A VISION FOR A GREENER CITY

THE ROLE OF VEGETATION IN URBAN ENVIRONMENTS

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Proceedings
ABSTRACT

Ideas about green cities have been around for centuries, however it seems that these ideas have been sidetracked by a strange mixture of opposites: neoclassical economics and town planning regulations. On the one hand contemporary economics has divorced itself from ecology and on the other, town planning regulation, originally based on garden city ideas, has helped to facilitate cities where 'nature' is idealised, packaged and confined to parks and gardens. This paper suggests there needs to be a creative tension between the economic and ecological dimensions if a city is to emerge.

If a vision for Greener City is going to be realised then we need to place this quest within the historical context of those who have struggled with this tension, from writers such as Morris, Ruskin, Howard, Geddes, Mumford, Jacobs, Schneider and McHarg. This lineage has attempted to resolve the contradictions of the industrial city - how to be human and green - or the need for an 'organic' process that sees nature and the city as indivisible. But it seems the modern city (ecosystem), particularly those based on the sprawl based model of Los Angeles, are neither human nor green, and seem to be heading towards collapse ecologically, economically and socially.

The contemporary urban ecology movement, which is now a dominant feature of present urban discussions around the world (at both a professional and activist level) is part of this historical lineage in trying to resolve these issues, but now the stakes are much higher.

Thus it is important to examine our attitudes to the city and how they are influenced by urban philosophers such as those listed above. But often we have been influenced by anti-urban writers who leading urban greening programs that become tokenistic and excuses for people to try and hide urban problems rather than solve them, eg urban sprawl, traffic and waste water.

In this paper we will then show how the tension in these traditions has influenced urban form and the potential for greening, before providing some insights from contemporary physics, ecological economics and ecological design as a basis for the way forward.
of bush which soon needs cleaning up with lawns and irrigation. The human is left to the individual to do in their backyard but has little potential for any expression in the public spaces of our cities. These identical, mechanical, suburbs are now becoming universal - once you could only find them in the so-called New World i.e. North America and Australasia - now they appear in Europe and Asia, Latin America and Africa.

Despite each new suburb claiming to be "a unique lifestyle" or "fresh, country living" they are all absorbed into a monotonous megalopolis that sprawls in every direction, devouring natural bush and farmland, and filling the air with automobile emissions.

In such suburbs 'human creativity' is left to the colour of your garage door and back shed hobbies, and 'nature' to the kind of street tree and vegetable garden you have. 'Radical' means to have a pink garage door and do permaculture in the backyard.

There is a need to get behind the ideas that have led us to this mechanised form of city building. Such mechanistic thinking derives from applying technological thinking to all areas of life (Ellul, 1964). It is described today in rather deprecatory terms as "modernist". This mechanistic era is ending in most areas of human endeavour as post-modern critiques destroy the assumptions that it is built on:

- that all human beings are the same and can be programmed into lifestyles just as a machine can be driven or programmed.
- that nature is not important in itself but can be modified to suit our needs.
- that efficiency is achieved through large scale mass processes whether they be industrial production, water treatment or governance.

(Cook, 1990)

The questioning of modernism began in the creative community (art, literature, architecture...) but in the past 20 years it has been picked up by the environmental movement who saw the impact of the industrial/mechanised mindset on forests, rivers, soils - anything natural and diverse. The creative and the environmental are inseparable parts of the one critique of modernism as the human and the natural cannot be mechanised without both losing their core character. The two are obviously linked when it comes to cities. The post-modernist critique has not however been applied much to cities until very recently, probably because the environmental movement were not focussing on cities until recently. Now across the world the environmental movement has its eyes firmly on the city and is asking: how can it be greened?

**POST MODERNISM AND URBAN ECOLOGY**

This "Greening the City" conference is part of a global movement known variously as Urban Ecology, Eco-cities, Sustainable Cities, Ecological Cities... It is everywhere apparent and it is seeking to find deeper answers to the urban issues of our day than can be provided by better technology or more efficient government. It is a paradigm shift.

