appeal of the ship as autonomous vessel at sea was reinforced by the debut of the fully deigned space rocket in which every detail had to be designed to sustain life under extreme conditions. The distance from outer space to underwater was short. Though not immersed, the strongest visual cue for Walking City stood in deep water: the wartime anti-aircraft Shivering Sands Fort, the fort featured in ‘Living City’, outside territorial waters in the Thames Estuary off Whistable, Kent [figure 22]. The association was particularly obvious in ‘Walking City on the Ocean’ (1964) version of the project [figure 104]. The controversy in the summer of 1966 over the shutting down of the pirate radio station that had set up shop in the fort to broadcast pop music only reinforced the inspiration that these military relics had already contributed to the Archigram imagination. The replacement of arms with ‘rock-‘n-roll’ illustrated the new task of hardware to accommodate flexibility in program. These forts were an instance, as Chalk wrote in ‘Hardware of a New World’,

...where one medium gave place to another, where apparatus of war at one moment in time was later thrown out and replaced by pop-music transmitters--so, in the fabric of future cities, the ‘architecture’ can be conceived as an adaptable megasystem cradling a continually changing range of media. And suddenly the medium is seen to be more important. Architecture will no longer be concerned with individual buildings or groups of buildings, but with forming a permissive environment that is capable of any configuration according to circumstances.

True, Chalk acknowledged, the fort was no submarine.

Young architects in Britain, who have no first-hand experience of space or underwater programmes, look to whatever is available to them for indications of a future. If the Thames forts and oil rigs are seen, not as isolated facts, but as a confirmation of our attitudes, then our analogies

⁵⁶Archigram, *op.cit.*, p. 7.

⁵⁷Cook’s response to Banham’s assessment: “Whether or not these [multi-level environments] used a megastructure is simply a further extension of the line of thought and not an *a-priori*.” (*Experimental Architecture*, *op.cit.* p. 100)

⁵⁸analogy drawn in *Experimental Architecture*, *ibid.* p. 97. The ship and the shipwreck have been central social and architectural metaphors from Alberti to Moby Dick to Foucault.

become less suspect. These sea structures have a deep significance to us, as pointers to the shifting nature of architecture and environment...⁵⁹

Thus reciprocity between the forts and Archigram imagery was mostly by way of visual analogy. The forts had “[t]he same tube connectors, the use of the diagonal, the linking of nodal points” as the Archigram projects would have.⁶⁰ Much was made of the fort’s diagonal supports, literally in the legs of Walking City and more loosely in the transportation tubes of Plug-In City. In fact, the plug-in strategy was based on the diagonal and on ‘nodal points’.

Given the brief, “Within the big structure anything can happen”, the diagonal played a prominent role in the Plug-In City [figure 105]. Under the heading ‘Diagonals and Connections’, *Archigram 5* listed a range of structural uses of the diagonal from the latticework of the Crystal Palace (1851) to the contemporary examples of Schulze-Feliz’s Spatial City and Constant’s New Babylon [figure 65].⁶¹ Perhaps the most three dimensionally conceived of their examples was Noriaki Kurokawa’s Town Plan for Tokyo (1961) in which high-rises were twists of horizontal and vertical planes resembling human DNA [figure 106]. Many cases relied variously on terracing or the spaceframe, both of which required the vector for their dramatic height and span. The least obvious choice was an atmospheric sketch selected from Piranesi’s ‘Imaginary Prisons’ series (1743-4). In addition to the suitability of Piranesi’s quarrel with accepted architectural values and the elevation of human freedom to the status of historical law to

⁵⁹FORUM, October 1966. Chalk reevaluated his enthusiasm in 1972: “Initially associated with the iconography of the space programme and its underwater equivalents...the urgent appeal in the sixties has now cooled for me. Man has leapt up and down on the moon, played a golf-stroke even, and we are not much better for it. We have plumbed the depths of the ocean and anti-gravitated to another planet, but it is belligerently simple--clearly a military defense operation, and the spin-off back on earth in the final analysis is minimal...David Greene, Spider Webb and I clamoured ecstatically over the rocket support structures at Cape Kennedy. I visited the NASA control centre at Houston and later witnessed the second Surveyor (manless) moon landing on the monitors at the Jet Propulsion Laboratories in Los Angeles...The technician assigned to me, sitting in front of a bank of 39 close-circuit TV monitors of the lunar operation, was in fact watching the Johnnie Carson Show on the fortieth.” (*Archigram, op.cit.*, p. 32)

⁶⁰FORUM, *op.cit.*

⁶¹Schulze-Fielitz’s Universal Structure appeared alongside New Babylon in *Archigram 5* as examples of umbrellas for growth and change on the page before a section of Plug-In was juxtaposed to a detail of New Babylon. “Constant, in a part of New Babylon uses a close-knit diagonal net to establish platforms and building-objects. The big structure in Plug-in City is at the other end of the scale in that it incorporates lifts and services within the structure tubes.” In a rare moment, Cook acknowledged his influences: “I don’t think something like “Plug-in City could have existed without the Smithsons, or without Paolozzi, the Russian Constructivists or without weird structures having been done by funny Dutchmen in the 1950s like Nieuwenhuys.” (*Responses*, *Architectural Association Journal*, December 1966, p. 140)

the Archigram agenda,⁶² the veering walkways and gangplanks of his architectural fantasies shared sublime characteristics with the megastructure. As will later become clear, the softening of the megastructural line would resolve the sublime into the picturesque.

