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Healthy cities: Self-reliant cities

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SUMMARY

Today the global village is the metaphor that informs our actions and guides our conduct. The world economy now depends on long distribution lines, major transportation subsidies, large-scale production systems and a separation of authority and responsibility. Every community becomes totally dependent on others as suppliers of its materials, products, capital and as recipients of its wastes. This results in fragmented, passive and unhealthy communities. A healthy city is a self-reliant city, capable of determining its own future. The self-reliant city emphasizes holistic planning. Local self-reliance builds a self-confident and engaged citizenry while it strengthens local economies and protects the environment. Prevention, efficiency and the primacy of localism are the three governing principles of the self-reliant city.

Health is a by-product of the way a community is organized and the way its members act. This is no longer a controversial statement. As one Canadian health study concluded, "Self-imposed risks, lifestyles and the environment are the principal or important factors in each of the five major causes of death between age one and age seventy . . ." (Lalonde, 1974). Dr John Knowles, then President of the Rockefeller Foundation observed, "Over 99% of us are born healthy and made sick as a result of personal misbehaviour and environmental conditions" (1980).

We know that lifestyles, the environment and the economy are leading causes of morbidity. One study notes that they are the leading contributing cause of death for 11 out of 14 major causes of death, from heart disease and cancer to motor vehicle accidents and suicides (Dever, 1972). Johns Hopkins University researchers have quantified the relationship between unemployment and child and wife abuse, suicide and alcoholism. We know that stress can cause not only peptic ulcers and high blood pressure and headaches but can lower general resistance to organic infections (Selye, 1976).

The conclusion that a healthy life stems from a healthy environment and a healthy attitude is inescapable (See, for example, Moore, 1980; Lindheim, 1983; Hinkle). The World Health Organization declares:

> What is now emerging as the New Public Health is a synthesis which brings together environmental change, personal preventive measures and appropriate therapeutic interventions, especially for the elderly and disabled. However, the new preventive medicine goes beyond the historical focus on biological understanding and recognizes the importance of those social aspects of health problems which are lifestyle related. These health problems are seen as being social, rather than solely individual manifestations of dysfunction; underlying them are tangible issues of local and national public policy which city government is in a strong position to change or influence. (1986)

The Health For All programme focuses on cities for several reasons. Fifty per cent of the world's population will live in cities by the year 2000. Moreover, "The city with its own political mandate and often highly developed sense of civic pride is again uniquely placed to develop the kind of citizen-responsive health promotion initiatives which are necessary to tackle the new health problems of the 21st century. As the most

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decentralised administrative level which can marshal the necessary resources and which has wide-ranging responsibilities and networks it is in an ideal position to support the kind of intersectoral process which leads to creative, effective and efficient action." (*Ibid.*)

The WHO Constitution, adopted in 1946, defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". To achieve this goal requires profound societal changes. "Without peace, social justice, enough food and safe water, adequate education, decent housing and a useful role in society and an adequate income for every person, there can be no health for the people, no real growth and no social development." Thus the Health For All programme recognizes the need for systemic changes to achieve good health and focuses on the city as the primary mechanism to effect these systemic changes. However, having gone this far, WHO stops short of developing a new view of the city itself. The city is seen as an active agent to improve the health of its citizenry, but its overall function and status within the national and international arena remains unaltered. We continue to view the city as a passive, largely dependent entity on the world stage, a minor node in a global network. This poses an inconsistency that could hobble the Health For All project. *An active, vigorous, independent, healthy citizenry cannot be achieved in a passive, dependent, fragmented city.*

The global village haunts our imagination

We are governed by our metaphors. More than a century ago Henry David Thoreau observed, "A man is wise with the wisdom of his time only, and ignorant with its ignorance. Observe how the greatest minds yield in some degree to the superstitions of their age." The global village is the superstition of our age. We see history as an irreversible process in which smaller, self-sufficient villages lose their independence as technological development demands and makes possible larger and larger economic trading systems. We see the planetary economy as an inevitable historical outcome, the next stage in economic evolution. The planetary economy brings improved productivity and innovation and prosperity but demands the price of free and unrestricted movement of capital and materials and people.

Mobility has become synonymous with progress. Mobility implies separation. Separation has come to characterize our societies. We separate the producer from the user from the disposal site. We separate the farmer from the kitchen, the worker from the factory, the power plant from the appliance, the citizen from the government, the banker from the depositor and borrower. Cities have become gigantic organisms, relying almost entirely on imported raw materials and products. A city of 100 000 imports 200 tons of food, 1000 tons of fuel, 62 000 tons of water each day. It "exports" 40 000 tons of human waste and 100 000 tons of solid waste a year.

