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Architecture for a sustainable society

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ARCHITECTURE FOR A SUSTAINABLE SOCIETY

by

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A Thesis Submitted
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Master of Architecture

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ABSTRACT

ARCHITECTURE FOR A SUSTAINABLE SOCIETY

by David E. Marks

Modernism has radically endangered the nature of mankind's relation to the planet upon which we depend for survival, and humanity now has the ability to destroy our environment. Modern culture is unsustainable, and to avoid disaster new patterns of existence must evolve. Architecture must be a part of this change.

Many forms of architecture for a sustainable society have been posited. Some for a mass society of central control, others for a society returned to the agricultural village, and some for a society of self-sufficient individuals. These fail because they are utopian. Sustainable architecture for America must address the reality of the suburbs. In order to reduce waste of land and energy, a denser fabric is needed. But this fabric must offer the amenities of the suburbs, therefore I propose a melding of the traditional row house and the suburban house types.
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INTRODUCTION

For several billion years life has existed on the earth, and of that vast span mankind has occupied only the brief space of the last several hundred thousand years. One of many animals on the planet, we existed quite modestly for the great majority of our history, slowly increasing in number and spreading across the globe. It has only been quite recently that the creation of urban civilization, a mere five thousand some years old, has made humanity a significant and disruptive force upon the globe (1).

Within only the last several centuries, the originally European phenomenon of modernism has dramatically raised the stakes. This culture of constant, accelerating growth and change has swept across the planet, fundamentally altering the existence of all mankind and the earth on which we depend. It has been the source of great power and knowledge, resulting in the previously mythological abilities of flight, of instant global communication, of moving mountains and of leaving the earth to visit other worlds. Most significantly it has increased the material standards of life for many people.

Yet like Pandora’s box or the forbidden fruit this culture of growth has reaped a toll as horrible as the splendor of its triumphs. Millions of people have been killed and countless cultures erased by the tide of colonists from the burgeoning populations of Europe. Our tools of war have become so powerful that we now have the godlike powers of global holocaust literally at our fingertips. The vast majority of the peoples of the planet, rather than living in the greatly improved conditions of the west, live in poverty and suffer all the disruptions of the modern era with few of its rewards. Finally,
and most significantly, we find ourselves with the recently acquired ability to radically alter and destroy the very ecosystems of this planet of which we are a part and upon which we depend.

Commonplace are the manifold lists of the destruction being wreaked upon world ecosystems: rain forest destruction, ozone depletion, soil degradation, desertification, oceanic depletion and pollution, and global warming. These are all the end results of the essential phenomenon behind modern culture- geometric growth. Human economies have always effected their local environments and depleted local resources, but it is the geometric growth of population, and even more rapid growths of energy and material consumption that now pose such radical problems (2). The "exploitation of the earth's resources cannot continue to expand forever" (3). What we now face is the possible overtaxing of "the capacity of the world to produce food, absorb pollution, and yield natural resources" (4). Whether it is a Malthusian economic collapse due to resource depletion or the destruction of ecological life support systems, the future results of the continuation of the modernist expansion are disastrous.

This is the fundamental and widely held proposition that our present patterns of existence as a species are unsustainable beyond the near future, and that despite disagreement on the exact times and means, we must as a species must adopt a sustainable pattern of existence. Furthermore, beyond mere self preservation, it has been argued that the creation of a sustainable society is a moral imperative, both for the alleviation of current suffering and the obligation to pass the shared inheritance of nature and civilization to future generations (5). Beyond the obvious moral force of avoiding massive human suffering due to environmental or economic collapse, there has also been an increasing questioning of our moral right to destroy the variety
of unique and irreplaceable forms of life that occupy the earth with us. With current estimates of the extinction of one species a day (6) it is not surprising that many calls for the creation of a non expansionist society are based upon concern for non human life, the "rights of nature".(7). In any case, the need for visions of an improved path is compelling.