One of the consequences of the diagonal was that the joint, or the ‘linkings of nodal points’, was no longer the elementary meeting of the vertical and horizontal. Special attention had to be paid to mechanics of connection as evidenced by Wachsmann’s elaborate joint details.⁶³ The ‘Farewell’ issue of *Architectural Forum*, ‘Architecture in Transition’, dedicated a section to what it referred to as ‘Jointitus’, suggesting that the extent of this preoccupation bordered on the pathological.⁶⁴ The legacy of Jointitus couldn’t be more obvious than in the subsequent work of High-Tech, where the massive joints became objects in themselves, almost cartoonish in their dominance.⁶⁵ What the High-Tech aesthetic missed in the over-emphasis of binding things together was the inverse implication also suggested by the joint: disassembly. Peter Blake’s observation that the capsules of Cape Kennedy were “unpluggable at any time” was crucial to the Plug-In City where every element, including the latticework infrastructure of intersecting circulation tubes had an anticipated life span from 40 years to 6 months. As the city became increasingly striated into levels for movement at different speeds and criss-crossed with connections on the vertical, horizontal and diagonal,⁶⁶ the initial “beautiful and dramatic notion” of the city as a single building

⁶²For the influence of Giambattista Vico on Piranesi’s view of history, see Rudolf Wittkower’s ‘Piranesi’s *Parere su l’architettura*’, *Journal of the Warburg and Courtauld Institutes* II, 1938/39, pp. 147-58.

⁶³“This joint is a complicated systems of clamps, rings and wedges which can receive structural members from all directions, up to twenty at a time. The pipes of the space framework and the parts of the multiple joint are, however, already premounted and welded to such an extent that at the site only one socket has to be used to assemble them, and finally three simple steel wedges will lock them indissolubly in place.” (Conrads & Sperlich, *The Architecture of Fantasy*, NY: Praeger, 1962, p. 180)

⁶⁴Aug/Sept 1964.

⁶⁵The work of Nicholas Grimshaw went on to be particularly notable in this regard.

⁶⁶“The multi-level environment has already begun to emerge (first, in the separation of pedestrians and cars by using two levels; then in the further separation by extensive use of elevators and escalators; then in still further fragmentation with alternative levels for different speeds of vehicle, upper decks for garages and links between high rise buildings). The notion emerges as the question: why not connect at many levels and regard the higher density parts of the city as a layer cake which can contain random movement not only horizontally and vertically but diagonally as well? Along with this goes the idea of such a system as a container for random development.” (Cook, *op.cit.*, 1970, pp. 97-100)

dwindled away.⁶⁷ Even in format, *Archigrams* 7 and 8 would refuse to cohere: both were a bundle of unbound sheets. Networks abhor a totality.

The plug and frame, a system designed around attach- and detachment, were fundamental to the group's urban strategies, from Chalk's Capsule Homes Tower [figure 75] and Underwater City, both of 1964, to Green's Living Pod Tower (1968): "With apologies to the master", Greene told the audience of *Architectural Design*, "the house is an appliance for carrying with you, the city a machine for plugging into."⁶⁸ *Archigram Seven: Beyond Architecture* was essentially given over to explorations of the plug-in strategy, including an American example imported from Yale,⁶⁹ and an application to the Paddington area of London. In the Mobile Paddington model, Lego blocks represented the pluggable parts. By 1967, Plug-In City was "being extended to investigate the interrelationship of existing decaying built-up areas (particularly 'twilight' zones) and the phased re-energy of city mixturing."

Banham attributed much of the *Archigram's* success to the allure of the plug-in concept. He wrote: "The strength of Archigram's appeal stems from many things...But chiefly it offers an image-starved world a new vision of the city of the future, a city of components on racks, components in stacks, components plugged into networks and grids, a city of components being swung into place by cranes... many of the future environments of man on this crowded little planet are probably going to be as highly mechanized as Archigram's Plug-in Metropolis."⁷⁰ The appeal of these visions to the alternative scene was confirmed Bathroom Tower (1968) by Terry Farrell and Nicholas Grimshaw that plugged thirty pods into a steel core to add services to a student building. Plug-In City was also the first Archigram project to make the popular press as a feature in the *Sunday Times Colour Supplement*.⁷¹ At the same time as made Archigram recognizable, it suffered from its popularity: "The infamous plug. Plugging-in is a term that has consistently been misused as a description of an architectural style. Plugging-in, however, defines an attitude, not a style; a way of thinking that shows a shift in interest from the building to the device. A shift from aesthetics to the way portable hardware restructures our behaviour. The city is merely a giant socketry, and architecture has

⁶⁷*Archigram* 5, unpaginated.

⁶⁸*Architectural Design*, Nov 66, pp. 570-6.

⁶⁹*Archigram* 7 was published at the time when both Webb and Greene were teaching in the US.

⁷⁰excerpt from *Design Quarterly* included in the IDEA conference pamphlet.

