

## HEALING THE CITY:

### Thoughts on Urban Permaculture Design

by Declan Kennedy and Kathleen Battke (Aug 2007)

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What does ecology mean in urban design and planning? Where does a 'perma-city' come into the picture? Indeed, what does permaculture mean within the context of 'urban design'?

A perma-city or a designed eco-city with as many permanent cycles as possible would use less natural resources (energy, water, food, etc.) and produce less waste (heat, air pollution, water pollution, sewage, etc.) than a conventional city. The terms "perma-city" and "eco-city" are – as the term "sustainable city" – relative. It is difficult to term one city as objectively sustainable and the other as not. But if we see it as a development process going on (that never ends!), or a spiral movement upwards, these terms can indeed be helpful to mark tendencies.

A city can, however, become more sustainable by taking certain actions. As the perma-city idea applies to buildings, housing and other components of a city, some of the most obvious measures are:

- Planting fruit, vegetables and other productive plants on roofs, facades, and in open spaces
- developing and putting emphasis on public transport
- cleaning and recycling surface water discharge
- saving fossil fuels – CO<sup>2</sup> discharge
- producing and using predominantly solar energy
- creating green corridors which flush dense urban areas with fresh air
- setting up healthy buildings – aiming at Com-Post Modern Architecture.

Many experiments to implement permaculture principles into urban settings are happening all over Europe since the 1970's - but all too few. We are not catching up with our environmental degradation in cities – quite the contrary. However, most of the successful experiments are 'bottom-up' initiatives, often based on technical principles – but still they are not always economically and socially sustainable.

As yet, few permaculture groups have gotten together and managed to get sustainable urban projects going. But there are some beautiful examples that can give us hope for an otherwise often pessimistic situation.

Such examples occur in free spaces in cities, such as

- unused areas
- demolished or unused building complexes
- in-between areas,

These areas are often used by citizen initiatives for temporary experiments, city farms, instant parks, wild-life corridors, etc.

In the 1970's, after the first oil crisis, many experimental projects were started, got a lot of publicity and then faded into oblivion. Later, in the 80's and the 90's, the self-administered, self-help housing projects were prevalent and these last to the present day – some even aiming at accommodating all generations. The food and energy self-sufficiency examples in Amsterdam and Berlin, Dublin and Hamburg, London and Melbourne, Seattle and Singapore, for instance, were seen as utopian but had a high educational and emotional component, especially for inner-city children, senior and immigrant citizens who are not always as mobile as the mainstream population.

The general lack of financial resources, due to the overall prevalent demand for high interest rates on hoarded monies, often create new slums out of old and even 1960-70's housing areas. These were and are the targets for squatting by peripheral and younger groups who often start new

social, economic and technical innovations. The complementary currency movement has originated partly from these situations, from run-down rural and urban regions - but also from permaculture designers realising that their projects 'do not always pay'. Here, again, we see a great potential for normal citizens to empower themselves, to pull themselves out of the often appalling environments and to allow a more or less permanent solution for urban dwellers. Cities will always be with us, and the more perma-cities we create the better.

*And we can do it!*

## **Settlement Patterns**

Many food and cosmetic producers, regions and hotels use the label BIO nowadays. The word "ecology" is in every mouth - even conservative politicians tend to picture themselves as ecologists. Great! We are getting places. After all, the word "conservative" comes from the verb "to con-serve" - *to serve with*. Again, conserving can be seen as positive action. There is, however, little or no consensus among planners and designers - nor even among permaculture designers - as to what exactly we are talking about when we speak of bio, ecology, or permaculture. Slowly, in the mid-80's the permaculture movement began to talk about ethics - after ten years of action. Others began listing mini and maxi solutions. We began to see the value in Christopher Alexander's work on Patterns and how these could be brought together into relationship that meant that we did not have to invent the wheel each time we had an ecological project.

I will use the three ethics of permaculture, as defined in the First International Permaculture Convergence 1982 in Australia, now taken over as the ethics of Gaia University in 2006, to give a base for our discussion:

- Care for the People
- Care for the Earth
- Share the Surplus.

What is necessary for me then is a vision of a perma-city:

- a city of proximity, mostly pedestrian with good public transport
- a city of energy descent with food producing gardens
- a city as a sharing of cultural, social and economic values.

