FULL-SCALE DESIGN PROJECTS: THE INTEGRATION OF THEORY, CRAFT AND ARTIFACT

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INTRODUCTION: THE TECHNOLOGIACAL CULTURE AND ITS IMPLICATIONS

We are all cyborgs now. Architects and urban designers of the digital era must begin by retheorizing the body in space.
William Mitchell[1]

The fundamental metaphorical message of the computer, in short, is that we are machines—thinking machines, to be sure, but machines nonetheless. It is for this reason that the computer is the quintessential, incomparable, near-perfect machine for Technopoly. It subordinates the claims of our nature, our biology, our emotions, our spirituality.
Neil Postman[2]

Our cultural setting is distinguished, in part, by ambiguity regarding contemporary technology and its digital progeny. At one extreme we have a obsequious devotion to technology and its implicit promise to make our lives more productive, easy and satisfying—on the other an often paranoid distrust of its value, and fears that it will dominate our beliefs and strip us of our humanity. Thus, between magazines such as *Wired* and *Plain*, for example, there is a polarized debate that *The Utne Reader* characterizes as "Technology is groovy Vs. technology sucks." Architecture, as a cultural phenomena, participates in this polemical debate, and displays some of the same prejudices and misunderstandings.

It is clear that contemporary culture generally embraces the promises of technology in an uncritical manner. Similarly, architectural theory and practice views technology as a defining phenomena. A particular theoretical strain in education, theory and practice argues that technology is the agent of a paradigm shift in the creation, use and meaning of architecture. The cynical critique of modernist planning and architecture by the 1960's Italian theoretical group Superstudio, that in the future "there will be no further reason for roads or squares," is now regularly uttered without the slightest hint of irony. Thus, William Mitchell describes the "City of Bits" as:

a city unrooted to any definite spot of the surface of the earth, shaped by connectivity and bandwidth constraints rather that by accessibility and land values, largely asynchronous in its operation, is inhabited by disembodied and fragmented subjects who exist as collections of aliases and agents. Its places will be constructed virtually by software instead of physically from stones and timbers, and they will be connected by logical linkages rather than by doors, passageways, and streets.[3]

The foundation upon which arguments of this type depend, is that our time is utterly different from the past, and thus is compelled to create an appropriate architecture designed to satisfy a new set of needs. Zeitgeist theories are certainly not new, and all depend on the particular conceit of cultural amputation from the past. Therefore it seemed perfectly logical for the Italian Futurists to describe the need for "an architecture whose *raison d'être* lies solely in the special conditions of modern life, whose aesthetic values are in perfect harmony with our sensibility. This architecture cannot be subject to any law of historical continuity. It must be as new as our frame of mind is new."[4] Challenges to this modernist polemic are not new either. In 1984 Leon Krier characterized zeitgeist inspired architecture as "merciless expressions of our times."[5]