⁷¹on 20 September 1964, p. 33

ceased to carry any symbolic value and has thus become irrelevant except maybe as a technology of containers of some sort.”⁷²

What lent Plug-In City more than visual punch was the novelty of its power source. The residential units, communal computers, hovercraft buildings and transportation drew their energy from a sophisticated version of the ‘brain’ that animated the Living City exhibition: the Computer [*sic*] City [figure 18].⁷³ Without this shadow, Plug-In City would not differ much from any other inert kit-of-parts architecture.⁷⁴ As Crompton’s spelling of 1964 indicated, Computer City did not derive from familiarity with advanced technology but from an idea of how computers could make the environment more pliable to life’s activities. Such use of the computer bolstered the Archigram ‘boffin’ self-image, a perception fortified by the tendency within British histories to position the evolution of the computer in the domain of the imaginative problem solver and less as evolutionary progress in engineering science. First the computer processed the desires of its inhabitants as data; then, depending on the sensorial input, structure adapted to create an environment conducive to the required activity or state: community or solitude, for comfort or work, for business or pleasure. In Crompton’s words: “The activities of an organised society occur within a balanced network of forces which naturally interact to form a continuous chain of change. A METROPOLIS is situated at the point of maximum display of interactive energy and shows the most complex field of forces. In the COMPUTOR CITY this energised field is synthesised at a much higher sensitivity and is programmed to respond to changes in activity. Time scales of change are fed into the computer so that reaction follows the natural cause at optimum rate.” This was not computer as a tool, but, like the Architecture Machine Group would attempt at MIT, fully integrated into the design process.⁷⁵

The mesh of Computer City avoided what Price called “that olde-time ‘image’ quality of visual wholeness and intelligibility still depressingly demanded by so many architects and planners.”⁷⁶ Lack of center, or even a pivotal axis around which the city could arrange itself, was an important corollary of the continuous web, making

⁷²‘Video Notebook’, *Archigram*, *op.cit.*, 118.

⁷³The misspelling would be corrected in subsequent references.

⁷⁴“The Plug-in City needed the Computer City as its shadow, otherwise it could not function.” (*A Guide to Archigram 1961-74*, London: Academy Editions, 1994, p. 222)

⁷⁵see Nicholas Negroponte, *The Architecture Machine: Toward a More Human Environment*, Cambridge, MA: MIT Press, 1970.

⁷⁶*Archigram 7*, unpaginated.

decentralization a significant component of the ‘open-closed’ question. Jencks was of the opinion that in the architectural context the attitude towards centrality was the most obvious formal difference between an open and closed society.⁷⁷ This was already inherent in Team X’s clusters, stems and webs. This aspect of the Computer City, and by extension the Plug-In, directly confronted the view of the city center as the heart of a place.⁷⁸ Cook claimed that in the Plug-In City, ‘the Centre is Everywhere and All the City is the Centre’. The project, however, which really tested the idea of center was ‘Instant City’ (1968-70) [figure 107]. The Instant City would not only displace and localize the center in its many city guises, but would also limit its duration.

The Network Takes Over

Instant City was unique within the Archigram *oeuvre*. Firstly, it was a long term project, developed over two years with financial support from the Graham Foundation. Also, unlike most *Archigram* projects, Instant City was a group undertaking. Neither was it a single idea or image, but a composite of “several on-going conversations”.⁷⁹ Instant City synthesized the transient structures of the *Archigram*, from trailored units to pneumatic ones, including airships, balloons, domes, and air-supported structures to supplement an extant, if provincial, urban condition [figure 108]. The mobile components would arrive at a town by road and air [figure 109]. Then, using the host city as a skeleton, software combined with the pre-existing hardware to form the Instant City. As much of the atmosphere was generated by displays like the ‘Audio-Visual Jukebox’ (1969), the ‘Holographic Scene-Setter’ (1969) and even the ‘Enviro-Pill’ (1969) as by skins and portable units [figure 110]. The results, the commentary described, tread the “theoretical territory between the ‘hardware’ (or the design of buildings and places) and ‘software’ (or the effect of information and programming of the environment)”.⁸⁰

After the event, the Instant City moved on as quickly as it had arrived. This was not the piecemeal transience of the Plug-In model. Disassembly was as rapid as assembly: the coming together of things already took into account their coming apart. This was after all the era of protest—against Vietnam and nuclear power, and for student rights.⁸¹ Ron Herron even composed a ‘Self Destruct Environ Pole’ (1969) for the

⁷⁷‘From Unicentre to Polycentre’, *op.cit.*, p. 334.

⁷⁸Right through the history of urban design up to CIAM’s *Heart of the City*.

⁷⁹Cook, *op.cit.*, 1970, p. 122.

⁸⁰*A Guide to Archigram 1961-74*, *op.cit.*, p. 246.

⁸¹Though London was relatively placid in this regard, the Milan Triennale to which Archigram brought the Suitaloon demo was shut down by student protest.

Instant City [figure 111], in the spirit of Gustav Metzger's auto-destructive art. It is at this point, after the intensity of the Instant City happening has passed, that the infiltration quietly occurs. "The Network Takes Over" and a residue of information was left behind.⁸²

The images made for this project were primarily responsible for the association of the Archigram group with the imagery of 'Swinging London' [figure 112]. Predominantly collages, the cutouts from glossy magazine were integrated with line drawings to amplify the leisure aspect of Instant City's technologically enabled change. No suited office-workers hurried through this glamorous world of mini-skirted models, pop icons, footballers and advertising slogans. Yet the agenda imbedded in the collage, while not critical of consumption, wasn't one of decadence: "we are nearing a time when the leisure period of the day is becoming really significant...people are realising that they could do things and know things, they could express themselves (or enjoy themselves in a freer way) and they are becoming dissatisfied with the television set, the youth club or the pub."⁸³

The use of collage for social commentary, especially relating to the modern condition as a kaleidoscope of mass-produced images, was already full blown in the work of some Independent Group participants.⁸⁴ But the Archigram strategy here, in image and content, was to take what they called the psychological resistance of the English to "vast upheaval" into account.⁸⁵ Just as the Instant City complemented extant institutions rather than implementing a full-blown network urbanism in one fell swoop, Instant City's message was embedded in a colorful set of images whose playful tone was an effective enough disguise to get them published outside of their own rarefied milieu, in the popular, as well as the general architectural, press.⁸⁶

Instant City expressed the group's intentionally anti-intellectual, lower-middle class stance that remained important to the group's self-representation. The agenda was to deliver the vibrant urbanism of a major metropolis to decentralized locations without

⁸²The final panel of six in 'Instant City Airships: sequence of effect on a typical English town' (1970).

