

# Holland and the ecological landscapes 1973-1987

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Allan R. Ruff

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Holland and the ecological landscapes



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# Holland and the ecological landscapes 1973-1987

An appraisal of recent developments in the layout and management  
of urban open space in the low countries

Allan R. Ruff

2237 6341



Delftse Universitaire Pers/1987



*Editor's note*

*In 1979 Allan Ruff wrote a little book which he published himself. It was called "Holland and the Ecological Landscape". As the book's title indicates, "The Ecological Landscape" is an idea, a specific notion of designing open urban space. Experiments in urban environmental design in the Netherlands have attracted a great deal of attention abroad, Allan Ruff's book being just one reaction. But how are the Dutch themselves coping with the heritage of the sixties and seventies?*

*Since 1973 Allan Ruff has been observing developments in the Netherlands from year to year. He has noticed that many of the originally introduced ideas are not being carried out, nor are they being improved. It is time to draw up a balance: this revised version of the 1979 book is the result.*

*"Holland and the ecological landscapes" is produced within the framework of the research project "Restructuring Urban Areas", and as contribution to the UNESCO-MAB (man and the biosphere) programme on human settlements.*



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## *Introduction*

It is now eight years since *Holland and the Ecological Landscape* was first published and almost two decades since the events it described first began. In those years many changes have occurred. Most gratifyingly, it can be said that many of the ideas the book contained have been taken much further by landscape architects and those involved in urban conservation, in many countries of the world. Whilst somewhat paradoxically, in Holland itself there are signs that the events of the seventies are being quietly confined to history. Both events could be regarded as good reasons for leaving the book to gather dust on the shelf, a small contribution to the urban green movement. But this would leave the story incomplete and would be a mistake for two reasons. Firstly, because of a continuing interest in those pioneering ecological landscapes; and secondly because it provides an opportunity to restate the reasons that prompted their development. Today many people from Britain, Sweden, Canada and elsewhere visit Holland to see those landscapes that inspired changes in concept and techniques in their own countries. Sometimes, today's visitors are disappointed for not only has time reduced the impact of those landscapes but some municipalities have modified their form and function. So this revised version of *Holland and the Ecological Landscape* includes observation of those case studies since 1973 and seeks to give some account of their success and failure. In a few cases, a number of other examples have been included where this helps to provide a more complete picture of the developments which emerged in the 1970s. Also for the purposes of completeness, the earlier case studies are included in an abridged form. For those familiar with the earlier publication this will be repetitious but for new readers it will provide a background to the aims and objectives of the projects, the techniques involved and perhaps most significantly some sense of the utopian optimism that characterised the 1970s.

One further note should be added concerning the use of the description 'ecological landscape'. Today ecology is often used synonymously with the word nature. In the 1970s the science of ecology had newly been brought to our attention through the

writings of such people as Rachel Carson, in 'The Silent Spring'; and other leading scientific propagandists like Erlich and Commoner. Their message was that the proper study of Ecology was man and his interrelationship with his biological and physical environment. The description of that relationship was ecological. The focus of that relationship, for myself as a landscape architect, was the urban environment and in particular the green spaces of the city. So much of this was the result of post-war planning and in many respects it completely overlooked the ecological dimension. Natural processes had been ignored and wildlife overlooked in its making whilst a relationship between people and their surroundings was non-existent. Hence the need for an ecological landscape, a need which has not diminished in the 80s though the subject of study seems to have moved from man to nature.

### The Ecological Landscape

The reasons for the development of an ecological approach to urban landscape varies from country to country, and though there is usually a general desire for more natural surroundings, the events that trigger this desire are often quite different. In Holland it is important to appreciate that the landscapes of the 70s were part of a general reaction to post-war changes in society and environment which affected many aspects of Dutch life.

At the beginning of the 20th century, Holland had been little influenced by the industrial revolution that had dominated the economic and social life of Britain in the previous decades. It retained a largely agrarian economy and the medieval cities of the western provinces had expanded little beyond their fortified canals and moats. The first major expansion plan was produced for Amsterdam south in 1915 by the architect Hendrike Berlage. Though some expansion took place in subsequent years, the situation changed dramatically after 1945. The Second World War left Holland in a near bankrupt condition, large parts of cities like Rotterdam and Arnhem were in ruins, fertile polders in the south-west were again under water and the far-eastern colonies, on which so much foreign trade depended were occupied and soon to

become independent. Strict Government measures were necessary to restore the economic base of the country; and this included the development of Rotterdam as the port of Europe. This led to the emergence of many new industries particularly in the petrochemical field. There was also a pressing need for housing; in 1945 a quarter of a million families needed homes, out of a total of two and a quarter million. This number would be greatly increased by the influx of immigrants from the former colonies and later, the dependants of the 'guest workers'. This necessitated a massive house building programme which took the form of suburbs and new towns around each of the old centres of the western provinces. From the 50s this region would be referred to as the Randstad or the Ring City.

### The New Suburbs

To achieve the building programme, politicians, planners and architects, as in all European countries, turned without reservation to the use of systemised, mechanical building methods. The resulting 'slab' block had been proposed earlier, by amongst others, the Swiss architect Le Corbusier but it had not been universally adopted until the 1950s. Its use introduced an entirely new concept in urban design and urban living. Like large pieces of monolithic sculpture, the blocks were arranged arbitrarily in their surroundings, which were no more than close mown grass and a scattering of trees. Perhaps because Corbusier had argued that in the machine age nature was to be spiritually enjoyed through 'sun, sky, grass and trees'. In reality the slab block broke with one of the most fundamental human psychological needs, that of distinguishing between the public and private domain. By disposing of the street, the new architecture also removed the front and back of the house. Later architects sought to overcome this deficiency by arranging, or linking, the blocks so as to enclose semi-private courtyards. Then the problem was of how to fill these voids. In some countries, including Britain and Sweden, no attempt was made and they were left windswept, unused and often menacing. From the beginning of the 1960s, the response in Holland was to fill them with woody vegetation, 'the Bosplantsoenen', which changed in constituents from largely Poplar varieties to native species, as the ecological movement

gained influence. Today, 25 years later, the suburbs of the sixties throughout the Randstad towns are being submerged under this new urban forest. It was against this background that the first case study of the Bijlmermeer was developed.

### The Silent Revolution

Trees, however, do not make a social environment, they can only contribute to the physical surroundings. By the late 1960s strong feelings were beginning to emerge in the Netherlands that the rate of change had been too great and price paid for it too high. A general reaction against post-war materialism erupted in the student riots of 1968 in Berlin and Paris. In Holland their counterpart was the more peaceful demonstrations of the Provos, later the Green Gnomes, who were a group of young people concerned about the environment and the economic circumstances that produced it. The concerns of this Group led to a wider agitation for political and social change and for those concerned with the planning and design of the environment, these feelings had to be expressed through architecture, town planning and landscape design.

The following extract from a pamphlet produced for the Ministry of Cultural Affairs, Recreation and Social Welfare in connection with the 1976 Vienna Biennale indicates the spirit of that silent revolution.

"Since the Provos and subsequently stimulated by the activities of 1968 many action groups have come into being. These are frequently supported by students with revolutionary ideas from the schools of architecture, social science and law. Apart from the realisation that those members of society who already have problems are left to fend for themselves, these groups further a consciousness that the current economic growth must not be allowed to continue. Too much has been sacrificed already, and for what?

Members of a community are now refusing to be rehoused in a new home, far from their family, friends and the pub. They flatly refuse to be removed from their community, which has its problems, admittedly, but which offers security, where you can

make contact with people, where you can, to a certain extent, expand. They refuse to be removed from surroundings with which they can identify. The old neighbourhoods are smartened up, streets are closed off to make parking difficult, flowers and shrubs are planted by the front-doors, the houses are painted in a fresh colour. The realisation that if one agrees to be rehoused, one will have to pay a rent that is far too high, leads to political action.

#### Ideas Change

Public authorities are now stimulating a move towards the renovation of older residential areas and infill of the gaps with new buildings of an appropriate style and scale. This means a re-education within the building professions and an adjustment of the machinery within the construction industry. If the speed of construction of new dwellings could be more critically planned and the scale reduced, it would be possible to experience again a direct contact between inhabitant and designer. In reaction to the deathly sterility and the consistently high rents of new homes there has been a noticeable growth in interest in the positive identity of older districts. More and more frequently they are being done up and adapted to the present day requirements, at the same time attempting to retain the existing character. Such areas, that have clearly grown organically, offer greater possibilities for displaying the identities of the inhabitants. Surely it must be possible to build new viable homes which, while meeting the material needs of today, still form a neighbourhood which has its own character.

#### The Needs of House-dwellers

The quality of the living environment is not only determined by the fulfilment of material needs of people. It is becoming more and more obvious that the social quality of the environment is as important, if not more so. Although it is possible for the human being to adapt himself to all kinds of environment, it appears that he has a basic need for an environment with many stimuli.

In a monotonous environment feelings of loneliness, boredom and estrangement develop. People had a need to be able to orient themselves, to be able to explore and to communicate. One must be able to let oneself follow the cycle of nature, but also the lifecycle of the human. Close to home, one must be able to experience the processes of the changing of the seasons, the contrasts of day and night, or sun and rain; to come into contact with and to experience wildlife and the nature of human existence; to observe processes of birth, life and death; to know what it is to be young and to grow old. The need to explore develops from the need to orient oneself. It must be possible to discover your surroundings and to know that it is there that you belong.

Children must be given a secure and spacious environment in which to develop their motor skills, to grow intellectually and emotionally. They must be able to discover that there are different forms of activity and work. One must be tempted to investigate further afield. People must have the opportunity to adapt and change their surroundings. One should be free to alter ones house or to construct a dovecote. It must be possible to organise a street party or a festival procession. This kind of social event indicates not only the need to explore, but also to communicate. People need contacts. It should not only be possible to meet people at the shops, the doctor's, at school or in the pub or community centre, but also in the street. Within the neighbourhood there must be all sorts of outdoor corners and places where you can meet people, not just briefly, but to stop and talk. If you want to arrange a social happening, the neighbourhood must be able to offer the necessary space.

However, the neighbourhood experience should not exclude the awareness that the local group fits into a larger social community. The design of housing developments must not be based on the non-existent average inhabitant. The specific needs of every group in society must be satisfied within the housing environment. There must be room for everyone. We must ensure that we build accordingly.



## Perspective

The initiative has been taken in the Netherlands, as elsewhere, by residents and designers, that could lead to a form of living that does justice to the real needs of people. Our aim is to point out the initiatives that have been taken, but to emphasize that this occurred at the fringes of the present socio-political, economic and technological system.

The gap which exists between the real needs of people and the choice with which they are confronted on the free market is great. There is a feeling of estrangement; there is no room for 'architecture without architects'. The only escape is to attempt superficial changes in the home, within the very limited possibilities, or to turn to such forms of recreational accommodation as caravans or summerhouses on allotments or in leisure gardens. Residents - whether or not organised into action groups - as much as professionals, would like to bring about changes in this situation.

The main changes in the housing process are brought about by those groups characterised by their social approach. Professional designers can build further upon this, especially by adapting their technical knowledge to society, There must, of course, be more room for amateur design, but this is not the point; it is the duty of the professionals to concern themselves with the people.

The actions of the residents and the ideas of the designers appear to follow on from one another.

Most interesting (more so than the agreement of the ideas) is the co-operation between residents and designers. A few years ago, those involved in such projects were designers performing a double role - working for an authority or a firm during the day, for an action group in the evening, or students of those living on social security. Not that there is much more true experimentation; new concepts of professional practice are linked with the residents' new ideas of living. The important question is the degree to which this experimental model can survive the approach necessary for the construction of a large

number of dwellings that are, nevertheless, required short-term. Characteristics of the experiment are handworkmanship and capacity for improvisation; through these groups the acts of building and living are brought into new relationships with one another. But what is going to have to be altered within the socio-economic system if we wish to build at a small scale and to decentralize the decision-making concerning our homes? Action can take place at two levels.

