

# Ecology: the Invisible Factor

Manfred Hegger

'He who is not yet dizzy, doesn't know better' (Peter Sloterdijk)

Our civilisation is developing with a blind and frantic speed. This development demands urgent alternatives. Ecological building is an obvious alternative in a specific area.

## Social Context

The basis for ecological building derives not from the architectural, but the environmental debate. Ecology relates to the world as a whole, the world we all inhabit; the 'global dwelling' understood as a multiply networked cybernetic system, in search of equilibrium. Ecological theory reveals the wider relationships between our basic existential needs, and creates insights into the long term effect of our own interventions. However, to attempt a comprehensive or definitive overview of those existential needs remains a hopelessly ambitious proposition, the issue being simply too complex. Environmental formulae, diagrams, equations, etcetera, in the manor of pre-ecological science, should be approached with caution.

In any case, ecology has allowed us to realise that incessant and ever quickening action against these 'natural' interrelationships threatens the very basis of our existence. We are cheerfully sawing the branch we sit on. Nevertheless, there are indications of changes in values. Optimists already see a fundamental new epoch on the horizon; the second enlightenment as the enlightenment of the first or even the very end of the scientific age. Whatever that may be, the threat of environmental collapse forces us to recognise the natural cause of regeneration and the limits of ecological systems; to respect them in our own social and technological systems and in planning our physical environment.

Even in economics the environment is now included, as a limited resource, along with traditional factors of labour, capital and land. Normative standards governing social behaviour and the relationship between man and nature are gradually changing. Within this process fundamentally different attitudes towards ecology can be discerned. One method of inquiry is *scientific*.

How does it work? What universally applicable laws lie behind this or that phenomenon? This approach, inherited from the nineteenth century, has developed within our own time into eco-system research. The object is no less than to comprehend the totality of living nature as a change of systems, and to discover the laws governing its interrelationships and equilibrium. Eco-system research is the basis for a comprehensive nature technology with man at the centre. Not without reason does this movement use the expressions 'environment' and 'environmental protection', with their implication that the problem lies outside the observer. This scientific methodology stands in contact to the *existential* method of inquiry: how do I live with and in, nature?

In this emphatically subjective approach one is less concerned with scientific principles and more with the acknowledgement of nature and one's personal responsibility. Here the ecological consideration is one component of an ethical system governing one's own life. The subject is contained within the same field of view – subject and object thus become one. Here the individual's own actions are all important. The radical nature of this position is therefore not manifested in words but in a correct life-style. The most important consequence of this is the renunciation of consumer behaviour.

Politicians rightly regard this attitude as naive. Social Scientists see the historical compulsion to maintain living standards as a significant obstacle. One also fears that these ecological demands can only be met at the cost of other, new social injustices. The technocrats among them have a more dynamic understanding of nature; it should be subject to manipulation, as a component of a project or experiment. Technology influences and accelerates these processes.

The neo-conservatives go further. They say: Why not let us create nature to meet our own needs? A functionally appropriate nature which does not limit economic growth; in other words, nature as an industrial product. Contrasted with this is the image of the fulfilled life in harmony with nature, as represented by the evangelical, emotionally committed ecologists. It appears by comparison romantic, expressing a tranquillity and peace alien both to society and nature itself. Here life stands still.



Spaceship Earth



? If these values are post-materialistic, they must have a different meaning than the ones in the implicated pre-materialistic era. One could argue that they are propagated to support a new kind of economical thought, in which human resource has become a very important topic in management techniques. Do you really think these notions are a critical answer to the materialistic world view of modern society, or could it be producing the same old conditions of production?

! Concern for the environment is being used as a new sales strategy. It seems to perpetuate our consumer society. Yet, at the same time it is carrying a strong notion of ethics. As a result, environmental arguments tend to be examined very critically. False promises increasingly often result in fatal sales problems (e.g. Daimler Benz, Duales System). On the other hand, reduced environmental impact of consumer action produces marked shifts (e.g. in packaging, in food). Ecological thinking seems to affect production and consumption increasingly.