Hand in hand with mobility and separation goes inefficiency. Thermodynamically our economies are extremely wasteful. Our central power plants convert only 30% of the energy consumed into useful work. Our automobiles and trucks are less than 20% efficient. We put in more than two Calories of mostly oil energy for every Calorie of food energy we get out of our agricultural system. We throw away more than 50% of what we consume.

Mobility. Separation. Inefficiency. A fourth feature of our economies is the emphasis on change. We have become consumers of change. In the United States 30% of the work force changes jobs every year. Almost 20% of the entire population moves each year. A sign of the times is that Mother's Day constitutes the single day's largest long-distance telephone sales. Children move hundreds of miles away from their parents and then relate to them sporadically through the miracle of modern electronics.

The driving force behind the new economy is the broker. Currency brokers. Stock brokers. Real estate brokers. All make their money on change. Change and the movement of goods and people from one place to another account for an increasing proportion of our economies. More and more people earn their money from change and the movement of products and people.

The global village produces unhealthy communities

Long distribution lines, inefficiency and separation give us fragmented, passive and unhealthy communities. A community's capacity to act in a concerted and coherent fashion declines. The cover of the Healthy Cities brochure depicts a city as a flower. Each of its petals represents another

sector of the community: recreation and leisure, employment, social services, environmental health, arts and culture, transport and communications, energy. The petals are all connected to one centre, through it they are connected to one another. The flower has biological symmetry and harmony.

But the reality of our cities is that the petals/sectors are not connected to a centre nor to each other. They do not look inward to the centre of the flower, but outward to external forces. Outside government bureaucracies establish the rules for many sectors. External owners guide our productive assets. This results in a passivity on the part of many local officials who view development as a process of attracting outside capital and selling to distant markets while dumping the results of one's system's inefficiencies in someone else's backyard.

The dependent status of our communities makes us susceptible to the message of the futurists who warn us that history is speeding up and only the totally adaptable will survive. The titles of these best-sellers reveal their message: *The Third Wave*, *Megatrends*. The future becomes an independent variable, unstoppable, inevitable. Our task is to understand its dynamics and to make the appropriate changes in ourselves and our communities. Since nothing is completely knowable, our best strategy is to jettison as much of our community baggage as we can and become completely flexible. To prepare for momentous change, we must strip ourselves of our stationary, place-related values and be ready to body-surf on the tidal wave of unstoppable forces that will soon crash on our communities.

In the global village, community has no significant role other than caring for the broken hearts and broken homes the global village creates. Indeed, a community that exercises authority is often viewed as subversive, an impediment to progress. Progress demands flexibility, change, mobility. Communities are parochial. They protect turf and desire stability and continuity. Therefore they must be subordinated. In each of our countries the nation-building process has subordinated local authority. In my country we now celebrate the 200th anniversary of the Constitution. America was not founded in 1787. It declared its political independence from Great Britain in 1776 and signed a peace treaty in 1783. But for most Americans the country began only in 1787 when a strong central authority was created, primarily to allow for the creation of a free trade zone and easier mobility among the separate states.

Today we are told that further economic development requires planetary free trade. Even now our respective national leaders are discussing strategies by which our nations can subordinate themselves to an even higher authority that will guarantee even greater mobility.

I was reminded of how much we take the global village for granted when I stopped in a Minnesota restaurant and picked up a toothpick. It was wrapped in plastic foil with the word "Japan" on its edge. Japan has no wood and no oil. Yet in the 1980s we transport oil and wood to Japan, wrap the one over the other and transport them to Minnesota. A single toothpick embodies more than 50 000 miles of transportation. This absurdity of modern economics was compounded last year when one Minnesota town opened a chopstick factory and began exporting them to Japan. I have this image of two ships passing one another in the Pacific, one loaded with toothpicks from Japan to Minnesota, the other loaded with chopsticks from Minnesota to Japan. Such are the attractions of the global village.

I was reminded of how much we take the global village for granted by the sad odyssey of the Islip, a New York garbage barge. This barge, with 3100 tons of rotting garbage was denied entry for months by five states and three countries. Meanwhile Washington tries to dump its sludge in Haiti; France signs a multi-billion dollar agreement to dump its nuclear wastes in China and Japan; Great Britain and the United States coordinate a research programme to send torpedoes loaded with radioactive materials into the bottom of the ocean. Great Britain's coal-fired power plants may be responsible for 50% of the damage to West Germany's forests. The Chernobyl disaster may have changed the very culture of Sweden's Laplanders. Garbage imperialism grows out of the global village.