We will need transition periods with low energy cars, with regional farmers' markets, with local exchange and trading systems (LETS) and regional complementary currencies for as much as a half-century to get to these goals - but these are some of the next achievable steps. We have to start somewhere! *And we will do it!*

We can build highly efficient houses that save energy, that need no heating in cold climates, no electric cooling in the tropics. People, like us, build these in eco-villages, urban eco-neighbourhoods and on the periphery of cities - already since before the turn of the 21<sup>st</sup> century. Unlike us, who has our respective workspaces at home for the last 20 years or more, most people have to travel 15 to 60 kilometres to get to work. Their personal ecological footprints have, therefore, become huge. It is just simply transferring the pollution from the chimney to the exhaust pipe. This is not a permanent solution for the resource and climate crisis that is increasing daily. Centralization has failed in almost every field.

Now, in some countries, particularly in Germany where we both live, the tax collectors and the politicians are supporting sustainable behaviour - the programme for 100 000 PhotoVoltaic roofs, for instance, or the tax and price rebates for renewal energy production and zero energy building - but once again without designing the system itself anew, without the holistic approach that e.g. permaculture design could deliver.

Eco-villages and urban eco-neighbourhoods are a good beginning but also need to look at their energy balance sheet. And they do not often do that regularly. Even if they are employing new solar systems, recycling wastes and houses, saving petrol and other energy, saving water, etc., their location and the corresponding necessity to travel by car usually puts a big hole in their otherwise welcomed endeavours. Here, I would like to mention the Dutch eco-village in Culembourg as a role model: They have pulled down car use (and ownership) by locating the eco-village immediately next to the train station on the line between Utrecht and Eindhoven.

## **Take accounting into account as part of design**

Accounting is part of Design - Sim van der Rym suggested this back in the early 1980's:

- Exploring the Carbon Footprint of our Homes and Mobility
- Setting up Energy Audits & Ratings
- Implementing Energy Efficiency & Renewable Energy Systems
- Future Proofing our Homes and Vehicles.

We all know the concept of the 'ecological rucksack', put forward by Friedrich Schmidt-Bleek of the Wuppertal Institute and others in the 1990's. It measures streams of material to determine the hidden energies in every product and service in MIPS (Material Input per Portion Service). In urban and rural settlement patterns – and especially in the many suburban developments all over the world - little of this measuring concept has happened for determining the efficiency of e.g. infrastructure, public transport and the amount of land used-up by this settlement pattern.

For each German, there is presently approximately 40 square metres built for their housing, but 600 square metres of paved area. Housing areas on the periphery of cities (suburbs) use up land wastefully. This is only possible because of subsidies on food production (even bio-food) – discouraging people to produce their own herbs and vegetables near their homes. Because of the general globalisation trends to produce cheaper and produce elsewhere than at home, we are continually using up good farming land in order to create the sterile rose-and-lawn syndrome, or 'industrial Parks' or production facilities, resulting more than often in urban sprawl.

We are our own problem. Most of us want to live individually in a green healthy environment in or near an urban setting: 'The main shopping street at the front door and wide open refreshing landscape at the back door, please.' This is usually easier for the politicians to sell to the population than a global ecological approach, based on energy descent and cost-benefit analysis for all humankind – because of its tiring watchfulness and regulations that seem to be necessary.

## **Towards a more holistic assessment of settlements**

Here we can look at a further development of the MIPS system as Holger Wallbaum did in his dissertation, amalgamating the five relevant themes of field of:

- Total Material Requirement (TMR)
- Cumulative Energy Expenditure (CEE)
- Global Warming Potential (GWP 100)
- Land Area Consumption
- Water Consumption.

These ecological indicators are put side by side with the five economic indicators:

- Planning and Implementation costs
- Production and Building costs
- Maintenance costs
- Demolition costs
- Costs of Rent including all Heating and Lighting costs.

Then, we add the final five that are social indicators:

- the Age Structure
- the Structure of Earnings
- the Unemployment Rate
- the Proportion of Employed Females per 100 employed males
- the Degree of Participation.

Wallbaum went one step further and used the COMPASS method to determine the value of a designed settlement, taking the ecological settlement of Flintenbreite in Lübeck, Northern Germany as his analytic example. This is a highly scientific method that can help designers during the concept period of a design as well as checking mechanism after implementation and later after a few years of people living there. Now Assistant Professor for Sustainable Construction, he is addressing conceptual, technological and at the same time sustainable innovations in the building industry. The regionally varying economic, legal, ecological, cultural and aesthetic frame conditions require constant rethinking and adaptation to apply sound approaches for specific uses and users. Integrity and adjustment are the dictums that have to be considered by sustainability-oriented planners, users and operators in order to realize sustainable reconstruction in cities.