- Through a general attempt to change the socio-economic structure. The real needs of people must be put before profits.

- Through a search for alternatives within the design professions. On the one hand there must be room for design by non professionals. On the other, trained designers must respond to people's needs, possibly involving other disciplines (sociology, psychology, ecology, etc.)

The way in which the present socio-economic system works leaves little room for real solutions. If the first action level is lost to sight, isolated alternatives develop. If no action is taken at the second level, then nothing will happen. The work has be be done at both levels."

## 1.0 AMSTERDAM BIJLMERMEER

The Bijlmermeer, commenced in 1960, was the last of Amsterdam's extensions and was intended for a population of 100,000. It was also planned as a showpiece for a new concept in urban living and as such it comes closest to realising Corbusier's Villa Radieuse. The framework of the suburb is provided by the main elevated arterial roads. One runs along the southern edge whilst the other divides the site, running north/south. It is not possible to raise these on pilotis, but extensive planting along the embankments gives an impression of the landscape flowing over the top rather than underneath. From the arterial roads run service roads which terminate in large parking blocks adjacent to each housing unit. These roads surround the traffic-free, residential cells. The housing units within these cells are mostly eight-storey, white monolithic blocks arranged into interlocking hexagonals. The blocks enclose communal gardens which range in size from two to five hectares. The only real difference from the Corbusian model for these blocks and their courts is the variation in form and reduced height. This was due to the lower load bearing capacity of the soil and the high water table.

However, there was a very real change in the design of the landscape. The landscape architects in the Amsterdam Parks Department began to appreciate the social and physical implications of such a layout and the inhuman scale of the architecture. There would be problems of self-identity caused by an inevitable loss of privacy, whilst the variable micro-climate resulting from the resistance presented by the 80-metre high blocks to an almost constant North Sea wind, would result in considerable physical discomfort. Moreover, conventional landscape treatments would not overcome these problems and in the meantime it would, as the Official Report states, 'be unthinkable to force residents to live for many years with the earliest stages of cultivation because of the use of conventional methods.' (1) The designers saw the only way to overcome these problems was by extending the techniques of the Amsterdams Bos into the urban housing landscape.

The Amsterdam Forest Park (2230 Acres) had been developed as a

recreational woodland in the mid 1930s. Here the designers' intention had been to create a woodland with all the character of a north-west European forest and consequently, native species were predominantly used in the initial planting. The site of the Forest Park was a recently reclaimed polder, as such it had a variable soil, places of poor drainage and was exposed to the winds blowing in from the North Sea. The success of the Forest Park in drying out the soil, creating shelter and above all providing an attractive facility, used by 40-60,000 visitors during fine summer weekends now provided an inspiration for the designers at Bijlmermeer.

Some idea of the new attitudes can be appreciated from the following extract from Amsterdam's 'Official Guide to Green Space':

'In laying out the open spaces in Bijlmermeer, attention was mainly focussed on the inhabitants. That is why the bundled green space is again subdivided into smaller, sheltered compartments for the residents to feel protected, and to give prominence to all facets of recreation. Tall screens of greenery were then placed along the facades, so that their height is broken and their overpowering effect is mitigated for people outside. Particular emphasis was laid on the planting of trees. Instead of pretty gardens there will be natural-looking wooded areas and shrubbery.

Fast growing trees were planted, such as poplar and willows which reach maturity in a short time. These were complemented by stockwood such as beech, mountain ash, hawthorn, hornbeam, spindle tree, flowering currant, hazel, oak and hedges such as yew, privet and elder.

The landscape architects at Bijlmermeer have gone out of their way to try and imitate nature as much as possible. That's why plants, such as cornflowers and bramble, poppy, clover, dandelion and dog's tooth are allowed to grow wild. This calls for another kind of upkeep, no neat lawn edges.

The green in Bijlmermeer has a specific function. Rows of trees planted in certain ways and placed near the facades in the right position have to break the winds and prevent them from beating

down on the flats. Trees and shrubs temper the elements and offer protection. The aged residents as well as children have their sunny, wind sheltered spots. Everything in this district is part of an experience in living...'

### Living with Greenery

Parks Division - Amsterdam Public Works Dept. (2)

#### 1.1 The Woodland Structure

The woodland structure at the Bijlmermeer can be described under three headings:

(1) the Roadside Verges, (2) the Urban Periphery, and (3) the Inner Courts.

##### (1) The Roadside Verges

The planting along the roads was used to screen the traffic from view, so lessening its psychological impact and reducing heavy particulate pollution. On the Expressways there is a wide verge of 50 metres which is reduced to 20 metres alongside secondary service roads. Research by Raod, Parks Director at Rotterdam (since retired), and others has shown that planting laid out in overlapping strips reflects noise better than a homogenous mass (3). This practice has been adopted on the Expressways

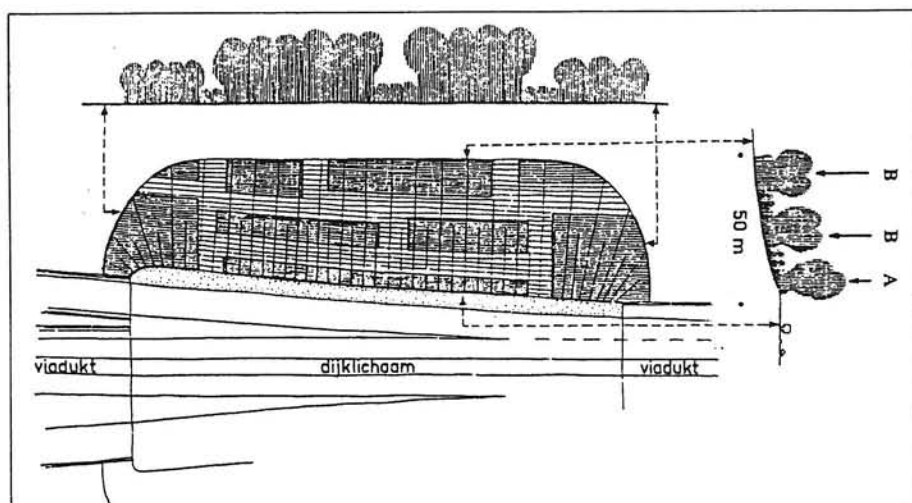


Diagram 1

- A - Poplars, later thinned
- B - Forest species, like Oak and Maple
- A special thick edge by the roadside increases the noise reduction

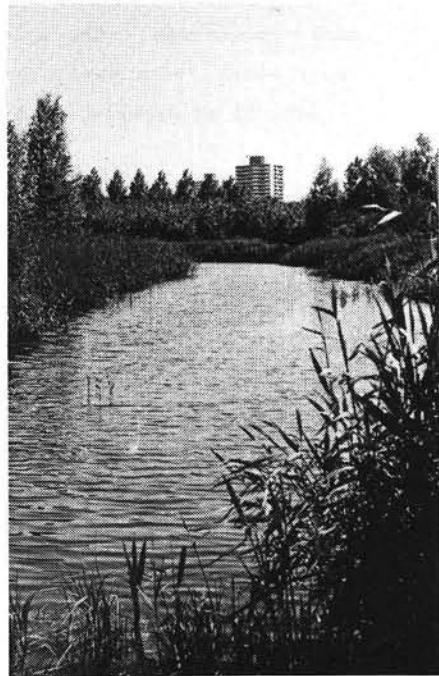
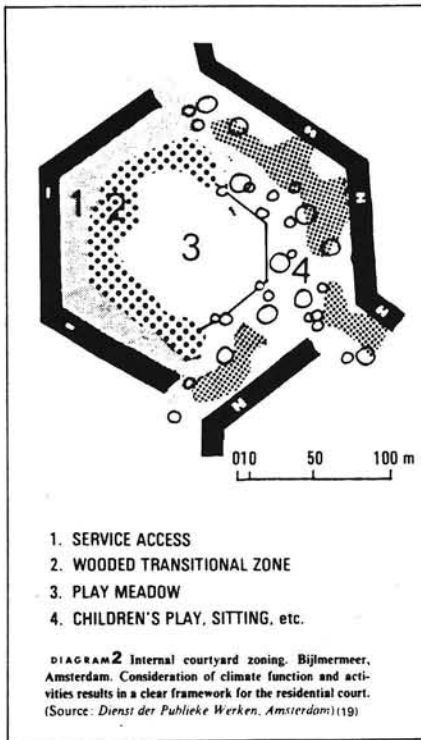


Photo 1. The Bijlmermeer. Peripheral planting

(Diagram 1). On the secondary roads a more homogenous mass has been used. Beck (1967) has examined the efficiency of different tree and shrub species in reducing noise (4). A correlation of the species used along the road verges and their known decibel reduction serves to show the effectiveness of this planting (Table 1).

(2) The Urban Periphery

The woodland planting around the periphery has three functions:

- (a) to reduce the scale of the buildings for those approaching along the pedestrian routeways;
- (b) to provide a harmonious link with the surrounding polder landscape;
- (c) to provide small recreation features close to the housing blocks.

The southern edge of Bijlmermeer illustrates how a narrow strip barely 200 metres wide, can be treated to give a completely natural appearance to a small neighbourhood park. The fisherman

TABLE 1

Trees and Shrubs used for Roadside Planting at Bijlmermeer

Species	Noise Reduction
<i>Alnus glutinosa</i>	4-6 dB
<i>Betula verrucosa</i>	
<i>Cornus alba</i>	
<i>Corylus avellana</i>	
<i>Forsythia x intermedia</i>	
<i>Crataegus monogyna</i>	
<i>Sambucus nigra</i>	
<i>Quercus robur</i>	6-8 dB
<i>Viburnum lantana</i>	8-10 dB
<i>Tilia platyphyllos</i>	
<i>Acer pseudo-platanus</i>	10-12 dB

Based upon Beck 1967)

on the river bank is totally screened from the buildings and is aware only of the sights, sounds and smells of nature. Equally important, the height of the blocks from the pedestrian approach route has been greatly foreshortened by the peripheral woodland.

### (3) The Inner Courts

The most significant advance at the Bijlmermeer was in the treatment of the Inner Courts. This began, at the planning stage, with a careful climatological analysis, seen as 'a prerequisite for laying-out these areas in a responsible manner'. Determining factors in this analysis were the position of the sun in spring and autumn, and the effect of wind in relationship to the buildings. Following this analysis, the courts were zoned by relating function and planting in the following way (Diagram 2).

Zone I The Access Zone. The gallery side of the court is subject to the full force of the downward air movement off the side of the building and this makes conditions unpleasant and prolonged stays improbable. So the area is zoned for pedestrian and cycle access using a hard surface of stone or asphalt.

Zone II The Transitional Zone. A short distance away from the block the wind begins to eddy and planting is used here to break up the turbulence. Pioneer species like poplar and alder have been used, along with other wind tolerant species, like elm. This planting is used elsewhere in the court wherever wind turbulence is expected. The transition zone planting is also placed close to the block so as to diminish its scale from within the court and to prevent observation of people in the court by those in the building.

This intimacy and smallness of scale is accentuated by mounds used in conjunction with the planting. On the inner side of this planting, more vulnerable species have been used in an irregular arrangement so as to create smaller private spaces for individual use.

*Photo 2. The Bijlmermeer  
The inner court, the access zone.*



*Photo 3. The Bijlmermeer.  
The inner court, central zone*





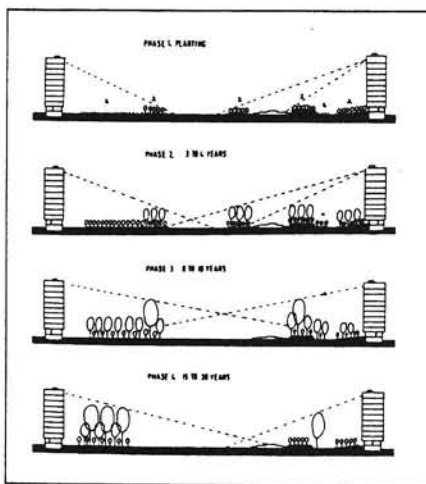
Zone III The Central Zone. The centre of the court lies half in sun and half in shade depending on the time of day and this coolness makes the zone ideal for active games, like football, netball, etc.