Nevertheless the ecological movement has set a great deal in motion within the structure of society, through crucial concepts such as 'think globally, act locally', self sufficiency and self-help. In the future rigid distinction between paid and unpaid work and between living and working will no longer be possible, with not only greater self-employment and self-sufficiency, but also the increasing trend to working at home. The technology available to our information-based society provides the necessary preconditions for these changes. Whether the associated risks can also be overcome remains to be seen (e.g. isolation at work, increasing stress from competition, automated work monitoring, loss of solidarity and support etcetera).

Post-materialistic values such as self-awareness, introspection, idealism, co-operation and holistic thinking are increasing in significance; essential among our concerns are community participation and self-realisation. These values apply primarily to the sphere of leisure and non-paid work, however, in the formal area of employment similar changes can be observed. Traditional virtues such as hard work, discipline, rigour and order are still in demand, but gentler qualities such as motivation, group identity etcetera are becoming more widespread.?

Sociology embraces this change in society's value system within the expression 'Post-Modern'. Similarly the Post-Modern relationship between man and the environment are determined by the head and the heart, requiring a more responsible attitude to nature and resources. Post-Modernism acknowledges this social change.

#### **Ecological Architecture**

It would, of course, be a mistake to assume that the architecture of post-modernism is the same as Post-Modern architecture since it is acknowledged that this term, has already been usurped. Postmodern architecture is characterised by a mixture of eclectic montage lifted from past styles and periods combined with the visual imagery of the fun fair; it is a formal and closed architectural style.

The changes of objectives and values, embodied in Post-Modernism, are far more aptly expressed in

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ecological building, which makes the essential issues of the environmental debate tangible. It has given them physical form and provided visual evidence.

Ecological architecture can be divided into two main categories: 1) buildings belonging to the technical/ecological infrastructure such as wind power and solar energy installations, and 2) buildings as architecture (close to environmental desiderata).

It is significant that only a small number of ecological projects have so far been carried out; many remain on the drawing board. Of the projects built, the majority are single houses on the urban fringe; groups of houses or estates form a far smaller proportion and apart from the occasional meeting hall there are practically no public buildings.

In German-speaking countries in particular, ecological architecture has developed out of the crisis in architecture of the seventies, and out of the criticism levelled at the barrenness of our cities, and their disregard for human needs. In addition recent medical evidence on diseases caused by asbestos or the use of timber preservatives have focused attention on the important role in our well-being that buildings play by providing our 'third skin'. Over and above these factors there is the widespread awareness of the mindless waste of both energy and resources, constituted by buildings, which could not be allowed to continue.

Like all new movements, ecological architecture has searched for its roots in the past and in the process discovered the remains of the vernacular building tradition. Norwegian log huts, Tessin mountain villages, Indian pueblos, along with other examples, have all been held up as examples of 'building in harmony with nature' and contrasted with Western imperialist architecture. This is, of course, a misrepresentation since it is these very buildings, constructed by the 'little man', which represent man's 'battle with nature' even if often built with very limited resources.

In its architectural manifestation ecological building has made practically no really effective contribution to any coherent urban design. In terms of design quality the few built examples lag far behind the garden suburbs built at the turn of the century. It is, however, only in this wider context that one can



create an ecologically based relationship between man, building, infrastructure and nature.

By comparison ecological engineering has developed at a rapid pace; one only has to think, for example, of solar and wind powered generators. Systems such as these have an ability to fascinate; they are simple, innovative and extremely effective, demonstrating the economy and practicality of energy collection in an aesthetically attractive manner.

Like the ecological movement in general, the ecological design movement appears to be split in two directions; the one evangelical and emotionally based, the other technological. Currently the former position is mainly occupied by architects while the engineers tend towards the technical and reformist position.

The requirements of ecological design are exhaustively set out in the various manuals, pattern books and prescriptions (see table), but ecological action extends beyond such rule books and what is necessary is a matrix of principles which can be related to the individual problem, and an integrated application of the rules that exist.?