## Community Sustainability Assessment

A few of us in the *Global Ecovillage Network* (GEN) put together an approach - more like a yardstick - for self-assessing how ecological we are in our very different eco-villages all over the world. The CSA (Community Sustainability Assessment) on the GEN web site:

[www.ecovillage.org](http://www.ecovillage.org)

is based on the indicators:

- Social/Community
- Ecological/Technical
- Cultural/Spiritual.

With the aim of creating and presenting to the world outstanding examples of what it means to live in harmony with nature in a sustainable way, GEN promotes and facilitates communities - whether rural or urban - which develop and implement technologies and practices such that human activities are harmlessly integrated into the natural world. This integration is meant to take place in a way that is supportive of healthy human development and can be successfully continued into the indefinite future.

The *Global Ecovillage Network* is developing the concept of sustainability auditing to provide measuring rods for individuals, as are also the groups working in the *Global Action Plan*. For existing villages and communities, they also compare the current status with ideal goals for ecological, social, and cultural sustainability. Such tools are to be seen as learning instruments - pointing out actions how individuals, businesses, communities and cities can take to become more sustainable by changing their daily behaviour. The process of Community Sustainability Assessment is an exploration and cultivation of the qualities needed to bring mankind through the 21<sup>st</sup> century.

Community Sustainability Assessment is a comprehensive checklist and anyone can complete it to get a basic idea of how sustainable their community is. This assessment tool is applicable to any community or neighbourhood. While it requires good knowledge of the life-styles, practices and features of a community, it does not require research, calculation and detailed quantification. This assessment takes about three hours for an individual to complete, or a series of sessions if done as a group experience by community or neighbourhood members.

*And we are doing it!*

## Holmgren's Permaculture Principles in urban settings

David Holmgren, Co-Founder with Bill Mollison of the Permaculture Concept, has given us an easy access to the complex permacultural thinking by explaining the basic insights in twelve principles, We will expand these principles for urban issues:

### 1. **Observe and Interact**

*"Beauty is in the eye of the beholder"*

- Observe, Recognize and Appreciate Details
- Interact with Care, Creativity and Efficiency
- The Thinking and Design Revolution
  - I. All observations are relative*
  - II. Top-down thinking, bottom-up action*
  - III. The urban fabric is the textbook*
  - IV. Failure is useful so long as we learn*
  - V. Elegant solutions are simple, even invisible*
  - VI. Make the smallest intervention necessary*
  - VII. Avoid too much of a good thing*
  - VIII. The problem is the solution*
  - IX. Break out of urban design cul-de-sacs*
- Free up Design Education and Communications Media
- Scepticism and the Limitations of Direct Experiences
- Modern Context for Action Learning
- The Importance of Interaction

Here I make an appeal to humanity in stating - that: *We need a vision*, because global problems cannot be solved by market mechanisms alone. I see the way ahead in the thousands of small, smart decisions that reflect a new awareness shared by millions of people and help ensure the survival of society. The vision and strategy of *an ecological urban design* has the advantage of not only being feasible, but also corresponding to the vision many people share of a world in which they would like to live. Making the vision a reality only requires the will to take a calculable risk and shed old prejudices and patterns of behaviour. In view of the problems bombarding us from all sides, this can only be seen as a hopeful perspective.

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### 2. **Catch and Store Energy**

*"Make hay while the sun shines"*

- Urban Energy Characteristics
- Re-building of the Natural Capital in the City
  - I. Appropriate Use of Renewable Resources*
  - II. Urban Fabric as Energy Storage - How Buildings can catch and store Solar Energy*
  - III. Photosynthesis & Respiration*
  - IV. Water Storage in Cities - Plumbing: Sewage, Drainage*
  - V. Soil & Organic Matter*
- Nutrient & Carbon storage in the City

Present energy-saving options and the rational use of energy for heating purposes, and of electricity and transport can cut energy consumption to less than 30% of its current level. *In an energy-efficient city*, energy is primarily generated on a renewable basis through sun, wind, tides, geo-thermal energy and organic mass. Buildings are designed for optimum passive solar use, both cooling and heating. Intelligent designs achieve a maximum annual consumption rate of 10 kilowatt hours per square metre of living space, which is amply covered by regenerative energies.