Zone I - The Access Zone. On the sunny side of the court, the apartments are provided with balconies, whilst at ground level the play spaces and sitting areas are arranged into a series of connected spaces. Mounds and pioneer species have again been used to create shelter, particularly around the play spaces, though the plant material is without thorns, as this is thought to be more friendly. In many courts, or on their periphery, an additional element is the water courses that have been located in full sun so that the rapidly warmed water will provide good facilities for waterside activities. After this climatic zoning, detailed proposals were made for each court.

### 1.2 Plant Selection

A Further innovation at Bijlmermeer came with the selection of

*Photo 4. The Bijlmermeer.  
The inner court the sun zone.*



**Diagram 3**  
Phasing of woodland planting  
Source: Dienst der Publieke Werken Amsterdam



plant material. Whereas in the gardenesque landscape, trees and shrubs were selected primarily for visual effect, for example, shape, colour, seasonal interest etc., the planting at Bijlmermeer had to achieve a natural woodland appearance in the shortest possible time; this naturalness eventually bringing its own aesthetic quality. To understand this planting, the designers categorised the woodland into its four main components:

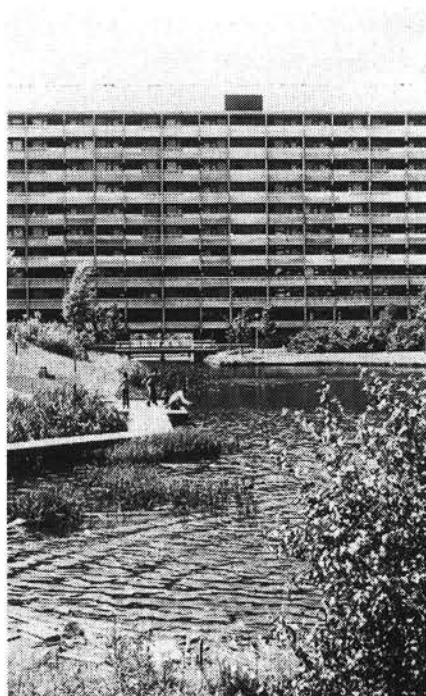
(1) Principal Species. These are the main woodland dominants or co-dominants as in a natural woodland. These are Oak (*Quercus robur* and *Q. petraea*) but also Ash (*Fraxinus excelsior*), Beech (*Fagus sylvatica*) and occasionally Pine (*Pinus sylvestris*). In certain exposed or pioneer circumstances, Elm, Poplar, Birch and Alder also used to form associations.

The percentage of these species is determined by function, for example, shelter, filtering, screening and the ecological association desired.

(2) Filler Species. These are the other species found in a woodland, though they are not always present in a natural woodland. They give diversity, often through colour in leaf and flower, e.g. Whitebeam (*Sorbus aria*), Bird Cherry (*Prunus avium*), Gean (*Prunus padus*), Rowan (*Sorbus aucuparia*), etc.

(3) Pioneer Species. These are fast growing species that naturally colonise bare or disturbed ground, e.g. Poplar (*Populus alba*, *P. tremula*, *P. serotina*), Alder (*Alnus glutinosa*), Birch (*Betula pendula* and *B. verrucosa*) and Willow (e.g. *Salix cinerea*, *Salix viminalis*) etc. These species are used in the same way as in forestry, to screen and shelter other species. The particular species used are dependent on soil type and moisture conditions. They are progressively removed during the early years of the woodland except in specific areas, e.g. low-lying wet areas, dry mounds, etc. Such areas may be specifically created to give diversity to the planting.

(4) Edge Species. These species are found naturally between the woodland edge and the open grassland, that is, just in or outside the forest canopy. These species serve three functions:



*Photo 5. The Bijlmermeer  
A child at work in the garden*



*Photo 6. The Bijlmermeer.  
A more natural treatment of  
the waters edge.*

1. ecological, in that for wildlife the most diverse and valuable part of the woodland is its edge;
2. visual, in that it creates a more natural effect;
3. cultural, because many of the species are thorny, e.g. rose, bramble, hawthorn (i.e. pioneer species of the thicket stage) and they protect the planting on the inside. Their irregular and untidy growth also prevents the tidy minded maintenance operator from mowing up to the woodland planting. The maximum length of edge should be created by making it irregular in outline.

A major determinant of plant selection and establishment in all the western suburbs is the method of building construction. The high water table prevents the use of deep foundations, so the under-building is buried with a thick layer of inert sea sand. The layer of sand naturally obliterates all existing vegetation so that the new plant communities have to be determined by observation of off-site indicators. At the Bijlmermeer, the

eventual woodland was to have a character of a pedunculate oak woodland with a rich ground cover - a *Quercetum violetum*. In this the Principal, Filler and Pioneer species were arranged in a ratio of 65%: 17.5%: 17.5%.

#### Plant Grids and Specification

In the early years at Bijlmermeer the planting plan for woodland was in the form of the traditional grid, adopted earlier at the Bos Park. One advantage claimed for this method was that the species were planted approximately as the designer intended. However, the disposition of trees and shrubs is not critical in the first fifteen years when all the planting is in the thicket stage.

A grid also takes office time to prepare and cannot be accurately checked on site by the landscape architect or quantity surveyor. Where an experienced contractor or direct labour force is used a more natural effect can be achieved through the use of a planting schedule. This gives details of the number to be planted in each area, according to the ratio of types. Details can also be

*Photo 7. The Bijlmermeer.  
Removal of the forest planting*



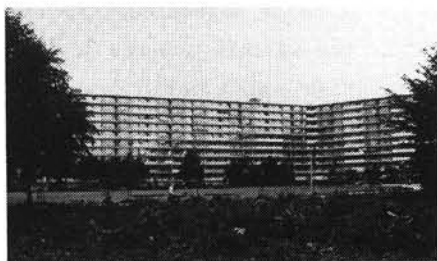
*Photo 8. The Bijlmermeer.  
The Acces zone 1987*



*Photo 9. The Bijlmermeer  
The "new" simplified landscape*



*Photo 10. The Bijlmermeer. The  
"open" courtyard with exotic  
planting.*





*Photo 11. The Bijlmermeer  
The managed landscape.*

included of specific requirements, for example, the location of edge species; waterside planting, where plants are to be single or in groups, etc. A planting schedule was adopted at Bijlmermeer in the later phases of development. The pioneer species will subsequently be thinned and in some cases replanted with a second generation of pioneer or climax species. To achieve the rapid effect, referred to in the official report, the planting areas are more spacious and the open spaces smaller than they will be in the final stages. As growth matures, the open spaces will be enlarged to provide a balanced ratio between the vertical and horizontal planes (Diagram 3).

Although most of the grass in the open spaces is kept close-mown, areas of wild plants have been established in some small bays.

### 1.3 Commentary

After ten years the landscape at Bijlmermeer has satisfied most of the objectives the designers set for themselves. In summer, when most people are in the landscape, the woodland screens the buildings and in the courts, there is sheltered private space even on the most windy days. The Bijlmermeer has successfully extended the techniques pioneered at the Amsterdam Bos (thirty

years earlier) into urban housing. The reasons for this can be summarised as:

1. The planting and the landscape has ceased to be a decorative feature and has become a functional, structural element in the external environment.
2. The woodland has created identifiable spaces which are physically comfortable.
3. The range of physical sensations has been greatly increased.
4. The opportunities for formal and informal recreation have also been extended.
5. In management, the landscape is increasingly becoming low cost/high return, as maintenance decreases and social value increases.

But in spite of its success the landscape Bijlmermeer has severe limitations, especially in ecological and social terms.

The landscape with its extensive use of native species cannot be considered natural. Even when the planting has matured, acquiring greater naturalness and obscuring human artifacts, the landscape could not be confused with nature. It still depends, like the Gardenesque before, on contrast between water, grass and trees. Where these elements meet, the designer uses such features as walls, hedges, and kerbs to reinforce and bring clarity to the design. In the landscape these barriers not only determine the visual aesthetic but also the behaviour of the individual. In some cases the messages conveyed are essential to survival - like kerbs at the edge of the road. Elsewhere they may inhibit the interaction of the individual with the environment. At Bijlmermeer, for example, there is little evidence of children walking into the woodland blocks or digging up the grass area. In the past, this evidence of neatness and order in the Courts at Bijlmermeer would have been regarded as an indication of success, but in the early 1960s a critical reappraisal occurred in Dutch society. It was realised that such barriers were unnatural. In natural areas, like the seaside dunes, commons, wasteland, with no such barriers social or ecological, tree, shrub and herb communities would imperceptibly merge, whilst people could disperse throughout the area. The

only constraint would be real physical barriers, such as steep slopes, wet areas, etc. The next stage was to create an ecological landscape which would allow freedom of expression for wildlife and people, but this obviously called for new techniques and concepts. The means of achieving this are discussed in following sections, but the effect of the change could be seen in these later phases of the Bijlmermeer completed after 1970. Here the Inner Courts began to resemble woodland glades rather than gardens. The harsh line around the planting was replaced by a gradual ecotone. The aquatic plants passed imperceptibly into the longer meadow grass and beyond to the trees and shrubs.

It was almost as though Dutch society and the landscape had come to the edge of a precipice and realised their danger in time. As the biologist, Rene Dubois, has said:

'...societies and social groups that have removed themselves into a pleasure garden where all was designed for safety have achieved little else and have died in their smug little world.' (13)

By 1968, there was a growing demand from the inhabitants of the new suburbs for a new 'natural' form of landscape, a landscape which would allow freedom of expression, involvement and habitats for other wildlife.





## 2.0 LOUIS LE ROI

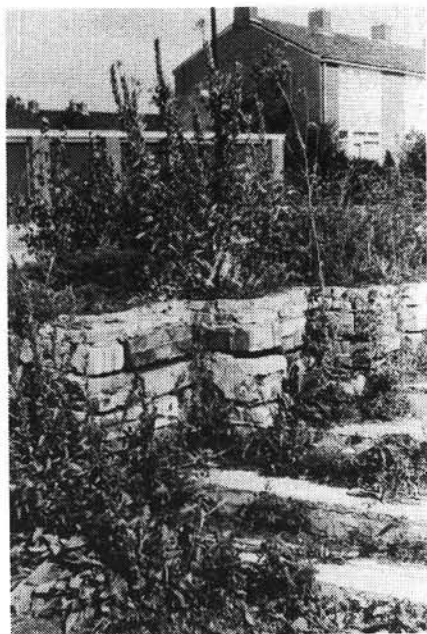
One of the prime reasons for the extent of the debate and the emergence of a new philosophy of urban landscape was the catalytic presence of Louis Le Roi, art teacher and gardener, from the northern town of Heerenveen. Le Roi successfully related the ecological arguments of the 1960s to the urban landscape and though not always scientifically accurate, his enthusiasm awakened people to an awareness of their environment.

In his book 'Natuur Uitschakelen Natuur Inschakelen' Le Roi argued that the country had become divided between two vast monocultures; the rural environment, which contains such activities as farming, forestry and water catchment, and its urban counter-part with housing and industry. Sandwiched between these two was a growing extent of land in public ownership, the urban landscape. Some of this land was accessible in town or country parks but much was inaccessible in motorway verges, roundabouts, airports, etc. This situation had arisen at a time when the individual was coming under increasing pressure for space. If people are fortunate they have a 'tiny house and garden, but cannot move without treading on their neighbour's toes'. (6)

It has not been possible to provide the necessary space or to satisfy individual needs within the urban landscape. In his plan



Photo 12. Louis Le Roi.