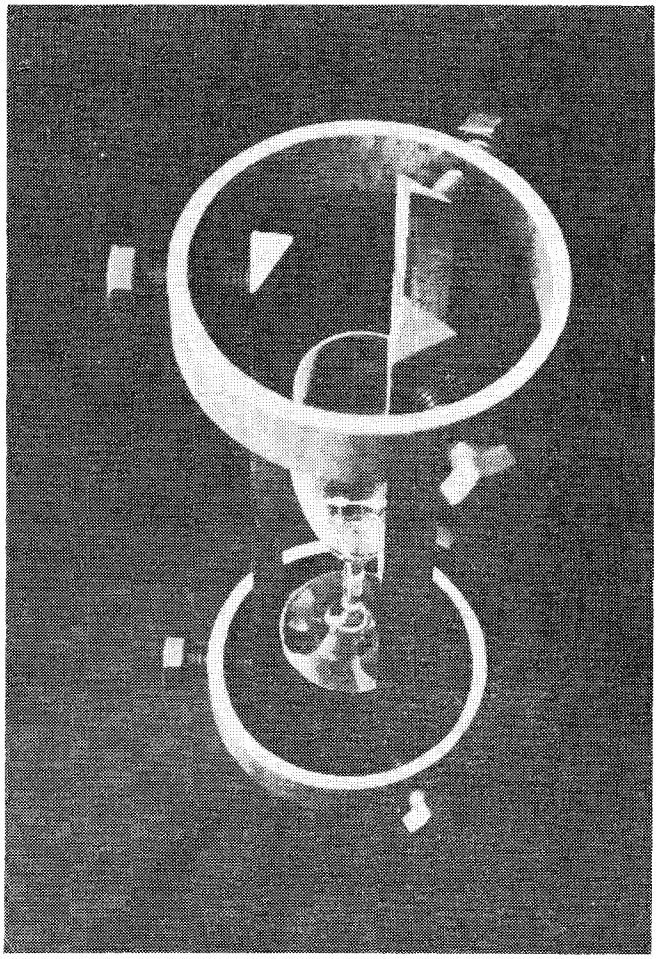
Just as there are proponents of "new science" and "new technology," there are others who are less enthralled. Jeremy Rifkin, Bill McKibben and Neil Postman often vociferously bemoan the second technological revolution, as passionately as others celebrate it. Neil Postman questions the oligarchy of "technopoly" and critiques its unqualified acceptance. While recognizing the numerous benefits of technology, Postman outlines its subversive effects in education, politics, social science, medicine, management, psychology, and overall cultural goals, values and self-definition. According to Postman, it is not so much the machines and technologies that are responsible, but their transformation of our belief systems. For example, he argues that the scientific method has been indiscriminately applied to almost all areas of our lives including human behavior, and that consequently subjectivity has been devalued. Humans have become machines at the same time that machines have been anthropomorphised—all of which is reflected in our social and work patterns, and societal beliefs.[6]

It is important to recognize that just as zeitgeist theories have historical precedents, so do the above counter-viewpoints. The late nineteenth century, much like today, was a transitional time where the effects of the dominant technologies of mechanization and mass production and their consequent world views, were critiqued. As we worry over the effects of the information age and the shift from a manufacturing to a service economy, so did the Victorians question the industrial revolution. It is not surprising that England, a nation that felt the effects of industrialization more that its continental neighbors, became the center of an often revisionistic re-appraisal of Victorian Society. Luddites actively resisted mechanization, writers such as D.H. Lawrence coupled industry with a loss of humanity, and the Arts and Crafts Movement looked to the medieval world as an antidote to mass-produced architecture and furnishings.

The genesis of the Arts and Crafts Movement was Pugin's Medieval Court at the Great Exhibition of 1851. Subsequently, the Arts and Crafts Exhibition Society was founded in 1888. The initial promulgators of the Arts and Crafts Movement, Pugin, Ruskin, Morris, Lethaby and others, called for a return to simplicity, truth to materials, a synthesis of design, art and craft, the primacy of comfort, and an almost nationalistic regionalism.[7] In the arts, Ruskin's protégés, Dante Gabriel Rossetti and the Pre-Raphaelite Brotherhood (founded 1848), insisted on a return to pictorial realism, iconographic and mythological content, and medieval painting techniques. William Morris's "News from Nowhere" depicted an ideal, post-industrial society, and he founded Morris and Co. in the belief that art should be an "expression by man of his pleasure in labour." According to William Curtis, Morris "advocated a reintensification of the crafts and a reintegration of art and utility."[8] Subsequently, the movement found its continental counterpart in Art Nouveau, and was influential in the founding of the Deutscher Werkbund in 1907 and the philosophy of the early Bauhaus. Gropius emphatically stated in First Bauhaus Manifesto of 1919 that "Architects, sculptors, painters we all must return to the crafts!"[9]