In ecological building individual decisions and actions must be made within a comprehensive framework. At the same time the changes in society, described above, need to be met, while also creating a structure for society's own relationship with both nature and the environment.



Monte Verità from the series *Freude in der Freiheit*, 1922



### A Short History of Ecological Design

The process of industrial urbanisation weakened the innate relationship between work and leisure, man and nature. In order to reverse this process of alienation there have been continuous attempts at reintegration.?

In mid-nineteenth century England there were the modern workers' estates with their communal gardens. Around the turn of the century they were succeeded by Ebenezer Howard's garden city movement, which attempted the reintegration of town and country. The entries for the competition *The Growing House* organised in 1932 by Berlin's City Planner, Martin Wagner, are of particular interest; the designs contain the first examples of conscious ecological design with entrants proposing conservatories and using the principles of solar energy and rainwater conservation. Although the concepts for the basic house types are extremely simple, they are designed to be extendible and are suitable for self-build. These beginnings allow us to guess at how modern architecture might have developed; instead they were distorted by the *Blut und Boden* movement in the Third Reich, to its own ends, and any promise of reform was completely extinguished.

Our consciousness of the unique and finite nature of the Earth has now been re-awakened by space travel, the energy crisis and incipient environmental problems. The first man on the moon surely recognised just how precious our resources of food, water and shelter must be. The view of the earth from the moon served to strengthen this awareness of the planet.

? Before building a brief should be written. What do you think the chances of an ecological approach could be in that phase of the process? It must be much more satisfying to design in an ecological manner with a brief which produces the right conditions for such a design.

! This is correct; the importance of a detailed brief with respect to the environment has been proved by a number of competition results and buildings. Ecology is not a style, nor an attribute of a building. It rather refers to a way of thinking. Therefore, ecological considerations need to come in at the very start of planning. They determine the end-product in many ways, in subtle rather than in obvious forms.

? If you speak about the 'innate relationship between man and nature', you seem to imply one of the pillars of ecological thought: the belief in a natural harmony. Even if you nuance this by stating that today's society needs a comprehensive conceptual framework, this basic notion remains. Then, of course, one can also speak of 'alienation'. However, this essentialism faces many objections from postmodern social theory, which renounces any functionalist thought of society as an organism. Could you argue why you still believe in the concept of alienation in a post-Marxist world?

! The term 'alienation' is not a Marxist invention. In a wider sense, it was used by Hegel to describe materialist ideas of nature and history, also describing the lost unity of man and his environment. Ecology is all about re-establishing this missing link.

### Air

Development in fresh air generating zones or lanes is to be avoided. In creating settlement and building layouts, main wind directions are to be considered. Overheating and lack of air exchange are to be avoided by appropriate density and building patterns. Inversion climate in public open spaces can be escaped by leaving air lanes and creating moderate roof surface temperatures (e.g. planted roofs). In areas with high wind speed, unwanted wind cooling effects may be avoided by appropriate building forms, good surface: volume ratios and wind screening (by buildings or plants).

#### Measures:

- no high rise building in delicate climate conditions,
- low air resistance building forms in relation to main direction of wind,
- wind screening vegetation in areas with high wind speed and danger of cooling thoroughly,
- planted roofs for low surface temperature and oxygen generation.

### Energy

Non-renewable energy should be applied in a rational and economic way, environmentally harmful and toxic emissions are to be



minimised. Energy loss (e.g. caused by transmission of energy) is to be reduced. Buildings ought to be constructed with high insulation standards and heat storage capacities. Wherever possible and feasible, renewable energy should be adopted.

#### Measures:

- use compact building forms and minimise cooling surfaces in order to reduce heat losses in moderate and cool climate zones,
- prefer natural ventilation and cooling means to technical ones wherever possible,
- arrange zoning and orientation of uses according to sun exposure and other conditions of climate,
- make use of ambient energy sources.

#### Water

Use of drinking water ought to be minimised, by water saving systems and by collecting and using rain water or waste water for inferior purposes (e.g. toilet flushing, watering gardens, laundering). Underground water may be fed by rain water. Roofs and other surfaces (except streets) ought to be drained direct into soil. Waste water may be pre-cleaned or cleaned on site.