It is also still a little confused. Almost any new urban area is claiming to be sustainable. But often these present rural images as their basis for claiming sustainability. For example, the winners of the recent Jerrabombera design competition in Canberra, have presented a design still based around densities similar to the 1/4 acre block suburb and assume that their mixed use and home based work will be economically viable and more sustainable because the proposal is more self-sufficient, more permacultured, more treed, more water sensitive and has more bush spaces (Sustainable Human Habitat Consultants, 1994). This is what we have called the "rural villages" approach and we do not believe it ultimately represents a sustainable urban form (Newman, 1994). It is a rationalisation for making even more sprawling cities, for creating more non-viable hobby farms and for making cities even less able to provide the human services which are essential for city living. It is ideal for renewing country towns but it is not a green city as it makes cities even more automobile dependent. It is a recipe for the smog-bound, dehumanised suburban sprawl of Los Angeles. It is not an ecological or human city.

Our approach is to try and capture some of the traditional character of cities that are both greener and more human than our mechanised suburbia, but to do so using innovative technology and innovative local community processes that can help to facilitate these green and human qualities. Thus we are trying to create "urban villages" as the core of our green cities (see Newman, Kenworthy & Robinson, 1992). The basis of urban villages is that human creativity and ecology cannot be confined to private activities in backyards, no matter how productive or permacultured it may be. Cities are mostly about how communities creatively use their public spaces - the streets, parks, squares, shops, streetscapes, public transport, creeks/
drains, everywhere that is not privately owned and to which we all share in some way. This urban commons is where the important process of community occurs as well as most of the important ecological processes. Facilitating such processes is not new but builds on ideas that are part of a long tradition - the 'organic' city approach to Town Planning.

THE ORGANIC CITY

When any of us travel to Europe or the Middle East or anywhere that there are settlements which are pre-modern there are certain important qualities which become immediately obvious to us. These qualities are often summarised by the word 'organic' which brings together not only its human and green texture but also the processes which allowed this to happen from within the community rather than through an imposed process. These qualities are:

- The buildings are non-uniform but part of a pattern, they appear to grow out of the landscape and in many places are hard to distinguish from it.

- The streets are filled with people walking and all major local destinations are reachable by a short walk. The key to this is the density and mixed land use which has grown from the need to have sufficient people living nearby and sufficient work, shops, schools etc. within walking distance. Each combination of landuse is organic to the city's peculiar history and culture but all have the qualities of a pedestrian place. As Kostoff (1991) says: "Urbanism according to Sitte (German author in 1898) is precisely the science of relationships. And these relationships must be determined according to how much a person walking through the city can take in at a glance." (p.83).

- Nature is not lost in this city. Water and trees can be central to its streets and public spaces and most of all there are strong rural productive landuses immediately adjacent to the city that are integrated closely into the functioning of the city.

These are the 'urban villages' of history and although some characteristics can be found in modern cities, mostly they have been obliterated. It is romantic to suggest that they can be just copied to replace our modern suburbs, but we can learn from the principles and then we can see how our technology and urban processes can help us to green future urban development.

The process which has substantially obliterated this 'organic' form of city is largely due to the Industrial Revolution. It is an incorporation of the mechanistic scientific approach to all aspects of life. It is the problem now recognised by ecological economists who see how mechanistic economics destroys the human and the ecological (Daly & Cobb, 1989). However the specific problems created by the Industrial Revolution itself have not always been negative to the green city.

GREENING THE INDUSTRIAL REVOLUTION CITY

The Industrial Revolution brought about a rapid growth in cities as economics changed from rural production to industrial production. As more people and industrial processes filled the old 'walking cities' of Europe they became impossible to live in. The wastes in the streets and the pressure for more and more housing in the confined walking dimension of 5 km or so, led to a new kind of city - the 'transit city'. New transport technology meant that by trams and trains you could link together a series of urban villages like pearls along a string. This solution meant that walking scale areas could be retained once a new form of linkage was created. And natural areas could be retained in the corridors between development. Australian cities were built in this form in the late 19th and early 20th century. Cities like Stockholm have retained this basic urban form.