According to Peter Davey, the Arts and Crafts Movement is "more and more relevant to a contemporary architecture fumbling to re-discover compassion and individualism." Parallels can be established between the debates of Victorian England and contemporary architectural education and practice. In 1891 a manifesto penned by the St. George's Art Society, whose members included W.R. Lethaby and Edward Prior, argued that architecture should be a *craft* and not a *profession.* Today, the architectural profession has adopted polar positions of a different type, both of which rely on technology for their definition. These unbalanced views accept technology either as a pervasive, theoretical set of beliefs, or as a system which we train students to serve. In the former, architecture is individualistic, theoretical, cultural expression—the other, anonymous, skills-based, professional services. We either educate our students to be idiosyncratic and individualistic sages for the new digital world—or train them in mass-market skills for placement in a specialized and mechanistic industry. The former is allied with the avant-guard and zeitgeist theories—the other submits itself to a mechanistic system of professional service. Both accept technology without reflection. What is necessary are alternatives that question the dominance of technology and return to its fundamentals.

The root word of technology is *tekhne,* which means "skill, art or craft." This definition implies that the act of making and creation is intrinsic to any technology and offers a valuable perspective on this ubiquitous term. In the design studio, large and full-scale constructions can serve to return the technology of architecture to a more direct, humanistic activity. Often hands-on, constructive projects are regarded as practical adjuncts to construction technology courses, or handi-crafty, "let's build something and then talk about it" exercises. Both characterizations imply a lack of theoretical content. I argue that instead, large and full-scale projects are potent vehicles for theoretical inquiry that fill an important gap in architectural education, and serve to re-establish architecture as a humanistic, tectonic, creative activity.