Architecture, being a primary articulation of the values of any society and a primary consumption of energy and material, is necessarily deeply entwined within any vision of social order. Also Architecture is inseparable from the urban form it occupies. Consequently there is an urgent need for architects to explore the character of their professional production in the context of a sustainable society. In particular, in the United States, which uses a vast amount of resources and generates pollution far beyond the per capita levels of the rest of the world, there is a particularly urgent need to explore the nature of a sustainable society for its culture. So, this paper shall attempt to examine the character of a sustainable, or 'green' architecture for the culture of the United States.

The fundamental patterns of our now globalized culture, our essential reliance upon geometric growth in all its facets for our existence, is a way of life which will end soon as we approach the finite limits of the earth as a resource base and a sink for wastes. Because of the desire to avoid the horror of a rapid withdrawal from our growth addiction, there has been a great deal of theorization about the character of a sustainable society, one more in harmony with our planet’s life rhythms and able to pass the human inheritance on indefinitely into the future.

Perception of the extreme schism between modern civilization and the life processes of this earth predate the currently popular crises of the ozone hole
and toxic waste disposal. The general body of criticism of modern industrial civilization and its relations to the natural world, termed ecology, is about one hundred years old. The word was first coined in 1866 by a German holistic biologist (8), at a time when deforested, eroded land, species extinction and the pollution of coal industry were abundant evidence of a problem. The term has since grown to encompass a broad variety of cultural critiques, scientific critiques and political action movements (9).

Concurrent with the rise of ecological critiques of western industrial civilization has been the rapid increase of urban size beyond any historical precedent, and the related urbanization of the population as a whole. These cities were the generating sites for the forces of modern expansion, and were also the receptors of its greatest destructive powers. As cities became the home of the majority of the population for the first time in history, they also evolved into the most polluted, unhealthy living environment ever known. In the early half of the nineteenth century the living environments in industrial cities were so poor that the life expectancies of the upper classes was under thirty years, and for the working classes it was under twenty years. This trend, originally limited to the cities of the developed world, has become globalized. By the end of the century over half of the world’s population is expected to be urbanized, many of them living in the number of cities in the underdeveloped world, about 42, whose populations are expected to reach 10 million (10).

In the context of the coal choked air, polluted waters and teeming housing conditions of the early industrial metropolises, it is little wonder that the rise of ecological critiques of our civilization as a whole have been accompanied by a variety of proposals for reformed urbanism and the architecture which accompanies it. Reacting to the industrial metropolises of the first world in the nineteenth century, a
variety of utopian reforms of urbanism were proposed early in the twentieth century by architects and planners. These are of crucial importance to any proposals for sustainable architecture today. A cursory examination of the types of building all vaunted as "green" architecture reveals an astounding variety, from single family houses buried underground with self contained water and energy supply systems, to vast hive like constructions, to modest townhouses bestride rolling greenways. These all purport to share a concern for the full range of environmental effects of the building, from energy use to the source and manufacture of materials, yet all have resulted in some radically differing proposals.

The variety in proposals for specific buildings can be explained by the differing assumptions of the sustainable urban context which they are intended to occupy. These differing theories of the nature of an ideal "green" urbanism all essentially stem from the more mainstream proposals earlier in this century for urban utopias. Each of these urban utopian proposals sought to reform the evils of the industrial metropolis, and each embodied very different social visions and proto-ecological elements which the specifically "green" theories are an extension of. These urban utopian visions can be dissected into three essential categories, which I shall term the Modernist Megastructure, the Retro-Village, and the Broadacre suburb.
THE MEGASTRUCTURE

During the first half of the twentieth century, the most popular model of utopian urbanism among architects, and to a degree among planners, was the Modernist Megastructure. This was the advocated model of the Modernists, such as the members of CIAM, and is generally associated with Modernist architectural expression. Its primary characteristic, as implied by the name, is the grand scale of its structures, and coincident with this, the intention of unifying diverse urban functions within a single building, or a limited groupings of the same.

Its central justification is its analogy to the factory, and its productive role within society. In contrast to the inequities, filth and chaos of the industrial metropolis it was to reorder the city to be clean and efficient and provide generously for all by following the methods of industrial organization. It would, like the massive factories, standardize production, centralize controls, and simplify processes so as to engineer them to perfection, thereby offering the benefits to urbanism that the factory had given consumer goods.