The process by which city governments came to build this type of city was town planning. It arose from the ferment of city change 100 years ago and was an integration of the human and the green - it incorporated the social reformers i.e. people committed to greater human health and moral welfare, and it incorporated the environmentalists i.e. those people committed to a city more sensitive to nature and to traditional city forms (see Hall, 1987). Thus the transit city solution was provided as a combination of human/green values and a new kind of technology. Many cities benefited from this solution but all had to battle through the changes from one way of city building to another.

A new profession of town planning was born which acted to integrate and provide the guiding ideas for a city in its layout. Any history of these urban changes will show the struggles to provide an answer to the challenge of building cities involved one group of reformers who stressed the need for organic values in the city. Now as then we find these ideas hard to locate as bureaucratic processes take over and squeeze out the organic life forces. We need to rediscover the origins and basic concepts of the 'organic' city and recognise that the modern day environmentalist who is committed to winning back a more human and
ecological city, is not someone with horns who can't understand modern needs and wants. They are in fact part of a long and important tradition in city building that is neglected at the peril of the city.

THE 'GREEN' CITY FAMILY TREE

The lineage of those who have contributed to ideas on cities can go back into deep traditions of Greek philosophy and Judao-Christian theology. The polis of the Greeks was a place for people to meet together and provide a community that would be more diverse and enriching than individual families separated and self-sufficient. The Jewish city had organic principles at its heart. Zechariah says in 500BC in his vision of how Jerusalem shall be:

"I will return to Jerusalem, my holy city, and live there. It will be known as the faithful city ...
Once again old men and women, so old that they use a stick when they walk, will be sitting in the city squares. And the streets will be full of boys and girls playing." (8:3-5)

and Isaiah railed against Babylon for its oppression of humans and nature and predicted a day when this archetypal city would collapse and cease its oppression:

"The whole world has rest and is at peace, it breaks into cries of joy. The pines themselves and the Cedars of Lebanon exult over you, Since you have been laid low they say No man comes up to fell us." (14:7-8).

The fundamental failing of the Babylon-type city in the Bible is the arrogance of privatism, of thinking that you can live for yourself doing whatever you want in your own backyard without concern for the community and public realm. As Zephaniah said about Ninevah:

"This is the city that exulted in fancied security, saying to herself 'I am and I alone'.
And what is she now? A waste, a haunt for wild beasts,
At which every passer by shall hiss and shake his fist
Shame on the tyrant city, filthy and foul!" (2:15)

But the lineage of importance to this paper is the one that has fought for the green city in modern times i.e. those who stood for the organic city as opposed to the mechanical city, the human and green city as opposed to the dehumanised and artificial industrial/modernist city. This lineage can be seen to follow through the following people:

John Ruskin (1819-1900)
William Morris (1834-1896)
Ebenezer Howard (1850-1928)
Patrick Geddes (1854-1932)
Lewis Mumford (1895-1990)


As you read the literature from these people you can see a common thread of 'organic' thinking - they believe in the need for diversity, human scale, sensitivity to history and to nature, community-based processes and creative artistic expression in the city.

THE ORGANIC PROCESS

The earlier 'green' urban thinkers who won the best elements of the transit city, had some success but now the contemporary organicists are not so obvious. Has the mechanical city been sweeping all before it in recent decades? Are organic/green ideas just forgotten or brushed aside? No! They have been the vanguard of processes that have maintained the best features of our cities. Much has been lost but there are many victories that have been won - all of the above listed people can point to wins and losses in battles that defined their lives and formed the contexts for their writing. All were deeply involved community activists as well as urban writers and academics.