#### Measures:

- use water saving taps,
- collect rain water in water tanks, cisterns, or ponds, create wet biotops,
- clean and use rain water for toilet flushing, watering and laundering,
- reduce need for large scale and expensive rain water drainage, retention and purification systems,
- feed surplus rain water into underground water supply,
- pre-clean or clean waste water on site by biological means.

#### Materials

Buildings should be designed and built with regard to the use of natural resources for building materials, transport and construction. This includes the use of energy resources for production, transport and use/maintenance. Hazards originating from materials have to be reduced to a minimum for builders as well as inhabitants. The use of non-renewable resources is to be minimised.

#### Measures:

- use materials with low energy impact in production, transport, and use/maintenance,
- avoid materials containing hazardous chemicals harmful to builders and inhabitants,
- prefer materials produced from recycled materials and lending themselves to recycling after use,
- make use of long life materials and materials for easy repair.

#### Soil

Ground ought to be in use in an economic way. Recycling of spaces used previously is superior to reclamation of virgin land. Sealing of ground is to be minimised. All areas not used for traffic should be kept for vegetation. Subsoil water streams must not be interfered with in building processes.

#### Measures:

- confine building developments to recycled land or empty sites within built-up environments,
- use building patterns with minimal circulation spaces,
- choose socially acceptable housing densities,
- reduce traffic areas to a minimum
- arrange parking spaces with minimised circulation areas.

#### Waste

Waste is to be avoided in production and use. Unavoidable waste should be collected and prepared for recycling.

#### Measures:

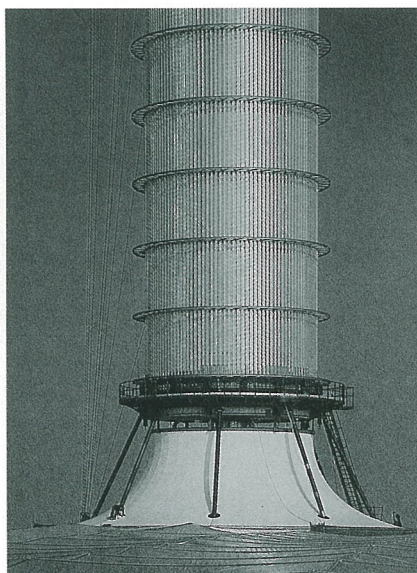
- avoid waste by introducing composting for organic remainders,
- collect recyclable materials separately, create appropriate spaces and facilities.

Experiences such as these have led to the rediscovery and revaluation of much that had been previously either buried or destroyed: • the alternative buildings of the Hower children and drop-outs created from the refuse of consumer society, or from what nature provides free, • anonymous, climate dictated buildings, convincingly published by Bernard Rudofsky, • energy saving initiatives to cope with the first energy crisis, • experiments with passive and active solar energy and other 'renewables', and • the concept of 'building biology' and its contribution to health conscious design. Building biology attempts the integration of many of these principles. However, it frequently fails as a result of the complexity of the problems involved.

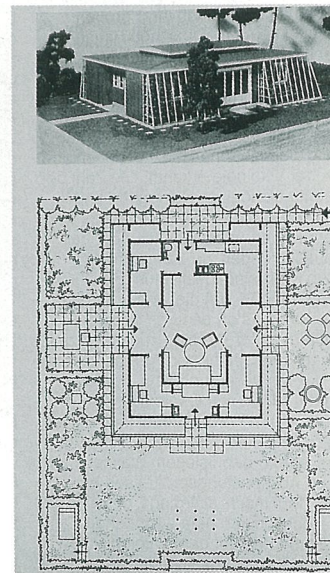
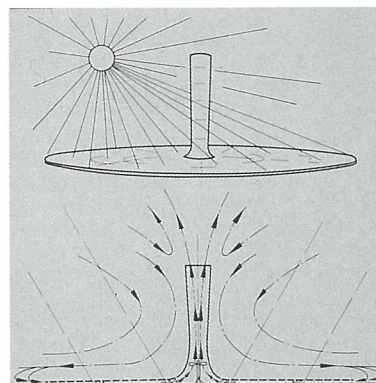
#### Dilemmas and Traps in Ecological Architecture