⁸³*A Guide to Archigram 1961-74, op.cit.*, p. 240.

⁸⁴Collage as social criticism began in London's small Surrealist circle. According to E. Wolfram, "The honour for making the first modern collage of British origin belongs to the satirical and idiosyncratically baroque visionary Edward Burra (born 1905)." (*History of Collage: an Anthology of Collage, Assemblage and Event Structures*, London: Studio Vista, 1975, p. 118)

⁸⁵*A Guide to Archigram 1961-74, op.cit.*, p. 242.

⁸⁶Color feature in the Daily Express, 3 August 1970 and two spreads in AD.

the associated burdens of permanent hardware. Like most Archigram projects, Instant City was geographically unspecified [figure 113]. Walking City's backdrop of the New York skyline could just as easily be the Giza pyramids. But while the Plug-In was applied to the environs of London, Instant City's locales were predominantly seaside resorts and industrial towns, as had been the itinerary of the 'Living City' exhibition [figure 114].⁸⁷ Again, the connections were more important than any single object contained in the network. 'Great Britain: Instant City Progression' charted the web woven as the city traveled from point to point, constantly displacing the center from *urbs* to suburb [figure 115]. By creating an "inter-town organism" which would connect all cities and towns, the geographical and socio-economic dominance of the capitol city, London would be displaced. Neither was the proposition of transporting knowledgeability to the suburbs uni-directional; the intention was also to tap the "potential intelligence" of the towns.⁸⁸

In the Instant City, the 'Programme Background' explained, "the notions of urban dispersal and the territory between entertainment and learning" were joined.⁸⁹ And the Instant City included educational components prominently in its supplies, in the manner of Price's Potteries Thinkbelt (1965-6) or Tony Dugdale's Learning Shed (1965-6): education as an egalitarian, non-coercive endeavor. A central feature of this was the 'Ideas Circus', an arena to provide courses in "'Microbiology for All', 'New Maths', 'Modern Architecture', or whatever" [figure 116 & 117].⁹⁰ According to the group's explanation, the circus was based on their experience on the lecture circuit where they found that there was little interchange of ideas and resources between academic institutions, forcing redundancy of skills and resources: "The idea would be to circulate between major provincial centres, tapping local universities, bleeding-off from them personalities, documentation and such things as film of laboratory experiments: then carrying on to the next town...The Circus would be programmed with basic film and slide material. The feedback facility is most important: verbatim documentation of seminars, documents, films, etc., would be printed-off and left behind."⁹¹

⁸⁷The hometowns of Archigram members, such as Cook's hometown of Bournemouth were the first to go on Instant City's destination list. Also featured were highway intersections in Los Angeles where Ron Herron was teaching at the time.

⁸⁸Cook, *op.cit.*, 1970, pp. 122-3.

⁸⁹A *Guide to Archigram 1961-74*, *op.cit.*, p. 246.

⁹⁰Idea Circus was a feature in *Archigram 8*, quoted from 1972, p. 101.

⁹¹A *Guide to Archigram 1961-74*, *op.cit.*, p. 233.

Like the Instant City as whole, the Ideas Circus was a means to an end, “a tool for the interim phase: until we have a really working all-way information network.”⁹² When the network was complete, the Ideas Circus would not be a hierarchical component. There would be no distinction between it as an informational unit and the rest of the urban experience. This interim stage reflected the limitations of the systems model, not Archigram’s idea of a final destination as they came to understand the limits of their borrowed terminology: “In systems planning we are reaching a point where the ‘software’--the unseen relationship--is sufficient to determine the control and positioning of elements with which we live. The environment can now be determined by a systems analysis of our requirements, and the ‘seen’ world could become servant to the ‘unseen’ motivation...This over-simplification has the rhetoric that is necessary at this moment in history. In many ways it parallels the great excitement of the discovery of the machine for the Futurists 50 years ago... Systems are not a panacea. They have a necessary place in the evolution of intelligence.”⁹³

The transience of knowledge that was fundamental to the urban experience of Instant City was evolving towards a point where information and the city were synonymous. In its ideal form, Instant City would provide a bundle of services; its urban strategy would be connectivity and speed over geographical advantage. As Paul Virilio has written, the city has always been “first and foremost a human dwelling-place penetrated by channels of rapid communication (river, road, coastline, railway). It seems we’ve forgotten that the street is only a road passing through an agglomeration, whereas every day laws on the “speed limit” within the city walls remind us of the continuity of displacement, of movement, that only the speed laws modulate. The city is but a stopover, a point on the synoptic path of a trajectory, the ancient military glacis, ridge road, frontier or riverbank, where the spectator’s glance and the vehicle’s speed of displacement were instrumentally linked. As I have said in the past, there is only *habitable circulation*.”⁹⁴

To inhabit circulation in an advanced network, information and the city would be fully decentralized commodities that traveled the same infrastructure, like computers on phone lines. This was not a mere reduction of electrons to cables, of content to form, but an ontological reduction of the difference between structure and information. As modes of communication, the publication and the built environment used the same methods,

⁹²*ibid.*, p. 233.