Jane Jacobs' book on the "Death and Life of Great American Cities" has been the inspiration for many victories from Greenwich Village to the Sydney Green Bans. She moved to Toronto in the late 60's and was a major force in that city's choice to stop building freeways and instead to create transit-oriented urban villages as the basis of their development (see Kenworthy, 1991) There are many other stories of hope that we like to collect (Newman, Kenworthy & Robinson, 1992) and each few months there are stories that can be read in every edition of Urban Ecology's newsletter.

THE GREEN CITY MOVEMENT TODAY

Today the organic city movement is alive again and has a new sense of vision - not before time. It is timely because cities continue to grow and sprawl devouring rural and bush land, filling the sky with automobile emissions and creating suburbs where we have considerable ambivalence - we sense something is wrong but don't know quite what it is (Community and Family Commission, 1991). It is also timely as the whole mechanical vision of how we should function is being questioned and torn down by popular culture.

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But we should never underestimate the power of the mechanistic spirit to dominate and control our society, particularly when post-modernism only laughs at it but has no obvious other set of solutions. The 'organic' solutions are however being rediscovered. The urban ecology movement is networked across the world and is struggling to:

a) Stop freeways and provide a new vision for transit-oriented urban villages, pedestrian scale developments, traffic calming, bicycle facilities... (STPP, 1994).

b) Provide neo-traditional planning that emphasises real streets where people can meet and kids can play, which go in a short distance to shops and schools and other activities (Calthorpe, 1993).

c) Bring environmental thinking into city planning through water sensitive design, community permaculture and other green innovations (Hough, 1984; Newman & Mauritz, 1991; Moran et al, 1993), and

d) Establish more community-based participative processes with technologies that can bring local management to urban villages in water, waste, power, open space, transport and other services... (see Newman & Mauritz, 1992). Box 1 sets out the range of community scale technology that is now available to facilitate community processes.

Box 1: Examples of Community Technology

<table>
<thead>
<tr>
<th>Community Technology</th>
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<tbody>
<tr>
<td>Stormwater</td>
<td>local recharge</td>
</tr>
<tr>
<td>- local recharge</td>
<td>- harvesting</td>
</tr>
<tr>
<td>Sewerage</td>
<td>small scale local plants (high quality)</td>
</tr>
<tr>
<td>- water reused locally (industry, community gardens)</td>
<td>- all</td>
</tr>
<tr>
<td>Power</td>
<td>garbage methane and biomass burning</td>
</tr>
<tr>
<td>- renewables</td>
<td>local</td>
</tr>
<tr>
<td>Natural gas and hydrogen</td>
<td>cogeneration</td>
</tr>
<tr>
<td>- local distribution (production)</td>
<td></td>
</tr>
<tr>
<td>Solid waste</td>
<td>- collected, treated and recycled locally</td>
</tr>
<tr>
<td>- composting linked to permaculture gardens</td>
<td>- corridor distributor</td>
</tr>
<tr>
<td>Light rail</td>
<td>- can be local authority owned (again)</td>
</tr>
<tr>
<td>- linked to transit</td>
<td>- community based</td>
</tr>
<tr>
<td>Demand responsive minibuses</td>
<td>- co-ordinates all community buses</td>
</tr>
<tr>
<td>- electronic networking, faxes, videophones, data processing made available in community centres, like post offices</td>
<td>- for job creation and community building</td>
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But the battle for the city is just as fierce as it was in the 1890's when an urban paradigm shift occurred of a similar nature to the one we are facing now (Newman, 1992). Thus at every level these changes are opposed:

a) There is a freeway building frenzy across the world suddenly, almost as though the engineers are having a last desperate push of the old paradigm before they have to admit defeat as they have in Los Angeles after the Century Freeway was declared the 'last to be built' (see Newman, 1994a).

b) There is enormous cynicism amongst Town Planners about neo-traditionalists and urban village concepts - unless they can incorporate the terminology into normal suburbia through planning language and claim that they have been doing it all along. Almost every new suburb today claims to be an urban village.

c) There is constant bickering if not war between EPA's and planning authorities over who looks after the environment in cities - whilst the mechanical suburbs keep rolling out.

d) Service agencies like Water Authorities, Electricity Commissions and Transport Agencies are totally unable to let go of the central powers for localised technologies and management. They are ready to fight it to the end.