In ecological design the same contradictions occur as in the environmental debate at large; in both, different kinds of questions are posed; there are (as well as in the other factions), both fundamental and technological movements. Translated into built form the dogmas and principles of those groups produce a paucity of architecture and, according to the philosopher Jürgen Habermas, suffer from 'under-complexity'. This applies to the eco-technocrats, whose rigorous optimisation, applied with cold logic, would inevitably produce a new Functionalism. In urban design, for example, most would be a rigid architecture of long, narrow fronted blocks with uniformly correct orientation.

'Under-complexity' is also a danger to the fundamentalist group with their highly subjective ethical



Solar heat power station



Martin Wagner, The Growing House, competition entry, 1932

system. The esoteric aura surrounding them creates barriers against the outside world. In contrast to the technological ecologist, the movement demands adherence to the correct life-style. This, and the appropriate rituals in behaviour, make the individual either a member or an outsider.

However, truly consistent ecological behaviour generally presents a conflict with the well insulated economic status enjoyed by the typical 'eco-house' dweller and society's most efficient contribution to ecological reform would be a simple reduction in consumption. Since this sort of self-imposed limitation is uncommon, the ethical principles of this group generally descend into a trivial 'green consumerism'. Even the Old Left and the Greens look after themselves quite comfortably in the face of apparent ecological catastrophe. A conformity to ethical principles is affected which has little substance in reality, or which is otherwise compromised by concern for their own well-being. They live apparently agreeable and healthy lives without having to pay much regard to the more complex aspects of the environment.

The creation of 'one-dimensional' rules prevents the very variety and openness needed if ecological principles are to be applied into buildings on a more comprehensive scale. This will not encourage the creation of a new, everyday building culture on environmental lines. Ecological design may only achieve a break-through when it is able to demonstrate good examples and evolve an appropriate architecture.



Architects continually create traps for themselves by translating simplistic one-dimensional rules into built form:

1) *The Regionalism Trap*: the retrospective search for vernacular or regional architecture as a reaction against the apparent uniformity and banality of modern architecture. Regionalism assumes that all the traditional built forms provide the optimal response to local environmental conditions and are therefore an automatic guarantee of ecologically sound architecture.

However, 'Mickey Mouse architecture' and romanticised provincialism are often the response. The result is a collection of 'film sets' carried out in an international provincial style derived from anonymous and rustic buildings. It imitates rather than innovates; nevertheless the style apparently provides reassurance allowing us to enjoy the benefits of progress and to avoid the sufferings of change. Ecological Regionalism is both retrograde and addicted to harmony.

2) *The Building-Biology Trap*: this is an anthropocentric concept, placing man (in this case the potential user) firmly at the centre. Its adherents allege quite simply, that the modern house makes us sick. 'Healthy living' is the key expression for this group, and also the title of one of their specialist magazines. This can be achieved only if one follows their comparatively simple rules, for example natural materials are good, whereas plastic is bad. Similarly concrete is carcinogenic, but because one cannot dispense with it entirely a distinction is drawn between the good 'bio-concrete' and the internal electrical-field producing 'old-fashioned' concrete. The theory equals the effect on health of quite disparate phenomena such as certain timber preservative treatments, the alleged effects of electrical ring circuits and even the electro-magnetic field supposedly spread like a net over the whole globe. The primary concern of building biology is individual well-being of the building user. The ecological side effects are seldom properly considered, (damaging interventions in natural and social systems, such as the over exploitation of cork oak, transport expenditure on exotic materials like cocos fibre and the limited durability of many materials). Natural materials are employed as if there were no naturally occurring poisons. Building biologists claim that they alone build in harmony with nature. This, of course, is a misconception: building has always been a struggle against nature, often carried out within regional traditions and with extremely limited means.