This type has a variety of social implications. Just as a factory has a centralized management and is controlled by an elite technical class, so too the megastructural city, with its unified ordered design, the standardization of its parts and the collective assembly of function within a single structure, implies centralized control on a massive scale, -a technocracy. By building all functions into the structure of a solitary building, it both provides the possibility of engineering all aspects of use, and eliminates the possibility of local innovation. It implies the equalization of the individuals who occupy its standardized components, and their
relative powerlessness in comparison to the central authority needed to create and administer its heroic fabric, analogous to their physical diminutiveness in comparison to its scale. It is the urban expression of a centrally controlled, technocratic, socialistic mass society. This implicit nature has held true, this being the favored method of city building of the former Soviet Union, and even of many attempts of the federal government of the United States to house a powerless urban underclass.

As with all of these main categories of utopian urbanism, these characteristics are best illustrated by one of the earliest and best known statements of the idea, its seminal form. In the case of the Megastucture this is the Urban theories of Le Corbusier. Well known amongst architects, his urban planning theories first took form in 1925 in his Plan Voisin, his proposal to demolish nearly two square miles within the heart of Paris and replace them with eighteen enormous cruciform skyscrapers (11). Here in the first of his many radical urban proposals we see the essential characteristics of the megastuctural type so oft reproduced in planning theory.

These skyscrapers were to be the managerial headquarters of the great industries of France, showing the intended allegiance between this type of urbanism and mass urbanism. Even more illustrative of its portentions of central power were Le Corbusier’s intentions regarding the implementation of this radical urbanism. He believed, correctly, that both individual property rights and parliamentary government were inimical to his proposals, and that “some higher authority was needed, and authority that could overcome all weakness and divisions that prevented action. The power to mobilize the soil would therefore be vested in one man, the Minister of Public Works”(12). Here, in the unquestioned seminal form of the type we can see all its alliances to standardization, central authority and the negation of individuality.
This type of urban planning was not exclusive to Le Corbusier. Another famous advocate of it from approximately the same period was Ludwig Hilberseimer. His images of a new city for the machine age are the prime symbol of the horror of this tradition, with their unrelenting repetition of characterless city blocks whose only determinant was to be standardized efficiency. This tradition, formalized in the tenants of CIAM, was later carried on in the work of Team Ten, Super Studio, and the Japanese Metabo lists, to name a few. All of these individuals and organizations continued and distilled the urban ideal of the megastructure into still larger and more oppressive visions.

This vein of urban theory does have some proto-ecological aspects which are fundamentally connected to the type. This is mainly because the root justification for the type was the problems of the early industrial cities and these were largely of an environmental sort. In order to counter the pollution and lack of sunlight, fresh air and hygienic living conditions rampant in the industrial metropolis, the megastructure promised to provide equal access to sunlight and air, and to fill the city with greenery in the voids left by its concentration of the built fabric. The necessity of providing adequate sunlight was a major justification for the tower fixation of the type, as fixed early on by the famous diagrams of the efficiency of solar access in tower slabs created by Walter Gropius. The vast swaths of green space indicated in the Plan Voisin and in all subsequent articulations of the type can also be seen as essential proto-ecological characteristics. Finally, connected to the need for solar access, are the many investigations of design responsive to climate, particularly as seen in the work of Le Corbusier. His Brie Solier, famous expressive parts of his buildings, were all about providing passive solar advantage to dwellings and office space.
All of these proto-ecological elements find their most distinctive and actively ecological formulation in the grand megastructural propositions of Paulo Soleri. Soleri proposes vast complexes, so large that small figures of the empire state building are superimposed for comparison, which are to be “metropolitan solid(s) saturated with flux and liveliness”(13). These Arcologies, which he defines as the physical definition of human ecologies, are like vast “cybernetic organism(s), growing of (their) own volition”(14). They are the totality of all human life contained in a single structure which acts like its own life form, efficiently maintaining its own metabolism, and with the human inhabitants acting almost as ants in a mound or perhaps cells in a larger organism. It is ultimately efficient in its use of land, energy and transportation because of its compactness, and many of the huge arcologies are formally determined by their energy production from non polluting renewable sources, such as rivers, air turbines or solar exploitation. Soleri’s arcologies make the totality of urban existence into a unitized, ecologically sustainable organism, designed far beyond the scale of individual initiative.