But small victories are also achieved and they begin to form a pattern that gives heart to the new generation of 'organic city' thinkers. As the world community confronts this new approach, OECD, ECE, UN and almost every other international agency, even the World Bank, have their Eco-city programmes. The processes of change are gaining momentum at every level but in the end will live and die based on local communities.

WINNING BACK THE GREEN, ORGANIC CITY

In order to rediscover the principles of the green, organic city as we move into a new millennium, there are three important ideas that will need to be incorporated into Town Planning:

- Rediscovering the positive qualities of density in walking-based centres and subcentres linked by transit.

- Rediscovering the positive qualities of mixed land use.

- Rediscovering the positive qualities of natural processes and localised community processes in the city.

Each will be elaborated to provide a final perspective on the green city.
Rediscovering the positive qualities of density in walking-based centres and subcentres linked by transit.

The urban village is primarily human in scale because walking (or cycling) is the best way to get anywhere. Car use will obviously have to be restricted through pedestrianization, parking controls and traffic calming, and there will necessarily have to be electric transit linking those urban villages (making use of the 21st century's renewable fuels). These transport systems will have to be fought at every step (eg see Perth's rail revival in Newman 1992a) but already the priorities are changing in this direction in most US cities as they reach the limits of car-based city thinking (eg California has $10 billion going into new transit systems). However the hardest battle in Anglo Saxon cities seems to be over density where even the smallest dual occupancy proposals are seen as the devil.

There are good and bad reasons why people fear density. The good reasons are that we haven't done much good organic high density design - the 60's flats are about as organic as plastic flowers. But Fremantle and Subiaco in Perth, much of inner Melbourne and Balmain, Glebe and Paddington in Sydney show that we once knew how to do it. And the new Better Cities urban villages are beginning to show that we may be able to do it again. The bad reasons are that we fear the health problems and social ills of high density industrial city slums. One part of the nineteenth century town planning movement (primarily in England) identified all the environmental and social ills of industrial cities as being associated with density. This movement was captured in the Town and Country Planning Association's slogan 'Nothing gained by overcrowding'. They thus put all their marbles into designing new low density 'garden suburbs' and low density New Towns. What they lost was the human scale as nothing was accessible by walking. Milton Keynes is typical of the totally planned 'garden city' New Town with low density heavily zoned urban parts that are set in a sea of heavily watered grassed open space. No-one ever seems to be visible in Milton Keynes, the carefully designed walkways and cycle paths almost unused whilst the roads and car parks are full. Milton Keynes has been studied in comparison with a Dutch New Town called Almere, typical of a European tradition of building at a density that enables walking and cycling to be the central function (Roberts, 1992). The data are compared in Table 1.

Table 1. Comparison of Milton Keynes (UK) and Almere (Netherlands) in travel and land use characteristics. Both are small New Towns. Source: Roberts (1991).

<table>
<thead>
<tr>
<th>Modal Split</th>
<th>Milton Keynes</th>
<th>Almere</th>
</tr>
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<tbody>
<tr>
<td>Car</td>
<td>50%</td>
<td>35%</td>
</tr>
<tr>
<td>Public Transport</td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>6%</td>
<td>28%</td>
</tr>
<tr>
<td>Walk</td>
<td>6%</td>
<td>20%</td>
</tr>
<tr>
<td>Walk &lt;3km</td>
<td>68%</td>
<td>18%</td>
</tr>
<tr>
<td>3-7 km</td>
<td>24%</td>
<td>6.3km (much less for non-work)</td>
</tr>
<tr>
<td>Density Form</td>
<td>45%</td>
<td>35-40dW/ha</td>
</tr>
<tr>
<td>% Trips &lt;3km</td>
<td>200dW/ha</td>
<td>'scattered', separated use.</td>
</tr>
<tr>
<td>Proportion who see a car as 'essential'</td>
<td>70%</td>
<td>50%</td>
</tr>
<tr>
<td>% Households with children under 12 years</td>
<td>52%</td>
<td>16%</td>
</tr>
<tr>
<td>% who are always supervised outside home</td>
<td>6%</td>
<td>48%</td>
</tr>
<tr>
<td>% who are never supervised outside home</td>
<td></td>
<td></td>
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</tbody>
</table>