⁹³*ibid.*, p. 222 (elaboration, not the same as the hard-soft editorial in Archigram 8)

⁹⁴*Speed and Politics*, tr. M Polizzotti, NY: Semiotext(e), 1986, p. 5 (original italics).

even more, served the same function. The text for ‘Introducing the Archigram Network’ which was part of *Archigram 7* was adamant: “The printed page is no longer enough: ideas and situations now involve movement and sequences that need film, colour, magnification and explanation in length: Magazines will dissolve into hybrid networks of all media at once.” The promise in *Archigram 7* that “there may be no buildings at all in *Archigram 8*” played itself out in the embrace of a philosophy that tended towards the dissolution of the object. After the conclusion regarding the insufficiency of the printed page would come the one in *Archigram 8* that claimed: “the concept of ‘place’ exists only in the mind”.⁹⁵ The utter dissolution of architectural interventions could not be far behind.

⁹⁵Archigram 8, unpaginated.

Conclusion: The Technological Picturesque

The time has come, it seems, to face the facts: revolution is movement, but movement is not a revolution.

Paul Virilio, *Speed and Politics*

The Instant City package supplied parts for a metropolitan experience, but was not predicated on replicating the big city. Freed of ‘hardware burdens’, Instant City was able to infuse lower density areas, as in the examples of the ‘Tuned Suburb’ (1968) and ‘Moment Village’ (1968) [figure 28] with services, as well cities and towns. One of Instant City’s standard components, the ‘Information Pergola’ (1969), was even a smart adaptation of garden furniture [figure 118].

It had to be acknowledged, though, that even the Instant City’s lightest skins were not truly ephemeral stuff: “All right--it’s still a hard network”;¹ “The plastic house remains a house, the Plug-In City remains a city, the street in a tube remains a street.”² In 1971, came the proposal for the “inevitable next step”: a kit-of-parts brings the experience of country to the city. Cook’s cartoon, ‘and now.... or the actual city.... INSTANT COUNTRY’ (1971), had a hologram horse standing in a street permeated with the imported smells and sounds of spring [figure 119]. ‘Instagrow’ vines climbed a facade in the background. That it should seem inevitable for a system which began with the massive bearing of the megastructural to first soften into skin and then melt into landscape comes round again to the dichotomous relationship of a city-based society with powerful national myths about its countryside. Even the native architectural theory derived from a philosophical attitude towards the landscape.³

Gardener’s Notebook

The focus of what would turn out to be the final newsletter, *Archigram 9* (1970), was Greene’s ‘Gardener’s Notebook’, a proposal for “power-point homesteading in a paradise garden of appliances” posited as the “World’s last hardware event and gardening

¹‘Instant City Children’s Primer’, *Architectural Design*, May 1969, pp. 274-280. (reprinted in *Archigram 9*)

²Peter Cook, *Experimental Architecture*, London: Studio Vista, 1970, p. 90-1.

³In addition to the Picturesque many of England’s prominent designers were natural scientists, like Christopher Wren, even botanists, like John Evelyn and Patrick Gedes.

series”.⁴ In keeping with the gardening theme, the spread was printed in alternating patches of green and brown ink. Greene wrote, “It used to seem a nice idea to carry your environment around with you...but it can be as much of a drag as having it stuck in one place.”⁵ Portable hardware whet the appetite for an environment “free from the pornography known as buildings”:⁶ “We should all be busy persuading ourselves not to build but to prepare for the invisible networks in the air”.⁷ In the meantime, the event that truly anticipated the invisible environment was to be “a fully-serviced natural landscape” which Greene called the ‘Bottery’ [figure 120].

The Bottery was sustained by a variety of ‘bots’: an ensemble of robots that serviced the landscape. This array grew out of an encounter with the ‘Mowbot’, a battery operated lawnmower made commercially available in 1968 that Greene first discovered in *Popular Mechanics*.⁸ The Mowbot cut a swath through the grass until it picked up a signal from a wire buried at the lawn’s edge and reversed direction. Greene’s first published a version of the Gardener’s Notebook in the September 1969 issue of *Architectural Design*. There he included an advertisement in which an elf-sized female alien with antennae topped by silver spheres emerged from the Mowbot. When ‘An Experimental Bottery’ appeared in *Archigram* 9, the product brochure provided the basis for an extended program for robots of all kinds: the firebot, combot, eatbot, *etc.* In addition to robots that did the chores the skinbot provided enclosure [figure 121]. As its name implies, the skinbot was not far from the spirit of the inflatable: eighteen cubic meters of air-conditioned space for cooking, sleeping and storage wrapped with a skin. The infrastructure for all this would be interred like the network that communicated with the Mowbot.

In keeping with Greene’s beliefs, “that all the trends in society and technology are searching for flexibility and versatility”, each bot adapted to a multiplicity of tasks: “Specialization is dead. In the building world the idea of the multi-purpose shed pays lip-service to this observation, the idea of non-specialized systems and architecture begin to

⁴*Archigram*, Basel: Birkhäuser Verlag, 1991, p. 112. The text in the catalogue is based of the script for a four-screen slide show assembled by Greene and Mike Myers.

⁵*ibid.*, p.113

⁶Greene quoting Jack Burnham, *ibid.*

⁷*ibid.*, p.110

⁸see Mark Wigley, ‘The Electric Lawn’, *The American Lawn*, ed. G Teyssot, NY: Princeton Architectural Press, 1999, pp. 171-176.

interact: the plane that jumps, the boat that walks, the tie that is a pen.”⁹ In the Bottery, all you need is a lawn and maybe a shed.