Though certainly questionable upon a plethora of technical grounds of efficiency, Soleri’s proposals share the problems of all the megastructural proposals. No matter how bleithe the visionaries are of their potential for human liberation, these are always the physical embodiments of central authority, the total removal of all individual control in the name of the greater good, whether that is defined ecologically or otherwise. This is certainly an inimical idea to the United States, where central authority held in check for the individual rights of the citizen has always been a fundamental aspect of American culture. Such cities, where individual control could be measured in direct analogy to the individual’s size versus the gargantuan
dimensions of the structure, could never be appropriate to the United States, and
hopefully to the world in general.
THE RETROVILLAGE

A second primary current of utopian urban theory in the twentieth century is the trend of the retro village. This utopian ideal is essentially the proposal of recreating village society and its physical embodiment as a palliative against the maelstrom of modern existence. This type has had a particularly rich history within environmentalist circles, because the village society which it seeks to recreate is the only form of human existence which is proven to be sustainable.

This idea, of remaking an ersatz version of a better past condition of civilization had a history throughout the nineteenth century including the neo-gothicism of Pugin, and the neo crafts guild ideas of Ruskin which both sought to re-institute romanticized forms of medievalism as a cure for the ills of industrial society(15). The retro-village type is essentially a direct recreation of the idealized physical characteristics of the agricultural village, by being small in population and pedestrian in scale, self sufficient economically and culturally, composed of a balanced population and set at a predetermined size with abundant access to nature(16). It is usually accompanied by some gesture towards agricultural self sufficiency and the assumption of a cohesive communal life involving social bonds based upon common geography and economic bases.

As an abstract entity it is vulnerable to all the praise and criticism of the actual traditional village. It is a place of security and little alienation because of the intimacy of social networks, a place where the small scale makes it possible for the individual to have some voice, and the restricted scope of the economics makes it difficult for
any abuses, human or environmental, to be affected. Simultaneously it is also subject to the rigid social controls and restricted privacy of the closed social network, to the economic vulnerability of the totally self-sufficient community and the general lack of choice within its constricted boundaries.

Just as the Megastuctural Structural type found its most seminal statement in the urban proposals of Le Corbusier, the Retro-Village found its most fundamental and early statement in the Garden City proposals of Ebenezer Howard. Howard proposed his Garden Cities, small communities of about 30,000 with a self-sustaining industrial and agricultural base, to be the perfect combination of the benefits of both city and countryside, with none of the vices of either(17). His Garden city had all the essential physical characteristics of small size, self-sufficiency, and greenbelt, but more importantly it exposes the medievalism and social constriction endemic to the type. The first of the two models of the Garden City ever produced, Letchworth, designed by Unwin and Parker, clearly show the medieval village that is the root of the types appeal, by making such an authentically medieval appearing village that the uninformed are easily fooled by its nostalgic appearance into believing it is the original item. Equally illustrative are Howard's specific intentions for the administrative details of the facility. Not only was all the land of the community communally owned, but there was to be but one store for each type of good or service rented on a community lease. Here we see plainly how easily local control and democracy could mean claustrophobic constriction and local tyranny within the closed setting of the small community(18).

Since the founding statement of the retrovillage as a urban theory it has recurred in many instances. It is the root of the New Town movement which occupied the British planning authorities for the majority of the century and which
made brief forays into the United States in the form of the Greenbelt Towns created under the Roosevelt administration and the New Town Housing Act of the late sixties which resulted in the creation of the Woodlands newtown just north of Houston. It has even recently made an appearance in the neo-classical urban theories of Leon Krier in the form of his pedestrian urban quarters.

Because of the infusion of pastoral idealism the entirety of the retrovillage type is essentially proto-ecological in nature. The recollection of the village past, the call for agricultural self sufficiency and the physical hallmark of the greenbelt all have made the retrovillage is always a green proposal to some degree. This is seen in the fact that the experimental New towns of the United States during the 1960's were the first developments to include environmental impact statements. However, amongst the plethora of newtown proposals of the last century there are a number which have become most definitively ecologically oriented.