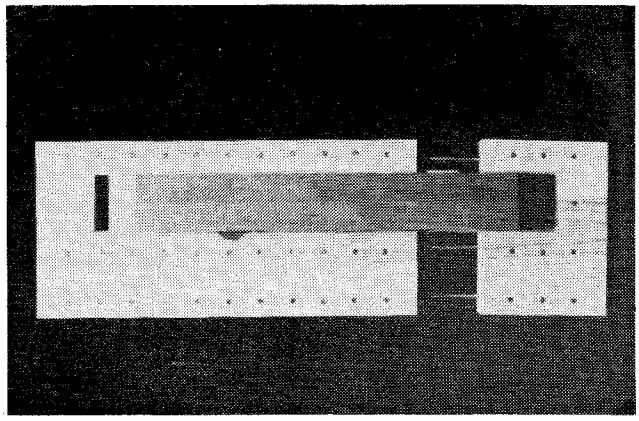


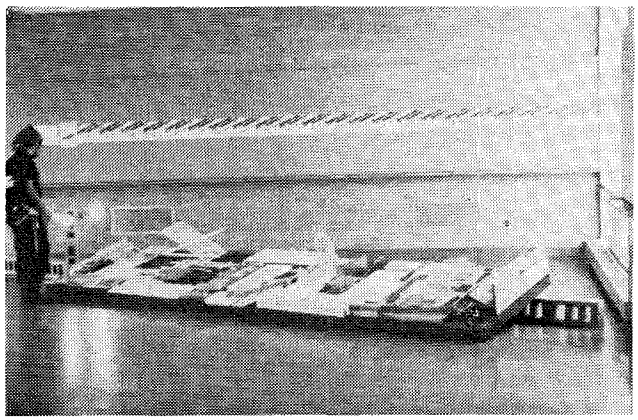
THE PROJECTS

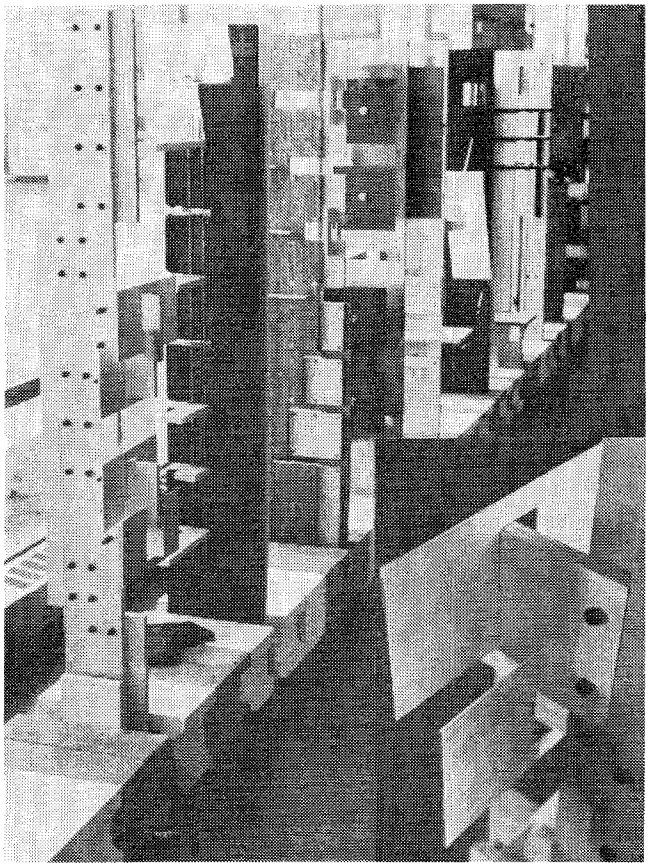
The following projects conform to various types, had particular pedagogical intents, and utilized specific methodologies. The types of projects included those that addressed the following issues: adjuncts to structures/building systems; structure and space; body measure and experience; and the integration theory, craft and artifact. As will become apparent, these are categories of convenience; all projects synthesized most if not all of these listed elements.

The principal pedagogy and methodology of the projects was to create opportunity for students to engage in the "direct" creation of architecture. The projects challenged the artificial boundaries of concept and creation by eliminating the "middle-man" of scale models, drawings, verbiage, precedent, site surveys, and at times even the professor. They were mundane in the true sense of the word[10] in their emphasis on respecting the essential nature of materials. Similar to the Arts and Crafts Movement, they emphasized simplicity of organization and tectonics, as well as serving to challenge the pervasive academic and stylistic climate. Lastly, the site-specific work focused on the dialectical interrelationship of object and environment.

Some large and full-scale projects are effective adjuncts to the structures/building systems curriculum. For example, in one exercise at Lawrence Tech, students worked directly with apprentice masons to learn masonry techniques and construct a full-scale masonry wall. The project was part of a masonry design





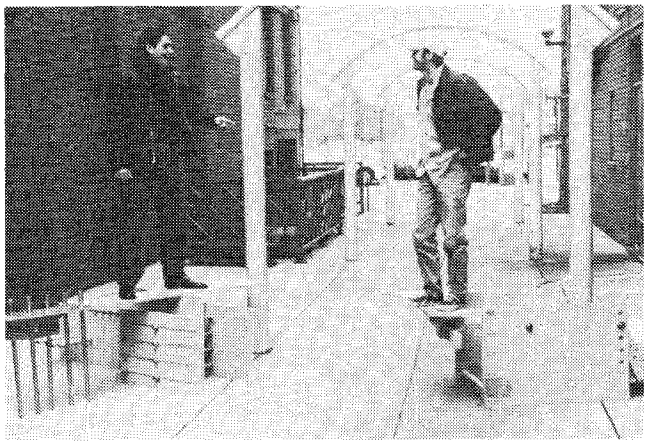


competition and also involved large-scale detail models, and detail drawings at a scale of 1:5. These later exercises focused on the integration of concept and organization, and material expression. Through recognizing the modular nature of masonry design, the expressive potential of the material was directly related to the form, organization and content of the architecture. A similar project from the first year program at the University of Manchester was entitled "Part of the Whole" and asked that the students take a fragment of a just completed project (a potter's studio located on the Yorkshire coast) and design it in detail, using models at 1:5. The educational objectives included a "focus on body measure, use, quality, materials, and construction," and suggested that the chosen "part" might be an "entry, a window seat, a set of steps, a built-in counter..." The students were directed to "examine this part separately, and in relationship to the whole. Design the chosen part thoroughly, considering scale, proportion, use, materials, construction..." This exercise raised many questions related to methods of construction. What also became apparent was that the large scale models illustrated and explored aspects of the previous projects that had been just minimally indicated. By thoroughly designing a select portion of their project, possibilities regarding the work as a whole were suggested. The students grew in confidence because they understood that in time they could "completely" design a project