*Photo 13. Heerenveen  
The Kennedylaan, informal  
construction detail.*



*Photo 14. Heerenveen. The  
Kennedylaan, Environmental  
education in a people's park.*

for a new city region, Le Roi proposed that the land between the two monocultures should be returned to individual use. The land being divided into parcels for small-scale food production, which in Le Roi's example, could be run on macrobiotic lines. These parcels would be surrounded by extensive woodlands to screen the alien monocultures. The woodlands would also provide space for the making of small 'People's Gardens' and the laying out of a network of footpaths, to overcome the present deficiency in the landscape. Nature reserves would be established outside the region as reservoirs for wildlife. These would be linked to the woodlands and new artificial ecosystems would penetrate into the centre of the town to encourage wildlife into urban areas.

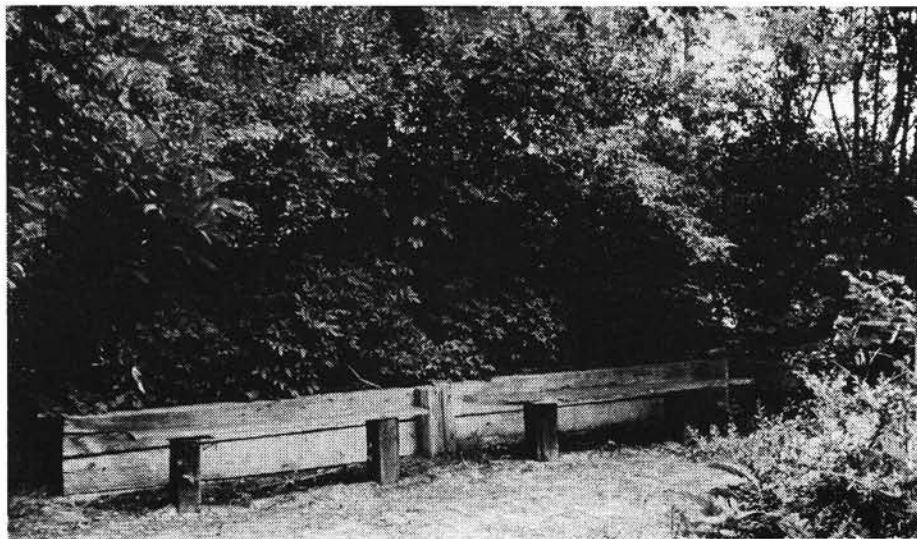
Le Roi's ideas touched upon a raw nerve of a society which had seen sweeping changes in both the rural and urban environments. People, in Le Roi's words, 'were desperately seeking to find a compromise between the technology necessary for survival in the present day and those former values that had been lost or were in the process of being lost by too much technology.' (7)

Nowhere was this more apparent than in the new suburbs which Le Roi considered were the result of architects and planners prepared only to argue over concepts and who were preoccupied with 'squares and circles' without which they couldn't design. Le Roi echoed the feelings of many when he said that 'the architects and planners lacked the necessary vision and had lost touch with the people for whom they planned and the land they managed.' (7)

*Photo 15. Heerenveen. The Kennedylaan 1987. A faded dream.*



*Photo 16. Heerenveen -The Kennedylaan 1987- neglected and broken seats.*



## 2.1 The Kennedylaan

Le Roi's opportunity to try out his ideas on a small scale came in his home town of Heerenveen. The Town Council made available a central grass strip between the residential roads, called the Kennedylaan. This was situated one mile from the city centre. Le Roi's model for the artificial ecosystem showed theoretically how this area should work.

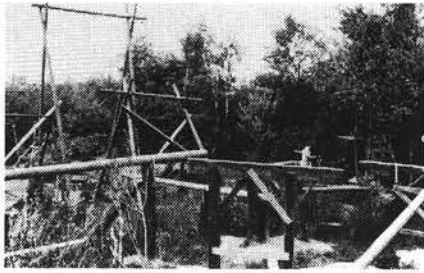
The reality of the situation in Heerenveen supported Le Roi's arguments. The public park which was to service as a reservoir for wildlife, although visually attractive, was biologically sterile. Broad hard surfaced paths conduct the visitor around whilst close-mown grass stretched down into the water. Similar circumstances were repeated in the housing along the Kennedylaan where the neat and tidy gardens would provide little cover for any dispersing wildlife. Near the end of the artificial ecosystem was a large tarmac-surfaced car park, which, as Le Roi states, totally sterilises the land and dissipates all natural energy from sun or rain.

The alternative to this situation can be witnessed barely a quarter of a mile away on a disused service canal. Here a derelict canal had been left to nature and a rich profusion of aquatic plants and animals has resulted. This canal is crossed by an old wooden bridge and, though designed, the wood reflects the trees from which it was cut and the hand of the craftsman who made it. There is a harmony between nature and the artifacts of man which does not exist in the public park but which Le Roi argued was essential to harmony between Man and Nature. Certainly on this stretch of canal people linger to enjoy the sensual pleasure of nature, whilst exchanging the time of day.

### Construction of the Kennedylaan

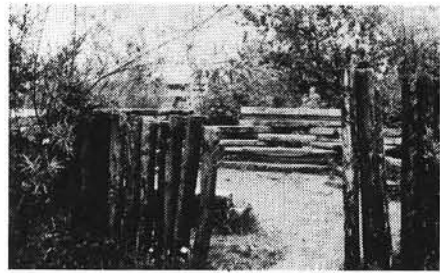
Such concepts as energy conservation, the spontaneity of nature and vernacular design all influenced Le Roi's ideas of an alternative urban landscape.

Le Roi also believed that once people were freed from the inhibitions of a plan and its dubious aesthetic values, people



*Photo 17. Groningen Lewenborg. The childrens playground.*

*Photo 18. Groningen Lewenborg The meeting place.*



*Photo 19. Groningen Lewenborg. Residents garden making.*

*Photo 20. Groningen Lewenborg. The village pond.*

could create their own park - the 'People's Park'. In this Le Roi shared the belief of Simon Nicholson in England that for too long 'planning, design and construction has been considered so difficult that only the gifted few, those with degrees, certificates in planning, engineering, architecture, art ... and so on, could solve environmental problems' (7). By using inexpensive cast-off material, individuals and the community could derive all the satisfaction that comes from creativity and the assumption of responsibility for one's environment. (8)

At the same time, Le Roi's observation of spontaneous natural communities, like the growth in the disused service canal, led him to believe that nature would always create variable and therefore beautiful scenes. All that was required was a rich provision of plant materials, either 'native or exotic for nature recognises no distinction'. In the Kennedylaan, Le Roi used over 1,000 species of trees, shrubs, herbs, ferns, bulbs, fungi and mosses. The process of natural selection would, Le Roi claimed, create a rich and diverse habitat within seven years.

The effect of the Kennedylaan, after this interval of time, was overwhelming and much of what Le Roi claimed had become a reality, though not with regard to the planting. Through its simplicity and spontaneity, both in construction and planting, the Kennedylaan achieved a quality rarely found in the more conventional municipal park. It is a quality that derives from the aesthetic of nature. As one enters, all the stress and strain of the surrounding town falls away and is replaced by the sound of birds, the flight of dragonflies, the sight of snails on the hogweed stems. In the shelter of the trees the sun's warmth is pleasant and free from glare whilst the trees make pleasing patterns on the path. The senses come alive. At weekends the Kennedylaan is full of people though not in an overcrowded way, for many of them are pursuing activities not associated with the urban landscape - children gathering seed heads for winter display or a family group botanising with a 'Keble Martin'. As Le Roi had said, harmony in nature brings a closeness to nature and between people, so that people stop to talk in a way that would never happen on the pavements to either side.

Although Le Roi's ideas met with stern opposition amongst some landscape designers and parks officials who believed that he sought to replace design with anarchy, there was widespread acceptance among the people of the Randstad suburbs. In the three years after 1968, many Le Roi gardens and playgrounds were made by parents, teachers and even local authorities in response, for example, to requests from members of old people's homes.

Le Roi helped to create a new ecological awareness in society and liberated a creative force which was instrumental in convincing people that they could be responsible for their environment.

#### The Failure of the Kennedylaan

Set against this positive achievement, the Kennedylaan and the other Le Roi gardens failed in the establishment of vegetation and the making of an artificial ecosystem. The cause of this failure must be attributed to arrogance rather than ignorance. However, in fairness, the fact should not be overlooked that the Kennedylaan was very small for this combined experiment, being only 18 metres wide and 1.5 kilometres long. Once it proved successful there was bound to be a conflict between people and

nature. The collection of seed heads, for example, was also the removal of a seed source for wildlife and continuation of species in subsequent years. But Le Roi also overlooked the fact that not all plant communities are species-rich and attractive. Many are dominated by a small number of highly competitive species.

The appeal of such species as Nettle (*Urtica dioica*) surely must lie in their scarcity and this diminishes as numbers and extent increase. The competitive strength of plants was also ignored, although this fact has been recognised and respected by generations of gardeners. The folly of such unusual interplantings as *Festuca ovina* *Glauca* with Sow Thistle (*Sonchus olearaceus*) was not the visual appearance, but that the more competitive thistle will always exclude the grass. Although Le Roi would claim that this was natural selection at work, this fact was already known and the *Festuca* was therefore lost needlessly. Equally ill-considered was the random tree planting. In one section willow, elm, birch and sycamore had all been planted in the same light sandy soil, yet the willow species prefers a moist humus soil, the elm a deep fertile soil, and though the birch was suited, it is likely to be suppressed by the sycamore. This species will cause a heavy shade reducing its attraction to wildlife and visitors alike.

The effect of competitive exclusion and wear and tear, resulting from increased use and the removal of plant material, caused the Kennedylaan and the other Le Roi gardens to move towards uniformity rather than the promised diversity. By the early 1970s there was a general disillusionment with Le Roi's ideas, and though his critics saw this as a victory, the 'self-destructive' element of his work may have been its greatest asset. Had the gardens been entirely successful, Le Roi's ideas would have further exacerbated the division between the community and the local authority Parks Department. As it was his catalytic effect was to bring people and Parks Departments into closer partnership, both concerned with creating a more satisfactory human ecosystem. As Bengtsson and Bucht summarised it, 'it is important ... that along with the vegetation we also create not a complete environment but one which is in a constant state of change. If residents are to appreciate their immediate

environment, they should not be presented with it as a 'fait accompli', but should be allowed to help create it. Planning for care and change in the vegetation of a housing area could hopefully be a means for assembling residents for regular discussion of common problems in the external environment.' (9)

How true this was can be shown by the Gillis Estate in Delft which was one of the first experimental landscapes undertaken by a local authority in the late 1960s.



### 3.0 DELFT

The 'silent revolution' had been concerned with the rights of the individual in the democratic society. In landscape terms Le Roi raised the important question of 'who was the landscape for' and on a small scale had shown that people could design and construct their own immediate landscape. As Lady Allen of Hurtwood made clear in her excellent book 'Planning for Play'.

'When we think and plan for play opportunities for all ages, we should never forget that play is not a passive occupation. For children and young people it is an expression of their desire to make their own discoveries in their own time and at their own place. At its best, play is a kind of research, and like all research at the adult level, it should be an adventure and an experiment that are greatly enjoyed.

Children and young people in the so-called civilized countries probably enjoy better living conditions than ever before; good hygiene, good food, better schools and better housing. But there

*Photo 21. Delft - Voorhof  
Adventure play.*



*Photo 22. Delft  
The unplanned play of children*



still remains immense emotional poverty and privation. There may be less direct hardship, but we are aware of more depression, more mental illness, more violence, more delinquency and more drug-taking.

The fact has to be faced that modern civilization interferes with a hard and heavy hand in the spontaneous play of children. The use made of land around buildings is still, almost always, totally unsuitable for children. Most of the vast rebuilding schemes in many countries are horrible places, planned without love or understanding. This arrogance, this paucity of invention, this disregard of the worth and scale of the individual, represents a world-wide disease and is one of the tragedies of affluence. The designer must devise new means for establishing a connection between the buildings he creates and the people on the ground.

What can be done about it? Much that is charming for children in and around their homes has been destroyed. Most of the shadow and mystery that lend enchantment to children's play have been swept away. Modern homes are hygienic and practical, and so cunningly planned that every corner is utilised. Gone are the private places where a child could create his own world. Vanished are the gardens where he could keep his pets or enjoy his hobbies, or even watch his father working with real tools.