3) *The High-tech Trap*: the adherents of this movement maintain that all problems, including environmental ones, can be solved by the rational application of science and technology. This is raised to the level of architecture, even if only emblematically. While it is no doubt correct that in the future we will use more rather than less, technology to solve environmental problems, High-tech equates the use of means with architecture itself. This is done through imagery, such as the use of over-dimensional conservationists, large areas of solar wall or the expression of eco-technical system and plants by means of deconstruction. 'Eco-tech' may produce interesting solutions in individual buildings and be appropriate to pilot projects and prototypes, but there is a danger that employed in the wider context it could be over-prescriptive; for example it might dictate that groups of houses should all be uniformly oriented in order to achieve optimum solar gain; this would be inimical to create user-friendly social spaces. This application of new technology may be environmentally friendly, but it diverts attention from indeed essential issues such as social interaction and may lead to the postponement of decisive action in more crucial areas.

4) *The Alternative Trap*: ecological design like many other aspects of ecological thinking was initially developed within the 'alternative movement'. From this it has been possible to campaign on rational issues such as simplicity of life-style, modesty, recycling as source of building materials and solar energy. They have been put into practice in a number of imaginative ways using glasshouses, domes, mud structures, 'pueblo' dustings along with a variety of other architectural fantasies. Although there are numerous fascinating structures and spaces, their image has remained esoteric – even bizarre. The occupant's desire for self-expression is often manifested in extreme forms which have virtually no common ground with the needs of the average European householder. Often self-built, these structures are usually crudely constructed, with little regard for conventional comfort and technical performance and of limited life-expectancy. This awkward ideology and the buildings devised from it, have played an important role in initiating the debate and extending horizons. However, ecology is now too important an issue to be left neglected in its niche of the alternative ghetto.

With all these particular movements the suspicion arises that there is a deliberate attempt to make ecological architecture as visible and deliberate as possible. In the case of prototypes or exhibition build-





ings this no doubt has its place but ecological architecture cannot simply be achieved by the use of grass roofs, or 'green' façades, cladding or conservatories. The sum of the parts of the genuine ecological components should not be obvious or force its presence on the observer. In the majority of cases the rule should be: *ecology is invisible*. The above instances also demonstrate the fact that design principles are generally over simplified and one-dimensional. They too easily filter out the complex reality of society and exclude the potential for real diversity.

#### Themes for Ecology in Architecture

**Complexity and Simplicity** The morals of ecology imply a comparison between simplicity (holism) and diversity (of life-forms). The comparison of the two concepts appears at first sight to bring a contradiction. Great diversity implies the opposite of simplicity, namely obscurity and heterogeneity. In contrast to simplicity, diversity is a new concept introduced into the debate by the ecology movement. The model of natural equilibrium which exists in human society can be ascribed to diversity to a degree that puts it at the other end of the scale to the traditional political goal of equality.

A literal transference of ecological diversity contains an element of arbitrariness, even danger. Is it, for example, correct to interpret savage nature as natural harmony? Should natural cycles, with their inevitably amoral, but highly complex evolutionary rules, serve as models for human society? Or is a pacific nature – a controlled complexity – implied here?



Manfred Hegger / Doris Hegger-Luhnen / Gernot Minke / Günter Schleich, Ecological settlement Kassel-Frasenweg, 1987



**?** Complexity has become one of the main topics of postmodern theory but from an interested point of view one often perceives complexity as the cosiness of our time, in which everything has its particular place, but no values are valid to discriminate. What is terribly difficult is to develop a critical macrosocial theory that provides you with arguments for a public debate on social objectives, and at the same time to respect complexity. Could you elaborate on the link between ecology and dialectical theory? How do you consider the fate of dialectics anyway?

**!** If critical theory is about a reasonable society, about man liberated to experience a new sensuality, this carries strong relationships with the idea of human ecology. It needs an appropriate way of thinking to understand ecological networks, and to find ways of economising on our environment. Dialectics may be a basis for this; not in a Marxist way, but simply as the old art of creating new ideas by logical operations and controversial thinking.