Greene described the bot collection as “machine[s] transient in the landscape”. In other words, they were still based on a physical idea of mobility. However, instead of focusing on the presence of migratory objects, the Bottery as a whole was concerned with absence: the absence produced in the landscape with the passing of transient machines. Once gone, the presence of hardware was marked only by what was left behind: “crushed grass and perhaps a tyre track, a footprint”.¹⁰ “The temporary place,” Greene continued, “retained perhaps permanently in the memory.” Or as he expressed it elsewhere: “Tomorrow, in a half an hour, next week, it will all have changed. There’ll be nothing remaining to indicate that it was there, the natural scene will remain unchanged. This small instant village will only exist in the memories of the people that were there and in the information of the robot. An invisible village. An architecture existing only in time.”¹¹

This shift in focus from presence to absence put a different spin on the problematic relationship that had consistently emerged over the decade between infrastructure and nomadicity, the ephemeral and the permanent, becoming and Being. Before the tension lay between difference between possibility (images) and realization (buildings), the virtual and the actualized. Here the confrontation was squarely between time and space. As Virilio explained: “We have to recognize that *geographic localization* seems to have definitively lost its strategic value and, inversely, that this same value is attributed *to the delocalization of the vector*, of a vector in a permanent movement--no matter if this movement is aerial, spatial, underwater or underground.”¹² But even vectors did not straightforwardly supersede locality. Nomads left paths; substances required conduits; virtuality depended on cables; and open-endedness demanded a closed circuit. The model of the city as a network was, on the one hand, all about time. On the other, the articulation of buildings as transmitters for intangible entities as transient as energy transfers and information relays took on a decentralized, closed form.

⁹ *Archigram, op.cit.*, p.112-3

¹⁰ *ibid.*

¹¹ *Archigram* 9 (unpaginated).

¹² *Speed and Politics*, tr. M Polizzotti, NY: Semiotext(e), 1986, p 135.

Invisible Networks

The Bottery was part of the LAWUN (Locally Available World Unseen Networks) project that Greene developed while teaching in the United States during 1969. The acronym indicated the goal of this project to transform the globe into a grass-lined sphere. *Archigram* 9 even included a packet of seeds to begin the process.¹³ Landscaping strove to pass off the artificial environment as unaffected, to make its interventions invisible--an ideal precedent for Greene's techno-ecological desires of being able to do "your own thing without disturbing the events of the existing scene". The guidelines for the traditional English garden dictated that cultural artifacts appear as part of the natural world; the Bottery presented architecture as part of the landscape of soft technology. This was an extension of the dream of transparency, disguising wiring in "rocks" and "tree-trunks" [figures 37 & 38].¹⁴ The Log- and Rok-Plugs (1968) concealed the metered services for mobile living containers, including cold water, electrical current, telephone lines, international information and educational hook-ups. These units would be indistinguishable from "the real thing": "All ranges are supplied with an embedded spore finish, to suit any locality, which will promote rapid moss, lichen or fungi covering."¹⁵

In keeping with this spirit, the group's only commission, a leisure center, made no architectural gestures above ground level. The complex was buried in excavated earth, leaving just hints in the landscape for what lay below. "[W]e have remained fascinated", they wrote in 'Mound, Ground, and Hidden Delights', "with the idea and the formation of the 'mound'."¹⁶ First introduced in *Archigram* 5, these artificial protrusions in the landscape were topographical transformations that built up gradually. Accumulated over time gave the appearance and certainty of a natural projection. The mound, they believed had "a myriad of conceptual links: to the idea of the 'city-as-a-single-building', to the aggregation of the unlike to the unlike in some amorphous, polyglot organism that is beyond single buildings, to the notion of place as ground and artefacts as transient plantings."¹⁷ Architecture perennials and machines that dissolve into picturesque

¹³for night scented stock purchased at Steward & Brewill Ltd., Central Market, Nottingham.

¹⁴This façadism provoked modernist sensibilities, as in this example of a letter published in AD Sept 1969, p. 3 in response to an article on the Log- and Rok-Plug in a previous issue: "Further, hiding energy/supply disposal points within plastic mock-natural forms sounds like the first step towards extruded Chippendale and Louis XV; and drawing them on gridded pseudo-screens adds an aura of computer drawing which is unwarranted."

¹⁵*Archigram, op.cit.*, p113.

¹⁶'Mound, ground, and hidden delights', (*ibid.*, p.120)

¹⁷*ibid.*

landscapes [figure 122]: geological and botanical language substituted for the biological rhetoric of technological application.

Landscape had often served as a tool, as in the example of the Geddes' valley section on which the Smithsons based their telescopic view of urbanism [figure 123]. The understanding of landscape as a strategy, however, was more rare. Paul Edwards has suggested that the alternative to the closed world of surveillance and militarism was not an open world, but a green one.¹⁸ The 'green world' was "an unbounded natural setting such as a forest, meadow, or glade... Its archetypal form is the quest, in which characters struggle to integrate (rather than overcome) the world's complexity and multiplicity."¹⁹ Thus the idea of the world as a grass-lined sphere was a model with the potential to overcome the internalization of open-ended technology and to return to the goal of diversifying, rather than limiting, possibility.

Virilio has described his Oblique Function as "the architectonic implementation of topology. Leaving Euclid's grid surfaces for the oriented surfaces of topology (Moebius band, Klein bottle, etc...). The Function of the Oblique is the application of topology to architecture as a whole, and not just to parking garages or the Guggenheim Museum. It's like saying: "Euclidean geometry has built architecture from early history until modernity, Tomorrow we will build with topology."²⁰ Topology, the graphic delineation of the natural and man-made features of a place, also incorporated the properties of geometric configurations unaltered by elastic deformations such as stretching or twisting. Gardens had come along way since they generated a grammar for the urban grid; now it was time for the gridded city to return to the garden.