One excellent example of this is the Cerro Gordo Ranch in Oregon, which is a self styled "Ecological Village Community"(19). "The basic design concept of the community is the reintegration of village and natural environments"(20). It is an even smaller far more ecologically oriented retrovillage than the Garden Cities of Ebenezer Howard. While its environmental and social intentions may be noble, it is grossly naive to try to recreate the cohesive, shared culture of the true traditional village out of the population of the diverse United States. One might doubt that without the traditional social proscriptions of the true village, in a situation in which every resident wants to "feel free to try new ways of relating and becoming who we are"(21) that any communal identity should exist at all.. Even if the voluntary interns of this ersatz village are able to form community together, it is certainly clear that any outsiders would not be welcome.
Another recent example of a specifically ecologically concerned tangent of the retro village movement is the Pedestrian Pocket proposals of Peter Calthorpe. Here the Garden City tradition has been diluted and altered for the purposes of accommodating reality and thereby affecting real change. It is, like Cerro Gordo, a much smaller increment than Howard’s Garden cities, being for only five thousand residents on one hundred acres rather than thirty thousand residents on thousands of acres(22). Rather than a conception of an entirely independent entity, Calthorpe proposes an alternative way of building the city from the current suburban sprawl, offering the pedestrian pocket as a place within walking distance of a transit stop, thereby making it a part of the larger urban milieu. “In a pedestrian pocket people would come to see themselves as citizens of the larger region rather than as participants of the fiction of an isolated town or city”(23).It is an environmentalist strategy, with the efficiency of land use(24) and the energy efficiency of clustered housing being offered in contradiction to the waste of the detached home.

The proposal by Calthorpe is a very realistic one and involves the acceptance of much of the reality of today, but it is still enamored to some degree with the idea of community as defined by a physical boundary. This is seen more in the graphics than the writing of the proposal. The diagram for the Generic outline of the pedestrian pocket involve the Radburn model of separated pedestrian and vehicular traffic and semiprivate spaces all linked together to form a enclosed pedestrian network, which when combined with the inclusion of a greenbelt at its perimeter gives the pocket the physical rhetoric of those who belong and those who do not. Though Calthorpe says explicitly that he does not wish the residents to necessarily work and shop within the same pocket they live in, the language of his design still indicates the inward focus that makes this an inheritor of the retrovillage
tradition. Although one may certainly imagine the existence of the pedestrian
pocket within modern society, it shares the essential danger of the retro-village type
of using the flag of ecology to further the economic and racial exclusion which
plague this country.

While the megastructural type of utopian urbanism’s central flaw lies in
its overtures of authoritarian society, the main problem of both the explicitly and
implicitly ecological versions of the retro-village is its constrictive nature. While
community may indeed be nurturing in many ways, it is impossible to retrofit this onto
a society essentially formed around the individual as the primary unit of identity. The
attempt to place our squared society within this round hole always shows the forced
nature of the fit. When communal identity is achieved by segregating out one
income class or ethnic group from the dominant culture, or the physical identity is
created by fences or greenbelts which merely lengthen necessary travel distances
then the poverty of the type is clearly exposed. To attempt to re-institute some
shadow of the physical forms of pre-industrial economic and social relations can only
result in a nostalgic showmanship which is unable to address the broad and
pervasive problems our society faces.
THE BROADACRE SUBURB

If the megastructural form of urbanism is the embodiment of mass society, and the retro-village is the embodiment of nostalgic community, then the final primary type of twentieth century utopian urbanism, the Broadacre suburb, represents the full embrasure of individuality. It is an ideal type which has been approximated in many ways by the actual suburbs which represent the majority of American urbanism today. Here, all the efficiencies and economies which gave the other two types their affinity to ecological ideas are reduced to the individual and her property. It is essentially justified by the mystique of the Jeffersonian independent yeoman, and the defining characteristic of the type is a focus upon the self sufficiency of the individual detached structure as the total unit to which the rest of urbanism is either irrelevant or merely a matter of addition.