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### **3. Obtain a Yield in the City**

*"You can't work on an empty stomach"*

- Models from Nature and History
- conserver instead of consumer values
- Positive Feedback - Solutions to the Problems of Success
- Timing and Flexibility
- Efficient Use of Open Urban Spaces as a Resource
- Accounting of embodied energy

Special care is placed on the selection of plant types, sizes and growth times. Thus, a *city of predominantly native species and productive plants* contains fruit-bearing bushes and trees, gardens, lean-to greenhouses, façade espaliers and herbaceous soil coverings that meet a good proportion of the settlement's needs for fresh fruit, vegetables and salad all year round, without much extra effort. The natural corridors, streams, ponds and wetland marshes also produce edible and medicinal plants for human and animal consumption. These products are fresher and cost less in terms of embodied energy, waste and money than imports that have travelled great distances, although these will be used to ensure added variety at the table. The sales of commercial products and exchanges of "surplus production" create permanent jobs and provide high quality products at reasonable costs for everyone.

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### **4. Apply Self-Regulation and Accept Feedback**

*"The sins of the fathers are visited on the children unto the seventh generation"*

- Nurturing Positive Feedback and Self-Regulation in Managed Urban Systems
- Top-Down and Bottom-up Strategies for Social Change
- Personal Responsibility & Self-Audit
- Self-Reliance and Disaster Preparedness
- Self-Reliance as Political Action

Conflicts are seen and dealt with as creative learning processes in a *city of creative conflict-solving*. Re-Using together instead of consuming individually, sharing jobs, cars, fruit-trees, playgrounds, buildings and open spaces for play, sport, leisure and communication also means going through learning processes together, leading a richer life, but also a more difficult one as well. Self-regulation is predominant, as people give and receive positive feedback. Design 'failures and mistakes' are seen as opportunities. Ultimately we would have a *city based on occupant responsibility*

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### **5. Use and Value Renewable Resources and Services**

*"Let nature take it's course"*

- Renewable Resources as Energy
- Investment of Non-Renewables - Ecosystem Services
- Trees: Urban Solar Power Plants
- Sustainable Use of Renewable Resources

This principle covers many topics. We will take water as an example, as it is the topic that we need most to deal with both on a local and global level. On-site rainwater seepage and the blanket ban on toxic substances entering the groundwater allow a *city that values recycling* to have its own decentralized drinking-water supply. Water-saving fixtures and the separation of faeces and all other organic waste for composting and fermentation cut drinking-water consumption to less than 60 litres per person per day. Grey-water from washbasins and baths, showers, washing machines and dishwashers is purified in nature-based neighbourhood treatment processes, and then seeps back into the groundwater. The each city district preserves natural drainage conditions. This means that wherever possible, storage rooms at ground level replace basements. Vertical and horizontal filters become just as much an integral component of open spaces in the form of constructed wetland marches, as rainwater, which is creatively allowed to come to the fore in flow forms, open gutters, streams and ponds.

## **6. Produce No Waste**

"A stitch in time saves nine"

- Waste or Exchange in cities
- Waste Minimisation
- Waste as Resource
- Industrial Strategies – Zero Emissions Research & Initiatives (ZERI)

Governed by the principle that "every waste is a resource in the wrong place", a *waste-free city* belongs to a regional, national and international network specially devoted to this aspect of sustainable husbandry, which helps to prevent over 95 percent of the current volume of waste. The aim is zero waste cycles. Be it domestic waste, excavation soil, building materials or waste from commercial or industrial production, the little waste (still produced here) is sorted on-site, before entering the respective recycling, down-cycling or re-use process. An *emission-free settlement* reduces energy consumption, treating wastewater in nature-based systems, limiting traffic and tree-lining streets, all these emission-free measures lower CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub> and other toxic gases, as well as reducing dust particles. Sod roofs and façades covered in climbers, as well as natural corridors between individual neighbourhoods, improve the air and temper climate extremes. Ultimately we would have an *emission-free city*.

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## **7. Design from Patterns to Details**

"You can't see the wood for the trees"

- Pattern Thinking and Language
- Structural Patterns in Cities and Urban Sprawl
- Land Evaluation and holistic Mapping
- Land-care and Redesigning Urban Areas
- Permaculture Urban Patterns
- Permaculture Urban Design – Zones and Sectors
- Bioregional Patterns & Aesthetics

We strive for a city on a human scale, with neighbourhoods to which residents can develop a direct relationship or a personal bond, but which have their own character as well. A city with nature corridors has woods, orchards, streams or wetland marches separating the individual areas and linking them to the surrounding landscape. A place where plants and animals have scope to thrive becomes part and parcel of our civilisation. A city that fits into its own bio-region, its landscape, its climate, celebrates its flora and fauna and its local culture. Open spaces and bodies of water typical of the area provide biological enrichment and orientation. A city of healthy buildings where building materials and construction systems (used in all buildings that are converted or constructed) are healthy, save primary energy goes easy on resources in their production, use and dismantling (from cradle to cradle). They are (re)-planned for multi-purpose use, easy conversion and expansion or reduction in size. Urban electrical cables and appliances are installed underground and connected in accordance with the latest findings to generate as little electric smog as possible. Before design commences, zones of geo-pathological interference are detected so that unnecessary health problems on top of them can be avoided.