The essential nature of structure and space, are also effectively explored through large and full-scale constructions. A first term project at the University of Manchester was entitled "Gravity and Balance." The project encouraged first term freshmen to develop workshop skills and forced them to confront the exigencies of structure and gravity. The students designed and constructed an organization that inscribed a specific volume and was balanced on a fulcrum. A limited palette of materials was required, and joinery and craftsmanship emphasized. Early in the project it was apparent that experimentation was the most effective design methodology. In the end there was no room for rationalizations or speculations; either the project balanced or it didn't.

The spatial and constructive concerns were also explored in a project entitled "Room for Mangaka." Within a prescribed volume and using a limited palette of materials (wood studs and drywall), the students experimented with ways of articulating and structuring space to create a space for the display of a Central African *Nkisi* power figure. Entry, threshold, light and proportion were also essential components of the project. After scale models and drawings of the designs were completed, two were then chosen to be built full size.

Full and large scale models and constructions also offer the opportunity to illustrate the size, scale and proportion of a given project, and it provides an antidote to the hermetic, often abstract studio experience. In this spirit my students and I visit their sites often to pace out significant spaces of their projects. Scale is essentially the relationship of an object or a space to the human being, so human bodies are ideal for illustrating size, scale and proportion. At Manchester Polytechnic during a series of projects on geometry and proportion, we had the students *en masse* create various geometric shapes using only their bodies. At the University of Manchester, during the mid-point of the "Potter's Studio" project mentioned earlier, we took a field trip to the Yorkshire coast and had the students place and indicate their buildings on the site using again only their collective bodies.



Through the direct and intimate nature of the design process in large and full scale constructions, the realities and implications of the student's concepts and the design process becomes less arcane, more tangible. A focus on body measure directly connects the student with the exigencies of scale and proportion. One project at the University of Manchester was entitled "Apparatus," and asked students to ""design and construct an appendage(s) to your body that either extends or inhibits one or more of your senses." Body movement, materials, and clarity of construction were emphasized, and the project concluded with a performance. The design process of necessity required experimentation and full-scale mock-ups. When it came to the performance many students needed to overcome embarrassment and inhibitions. However, a few were highly expressive, illustrated an integration of body, object and movement, and revealed in particular students a latent stage personality as well .

There are a number of projects that seem to succinctly illustrate the exploration of theoretical concerns through the use of full scale. One project done at the University of Manchester, was entitled "Precious Object" which first required the students to do a multiple view, full-scale drawing of an everyday object, (i.e. scissors, penknife, hand-punch, hand drill...), preferably one with movable parts. Next they designed and constructed a "container" for the project itself that incorporated and celebrated the inherent qualities of the object. This two week project again stressed the true size in the chosen objects. The drawings, done at full scale, I believe illustrated the "true nature" of technical drawings, which is to depict a real and tangible object. The "containers" themselves moved into a different realm. Here, the "context" of the chosen object and its "inherent qualities" resulted in a variety of responses, from clever or refined, to the vaguely sinister (figure 1). In all the demands of the tangible object could not be ignored, and materials and construction were rigorously addressed.

Often full-scale constructions serve to explore issues salient to a particular site and project. An Amtrak Rail Station, sited at a threshold to the downtown of a small city, provided the medium to address fundamental issues related to both formal and social relationships. It focused not only on the site as a threshold, but on the rail station itself as a place of meeting—a liminal space that joins the local and the distant, the static and dynamic, where families meet and say good-bye. Their emphasis was the interrelationship of elements and patterns as opposed to formal objects. Entitled "A Place of Meeting" the project description identified certain relationships implicit in the words threshold, limen, border, meeting, interaction, convergence, interpenetration..., and asked that they be conceptually expressed in a 1' x 3' relief, material collage through a limited palette of materials (figure 2).