The Picturesque stood at the point where time intersected with geography. Picturesque gardens had been built around a philosophy of sensation that centered on movement: the movement of bodies around objects through time and space. The distinction of such design hinged on the priority of bodily circulation over the optical vista. The subject was in motion, while the terrain, like the mound, changed slowly, with the season. In the garden of the Technological Picturesque, the stillness of the landscape was inverted. The primary role of sensory reaction was taken from the subject and placed with the object: objects move around bodies; you stay put and adaptive machines are

¹⁸Edwards draws the 'green world' model from the literary criticism of Northrop Frye. (*The Closed World: Computers and the Politics of Discourse in Cold War America*, Cambridge, MA: MIT Press, 1996, p. 13)

¹⁹*ibid.*

²⁰Paul Virilio and the Oblique (interview)', *Sites & Stations: Provisional Utopias*, NY: Lusitania Press, p. 179.

transient. The question of what aspect of the environment, the subject or the object, has the status of motion, as the Independent Group had learnt from Thompson, is not irrelevant. If in the former nature and culture were presented as indistinguishable, the latter now presented technology as the landscape that was inextricably intertwined with architecture. Archigram inverted the sensorial frame of the earlier philosophy by responding to sensory input, rather than projecting a series of impressions; while the Picturesque garden provided a stable set of forms which *produced* perceptions in the mind, the technological picturesque was to be *determined* by projections of desire.

There had already been a whiff of the Picturesque in the rambling format of the Archigram itself, with its fold-outs and cut-outs resembling the pages of a landscape book crossed with a Dymaxion map in which the instant ruins of architecture's history--the decaying temples, grottos and pagodas--were transformed into structural parts tending towards obsolescence.²¹ Disposability put the process of object decay in fast forward. Greene's plans for the disintegration of the remainder of architectural form into the impulses of the wired landscape pushed the horticulture imagery right out of the presentation format and into the realm of theory. Archigram's reverence for the ideal of an ephemeral architecture transformed the melancholy of the ruin into optimism for technological potential. As Popper had feared, the implication of viewing the world as process was to reduce everything "to flames, to processes, like combustion".²²

Given the distaste of the previous generation for the New Humanism that was affiliated with the suburban, the association with the picturesque was particularly laden.²³ Neither did this association escape judgment that went beyond the landscaping of the decade's turn. "Archigram would seem to be making *picturesque images of the future*. For all of the unplanned randomness, the happy jerkiness, the obviously high-pitched tonality, the aggressive syncopation, all the famous ingredients of Englishness in action are now given a space-age gloss. Anything might here happen: the death of architecture, non-building, Andy Warhol bug-eyed monsters, immediacy of feeling for life, instant

²¹Like the 'before and after' drawings that Capability Brown presented to his clients which Tom Stoppard parodied in his play, 'Arcadia'.

²²*The Open Society and Its Enemies*, London: G. Routledge & Sons Ltd, 1945, vol. 1, p. 11.

²³While Nikolaus Pevsner was busily arguing the case of what he thought was a peculiarly English invention sharing fundamentals with Modernism in his Reith Lectures of 1955, the Picturesque was achieving an increasingly bad reputation amongst the younger architects for whom it came to signify suburban banality and the 'most debased English habits of compromise and sentimentality.' For a discussion of the politics of the Picturesque, see Banham, 'Revenge of the Picturesque: English Architectural Polemics, 1945-1965', *Concerning Architecture*, ed. J. Summerson, London, 1968.

nomadism, the wished-for end of all repression. We are presented with townscape in a space suit".²⁴

True the group flaunted suburbia and provinciality in the face of the revulsion that was the mark of the urbane architect. But in the end, suburbia was itself transitional: "For the present we have to wait, until the steel and concrete mausoleums of our cities, villages and towns, etc., decay and the suburbs bloom and flourish".²⁵ The suburbs too shall pass and the "world will perhaps again be a garden."²⁶ In that garden, software melts right back into nature, meshing with the rocks and logs. "Gently then, the project dissolves from the simple mechanics or hierarchies of 'structuring' and like-objects. Just as did the Plug-In City: it sowed the seeds of its own fragmentation into investigations of a gentler, more subtle environmental tuning."²⁷ The move was towards a world that did not exist as a sum total of things but as a totality of events, a place in which everything is process rather than material. This kind of investigation was furthered in *Archigram 9* by the holography of Scene Setter [figure 124] and the mental state of Enviropill: "the future environment does not, after-all, have to be there at all.... Switch on the people/turn on the crowd/bring in the whole scene."²⁸ [figure 125] Finally, architecture exists as a mental state, just as Greene had described the ultimate purpose of the Log- and Rok-Plugs: "It's anarchy--and its hardware--supported until it's under the skin or in the mind."²⁹ As the poem by Richard Brautigan described Greene's most optimistic dreams:³⁰

I like to think
(and the sooner the better!)

of a cybernetic meadow
where mammals and computers
live together in mutually
programming harmony
like pure water
touching the clear sky

I like to think
(right now, please!)

of a cybernetic forest
filled with pines and electronics

²⁴Colin Rowe, Fred Koetter, *Collage City*, Cambridge, MA: MIT Press, 1978, pp. 40-1.