Simplicity is, in comparison, an established ideal associated with modesty, curtailment and even asceticism, and thereby also with ethical and social values. The definition can also embrace balance, holism and integrity; concepts which for centuries have distinguished philosophy, the arts and other manifestations of the intellect. Their elementary principles are over-simplification of the complex processes involved in the reality of society and nature. This applies equally to the ecological principles described above; integrity and uniformity infer safety. But to quote Gustav Landauer: 'In mankind, and especially in nature there are no perfect forms, nothing rounded or complete. Only words, pictures, gestures and fantasies are rounded and perfect. Reality is in the movement'. At best simplicity can be distilled out of complexity by concentrating on just one point. For example the entries for the Growing House competition (described above) exemplify the characteristics of simple solutions, explored on several levels. Although a scheme of this sort has never been carried out, simplicity appears to dominate over complexity. Simplicity and complexity can be treated as opposites in a dialectal process, which may lead us to a new and complex quality in everyday architecture. **?**

**Ecology at different scales** The degree of ecological/technical input and the complexity of the problem are set out below:



*Individual dwellings/house groups* Here, where simplicity and modesty are the principal criteria, the fundamental approach is properly justified. The houses are relatively small and require only limited site area; the surface area of the enclosing structure should be a minimum. A simple basic form can be completed or altered incrementally over a period of time. A degree of self-expression is appropriate both to building function and the architecture. There should therefore be no restriction on the use of symbolism if it derives from the inhabitants' own desire for self-expression and a fairly loose planning framework should allow for the occasional excesses.

*City/region* For the city or region the situation is very different; in general an ecological/technological approach will be appropriate. It is unlikely that many will respond to calls for voluntary reduction in consumption. We cannot therefore assume that large, new fundamentalist eco-communities will develop with reduced consumerism as a widely accepted ethos (or even as an inconvenient necessity). One of the principal ecological requirements will be to decentralise these administrative systems. It would be feasible to promote a rational system of local government on ecological lines at communal or regional level, perhaps based on the model of Davis/California. Despite this, many systems will not be able to reduce consumption below a certain sensible economic threshold. Important decisions will continue to be made by central authorities; among them will be the most critical for environmental development – namely the legislative one.

We anticipate a positive development of an eco/technological organisation, which will become increasingly complex. Depending on circumstances this administrative organisation will have to be expanded.

*Community/Estate/Neighbourhood* The estate and neighbourhood establish an intermediate scale between individual, house and city; at this level the eco/technological and fundamental approach can complement each other. This is actually the context in which the complexity of the over-

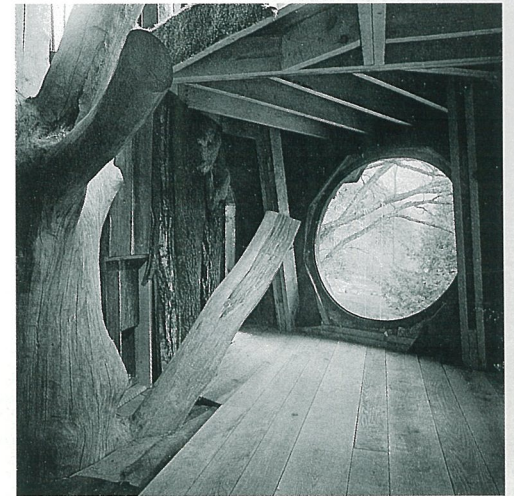
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riding requirements of society and community and the simplicity appropriate to house building, can be synthesised into architectural form. Here also, public space for different kinds of social groups can be overlaid with spaces for individual and private initiatives. Sensible ecological measures in the community would establish fairly loosely defined limits within which residents could operate, developing their own interests freely without the restrictions of group pressure. The individual can make his/her own ecological contribution outside the general consensus. At this scale it is also possible to develop an eco/technological infrastructure which would ensure a largely autonomous provision of energy, on the basis of the example pioneered by Vester in Denmark.?