It is too often forgotten, in our brash, practical, modern world, that twilight, shadow and beauty are as important to a growing child as food and air ...

How can we restore some of this lost mystery and keep alive keen sense of curiosity? All children, unless physically ill, have spontaneous gaiety. When their inherent curiosity and gaiety are crushed or limited by their living conditions, their vital creative drive may also be crushed' (10).

In 1968, the same year that this book was published in the Netherlands, the young planners and landscape designers in Delft began to develop the most experimental landscape so far. This landscape, in the suburb of Buitenhof, sought to keep alive a

keen sense of curiosity. It also finally established the distinction between the social landscape and the gardenesque park.

### 3.1 The Early Beginnings

The Parks Department at Delft had been demonstrating a greater concern for children in the urban environment since the mid-1960s. They had recognised that traditional play spaces and equipment were 'generally of bad function'. In the words of the Director of the time, H Bos, the metal climbing frames and swings were 'more suited to chimpanzees than young children'. In the suburb of Voorhof, to the south of the city, they began creating spaces they believed would give a 'greater effect of adventure play' (10). The spaces had wooden climbing structures and play houses with extensive sand area. These were conventionally sited alongside the road and for reasons of safety were surrounded by a 4 ft high pallisade fence. However, the fence also kept the children from mixing freely with the trees and shrubs, whilst the over-elaborate, rigid wood play structures prevented the child from creatively interacting with its environment. Commonly, when designers recognise the failure of metal and concrete they turn to wood, failing to realise that it is a material which is equally inflexible and unsympathetic to creative play without further social changes.

In a later stage of the Voorhof, the playground was sited in a pedestrian area, in close proximity to a school. This allowed the fence to be removed, so that the plants could edge their way into the playspace and the children could disperse into the planting. At the same time, the play features were made less elaborate and complex. Significantly, native trees and shrubs were used around these spaces, although the rest of the planting on the Voorhof was in the exotic gardenesque tradition. The designers were beginning to appreciate that a guiding principle in selecting plants for functional uses is low cost with high performance.

## The Spirit of Change

The play spaces of the Voorhog took the conventional landscape to its limits, but as at Bijlmermeer earlier, it was not enough. It was still the hand of the Parks Department that controlled man and nature. In the housing landscape, child and adult alike were surrounded by the artificiality of hard surfaces and ornamental landscape. Play for the younger children was segregated into specific locations whilst there was almost no provision for the child above 8 years old. Adults too could find no outlet for their needs and aspirations. In the atmosphere of the late 1960s, the Delft Parks Service realised that a radical new approach had to be adopted towards the urban landscape. It was further appreciated that with the inhabitants moving into the new suburbs from parts of the town without a tradition of parks and gardens, there was an opportunity to create a new landscape that matched the new mode of urban living. The feelings of the time were summed up in an unpublished report by the then Director of Parks, Mr H Bos. The following extract gives a feeling of the spirit of change:

'At the moment a very fast development is going on in many fields, too fast to be understandable for a lot of people.

This also applies to landscape designers as well as to the public, both of them developing an increasing interest in the use and upkeep of city parks, children's playgrounds, etc. In short, the whole urban landscape.

How did we design our new cities in the post-war period? We did it by standards based upon tidiness and order.

In that way, the parks and open spaces we created in our cities could only be looked at but they could scarcely be used. In different cities the new urban landscape is very much alike, everything is complete but monotonous.

Nonetheless a lot is lacking; for example, it is very difficult for children to play their own games like their parents used to do, who lived in a less over-populated country and could play in



*Photo 23. Delft, Gillis  
The Händellaan*

the streets without a lot of parked cars and dangerous traffic as there is today. At the moment the only freedom of a child is that which adults allow him.

When an architect is designing a playground for children, there are all kinds of standards to be taken into consideration, such as: access to the playground, safety, situation in the sun, a certain distance from home, the number of children living in the neighbourhood, upkeep, etc; but in spite of applying all these standards, it is evident to every spectator that the playground is not a source of inspiration for the children, it gives them no opportunity to play their own game. Children ignore the architect's good intentions but are delighted to play in other areas such as water, ditches, or building under construction. But also for adults it is very difficult to go their own way. Likewise, the green area between the houses is designed by standards according to the ideas of the designer.

When the laying-out of the park is finished it is often fine to look at, in practice it is not very useful. People always take a short cut to the shops for instance so the shrubs have to be defended by barbed wire.

Difference in thinking between users and designers'...'

But as life is going according to strict social rules at the moment, people want more adventure near their homes; they prefer narrow and winding paths to the straight ones, and wild flowers to cut lawns.

They like hilly grounds with little swamps rather than flat gardens. Some people even say, leave the site as it is when the contractors are gone and let nature have its own way.

Although for many designers this slogan goes too far, the whole idea is apparently a reaction to the concrete world we live in. When houses are under construction, the area which is to become a park lies vacant and wild flowers and shrubs spread themselves over the site, giving it a certain quality.

The Green Department used to neglect this quality and created a completely new one with the aid of bulldozers and draglines. By this time young families were moving in, the new shrubs and trees were still very young and it took at least three years before we gained the quality which was buried before the layout of the park started.

Did we in this way satisfy the most urgent demand for an environment where it is good to live? Are we willing to see and translate the need of the population, instead of pressing through our own ideas? It is very important that both the designer and the executor consult the public, teachers and children, to know whether or not they are satisfied with their environment and what the shortages are. The people themselves have to be educated not to be afraid of the city offices but to defend their own interest. During the weekends many inhabitants of the cities migrate to the countryside, to the woods, the moors and the dunes and everybody is delighted to walk on a small and winding path, to sit on a bank among high growing weeds, to pick flowers in the fields, to play with sand in the dunes and to run over the hills.

But at home everything is straight and tidy. Should we not ask ourselves if it would be possible to bring a piece of nature into



*Photo 24. Delft, Gillis  
The Hayanlaan 1973.*

the towns so that we can give the inhabitants some weekend fun during the week too?

Of course it is impossible to copy a piece of nature reserve in the city, but for all that it is worth trying and with good co-operation among town planners, landscape architects, civil engineers, etc. it must be possible to break through the current trend of tidiness'. (11)

### 3.3 Gillis Estate

The new landscape began in the next development to the Voorhof, appropriately called the Buitenhof, which translated means the Country Garden. The intention was to surround the housing with all the informality of the countryside, so creating a landscape of education with facilities for uninterrupted play. Today the contrast between the two developments is dramatic. On one side of the canal dividing the two developments is the landscape of close mown grass and carefully aligned trees in the Voorhof, whilst on the other side, rises all the untidy splendour of nature in the Buitenhof. But the real experiment of the

Buitenhof was to extend this country landscape into the Inner Courts of the high density housing, and provide a natural play environment. The opportunity to do this came with the building of the Gillis Estate which included two identical adjacent housing developments - the Handellaan and the Hadynlaan. These were typical of many similar developments seen throughout western Europe at the time, being four-storey maisonettes. It was decided to landscape the Handellaan conventionally and to introduce the country landscape into the Hadynlaan. This experiment was monitored by the Institute of Preventative Medicine at the University of Leiden. An additional factor which influenced the decision to use these developments for the experiment was the presence of other facilities close by - like a large park for organised games and children's allotments. The new landscape could not provide these facilities and there would have been undue stress without this provision.

#### The Handellaan

The most significant visual features of this development are the large car parks which dominate three sides of the Inner Court. These hinder access to the central area where there is a small formal garden and playground, similar to those seen in the Voorhof. A child could only reach the garden and play spaces by crossing the tarmac and avoiding the cars. The research team from Leiden found that many children chose to stay close to the door of the flats and wait for mother to carry them across. The garden and children's play space was arranged in the usual physical pattern making way which disregards the realities of natural social interaction between mother and children. This lack of connection between the physical and social environment is an obvious cause of failure in this landscape, as Herbert Gans, the American sociologist, has said, '... the physical environment is relevant to behaviour only in so far as this environment affects the social system ... or is taken up into their social system'. (12) Likewise, the emphasis upon the motor car and the failure to provide a satisfactory external environment can only be partially excused by the planners' desire to create a functional relationship between the car and home. There was a failure to appreciate that those left behind - children, mothers,



old people - need to escape from this sterile environment (Diagram 4).

#### Hadynlaan

In the Hadynlaan the car parking was moved to the periphery, following consultation with the residents, leaving the centre free for a simple natural landscape. The only building left in the Inner Course was the primary school. In creating the natural landscape there was no attempt to predetermine the ecological association. The spirit of Le Roi was too strong for that, that not so strong as to overrule horticultural common sense. The idea was to assist nature through supplementing the herb vegetation of primary colonisation, with trees and shrubs that occur in the later stages of succession, leaving nature to make the final selection. In addition to the existing or ruderal vegetation, such features as lowlying areas subject to flooding, former ditches, walls, were also retained.

These gave the subsequent vegetation added variation. Creating what can only be described as a wilderness, having the appearance of scrubland reverting to woodland.

A limited amount of grading was carried out on this otherwise flat site, though here again the chance to experiment was taken. Recognising the practical experience and knowledge, construction personnel have of site conditions, the designers involved the machine operators in two ways. On one half of the site, the Design Plan showed the location of mounds by hachures, but left the final details to be worked out on site. On the other half, the machine operator was given a completely free choice and on this windswept site he chose to excavate hollows rather than make mounds. The results of this difference have been more successful than could have been imagined at the time - the mounds are used for such locomotor activities as cycling, and the hollows are favoured for den building. The machine operators were also asked to identify places where young children were playing so that the 'sense of place' could be continued through locating play support features in the area (Diagram 5).

### 3.4 The Living Experience

As a play landscape, the Hadynlaan can best be appreciated through what Rene Dubois termed the living experience 'that highly personal inter-play between an organism and its environment' (5). In this case the organism is the growing child and the physical landscape provides the environment for social behaviour.

Often children's play is dismissed by adults as 'mere child's play'. In reality, play is essential to growth and is the leading source of development in pre-school years. Although often thought of as a single activity, play can be divided into two distinct categories, those of exploration and play itself. Unfortunately, the opportunities for exploration in the urban environment are extremely limited. In many architectural play spaces, it is the designer and the contractor who have had most of the fun of creative exploration and experimentation. The child is left with little more than temporary amusement. To some extent this was true in the play spaces provided earlier in the Voorhof, and later in the Handellaan. In the Hadynlaan, however, the child was free to engage in all categories of play appropriate to its stage of development.

#### Pre-School

It is generally accepted that pre-school experience of the environment is an important formative influence upon the child's intellectual, emotional and physical development. This begins in the warmth and security of the home where the mother and the family group help to convey a sense of confidence. Once the child is old enough to crawl, this confidence enables the child to respond to inner urges to explore its environment and start to delineate territory. Animal Behaviourists define this exploration as any behaviour which leads to increase the rate of change in stimulation falling on the animal's receptors, which is not impelled by homeostatic or reproductive needs (14). More simple, the child is responding to sensory stimuli, by touch, taste and sight.

Later, when the child is old enough to leave the safety of the

home, exploration of the external environment begins. This environment must continue the sense of security and comfort the child found in the home. It must also provide for sensory stimulation. In the Hadynlaan, the child was met by the gentle ambience of soft earth, green plants and a gentle microclimate. Here the child is able to explore as much with hands and mouth as with eyes - a fact often overlooked by designers of play facilities. A reduction in sensory stimuli will naturally have an adverse effect upon the development of the child. Lewis Mumford has made the observation that 'if man had originally inhabited a world as blankly uniform as a 'high-rise' housing development, as featureless as a parking lot, as destitute of life as an automated factory, it is doubtful if he would have had a sufficiently varied experience to retain images, mould language or acquire ideas (15). The significance of Mumford's observation is not retrospective, however, for every child begins Man's evolution anew and its development is concerned with images, language and ideas.