Both cities are claimed to be influenced by the Garden City tradition but only Almere has anything like the density recommended by Ebenezer Howard 100 years ago. The British Town Planning profession (after Howard) believed they could have a green city without the density needed for pedestrian qualities - they were wrong and the differences in Table 1 show it quite clearly.

The 'nothing gained by overcrowding'/abhorrence of density tradition was exported to all Anglo Saxon cities by the Town Planning profession. It is rarely questioned even though the evidence of social and environmental problems associated with density has been shown to be false and that crime, suicide and health problems are more easily correlated with low density, though in general they are more obviously associated with poverty and poor infrastructure/services (Newman and Hogan 1981).

Canberra is Australia's contribution to the 'nothing gained by overcrowding' tradition. The city is however Australia's second most car dependent city (behind Perth) despite its smallness and heavy commitment to planning (Newman and Kenworthy, 1989 and 1991). Its sprawl for a mere 250,000 people now goes some 30 km and its need for new freeways is as endemic as in Los Angeles. The Jerrabomberra design competition (for Canberra's new suburb) was awarded to an even more low density village with no transit base and no pedestrian qualities. Its 'edible landscape' may not be too tasty from the resulting vehicle emissions.

Town Planning needs to find centres to define as urban villages throughout the modern car-based cities we have constructed. It needs to ensure transit...
systems are built to the centre of each village. And it needs to allow all the creative human forces of its urban citizenry who want to live, work and walk in these urban villages, to be channelled into the rebuilding of a human scale.

People need to become involved in designing, building, landscaping and filling such villages with all kinds of urban activity as Jan Gehl suggests in his study of central Perth (Gehl, 1994). The technology for dense, solar-oriented, urban villages is available to assist this process (Woodroffe, 1994) and Town Planning can ensure that it occurs in an equitable, aesthetic and sustainable way.

We need to rediscover the positive qualities of density, particularly how it can help us create more walking environments in our cities.

- Rediscovering the positive qualities of mixed land use.

One of the other obvious differences between organic cities and modern cities is the degree of mixed land use. Old cities and even late 19th century transit suburbs (inner suburbs of Australian cities) are highly mixed. For the past 50 years town planning has been unmixing cities by the use of rigid zoning that separates single uses into each differently coloured part of the city’s town plan. The rationale was to prevent pollution from industry getting to residential or other areas but that was largely an excuse as controlling industrial impacts was always best achieved by simple health regulations or today through environmental control. If industries cannot meet the standards then they must go further away but the majority of land uses can be completely compatible. Separated zoning was in reality just another reflection of mechanistic thinking that could not accommodate any fuzziness (in the de Bono logic sense) in land use.

The result is a city with less diversity in local areas and a resultant greater level of travel, as well as the associated issues of extra traffic such as reduced safety and attractiveness of local streets. The data on Milton Keynes and Almere show this clearly where one has been rigidly zoned and the other is more organic and mixed with most local services within a short walk. It should be emphasised that residents of Almere preferred this kind of neighbourhood as do residents of Fremantle who in surveys recognised the value of living in a mixed use area as well as using 1/3 of the gasoline per capita of rigidly zoned, low density modern suburbs (Campbell and Newman, 1989).