An integrated planetary economy was supposed to make us secure. Yet, as Benjamin Franklin warned us more than 200 years ago, "The man who would trade independence for security usually deserves to wind up with neither." Global trade and increased mobility have tended to exacerbate, not reduce, tensions. Increased trade between north and south has not improved living

standards in the south. Developing nations borrowed huge amounts of capital to build the physical infrastructure necessary to promote exports. The resulting debt forced these nations to accelerate exports to earn the hard currency to repay the debt. Export growth often comes at the expense of production for domestic markets. Thus Brazilian *per capita* production of basic foodstuffs (rice, black beans, manioc and potatoes) fell 13% from 1977 to 1984 while *per capita* output of exportable foodstuffs (soyabeans, oranges, cotton, peanuts and tobacco) jumped 15%. Yet Fernando Homem de Melo, a leading Brazilian agronomist, can declare export promotion "a matter of national survival". In the era of the global village a nation survives by starving its people.

Transportation systems have become increasingly dangerous. In the United States 40-ton trucks now ply the highways, up from an average of 20 tons five years ago. These trucks are several times more likely to cause serious accidents. They increase pollutant run-off from roadways. Diesel engines account for 40% of the smoke emissions in Britain today. By one estimate diesel smoke makes up 80% of the 140 000 tons of elemental carbon emitted across Western Europe each year (*New Scientist*, 1987). The black, sticky and oily particles in diesel exhausts blacken the walls of city buildings and are probably a significant health hazard.

Heavier trucks also mean more noise. Noise has become a major menace in urban areas. The noise level has been gradually rising over the last two decades. Localities often have the authority to regulate noisy record-players and lawnmowers and barking dogs but they lack the power to regulate the noise from our transportation systems. The newest noise generator in urban areas is the aeroplane. Commercial air traffic in the United States has doubled since 1982. Business plane traffic has increased 400% since 1978. Air freight business is mushrooming. Businesses can now send packages overnight. The price they pay is nominal. The price thousands along the route pay is an interrupted night's sleep. A Swiss study found that road traffic noise needed to be more than twice as loud as aircraft noise to cause an equal disturbance (Grandjean, 1976). Another study examined the incidences of cardiovascular problems, doctor contacts and drug purchases for areas near Amsterdam's Schipol Airport and concluded that "airport noise, as prevalent around many airports, constitutes a very serious threat to public health in all its aspects: affection of well-being, mental disorders, somatic symptoms and diseases (especially cardiovascular diseases)" (Knipschild, 1977).

Change equals psychological loss. People who leave their jobs or their homes or move away from their communities face psychological traumas. As we move away from our families the cost of medical care increases. It has become increasingly expensive to replace the extended family with state-sponsored emotional support systems. The telephone call to mother does not replace the hugs and smiles. The loneliness of parents separated from their children leads to depression and alienation which often can be expressed by acute physical symptoms.

A new paradigm: A globe of villages

The global village captured our imagination for many reasons. For almost a century the price of energy declined. That allowed us to design inefficient systems without paying an economic price. The cost of disposing of wastes remained low for almost a century. Technological change seemed to demand bigger production systems and wider markets. As we switched from wood to steel in the late nineteenth century, with the advent of the internal combustion engine and the growth of nuclear power, big did indeed appear to be beautiful. The increased centralization of authority in the nation state overrode local political revolts against the global village. We came to equate mobility with freedom.

But in the last 15 years the underlying factors that made the global village appear worthwhile and inevitable have changed. The price of energy is no longer low. Disposal costs are rising rapidly. Both changes have occurred because of a political revolt. OPEC refused to accept minimal prices for its oil. Communities refused to allow garbage to be dumped in their backyards any longer. The price of oil jumped from $1.75 to $35 per barrel in ten years. The price of garbage disposal has risen in the US from $5 per ton to more than $50 per ton in just the last seven years.

The political revolt against long distribution systems takes many forms. In the late 1970s Minnesota farmers began shooting out insulators on high-voltage transmission lines to stop these potentially harmful magnetic fields from crossing their lands. Cities and states in the USA

are desperately trying to prohibit the transport of radioactive waste through their borders.

We are beginning to assess the costs of separation, mobility and inefficency. The data are still imprecise but some conclusions are warranted. Inefficiency and separation produce pollution. Separation and change generate anxiety. The breakdown of community from increasing resource mobility affects the health of its citizenry.