Where exploratory play fails to develop naturally, as it could not in the Handellaan, for example, the child is likely to be deprived. Without the establishment of territorial boundaries, it will lack a sense of self-identity. According to Dr. Mia Keller Pringle of the Children's Bureau in England, this can lead to anti-social problems during adolescence (16).

Alongside this 'exploratory' play comes the enjoyment of play itself, which has three characteristics: (i) an emotional element of pleasure; (ii) differing from non-physical responses in having no relatively immediate biological response. In the activity of play, during the pre-adolescent period, the child creates an imaginary situation. At the beginning of the pre-school years this is a solitary activity, except for brief moments of co-operation with other children. Later, with the development of speech and growing social awareness, group play becomes more significant. Once again, a diverse natural environment like the Hadynlaan will promote richer speech patterns and more imaginative group play. At this stage the child is beginning to fantasise the world it comprehends around it in such role playing games as mothers and fathers or in acting

out unpleasant events, such as bereavement or going into hospital. Without this play, Dr. Keller Pringle claims that the child is liable to be frustrated and unable to adjust to its changing situation. This sense of frustration can be as real among the planned neatness of grass and trees of the new housing landscape as in the mean back streets it replaced, whilst play equipment which is 'fixed' into preconceived forms, either 'real' like wooden shelters or 'abstract' like sculptures, will largely determine the child's play. In the Hadynlaan creative play is supported by the presence of water, soil, wood and other building materials which extend the child's imagination. The small play circles are intended as supports for this play - the surrounding pallisade fence is also a climbing frame and the low bench can be used for sitting or for placing sand pies.

The constantly changing natural landscape of the Hadynlaan also introduces the important element of time. The small woody plants gradually mature into trees with their seasonal variations; the wet flashes which appear in the low hollows during winter are replaced in summer by water mint and meadow sweet. The Local Authorities at Delft believe that the presence of a caretaker/warden is important to interpret this natural environment for children and many adults too. A member of the garden staff has been in residence since initial planting and is always on hand to assist and instruct young and old alike. The warden also provides tools and seeds for children who may wish to garden.

#### School Years

At around four years of age the child enters school which, in the Hadynlaan, has always been part of the landscape. The 'revolution' in primary school teaching began more than two decades ago and much emphasis is placed upon play, exploration and self-discovery as the basis of real education. Like the landscape the child has just left, the school in the Hadynlaan is full of natural objects, pictures, materials, etc. intended to stimulate the imagination. In these surroundings the rich pre-school experience will help the child to make a fuller creative expression in writing, painting, discussion etc. Once in school, the teacher begins explaining the natural laws that underly many



*Photo 25. Delft Gillis.  
The Haydnlaan 1974*



*Photo 26. Delft, Gillis  
The Haydnlaan 1982.*

of play activities, a greater attractiveness to children, a more efficient use of space and, above all else, satisfied multi-functional requirements relevant to both physical and social environments.

### 3.6 Making a Natural Landscape

If the new landscape was socially successful, it was less so in management terms. The plant material was selected on the basis of creating intermediate scrub vegetation. In the spirit of Le Roi, this vegetation had also to provide as rich a diversity as possible, though only species known to thrive in the locality and within a woodland situation were chosen (Table 2). These were principally native species, on account of cost, durability and their ability to coppice. After a few years, it was particularly noticeable that coppiced Alder and Rowan could be found at most path junctions, helping to create a pleasing natural sight line. The desire for colour was met by adding flowering species of

shrubs, exotic and native, associated with woodland conditions, for example, *Amelanchier laevigatus*, *Forsythia suspensa*, *Rosa rugotida*, *Weigela rosabella*. Most of this planting material was in the form of 1+2 forest transplants randomly arranged by the landscape contractor at 1 metre intervals. Grouping of species with specific site requirements or for special visual effect was noted on the Plant Schedule, for example, *Salix alba* 'Cheermesina' was to be located 'in groups in wet places'. A small number of standard trees were used and these were located on a Planting Plan. The function of the standard planting was to make a visual impact, to give the planting a mixed age appearance and to provide initial shelter. The planted areas were not fenced after planting as this would have been anti-social. People were encouraged to use the areas and specifically to work out path lines which were subsequently surfaced with crushed shell or shale.

For the first season after planting the open areas were seeded with agricultural seeds and their associated weeds like Poppy (*Papaver rhoes*) and Spurrey (*Spergularia arvensis*). This gave a quick initial cover but in the second season these annual species were replaced by the rapid colonisation of more aggressive perennials including Dock, Nettle, Thistles and Cocksfoot. In the wetter places there was common rush and water mint. The high fertility of the soil led to a high biomass and though the coarse vegetation could stand up to rough and tumble games it led to considerable maintenance problems. The use of herbicides and other cultivations was opposed for moral reasons by the residents and Parks Officers. As there were strict Provincial regulations against Thistles these had to be mowed out. This caused a neighbourhood response because people considered the thistles as part of 'their' gardens.

It must be remembered that thistles along with the rest of the luxurious vegetation were evidence of natural selection. However, the effect of herb vegetation in retarding the growth of trees could be seen from a similar housing area in Utrecht. There a resident, not so keen on the new approach, hoed the planting near to his flat with the effect that tree growth was much more substantial. After five years the trees and shrubs had

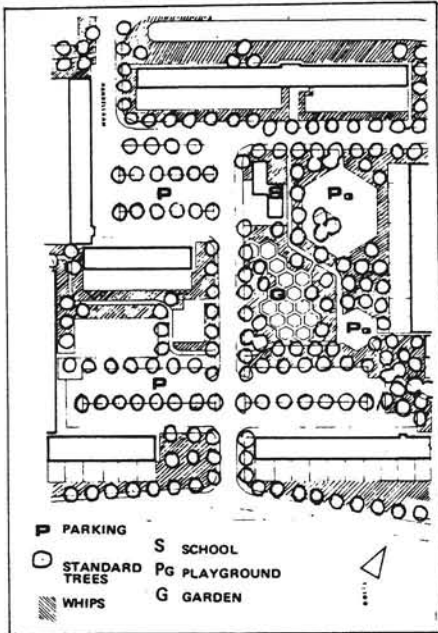


Diagram 4  
Delft, Buitenhof - Handellaan.



Photo 27. Delft -Gillis-  
The Händellaan. A hand-held  
new rotary cutter for wild  
areas.

of the physical phenomena the child has already experienced-like gravity, the nature of fluids and solids, etc. At the same time the child is beginning to appreciate the man-made laws of the social environment through learning to co-operate, join in discussion etc.

The landscape supports the school by providing an environment in which the child can test out or explore things it has learnt in school and come to the point of further questioning. More often, the landscape provides an escape from prying adult eyes or an outlet for frustration. Pent-up anger which might otherwise become vandalism can be diverted into the hammering of nails in building the den, or digging the flower plot, or simply cycling. Thus, the landscape serves as part workshop, recreation ground, garden, retreat and challenge. This also means that the problems of wear and tear, dens, flower picking, digging etc. are really signs of people using their landscape. A different approach to management is necessary to encourage these uses rather than to banish them, as in the past.

## Adolescence to Adulthood

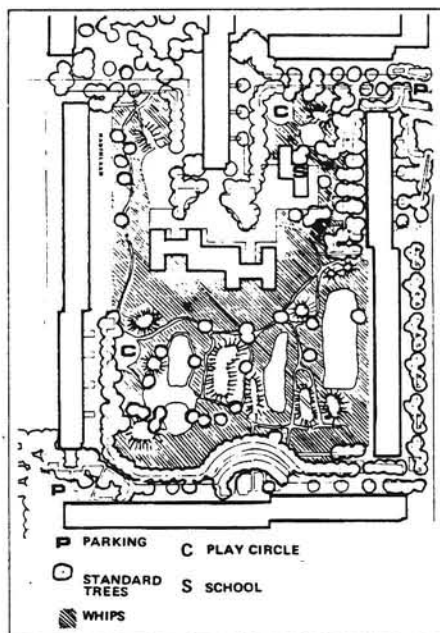
Although early experiences of the environment are important in shaping the physical and mental attitudes of the child, mere exposure to a stimulus is not sufficient. As Rene Dubois observed, 'environment only becomes a formative influence when it provokes a creative response'. This response is particularly important as the child enters adolescence, when increasing responsibility for the environment must be given. Without this responsibility, a sense of community will fail to develop. As Simon Nicholson has observed, the sense of community is in direct proportion to the degree to which the individual feels able to influence his external environment. It is not shaped solely by the physical framework of concrete, bricks and trees as planners and architects formerly believed.

To encourage this responsibility a large piece of ground was made available in the Buitenhof, solely for the use of young people. The only facility provided on this land is the youth club, run by the members themselves. This dispenses coffee and music throughout most of the twenty four hours, but any inconvenience to people in neighbouring housing is avoided by the isolation. The surrounding land is used as the members choose - for camping, bonfires, keeping animals, building cars, motor bikes etc. Possibly as a result of this responsibility, youth club members are becoming involved in all aspects of community life-politically and socially. Similar pieces of 'waste ground' can be seen in other towns like Amsterdam, Utrecht and Dordrecht. They recreate conditions which existed in most towns and cities before urbanisation was so complete.

Changes in the relationship between park officials and the people, from a 'them and us' situation to one of a co-operative partnership is still in an early stage of development. Confidence and trust have still to be developed. The former Director of Parks, Mr H Bos, gave the following verbal account of how this was established in the later stages of Buitenhof:

A small group of residents proposed that the Public Works Department should build a children's playground on a vacant piece of ground, unaware that the land had been left awaiting such a





response. Mr Bos explained to the parents that swings and climbing frames were more suited to gymnasts and did not engage a child's fantasy and he sent them away to look at several natural areas of the city. A week later they returned with a plan, which after discussion and a few constructive amendments, was agreed upon. The group then asked when the local authority would construct the playground, not expecting to be told that they would be constructing it themselves. They now had to return to their fellow inhabitants of the block to find out who would be prepared to help and what skills they could offer. Once this had been arranged, the Public Works Department supplied the technical assistance of builder/gardener and sufficient materials for one weekend's work at a time. After a month of weekends, the work was complete and the group organised an official opening by the Burgomaster. At this event, the Director of Public Works was told how sorry everyone was that the work was complete for they had enjoyed working together. Once again the group was surprised to hear that the work was not complete and that in future they would be responsible for the environs of the flats, keeping them tidy, in repair, etc. So every weekend a group of three or four residents can be seen looking after their landscape. In this way

a flat block has been changed into a community with social contact between the occupants through the catalytic agent of the landscape.

### 3.5 Interim Results

The aim of the experiment in the Buitenhof had been to create a natural, living landscape which would be put to a fuller and more diverse use than traditional open space. Any misgivings the designers may have had about this experiment were allayed by its social success during the first five years. The Report of the Institute of Preventative Medicine at Leiden found that the experiment had largely been justified. Based upon the observations of children the Report drew a number of important conclusions. In the Hadynlaan, children of all ages played over the entire area, whereas in the conventional landscape play was confined to a few places only - official areas like play and sitting places and the unofficial spaces like kerb sides. Pre-school children, between 0-4 years, were more often accompanied by adults in the Handellaan than in the experimental area. This was taken as an indication that adults considered the natural environment safe for children to play without supervision so satisfying the young child's need for security. A specific and unexpected observation concerned young girls between the ages of 5 and 13. Girls of this age group are liable to stay close to home and mother in traditional housing areas. In the Hadynlaan, girls moved freely about the area and were able to play and make hideaways in a normal way, unobserved by older girls and boys.