It is thus entirely feasible to remake cities with a greater mixture of uses - zoning schemes based on mixed use goals are not difficult as has been shown in Fremantle’s ‘inner city’ zone. It is also technologically easy as pollution control and noise-limiting building design can be done in a way that enables most work functions to be integrated back into the city, including those we formerly called ‘noxious’ (Newman, 1991). Indeed the information superhighway means that much information or service-oriented work can be done in local telecottages, or even at home. Although there are often social problems found when there is even greater isolation with more home-based work, the reality is that more and more home-based businesses are starting and most town planning schemes don’t allow it.

We need to rediscover the positive qualities of mixed land use in our cities.

- Rediscovering the positive qualities of natural processes and localised community processes in the city.

This final organic element is more related to process. First, we need to recognise more obviously and clearly the role of natural processes in the city and second, we need to recognise how local community processes can be used to shape the city.

Natural processes such as water systems, soil and air as well as flora and fauna are all part of the city. They provide all the free ecological services and when abused they tend to get back at us. Now we have attempts to turn drains back into creeks, to find ways that nutrients and organic wastes can be reused in the urban system rather than just flowing through it, to find out the limits to the air’s natural assimilative and cleansing capacity, as well as the capacity of water bodies such as rivers, lakes and estuaries on which cities are built. By understanding better the local ecology and how the human ecology of the city interacts with it, a city is becoming more organic. Such processes are well underway particularly when it comes to bringing water back into the city in a more natural way through completely functional systems for managing stormwater that also are a celebration of water in the city.

Local community processes have always been seen as necessary for supporting local government functions but not in any significant way for the important urban ecological functions of energy use, water supply, sewerage systems, recycling and public transport. As suggested before, the development of community-
based technology in recent decades has meant that smaller-scale provision of these services is now feasible. Local government used to manage most of these things 100 years ago when organic solutions in the transit city were being created. But most of this century has seen them centralised into larger and larger scale city-wide systems - usually justified by greater efficiency due to the scale and efficiency of large systems.

However modern industry has discovered that such efficiencies are usually lost because the human element is lost, thus Post Fordism is showing us how to break up large systems into more easily managed, locally responsive units that can enable the total system to work better. Quality in management is now recognised by the business world to be associated with greater autonomy in local decision making. This is echoed in the appropriate technology literature by the recognition that quality can be associated with small scale, locally responsive systems rather than the gigantism fetish of our 20th century engineers.

In order to have space for locally managed urban services, especially eco-services like water and waste management there will need to be a trade off with density increases for pedestrian village qualities. It is not hard to see that densities should increase around transit lines and in centres of activity but adjacent to this there may be low density areas of parkland combined with community permaculture/water recycling and waste management.

None of this will be done just for ecological purposes though it is a powerful pressure. It is our contention that a localised, organic approach is also better for social and economic reasons. Jane Jacobs in her many books on cities says that grand economic schemes do little for cities but the real vitality comes from the intricate, diverse relationships that flourish in urban communities where people meet casually in streets and social gatherings. She concludes that the 'science of city planning and art of city design, in real life and in real cities, must become the science and art of catalysing and nourishing those close-grained working relationships' (Jacobs, 1961).

There is much to gain from enlightened experiments in locally managed urban services that can help us to see whether such organic processes can work in the 21st century city. The shift in power structures, as with most areas of the city and its future, will not easily happen but the process is certainly worth fighting for.

We need to rediscover the positive qualities of local variability and local knowledge if we are to have green cities.

CONCLUSION

Greening the city is a process that is high on the agenda of cities around the world. It is not a new process as it has always been an agenda item for those who saw the organic qualities of the human and the ecological as essential parts of how we should live. It is important to see this long lineage. But there is a new edge to the need for greening the city not only because of the obvious maladies of today's cities but because the mechanistic approach which has dominated city building for this century is now seriously under question. Rather than despairing we should be grasping the opportunity to pursue innovative, organic solutions such as dense urban villages with walking qualities and transit linkages as their primary design characteristic, mixed land use as the basis of zoning and urban processes that incorporate nature and the local community at the heart of their rationale. The lineage of green urbanists gives us hope that the new burst of recognition will not be wasted but will leave a legacy that future generations will appreciate.

REFERENCES


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