Change undermines community and promotes stress. Some change is certainly necessary. A society should be open to accepting those new technologies and new ways of thinking that expand human freedom and well-being. But rapid change promotes disease. Communities should be able to import a better way of doing things without causing widespread misery. They should be able to cope with changing resource economics without technological breakdowns. But resiliency is different from an infatuation with change. A healthy community is not only resilient but is independent. It is capable of influencing its future.

That brings me to my main argument: a healthy city is a self-reliant city. Clean air, clean water, peace, quiet, a strong sense of community, and a sense of well-being can be obtained most effectively and cheaply through a strategy of local self-reliance. Biologist Russell Anderson defines self-reliance as "the capacity for self-sufficiency but not self-sufficiency itself" (1979). A self-reliant community is self-conscious and self-confident. A self-reliant city has the capacity to produce most of its basic necessities.

We need a new metaphor to replace our infatuation with the global village. We need to strive for a globe of villages, a planet comprised of self-sufficing communities, where trade is in information and knowledge and culture but not in goods or materials.

The principles of a self-reliant city

A self-reliant city relies on prevention. The late economist Ernst Schumacher remarked, "The smart man solves a problem. The genius avoids it." The data is clear. Birth control and sex education programmes cost pennies compared to unwanted pregnancies. Seat-belts and bumpers that deter physical damage are much less expensive than hospital emergency rooms and high repair bills. Recycling is cheaper than waste disposal. Energy conservation is cheaper than new power plants.

The second governing principle is efficiency. The self-reliant city extracts the maximum amount of useful work from its local resource base.

The third governing principle is the primacy of localism. Authority and responsibility go hand in hand. Communities take responsibility for themselves and are delegated the authority to establish rules that determine their future.

A self-reliant city treats itself in holistic fashion. Consider what the application of the three governing principles might imply when applied to the area of waste management. What if communities were to become responsible for their own wastes? What if legislation were enacted that required wastes to be disposed of within ten miles of their generation, whether the point of generation be a mine, an office building, a retail store, a manufacturing plant or a household? What if, in complying with this law, the power plant and industrial smoke-stacks were allowed to be no higher than chimneys, so that any pollution would fall on the surrounding community?

The result would be to force communities and businesses to dramatically increase the efficiency with which they extract useful work from their resources. One immediate result would be to change the nature of the current debate about garbage disposal. Currently waste-to-energy plants are favoured. These plants convert 100 tons of relatively harmless garbage to 20–30 tons of potentially hazardous waste ash residue. They reduce the need for landfills but increase the need for more secure landfills. Moreover, they produce significant pollution. One 2250 ton per day plant will generate as much lead as 19 000 cars using leaded fuel and travelling 30 miles per day (Martin, 1987). Thus, even as our respective national governments introduce regulations to reduce automobile lead pollution, they encourage the construction of garbage incinerators which would generate almost as much lead pollution.

Technically we can already easily triple our overall resource efficiency. What would be the implications of this? First, we would reduce pollution considerably. As the late Buckminster Fuller observed, "Pollution is merely an unharvested resource." By reducing pollution we

would reduce the diseases generated by dirty air and contaminated ground-water and soil.

Second, we would refocus our scientific and engineering resources on prevention and the design of elegant systems rather than treatment and the design of inefficient systems. One product of this new focus of science might be the development not only of ways to recycle existing materials but of ways of extracting useful work from overlooked resources. Consider the example of Ted Taylor, an American physicist who has used water to replace electricity. He sprays a fine mist of water into the winter or cold night air. It freezes into a slush and drops into an excavated pit in the ground. An insulating cover keeps in the "coolth", which can be tapped for its chilled water days, weeks, even months afterwards. A cheese factory on the US-Canadian border has used this ice pond technique for three years. It pays for itself in less than two years by replacing electricity that would otherwise be used to keep the food cold. The technique can also be used to desalinate water and to decontaminate water.

Consider also the potential for raising algae as a basic raw material. Scientists can now convert cellulosic material into biodegradable plastics with almost any properties. Currently our forests produce about five tons per hectare per year. Our crops produce no more than seven tons per hectare per year. But algae can produce more than 125 tons per year. They can convert a higher percentage of solar energy into chemical energy than ordinary crops.

The technical capacity exists to reduce by up to 90% the amount of materials our communities must import. Moving in this direction would greatly affect national and international commodity prices. It would also reduce the need for transportation.

By becoming responsible for our own wastes we might reinforce the links between city and countryside. One study in the USA found that in densely populated states a combination of human sludge and organic waste could fertilize much of the land needed to grow the foods needed for a healthy diet.