With regards to the pattern of behaviour the success of the Hadynlaan was less conclusive. As could perhaps be expected children's play activities and age proved to be closely interrelated. In both environments children of the same age groups predominantly undertook similar exploratory and play activities. However, a closer look at specific locations revealed that a more varied pattern of activity existed in the Hadynlaan. This was particularly so around flat entrances. The Hadynlaan had also more successfully integrated the environments of home and landscape, as well as school and landscape. In conclusion, the new approach to the landscape had led to different patterns

*Photo 28. Delft, Gillis  
The Haydenlaan. The emerging  
woodland structure 1985.*

*Photo 29. Delft, Gillis  
The Haydenlaan. The simplified  
woodland after renovation 1987*



covered the ground and suppressed all ruderal species. However, the suppressive effect of herb vegetation is only temporary. Evidence from the Dutch Forestry Service indicates that after seven years or so, depending on site conditions, growth returns to normal. This would seem to be the case at Delft where the vegetation in 1974 was in its seventh year, and a steady rate of growth has been maintained ever since.

Cutting of the vegetation was necessary to prevent tussock formation, which would limit use, and to reduce the fire risk by keeping the vegetation green and alive. The coarse vegetation is cut twice a year in late June/July and late August/September by a hand held rotary cutter. The unevenness of the ground makes the use of conventional equipment, like the Allen Scythe, impossible. After cutting the hay has to be lifted to avoid killing the underlying vegetation and further increasing soil fertility. The cutting of the herbage at the Buitenhof is carried out on a contractual basis and though the timing is seasonally appropriate it is often not exact. This is due to availability of labour and the vast extent of the area to be cut. As a result, cutting is often carried out before seeds have dispersed. Due to this and the heavy wear and tear, the Hadynlaan, like the Kennedylaan, is progressively becoming more uniform. It certainly has not created the rich variety of the countryside, of which Parks Director, Bos spoke.

## 4.0 THE USE OF NATIVE PLANTS

### 4.1 Ecological Principles

The plant communities of the Buitenhof were composed of ruderal species (defined as plant species growing under disturbed conditions, found in waste places or among rubbish). These had resulted from the 'abandonment' of comparatively fertile land to random invasion by seeds and other propagative material. The resulting communities were based upon such competitive species as Scotch Thistle (*Onopordum acanthium*), Couch Grass (*Agropyron repens*), Broadleafed Dock (*Rumex obtusifolium*), Hedge Mustard (*Sisymbrium officinale*) and Great Burdock (*Arctium lappa*). All these species are very common in the urban situation and correspond to people's image of 'weeds'. As a group they are not particularly attractive in leaf or flower, and it requires a great deal of education and sympathetic understanding for them to be accepted in the urban landscape. Most people are very keen to see their quick removal.

However, people have another distinct mental image of wild flowers in the rural countryside, as Mr Bos implied in his explanation of the 'new approach to urban landscape'. This image is associated with the vegetation of sand dunes, hay fields, country lands, dykesides, etc. Such communities are the result of either some environmental stress, for example drought or low nutrient levels in the case of sand dunes; or long-term management operations as in the case of hayfields. The species that make up these often species-rich communities are less competitive and rarely seen in urban areas. Recognition of the basic competitive distinction which exists between plant species is vital to the successful use of native plants in artificially established communities. A distinction ecologists like Eugene Odum have described as generalist and specialist species. (17)

#### Exploiters and Acceptors

Today, the distinction is more specifically referred to as Exploiter and Acceptor species. Exploiter species like docks, thistles, couch grass, are able to adapt to a wide range of environmental conditions. They have the ability to modify their morphological size and vigour according to the degree of

environmental stress. Most important, they have very effective methods of reproduction either producing large quantities of seed or extensive underground rhizomes. P J Grimes of the former Nature Conservancy Grassland Research Unit of Sheffield University has observed that the highly competitive species have four consistent attributes: (1) tall stature; (2) a plant which is usually densely branched or tussock forming and allows extensive and intensive exploitation of the environment above and below ground; (3) a high maximum potential relative growth rate; (4) a tendency to deposit a dense layer of litter on the ground surface. From observation it is possible to score plant species with respect to each of these features and so provide a competitive index (C.I.) over a scale of 0-10.

TABLE 3  
Derivation of the Competitive Index

Species	Attributes				Competitive Index (total /2)
	(1)	(2)	(3)	(4)	
<i>Chamaenerion angustifolium</i>	5	5	5	2	8.2
<i>Arrhenatherum elatius</i>	5	4	4	3	8.0
<i>Brachypodium pinnatum</i>	3	4	3	5	7.5
<i>Ranunculus repens</i>	3	5	3	1	6.0
<i>Helictotrichan pratense</i>	3	2	3	2	5.0
<i>Taraxacum officinale</i>	3	1	4	1	4.5
<i>Festuca ovina</i>	2	1	3	2	4.0
<i>Campanula rotundifolia</i>	2	2	3	0	3.5

Leaving aside the derivation of the index, which can be seen in Grimes' original paper, an example of such grouping can be seen in Table 5 (18). Species of high C.I., that is, greater than

6.0, form communities that are low in number of species (below 20 per sq. metre). These are the plants commonly regarded as weeds. Species of low C.I. form communities where there is a considerable variety of species (above 20 per sq. metre); for example, in areas of limestone screes and flower-rich meadows.

In such species-rich communities the Exploiter species have been excluded or their influence has been reduced. Grimes suggests that there are two mechanisms responsible for bringing about low incidence of species of high C.I. in vegetation of high species diversity.

- (1) environmental stress brought about by physical conditions such as drought and mineral deficiencies;
- (2) environmental stress brought about by management factors such as grazing, mowing, burning or trampling.

This causes defoliation or other damage which prevents potentially competitive species from attaining maximum size and vigour and reduces litter accumulation. In Grimes' model, which can be applied to both mechanisms (Diagram 12), it can be seen that under conditions of low environmental stress there is a low species number due to competitive exclusion. The high level of biomass in these communities results from the productivity of the soil, due particularly to Nitrogen. As the environmental stress increases the competitive Exploiter species decline in vigour and species of lower competitive ability, Acceptor species, are able to survive. With a further reduction in productivity, species density declines further until conditions of extreme environmental stress are reached. At this point, species density is limited by the scarcity of plants able to tolerate the specific toxic conditions. A similar gradient is found with intensity of mowing, grazing, etc.

Of the approaches described so far, the 'wilderness' landscape at Delft encouraged Exploiter species of high C.I. that formed species-poor communities which were capable of taking considerable wear and tear. In landscapes to be described at Amstelveen, Acceptor species were used in planned species-rich communities, which do not take active use but were perceptually

more interesting. Grimes' work also explains which such native plant communities must be maintained, to keep the soil impoverished or to prevent the invasion of Exploiter species. In addition, the chances of establishing a species-rich communities in the short term, by the 'laissez-faire' approach, as Le Roi suggested, are extremely slender.

#### Physical Factors

From the preceding discussion, it is evident that in seeking to establish plant communities artificially, a great deal of attention has to be paid to the competitive ability of each species and its compatibility with other members of the community. Similar attention has to be paid to the abiotic conditions of soil, the soil/water relationship and the influence of light. All these factors influence the type of community, its composition, maintenance and, ultimately, its cost.

Species rich communities result from soils that have a low nutrient status, particularly of nitrogen, and yet where trees are used, able to retain sufficient moisture. The colonisation of waste heaps indicates that trees and shrubs will grow on so-called poor soils, providing there is sufficient moisture. The habitat can be further modified by varying the height of the soil surface in relationship to the position of the underground water table.

The light factor compounds the effects of soil and soil/water. In the early years of succession the maximum amount of light reaches the soil surface and conditions favour the growth of ruderal species suited to disturbed arable ground. Much later woodland communities create shade conditions favourable only to woodland herb species (Table 4). This means that in the initial stages considerable hand weeding is necessary to remove unwanted seedlings, whilst later woodland species have to be introduced to specific locations. Similar closed communities exist with open grassland communities.



TABLE 4

General effect of light at ground level in high forest

Illumination level	Ground flora
Below 16%	Forest floor bare
16-18%	Mosses
22-26%	Herbaceous material
30-%	Regeneration of tree species

#### Plant Communities

The use of native species to create artificially semi-natural communities is based upon the broad division between plant communities found in Europe. That is, the woodlands and those of the open grassland, and the exploitation of the ecotone that exists between the two.

The woodland communities are the natural vegetation cover of eastern Europe and forms the climatic climax to most uninterrupted successional sequences. The main plant associations are those of the forest forming species of oak, beech, ash and pine. The maintenance of woodland communities is directed towards furthering the succession by operations like thinning and the introduction of tree and other species at appropriate stages of development.

The open grassland community emerges when woodland is cleared and it forms a secondary climax dependent upon the type of biotic control that Grimes described. If this type of community is created, it follows that maintenance costs will be higher due to the need for such control, in the form of mowing or hand weeding.

Between these communities there is usually a broad, species-rich, ecotone. An ecotone is defined as 'mixed communities formed by overlapping or adjoining communities in the transition area' (Weaver & Clements, Plant Ecology, 1929). Such ecotones are associated with glades, whether as clearings, broad paths or woodland edges, which are in effect one-sided glades. Where the glade is small in diameter, the vegetation will be influenced by

woodland conditions and woodland herbs will result. In larger glades, or woodland edges, the vegetation will gradually be removed from this influence and take on the character of an open grassland community. As there are few really distinct marginal herb species the ecotone is inhabited by species from both the woodland and open grassland. The exploitation of this ecotone is the main difference with traditional horticultural approaches. A great deal of the monotony of the urban landscape stems from the harsh line drawn between communities - between grass and pavement, shrubs and grass, water and water edge, trees and lawns. With native planting the broadest possible ecotone is formed to create the greatest possible diversity and perceptual interest. In design terms this means, for instance, that if paths are laid horizontal to the ecotone the visual diversity will be limited and the variation will have to come from the walker's relationship to either of the two communities - an ideal arrangement for a meandering walk. If the path is put across the ecotone the visual diversity will be greater - an arrangement suited to rapid movement e.g. primary footpaths, roads, etc. As the ideal width of an ecotone between woodland and open grassland is about 30m, it is perfectly feasible to create such dynamic corridors in many otherwise sterile urban situations.

When the ecotone is used with woodland and the two basic types of open grassland communities, species-rich and species-poor, it can be appreciated that the opportunities available to the user of native plant material are unlimited, especially as they range from high to exceedingly low cost.

## 5.0 THE HEEM PARK

One of the more interesting aspects of the ecological approach in the Netherlands has been the development of the 'Heem Park' in which only native species are used. The word 'Heem' defies exact translation but derives from an old German word meaning home or the surrounding environment. Such Heem Parks were first developed in the mid 1930's, though their origins can be traced to the early years of the century. In particular to the work of Jacques P Thijsse, a teacher, naturalist and in modern terms, an environmentalist.

### 5.1 Jacques P Thijsse

Thijsse was acutely aware that the rural polder landscape which had remained unaltered for centuries would shortly undergo significant changes. Such changes would irreversibly alter the landscape and mean a loss of quality in many people's lives. Thijsse was further concerned that these changes would occur before people were aware of the beauty and significance of the 'natural' landscape. Thijsse used his skill as a teacher to make people aware of the great diversity and beauty of the native flora and fauna. His books ranged from authoritative works like 'Birds of the Netherlands', to more popular books describing the native flora and fauna to be seen in and around the town and included contributions to school reading books.



Photo 29. Jacques P. Thijsse  
(Source: *Wilde Planten Tuinen*)

Thisjse argued that a new form of urban park was necessary to make people aware of the richness and diversity of the landscape. This could only be achieved by bringing the elements, the flora and fauna of this landscape, into the town for everyone's enjoyment. He believed that something was lacking in a park where the visitor could only marvel at the technical expertise of the Parks Service. He summed up these feelings towards the end of his life in an article, 'Instructive Plants':

'On one of those nice days around the first of October this year I walked in a beautiful garden where the benches along the path were taken with people enjoying the weather and the view. On the colourful flowers were swarms of butterflies. What a pity they were not made known to the people for their enjoyment. The people were separated from them by a trim grass verge on which they naturally must not tread.

I dream of a garden where the public, young and old, ignorant and informed can witness and experience the whole season of our native plants, from the first of January to the thirty-first of December. A garden where the town dweller can surrender himself to the flora and fauna.'