A museum and mixed-use project, sited at a prominent site on the edge of the downtown of the same city, emphasized the street as a communal room. The space between buildings, the street, sidewalks, alleys, were viewed as positive space—and a place of convergence of both a physical and social nature. A preliminary full-scale project entitled "Interface" identified certain relationships and asked that they be conceptually expressed. The project concluded with an installation in the university gallery (figure 3). The project description was as follows:

Areas where forces meet—surfaces of contact—these are often places of activity, interaction, irruption and meaningful expression. Our skin—thresholds—streets and alleys—natural and national borders... Express and articulate issues of interface, boundary, edge, in-between, interaction, interdependence, interpenetration... through a large/full scale construction/installation.

Similarly, a performing arts center project considered both the formal and impromptu theater of urban environments, and recognized the value of true public space. It utilized a preliminary, site-specific, exercise entitled "Speakers' Corner,"

preliminary, site-specific, exercise entitled "Speakers' Corner," a reference to the London tradition dating from the 19th century, where on Sunday mornings anyone may publicly speak. (Speakers' Corner was established by the local government of its time as a place for public gatherings and debate—a service it still in part performs. Today, often a simple podium serves as a stage for political or otherwise orations—inevitably with audience participation—a street theater of sorts). The project description stated that open societies and communities have traditionally depended on the freedom to publicly debate issues, present ideas, entertain - often in simple urban settings such as street corners, squares, and public greens. The students were asked to imagine a place in the small city where their project was sited, and construct a platform in the spirit of Speaker's Corner. A limited, appropriate palette of unfinished materials was utilized, as well as issues of craft and tectonics. The project concluded with a performance in situ. Its (not so hidden) agenda was the notion of the value of taking possession and care of public spaces (figures 4-5).

CONCLUSION

It is in the directness and accessibility of full scale projects that much of their value lies. Most aspiring architects enter the field because they "want to build" and yet few experience this in traditional studios. When students design at large or full-scale they can no longer "hide behind" small scale drawings and models, or verbiage. Instead they must confront the challenge of materials, connections and craftsmanship, and their relationship to conceptual and spatial concerns. The projects provide alternatives to traditional design methodologies and serve to challenge dominant cultural beliefs regarding technology and methodology. In this manner process and product approach a degree of integration, and the orthodoxy of technological specialization is challenged.

The holistic orientation of the projects directly challenges the fragmented, overspecialization of our culture. Jeremy Rifkin describes the 21st century workplace as radically changed by technology and automation. The means and methods of education are similarly challenged in a culture that extols the primacy of information, efficiency and specialized training. And yet, the learning environment of the traditional architectural studio has always been problem, not information based, and has emphasized self-directed exploration, personal interaction, and group collaboration. The reflective dialog[11] of the studio can never be replaced by technology, and will always depend on human interaction. This essential foundation of architectural education needs to be recognized and its enduring value affirmed.

This affirmation subverts the culture of technological totalitarianism and serves to re-establish the primacy of human invention and interaction. Therefore, reflection is achieved concerning the twin views of architecture as an expression of the zeitgeist of a technologically myopic society, or as specialized, mechanistic training. A humanistic orientation is not one that is prevalent today, and to speak of environments for human activities invites charges of nostalgia. It is for these reasons that establishing an intelligent perspective concerning the orthodoxy of technology is essential, and needs to be cultivated in the studio culture. Large and full-scale constructions provide an accessible integration of theory, craft and artifact and are an effective means to this end.