Environmentally conscious urban renewal can also be considered at this level. This would be a logical development, since by not building afresh but refurbishing the existing stock, resources could be conserved. Selective demolition the opening out of congested spaces, re-routing of traffic and the energetic remodelling of the existing built fabric would all be appropriate measures. This process should not however, threaten the social ecology at neighbourhood level. If over ambitious or one-dimensional strategies are employed environmental problems could be exacerbated rather than relieved. The Frankfurt research group, Social Ecology, have warned of the dangers of creating 'highly toxic packages'. The ecological question is always enmeshed within the social fabric, human behaviour patterns, spatial interrelationships etcetera, these are all subject to continuous change. Ecological architecture must be part of a new culture of everyday building.

#### **A View of an Ecological Architecture with Complex Characteristics**

All too often architecture fails as a consequence of the complexity of the total problem. The parameters set by technology and the social demands are extraordinarily diverse. Despite his best endeavours the architect runs the risk, of responding to them in an over-simplistic, or under-complex, manner. In their totality they create a tension and polarity between the social and formal, the real and utopian, the col-



House on Ohayo Mountain, Woodstock, 1948-71

? *The re-use of existing stock resources is of course very important but will require enormous social measures to accomplish the moral and economical shift. How do you think to get rid of speculation, the capitalist wish to shorten the turn-over time, the need for flexibility, etcetera. Who do you think is going to take these measures?*

! *In the past years, we have lost a political alternative. If capitalism alone cannot manage to bring about change to save our living fundamentals, we may experience the development of new alternatives with an ecological bias. Environmental measures need strong political action on an overall basis, complemented by an individual attitude based on strong beliefs. Policies are needed to reach both levels.*



lective and the individual. These are tensions which one should not attempt to smooth away; whenever one succeeds in maintaining them projects derive a particular quality – a dual character. This implies accepting things simultaneously, which at first sight might appear to be mutually exclusive. The usual compromise between these opposites is, however, often neither feasible nor desirable and only opposites which remain intact – the one informing or questioning the other – provide the correct degree of complexity and animation.

Ecological architecture is not concerned with the harmonious design of fashionable eco-stage sets on its own; even ecologically well considered architecture is not a panacea. The really important ecological decisions and actions take place outside the sphere of architecture entirely.

However, the environmental dimension creates another dynamic in architecture. The many layered fabric of arguments, ideas and actions directed towards a more careful use of our resources, will also fundamentally change our houses, our cities and the way we live together. It is therefore indispensable that ecological design will free itself from its esoteric or technological one-dimensionality and grow out of its niche position. It will affect all levels of house design from the construction of the individual house, to large scale planning and urban renewal. Here its integration alongside other disciplines, in the complex decision making process, will be of critical importance. Besides ecology social issues, time-scale, space and technical problems will all require proper consideration. However, it is to be hoped



Architecture without architects



Gunnar Daan, T. de Vries, House with studio, Langezwaag, 1988

that the many layers involved in such a planning process can produce simple solutions; the product could be a functional, lively architecture – an expression of the user as much as the designer.

A new form of building could emerge; complex in its conception but simple in its realisation. Modest and inconspicuous, it should be incomplete, offering scope for future developments. Reflecting the nature of our society, it would embody dual qualities: formal, vigorous but simple and perhaps elementary basic structures, accommodating a varied and informal 'fit-out'. Initial structures and spaces which stimulate the imagination, allowing space for varied and lively additions. In urban design terms it could have quite simple objectives such as spatial containment, the definition of ownership and zoning, whilst the basic built elements might comprise simple enclosures, enable cores and 'street frontage' buildings. In some instances the basic provision might just be the facade or structural system. These basic elements would allow completion and extensions to take place in discreet stages, within an overall planning strategy. In this way a new and vital architecture will develop, never either complete or self-contained, and evolved within defined parameters. Ecology would set the pace for a different, human architecture; one which both creates form and allows it to be created. A way of building which will make the learning process, passage of time and moods visible; giving expression the use and the users but containing the potential chaos, within an overall concept. The formal language of this dynamic architecture is ordered chaos, contained spontaneity, structural variety and complex simplicity.