As the megastructure found its seminal form in the urban theories of Le Corbusier and the retro-village in the Garden Cities of Ebenezer Howard, so the Broadacre suburb is essentially rooted in the Broadacre city proposals of Frank Lloyd Wright. Wright believed that democracy was the "...gospel of individuality" (25), and this belief is clearly displayed within the framework of his urban vision. His city was to be composed of a uniform scrim of settlement across the land, with a maximum density of one house per acre. Individuals could be agriculturally self sufficient within their holdings, and hold some outside work in office or factory only as need be. He envisioned the single family house which created the city to be a integral organic part of the landscape, and the polluting parasitic relation of the industrial city to the land was to be broken by this self sufficiency. However, to reconnect the isolated
individuals of his vision into a society, Wright envisioned a massive infrastructure of mechanical transportation. It is this transportation technology that allows the citizen to have his cake and eat it too. The benefits of Town and Country, envisioned by Howard to be made available via the small town in the country, are "... all now available to him by means of private car or plane, helicopter, or some other form of fast public conveyance" (26).

This American vision of self sufficient individuals and their houses juxtaposed with massive infrastructure for the private car has played a dominant role in the development of many American architects and is very nearly the actual model upon which the sunbelt cities of the second half of the twentieth century have grown upon. It has also resulted in a number of ecologically oriented urban, or rather anti urban visions based upon the inherently green aspects of the type. As the ecological promise of the megastructure lies in its factory scale efficiencies and total control of urban metabolism, and the retrovillage’s promise in the recreation of the proven sustainability of the agricultural village, the ecological promise of the broadacre suburb is the individual at balance with his land. Rather than the parasitism of modern economies, the individual whose sustenance is the place where he lives is necessarily at balance with it, having no where else to go. The addition of these sustainable units promises the creation of a sustainable society.

This premise underlies all the work of the sixties and seventies on climate and solar design for freestanding houses, all the experiments with buried houses and any ecologically oriented architecture whose primary and sole focus is the individual building and its maximum of self sufficiency and isolated efficiency. One of the most radically ecologically focused architects in this tradition serves as an excellent example. The “earthiship” designs of Michael Reynolds are intended to be entirely
self supporting environments for their residents. "These units must energize themselves, heat and cool themselves, grow food and deal with their own waste" (27). The ecological rhetoric of Reynold’s designs is intense, with the materials being recycled tires and aluminum cans, and the implication of its isolation are evident in the evocation of the ship as its image - the lone resident adrift at sea. He leaves unexplained, however, the method of fulfilling the economic and social needs of the residents, and one can be quite sure that the persons who have already commissioned his earthships have cars.

This is the fundamental flaw of the broadacre suburb, the transportation infrastructure that is necessary to reconnect the individuals who don’t actually desire true isolation. While the retro village attempts to nostalgically re institute community within a privatized society, the broadacre suburb nostalgically creates more individual isolation than is actually desired. Therefore, outside the parameters of the highly efficient individual residence one finds a huge expenditure of energy to reconnect the fractured fabric, creating a consumptive whole that is more than the sum of its sustainable parts. This is well illustrated by the actual fabric of cities like Los Angeles and Houston, as well as the outer suburban rings of most other American cities. One of the primary forms of energy use in the United States is for transportation. It is the sprawled transportation network, founded upon the private car, which makes the sprawled fabric of these conurbations into functioning metropolitan fabrics.

So, all these forms of utopian urbanism upon which most proposals of a sustainable architecture are built essentially suffer from the same problem, their utopian lack of fit with the true circumstances of modern society. By proposing solutions that, though ideally ecologically viable, are either too authoritarian, too crazily communal or too rigidly isolationist, they place themselves beyond the reach
of the culture they wish to inhabit, and so fail to address the very real problems we face. They either are ignored, or when implemented, are adapted to fit the true culture which inhabits them, and so miss their ecological goals in the unseen gaps between the utopian and the real. The problems of our society’s destruction and consumption of the life supporting forces of the planet are very real and immediate however, and if architecture is to have any effect upon these problems it must face the messy realities of our society and provide ways in which it may improve without becoming instantly an idealized, even undesirable characateur of itself.
URBAN REALITY