Contemporary culture in part insists on the sublimation of emotion and subjectivity. The dominance of objectivity, facts and science is reflected in the equating of humans to machines and is commonly expressed through language. We become cyborgs that are "hard-wired" for certain skills and tasks, and we "interface" with others. The overspecialization of medicine has reduced the body to a mechanism of replaceable parts, fitness is the care and maintenance of a biological mechanism, behavior a predetermined set of reactions, sexuality a repertoire of physical activity. (Our culture does express its dominant beliefs in surprisingly eloquent ways. In sexuality the "Main Street" popularity of bondage and its mechanistic accouterments provides a succinct technological analogy.) It is essential to confront this orthodoxy in an intelligent and reflective way, in part, to marginalize the increasingly reflexive paranoia present in politics. Militia conspiracy theories, religious fundamentalism, trade protectionism—all are unreflective reactions to a culture (and built environment) that is inhuman and mechanistic. Technological developments and consequent changes may be inevitable, but ignorance about their ramifications and proactive alternatives are not.

The direct act of making meaningful objects, and its implication that the built environment is an analogous activity, is implicit in large and full-scale constructions. Technology is a tool—an increasingly complex one, but like simple tools, is fundamentally an extension of our senses. Any extension consequently takes us further away from ourselves—thus we risk losing ourselves to our inventions. This justified concern is one which the late 19th and 20th century share. As Peter Davey states, "The Arts and Crafts people knew that quality of life depends on all five senses, and that it is to do with the experience of making and using artifacts." Now that we find ourselves in the middle of the second technological revolution, the Arts and Crafts belief that "thinking and making should be brought closer together,"[12] is an appropriate and necessary perspective.

The emphasis on humanism, simplicity, materials, craft and the creation of meaningful artifacts promulgated by the Arts and Crafts Movement offers us ways to confront status quo cultural assumptions and the dominant architectural culture. A synthetic approach to architecture promises an antidote to fragmentation and specialization, and a more humane, generous and interactive environment. Large and full-scale projects offer students a means to explore these necessary alternatives.

NOTES

1. William Mitchell, *City of Bits, Space, Place and the Infobahn*, (Cambridge, MA: MIT Press, 1995), p.28
2. Neil Postman, *Technopoly, The Surrender of Culture to Technology*, (New York: Vintage Books, 1992), p.111
3. Mitchell, *City of Bits*, p.24
4. Ulrich Conrads, Ed., *Programs and Manifestos on 20th-Century Architecture*, (Cambridge, MA: MIT Press, 1986), p.35
5. Leon Krier, *Houses, Palaces and Cities*, (London: AD Editions, 1984), p.101
6. Postman, *Technopoly*
7. Peter Davey, *Architecture of the Arts and Crafts Movement*, (New York: Rizzoli, 1980)
8. William Curtis, *Modern Architecture Since 1900*, (London: Phaidon Press Ltd., 1982)
9. Conrads, *Programs and Manifestos*, p.46
10. The root word of mundane is *mundus*, which means the earth
11. See Donald Schön, *The Reflective Practitioner, How Professionals Think in Action*, (New York: Basic Books, 1983)
12. Davey, *Arts and Crafts Movement*, p. 212

THE VERTICAL URBAN ENVIRONMENT OF HONG KONG

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HISTORICAL DEVELOPMENT OF URBAN HONG KONG

Hong Kong[1] has some six million people living on just slightly over 1,000 km² of land. A satellite photograph of Hong Kong will reveal that the urban areas where the bulk of the population lives take up only about one-tenth of the land. Hong Kong's urban areas concentrate mainly in two places: on the triangular tip of Kowloon Peninsula and along a thin coastal strip on the northern side of the Hong Kong Island. These urban areas hold a staggering population density of over 55,000 persons every square kilometre, and urban districts such as Wanchai and Mongkok even have twice that population density, ranking them among the most densely populated places in the world.

Why are so many Hong Kong people crowded into just a small portion of the territory? The answer lies very much with Hong Kong's topographic character. All of Hong Kong's urban areas are built on land with flat and relatively flat terrain, and most of this land was reclaimed from the sea. The rest of Hong Kong is of such hilly terrain—from 100 to about 1,000 metres above sea-level—that large scale development is technically difficult and economically unfeasible.