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## **8. Integrate Rather than Segregate**

"Many hands make light work"

- Integration in Urban Design
- Types of Ecological Relationships
- Each Element performs Many Functions
- Each Function is supported by many Elements
- Competition and Co-operation in Cities Districts
- Corporate Culture and Ecology
- Materialism and Spirituality working together
- Rebuilding Community – Chaordic Organisation

Settlements and cities can be seen as collective artworks, as *cities of human values*. The individual and collective effort of many generations lends them a special, unmistakable character. Nowadays it is possible to simulate this historical development and make various alternatives (of building anew or renewing existing quarters) understandable to all, quickly. Thus the complex process of coming to a consensus between the demands and needs of the occupants, the administrative authorities, the economy and the environment can be worked out easier until a plan has emerged that is tailored to the combined needs of those involved. The balanced, careful and conscious combination of chaos and order (chaordic) is about to prove as the best strategy for the organic development of such new structures. It takes time to make this shared vision a reality, but it forms the basis of the city's spiritual, intellectual and material expression.

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## **9. Use Small and Slow Solutions**

*"Slow and steady wins the race"*

- Energetic Limitations on size of Urban Areas
- Cellular Design and Scale
- Slow is Sane – Italy's CittaSlow Movement
- Reduce Urban Scale and Speed
- Ethical Constraints on Size
- Slow-Growth Strategies in Food
- From Hierarchical Design to Nodes and Networks

The density for a *city of short distances* requires an ecological settlement not much larger than 1.5 - 2 km in diameter, meaning that everyone can walk from one end to the other in half an hour, or bike or drive their solar-vehicles across in five minutes. Cities should be kept small or broken up into oversee-able neighbourhoods. Car-and minibus-sharing is available to the district community members for all medium distances. Public means of transport - buses and trains - are faster and cheaper alternatives for longer journeys. Efficient infrastructure planning is facilitated by service centres specialising in different aspects and located at public transport pick-up points.

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## **10. Use and Value Diversity**

*"Don't put all your eggs in one basket"*

- Biodiversity and the City
- Balancing Productivity and Diversity
- Diversity creates Stability
- Cultural Globalisation and Renewal of the Culture of Place
- Geographic Diversity following from Culture
- Rebuilding Community in Cities through Diversity
- Economic and Social Diversity

A *city of diversity*, a *DiverCity*, is where the living spaces and the working spaces are reconciled and long trips to work are unnecessary; where social and cultural activities, recreation and further training, community and individuality can exist side by side. By limiting traffic and noise pollution from production processes, *this beautiful city* is a place of calm and quiet as well as festival and entertainment. The architectural expression and urban design follows criteria of beauty, elegance and simplicity, fitting into the existing landscape and cultural heritage of the region.

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## **11. Use Edges and Value the Marginal**

*"Don't think you are on the right track just because it is a well-beaten track"*

- Edge as a Systemic Property
- Edge Effect in Urban Agglomerations
- Use of Edge in Urban Design according to the topography
- Water Edges – River or Lake or Sea – are design elements
- Effects of Intensity of Use
- Value of Marginal Systems

The size and density of the settlement defines *a city that uses as little space as possible*. This depends on the degree to which the area the city requires for its material supply and disposal – on what is really available, without being a burden on the region and the prevalent cultural norms. Expansion beyond this size leads to the founding of a city or a new settlement. The grid pattern had its origin in military thinking, a democratic *chaordic* society needs flow both in its structure and in its forms. The interface of edges between different elements produces diversity, stability and places of high interest.

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## **12. Creatively Use and Respond to Change**

*"Vision is not seeing things as they are but as they will be"*

- Systemic Perspective of Change - Ecosynthesis
- Flexibility and Gender Balance
- Ecological Models of Succession in Cities
- Lessons from Urban Design and Land Management
- Ecological Urban Design and Sustainability
- Economic and Social Succession

There is nothing so permanent as change. All occupants are involved to the extent they can and wish to be in local, community self-administration, and in formulating and implementing the ecological settlement design in *a city based on occupant responsibility*. All decisions are made on the lowest level possible, based on the principle of subsidiarity. As far as possible, everyone uses the local range of services, production and trade, education, and leisure, and supports links and communication with regional, national and international groups and networks. We can master four perspectives: how things were, how things are, how things might become and how things ought to be – and synthesizing them into a compelling concept of a constructive, peaceful urban future.