The reality of modern American urbanism is what Robert Fishman has termed the technoburb. Since the 1970’s more Americans have lived in suburban areas than in traditional city centers or in rural areas, and these suburbs have taken on a very different character from the original bedroom communities of detached houses. These decentralized cities, based upon the highway, are complex networks of residences, services and industry in a truly urban manner, though at the scale of the car. Though founded on the Broadacre ideal of everyman on his land with his car, these are truly interdependent, metropolitan fabrics with as much choice and variety available to the car owner as in the traditional city center. It is composed of complex networks of social and economic ties independent of local geography, providing a means of community appropriate to, or at least chosen by, a variegated, multicultural and individualized society(28). It is a “decentralized environment that nevertheless possesses all the economic and technological dynamism we associate with the city”(29).

This urban structure, for all its advantages, is fundamentally at the heart of the highest consumption per capita lifestyles that place the United States in the forefront in causing environmental disruption and destruction. The technoburb is fundamentally based on the waste of land and energy(30), and must be replaced with a more sustainable pattern of urbanism and architecture. One method of improvement is the increase of efficiency of the individual residence, and of the car as well. Though this is certainly an immediately viable solution, it fails to consider the far greater impact a larger change in the urban pattern itself might have.
One vital way of reducing the enormous waste of our urban patterns is to reduce the reliance upon the automobile for transportation. This is a classic lament, and is at the center of many of the New Town Proposals or Urban reoccupation proposals of the retro-village tradition. By using more energy efficient mass transportation and pedestrian and bicycle transportation, a great deal of energy could be saved. In order to do this a denser fabric is necessary, as mass transit is very inefficient at suburban densities(31). Moderate densities of 15-20 housing units per acre are necessary for transit to operate within its efficient range, and these densities allow the use of pedestrian and bicycle transit as well to become feasible. Another advantage of density is the efficiency of land use, preventing valuable agricultural land and virgin ecosystems from being urbanized.

One must be cautious of easily calling for density, however. There are many good and powerful reasons why Americans have chosen suburban living. Security, space for the possession of the car, and greenery are easily perceivable ones. A simple recreation of traditional row house densities with all the normal configurations of the type would be unsuitable to suburban amenities. The narrow difficult plans and lack of parking of traditional row houses can alone make them unpalatable as a residential type for modern America. The car must be accommodated, not only because it exists, but because in the correct situations it is actually a very efficient type of transport, and it is essential to modern social structures.
CONCLUSION

Therefore an Urban pattern and architecture, which could help create a more sustainable society, one capable of accommodating and embracing the complex metropolitan society of the United States and its technoburbs, could be seen as a conflation of the row house typology and the suburban typology. It would have sufficient density to make strict dependence upon the car as sole means of transport unnecessary, but it would allow it to exist. It would offer the private green space of the suburbs, and attempt to invest the street with a garden aesthetic (which also serves climactic purposes), while also approaching the street and making it a public space in the manner of traditional cities. The buildings which compose the fabric would be built of simple materials and would take advantage of passive and active climactic technology, as well as the inherent efficiencies of party wall construction. Perhaps in this way a architecture for a sustainable, multicultural, individualized, American society could be achieved.
NOTES


2. Ibid. p. 15


4. Ibid. p.164

5. Ibid. p.157


9. Ibid. p. 13


12. Ibid. p.218


14. Ibid. p.23


20. Ibid. p.186

21. Ibid. p. 187


23. Ibid. p. 5

24. Ibid. p. 4


26. Ibid. p. 127


29. Ibid. p.184

30. Ibid. p. 190

PERSPECTIVE
PLAN AND SECTION, SOUTH FACING 30' GARAGE UNIT
PLAN AND SECTION, NORTH FACING 30' GARAGE UNIT
20' UNIT
NORTH AND SOUTH FACING

20' PARKSIDE UNIT - SECTION AND ELEVATION
25' GARAGE UNIT
NORTH AND SOUTH FACING

25' DOUBLE UNIT-SECTION AND ELEVATION
BIBLIOGRAPHY