If communities were to recover large amounts of scrap material it would encourage local processing facilities which in turn encourage local final product manufacturing. The data is preliminary, but it appears that manufacturers relying on scrap materials are not only less polluting and require less energy and water but can also operate profitably on a much smaller scale. Consider the case of steel, the first industry to move significantly from a reliance on virgin ore to scrap. Mini mills, which rely on 100% scrap steel, already possess 30% of the market. They produce about 100 000 tons per year compared to 1 million tons per year for vertically integrated traditional steel works. The US has seven years of steel in its existing cars. Since the amount of steel being used is declining because of competition with plastics and anti-rusting techniques, one could argue that we have a sustainable supply of steel already.

This example shows that self-reliance as a strategy affects many traditional agencies and sectors. It becomes a basic organizing principle for a healthy society. By reducing pollution it reduces disease. By reducing consumption it reduces transportation which reduces stress and disease and frees more land for more valuable pursuits. By producing large amounts of organic material it strengthens the linkages to rural areas, encouraging a higher consumption of fresh food and better dietary habits. By reducing disposal costs it improves municipal budgets and increases discretionary income, both of which can be used for primary health care if needed. It creates new industries which serve local markets, thereby reducing imports and strengthening the local economy. Finally, the knowledge derived in the process can become a major export commodity, for lands short of resources in developing countries would willingly buy the licence for technologies that are based on cities that are short of resources in the north.

A self-reliant city values work not so much as a means to earn a living as a means to building self-confidence and an active body of citizens. A job provides one with a sense of belonging and accomplishment.

A self-reliant city redefines the concept of work. Fifty per cent of our productive work comes from volunteer labour, most of it from mothers and housewives. Yet these have relatively little recognition. The informal economy is the foundation that supports everything else, just as the manufacturing sector supports the service sector, although today the service sector is twice as large.

A self-reliant city values coherent neighbourhoods. The late psychologist, Eric Fromm, once told me of his conviction that there was an

inverse relation between the number of neighbourhood taverns and the number of psychiatrists. Once upon a time the bar-tender heard your problems over a ten cent beer. He could not solve your problems, but he knew you and the family and could nod in the right places. And in your drunken stupour, you endangered no one by walking home. Today you pay $50–75 per hour to go across town to see a psychiatrist who doesn't know you or your family and can't solve your problems either. In the US a major controversy has broken out over whether health insurance should include mental health costs, while the number of neighbourhood taverns continues to decline.

Moving towards a globe of villages

The first step in moving towards self-reliant cities is to redefine the way we allocate our resources. To do this requires us to develop a new decision-making methodology that more accurately weighs the costs and benefits of different projects.

This process has already begun. One of the enduring legacies of the environmental movement has been the quantification and internalization of external costs on the producer. The costs of pollution in terms of sickness, deteriorated buildings, laundry bills, lost work and reduced productivity have been well documented. Some economists and mathematicians have also begun to quantify the costs of monoculture, that is, of relying on one large technology rather than on a diversity of smaller technologies. In the USA for example, improved reliability and resiliency have been used to raise the price electric utility companies pay to small power producers. Insurance companies have begun to lower premiums to employers whose employees undertake wellness programmes that include exercise and good personal habits.

But traditional economics cannot be expected to do it all. We must impose our values on our decision-making process. The US Department of Commerce 1985 publication *Social Indicators III* notes, "Good health, family life and peace of mind are the only three components to be regarded as very important to a happy, satisfied life by over 90% of American respondents." Achieving these goals is not difficult if we change the way we value things. For example, stability and continuity might become evaluative criteria. People buying homes in a community should receive lower interest rates depending on how long they have lived in the community. Belonging should become a high priority.

A healthy individual has the capacity to determine his or her future. A healthy community has the same capacity. The Healthy Cities project can quantify its success in part by examining mortality and morbidity tables. But to address the larger concerns of peace and justice and equity it must consider the issue of governance and the primacy of localism. A global village has no place for vibrant, self-directing communities. A globe of villages does. It creates a new kind of inter-dependence in which communities trade with one another the new-found knowledge and culture they create. They pay a licence fee for the use of this information. These licence fees comprise the largest portion of the global economy. But no community becomes dependent for its well-being on the products or materials of communities around the globe. Personal security and national security become synonymous.

Cities are the storehouses of a nation's knowledge. Their density provides the catalyst for the development of new knowledge and innovation. Although the extent of local authority varies dramatically from one country to another, every city retains at least a modest amount of power to mobilize and educate its residents. The metaphor and paradigm of the global village haunts our imagination but it undermines community and good health. We need a new way of thinking, a new metaphor to inform our actions and guide our efforts. Modern science and technology allows us to recreate independent and coherent communities while sacrificing none of the good life. The globe of villages beckons.

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