Since the end of the Second World War, the population of Hong Kong has been increasing at an astounding rate of about a million people every decade. In 1946, just a year after World War II ended, the population of Hong Kong stood at one-and-a-half million. But political and social turmoil in China brought successive waves of illegal Chinese immigrants swarming into Hong Kong. The vast majority of these Chinese immigrants eventually settled permanently in the territory[2]. By the early 1970s, the economy of Hong Kong began to grow steadily, and as a result, there was a great need to develop land for offices, factories and other commercial use. At the same time, a fast rising population of four million people called urgently for land to be developed for housing and other related facilities. The great demand exerted on Hong Kong's very limited supply of land soon set in motion the escalation of property prices in the territory.

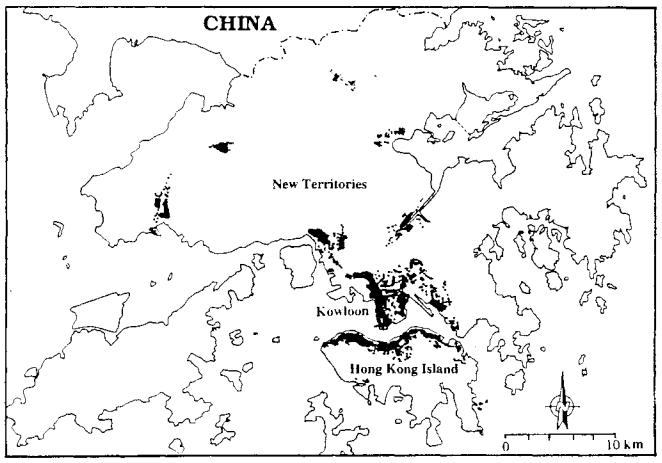

Figure 1: Map of Hong Kong showing the built-up areas (indicated by the darkened patches). The built-up areas on Kowloon and Hong Kong Island are the main urban areas, while those in the New Territories represent new towns developed in the 1980s.

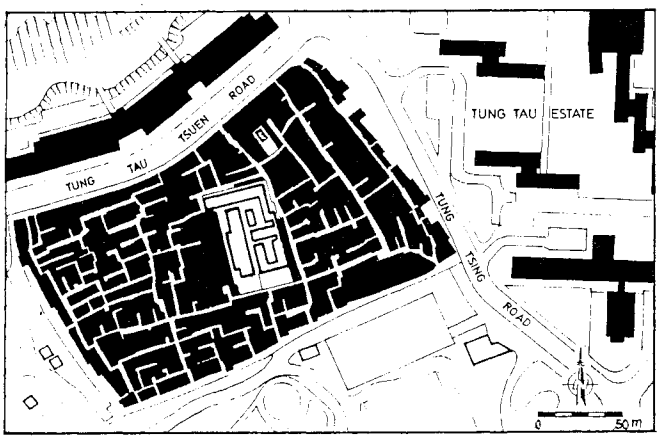

Figure 2: Ground floor plan of the Kowloon Walled City showing its labyrinthine network of streets. The group of buildings in the centre of the Walled City were single-storey buildings used as a school and a community centre.

ANARCHY IN THE KOWLOON WALLED CITY

The combination of post-war population growth, rapid economic development, and the government's laissez faire economic policy caused property value in Hong Kong to sky-rocket over the years. Today, property prices in Hong Kong are among the most expensive in the world. With so much money at stake, no property developer is willing to squander precious gross floor area of any building for anything that cannot be translated into money. This mercenary attitude has determined the urban form and character of Hong Kong by giving rise to a type of architecture in which the built-form is essentially the filling up of the entire buildable volume of a site as legally permitted.

The ultimate example of this squeeze-till-the-last-drop design principle in Hong Kong was expressed in the demolished Kowloon Walled City.[3] Imagine an entirely illegal development