²⁵'Instant City Children's Primer', *op.cit.*

²⁶ *Archigram*, *op.cit.*, p.110.

²⁷*ibid.*, p. 96.

²⁸*Archigram 9*, unpaginated.

²⁹*Archigram*, *op.cit.*, p113.

³⁰in AD, 5/69, p. 506. The poem, 'All Watched Over by Machines of Loving Grace' was published in Brautigan's *The Pill Versus the Spring-Hill Mine Disaster*, Delacorte Press, 1968.

where deer stroll peacefully
 past computers
 as if they were flowers
 with spinning blossoms

I like to think
 (it has to be!)

of a cybernetic ecology
 where we are free of our labours
 and joined back to nature
 returning to our mammal
 brothers and sisters
 and all watched over
 by machines of loving grace.

cybernetic landscape

Architectural revelations, Banham wrote, come in all forms. “They could be a paragraph from Ruskin’s *Stones of Venice*, or Geoffrey Scott’s *Architecture of Humanism*, or even Asimov’s *Caves of Steel*. But architects being the visual, graphics-besotted creatures they are, the revelations are more likely to be engraved plates in the works of Viollet-le-Duc, or the patent application drawing that revealed the essence of Le Corbusier’s *Maison Dom-ino*, the space-cathedral sketches of Bruno Taut or the renderings of imaginary skyscrapers by Hugh Ferriss, the Fun Palace drawings of Cedric Price, the colored collages of Archigram’s Peter Cook...or Ron Herron’s *Walking City* drawing, a long-legged revelation stalking the surface of the globe, a truth or illusion in search of a site on which to settle and become real. But then, the work of the architect as he bends over the paper, pencil in hand, is all illusion. He produces simulacra of reality, diagrams which, by some form of sympathetic magic, are supposed to cause real buildings to happen out in the instrumental world. We all know that it is not sympathetic magic but a vast and frequently fallible industrial complex that will turn the illusory vision into real construction but, for architects, the moment of magic, the revelation of truth, is when the pencil marks the paper, and the process of making architecture begins.”³¹

Creating images rather than objects, the Archigram group used a process of representation and dissemination to develop an informational architecture. The attempt to get outside of the closed games of language was rooted in the belief that an architecture of information would result in an indeterminate system. Others, like Diana Agrest, had this faith as well: “If the system of architecture and of design, even when we

³¹*The Visions of Ron Herron*, London: Academy Editions, 1994, pp. 14-6.

play with it, is always closed within a game of commentaries of language--a metalingual game--it is interesting to speculate on the outcome of a similar "game" of *non-design*, a game of the built world. For non-design is a non-language, and by comparison with a language, it is madness since it is outside language, and thus outside society. This non-language, this non-sense constitutes an explosion of the established language in relation to a sense already established (by conventions and repressive rules). It is symbolic of the built world outside the rule of design and their internal "linguistic" games. It permits us finally to understand another logic which informs the significance of building."³² Playing games of non-design, the cultural condition of restlessness would become a cityscape and information would approach, but never reach, the status of a substance. The gradual lightening of the megastructure into an urban experience free of the infrastructural anchor, aimed at the point where architecture would lose all its hardware metaphors, even that of the conduit. There would eventually be no difference between the architectural domain and that of information.

In the end, practices purporting to break the mold of urban form elicited the visual nostalgia of previous centuries. The 'before and after' pages of eighteenth century landscape books, the lumbering structures of Walking City evoked the prehistoric aura of the dinosaur, the monumentalized infrastructure of British 'High Tech'.³³ Representation's inevitable contradictions and baggage made Greene, influenced by Joseph Kosuth's 'Art After Philosophy', conclude that drawing should be abandoned.³⁴ The dematerialization of the object inherent in the tenets of conceptual art, he concluded with Kosuth, implied that architects need not be "directly concerned with the physical properties of things."³⁵ If architecture dissolves, and the image is architecture, then the image, and the *Archigram*, has no right to existence either. If, Greene wondered, architecture was, as Archigram insisted, "no more important than the rain",³⁶ why carry

³²'Design versus Non-Design', reprinted in *Oppositions Reader*, ed. KM Hays, NY: Princeton Architectural Press, p. 347.

³³Anthony Vidler pointed out this visual association in 'Planets, Comets & Dinosaurs: Mutant Bodies/Virtual Spaces', lecture at MIT, 7 April, 1998.

³⁴Conversation with Greene (1 June, 1998).

³⁵Joseph Kosuth, 'Art After Philosophy', *Art In Theory 1900-1990, An Anthology of Changing Ideas*, ed. C. Harrison & P. Wood, Oxford: Blackwell, 1992, p.864. Or as number ten of Sol LeWitt's 'Sentences on Conceptual Art' claimed: "Ideas alone can be works of art; they are in a chain of development that may eventually find some form. All ideas need not be made physical." (*ibid.*, pp. 837-839)

³⁶"When it is raining in Oxford Street the architecture is no more important than the rain; in fact the weather has probably more to do with the pulsation of the living city at that given moment." ('Living City', *op.cit.*, pp. 70-1)

on drawing the buildings? “If Archigram were wrong, then architecture cannot escape its historical mission to resist time and become, literally, an investment. It cannot become the rain; the nomad is destined to be a renegade, a vagabond; metamorphosis of form is undesirable, the wall of stone may not be the wall of light and the building may not be seen as a transient presence.”³⁷

Such would be the natural law of the Cybernetic Forest.

³⁷*Concerning Archigram*, London: Archigram Archives, 1998, p. 4.

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