All these principles have been taken or adapted from David Holmgren (Co-Originator of the Permaculture Concept): *Permaculture – Principles & Pathways Beyond Sustainability*, Hepburn, Vic., Australia, 2002 – see

[www.holmgren.com.au](http://www.holmgren.com.au)

## **Permaculture and Action Learning will help us break through**

The future is here, and it is not what we had imagined: 80% or more of the population of the world live in urban areas. As designers for sustainable systems, as permaculture practitioners, we cannot just ignore them and go on creating and living in our green oasis. We have to overcome this postulate that was so often mentioned in the 1980's and 90's: - 'do your own thing and forget about these (supposedly) non-thinking, greedy urbanites'. The urban fabric is a reality, is a manifestation of a system that we have enjoyed at the cost of nature and based on continual support we have been getting from less economically fortunate 'developing' countries. It is basically a system that is continually depleting itself and the resources of the earth, sustenance being mainly shipped into urban areas from outside.

The urgency of responding to climate change and energy security will require new directions in design. Much of the necessary changes will enable us to see an overall improvement in quality of life if we embrace permaculture methodologies and goals. All stakeholders have a role to play, and

urban designers will need a new set of strategies and skills to do so. Action Learning and urban permaculture design can help us break through. The urban permaculture groups will present the issues, outline some of the priorities for change, and introduce tools for effective engagement in building a more sustainable future. We also need urban thinking permaculture planners, policy makers, politicians and citizens.

We still have a lot to do and a lot to learn. So that is why I am still working on the concept of helping 'doers' to reflect on their doing and to learn from it while they are doing it – the concept of action learning, that was defined by the Englishman Reg Revans in the early 1960's. We are now bringing it again into the world of life-long learning through Gaia University in co-operation with Revans University. If you want to know more about this "complementary university" visit the web site:

[www.gaiauniversity.org](http://www.gaiauniversity.org)

### **Healing is possible – my conclusions**

Throughout my life – or at least the last third of it, since I met up with Permaculture - I have been involved in many dialogues attempting to shape the ideas of new generations and to provide accessibility to the pool of vast human resources capable of healing a "deeply wounded world." Now retired and living in the ecovillage of Lebensgarten Steyerberg with my wife, Margrit, what do I see as the challenge of the 21st century?

For global consciousness to develop, which is one of today's biggest challenges, reflection on actions, action learning and creative imagination are critical. These we find in Gaia University. Unfortunately, people tend to avoid facing up to the situations confronting them, and in today's world there are many means of disassociating ourselves from reality. Additionally, media distort the world situation - and mirrors convey to us false images of ourselves and of each other.

In the end, I think the operative word is "health", in the sense of becoming whole - at the individual level over the course of a lifetime, in the groups with non-violent communication and, globally, through the concerted practice of mediation in all conflict situations on whatever scale. I call my approach "urban healing", preventive medicine for an imperilled planet, homeopathic in nature - and urge us to look past the symptoms in order to identify the root causes of the world's malaise.

I do believe in magic, but no outside agency and no degree of wishful thinking can relieve us of our personal and collective responsibilities. As I see it, the future of humankind depends on us and us alone. At an age of over 70, I am convinced that to heal, we must move beyond the power games in which the 'enemy', so often our scapegoat, must be destroyed at all costs. Instead, we must come to terms with the fact that tension is inherent to every relationship. It is up to each of us to learn to accept, manage, and transform tension. See it as a learning curve. 'If we don't break through, we will break down'. History bears sober witness to the accuracy of this observation.

This timely and thought-provoking perma-city idea, being illuminated from all sides in the conference from which this book is a result, can be the answer - but needs to explore how we can save energy, resources and money by making our homes, our transport systems and our food production more energy efficient, more beautiful and more human. This is the way we need to develop our design abilities and use that potential to create urban ecology - the perma-city, urban-ecovillages, neighbourhoods and districts – indeed, an urban permaculture, which supports the dignity of all people and the vulnerability of natural systems, and which gives every sentient being their fair share. In the words of the Swiss/Englishman Sir Martin Brofman: "Anything can be healed".

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