Instructive Plants - De Levende Natuur 1940 (10)

These new parks Thisjse called Instructive Gardens and he laid out the first of these, the Thisjsehof, with the help of the landscape architect, L Springer near his home at Bloemendaal,

Haarlem. This was a place where 'teachers (and children as the teachers of tomorrow), could learn of the native flora, as well as birds and insects.'(20) Today this garden is still fulfilling the same function. Later, the first Instructive Garden in a public park was constructed at the Zuider Park in The Hague on the initiative of the then Director, S G A Doorenbos with the assistance of the garden architect, Mrs A C Garter Pelwijk. In the space of only three and a half hectares, all the main plant communities of the Netherlands were accurately reconstructed, using the appropriate soil and rock from each habitat or region. The communities include primary woodlands, like Hornbeam from the Limbourg region in the south, secondary communities like the

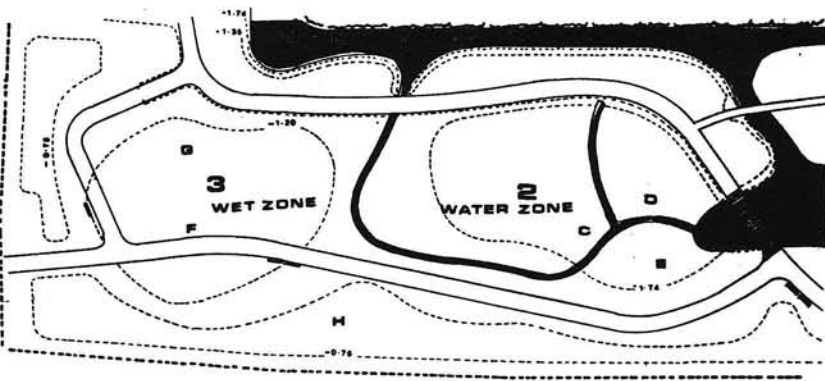
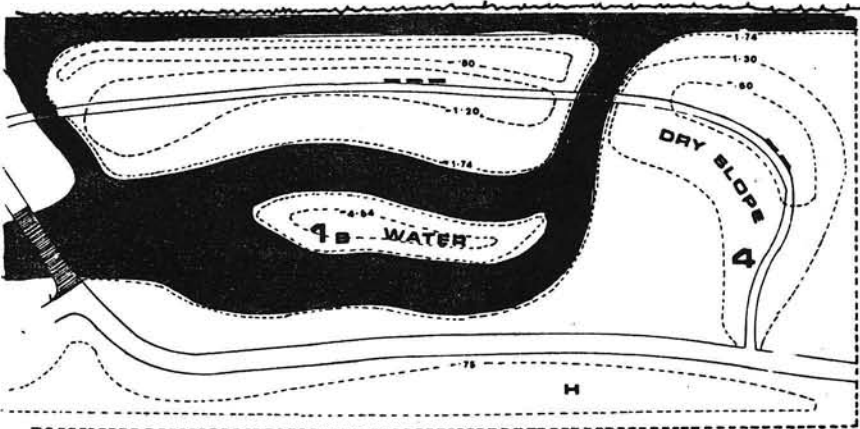


Diagram 6  
Amstelveen - Plan of the Thijssé Park Extension

heather moor from the Utrecht hills and special communities, like small sections of dykeside flora.

## 5.2 Amstelveen and the Heem Parks

Thijsse's Instructive Gardens helped to bring the experience of nature back into the town, at first for the benefit of the small minority. The further development of his ideas in the making of town parks came in Amstelveen which lies to the south of Amsterdam. In the 1920's the town had recently been established as a separate municipality and the Council was anxious to create an attractive up-market environment. They realised that one way to achieve this was through the making of attractive parks and open spaces. Then in 1939 the former director of Parks, C P Broerse started to create the natural park De Braak using principally though not exclusively native plants. It was Broerse who first used the word Heem Park to describe this new kind of park. In subsequent years he developed, along with J Landwehr, techniques for using native herbs.

One of Landwehr's first uses of native species was the result of circumstances rather than design. In 1940 the Parks Department at Amstelveen was reclaiming an old 'borrow pit' into a waterside park, but with the country under Occupation, there was little money for plant material. Instead, Landwehr decided to use native species in a narrow strip around the waterside. This proved successful, horticulturally, and with townspeople, and in 1949 Landwehr established an entirely new park using only native species. This park was later named after Jaques P Thijsse, acknowledging the influence of this important pioneer. The park was later extended in 1962 and 1972.

To keep and maintain the wild flora and to bring it to people in ways different from the usual way of designing a park, which will help their contact with the natural world.

It will be possible for a wider public to study and be educated about wild flora, so people will become aware that nature is something we cannot replace or do without. Everyone concerned with nature knows that the Netherlands has lost a lot in the past

ten years, not only in the number of species but also in unique landscape elements.

Most of the characteristic landscapes were maintained by the people in a way that demanded little, because of agrarian practices. A logical result of the disappearance of the typical environments is the disappearance of many plants and animals, and many more will disappear.

People who, through their culture and technology, have destroyed so much of what is interesting, call out for action against further destruction. We can no longer permit, unpunished, excessive cultivation of nature; money must be put into keeping and restoring nature as far as it is possible.

It is perfectly right and desirable to recreate environments in a cultured and technical way to regain a richness of species types and to stabilise them.

It is better to use modern technological methods to help maintain wild flora, to protect it and to plant it in parks and gardens than to allow the different species to disappear for ever. One will have to get to know well the natural circumstances of the



*Photo 30. Amstelveen.  
Jac P. Thijsse Park.*

different species and fit this knowledge into the teaching of others.' (20)

As in the Heem Park the intention is not to reconstruct accurately a natural landscape; Landwehr believes that this should be left to the Instructive Garden (3). Instead the visitor to a Heem Park is presented with an experience of the Dutch landscape through a series of landscape pictures. These naturally reflect the surrounding physical environment. So that at Amstelveen, a town on peat, the Heem Park is a landscape of water, fen and mere. Nearer the coast at Rockanje, Landwehr's friend and collaborator, C Sipkes, has created a Heem Park of dunes and moorland.

### 5.3 The Design and Construction of a Heem Park

The design work in a Heem Park can be divided between a pre- and post-implementation phase. In the first phase, the designer selects appropriate landscape pictures and determines the necessary plant zones. Thereafter, the initial work is concerned with 'setting up' the soil, water and the circulation routes. In the second phase, the plant material has to be carefully matched to the resulting surface conditions. This means that some species decline, even disappear, whilst other species have to be introduced.

#### Pre-Implementation Phase

Landscape designers in the western provinces have always had to pay particular attention to land drainage and the height of the water table. In the Heem Park the position of the water table can be exploited to give added variation to the habitat and the subsequent species diversity. In a Heem Park on peat, for example, it has been shown that the arrangement of vegetation is influenced up to a height of 1.50m above the water table.

Beyond that height the vegetation assumes the normal characteristics of any land communities. Taken with the light factor, the gradient gives the designer an opportunity to create many subtle variations in the vegetation. It is possible, for example, to have an abrupt change of level at the waterside so giving contrast between aquatic and dry land species.



*Photo 31. Amstelveen. The effect of discontinued maintenance in a Heem Park.*



Elsewhere the long gradient of a wet moorland may be terminated by a slight change in level, emphasised by a vegetation change from Heather to Bilberry. All along this gradient subtle changes in water and light will provide niches for specific acceptor species.

The extension to the Thijssse park in 1971 provided an opportunity to observe the making of a Heem Park in detail. The new extension had three principal zones, varying in degree of wetness. There was also a large area of open water, taken down by steps to a depth of 1.06 metres. This created an opportunity for zoning the rooting and floating aquatic vegetation. As light does not penetrate further than one metre in peaty water, extra depth was unnecessary (Diagram 6).

The first terrestrial zone is covered by 20 cms. of water and will be suitable for such waterside plants as Marsh Marigold. The second zone, at a level of 1.0 cms. above the surrounding water, will be inundated with water during winter and after heavy summer rains. These conditions will suit such species as Marsh Gentian and Grass of Parnassus. The surface of the third zone is

permanently dry (+64 cms) but the plant roots will be in moist peat, favouring woody marshland plants, like Heather and Bilberry. As the ground rises trees and shrubs, like Rowan and Rose, are introduced. The only area of non-fen planting is at the eastern end of the extension where the land rises sharply to meet the entrance path. Here species, like Pinks (*Dianthus* spp.) are intended to create a flower-rich bank.

### Soil

The importance of inert soil was stressed in the opening section. On the peat at Amstelveen this can be achieved by inverting the top and subsoil material to a depth of one metre. However, it is crucial that the peat be kept moist after this operation. If it is allowed to dry out, the peat will lose its structure and upward capillary movement of water will be impeded. If the drying process continues, it becomes irreversible and the loose peat granules will be subject to wind erosion. Surface grading is therefore a complex operation. The inverted peat has to be placed carefully in its exact location, avoiding further working which would help to destroy its structure. Landwehr does not believe in alteration of the soil type through the addition of large quantities of 'foreign' material. This is on account of the cost and the fact that even large scale importations make only the slightest variations. However, small amounts of imported material can be used for localised variations. In places where drainage pipes are used, for instance, the channels can be filled with limestone chips - or places enriched with pockets of lime-rich sand. In Zone 4, for example, sand was mixed with the peat to create conditions more favourable for the Pinks (*Dianthus* spp.). Small scale research in the Nursery at Amstelveen has shown that many other inert materials, at present disregarded for their lack of fertility, are suitable for use with native species. Finely crushed mortar and brick rubble in an untreated condition, for example, satisfactory for limestone flora.

### Paths and Bridges

The only artifacts provided in Heempark are the paths and bridges which must be kept as simple as possible, serving, as Landwehr said, 'only to go past'. Two types of path are used - those of

a 2-metre width which provide a more direct route through the park; and, in other places, paths 1.2 metres wide for people wishing to meander and study. Both paths are surfaced with organic materials like shale or crushed shell, and in the new extension wood chips are used on the narrower paths. Seats are only provided along the narrow paths and are carefully positioned according to the angle of the sun at various times of the day. Some seats are intended for use in the morning, midday or afternoon. Bridges in other parts of the Park are of rustic log construction, but in the Extension they are simple wooden planking.

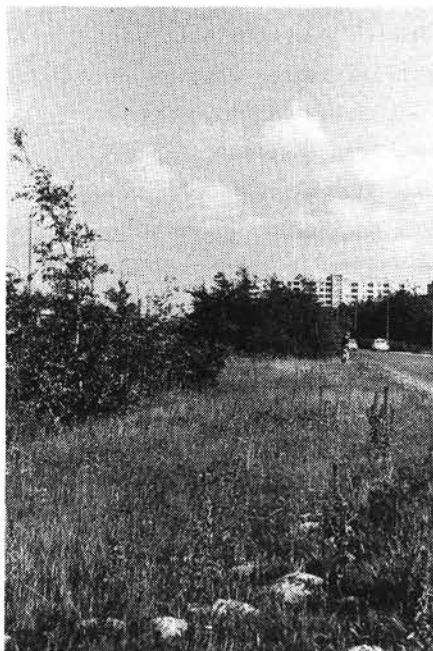
#### Woodland

The only planting which is decided in the pre-implementation stage is the peripheral woodland which Landwehr considers essential to exclude 'all sight, sound and smell of human activity'. So that, although this planting rarely exceeds 30 metres in width, it has to be successful in creating an illusion of a natural woodland glade. The tree and shrub species used are

*Photo 32. Amstelveen.  
Extension of the Thijssse Park  
A simple wooden footbridge.*



*Photo 33. Amstelveen  
The Beneluxlaan.*



not selected for any specific ecological association, but rather to give an impression of mixed deciduous woodland. In time this will allow the development of a species-rich herb layer (Table 5).

The planting makes use of a mixture of a limited number of standards with the forest whips which were random planted. After planting, the ground surface has to be kept clean by hand weeding until woodland conditions emerge and planting can take place.

#### Post-Implementation Stage

##### Planting

After construction comes the skillful operation of seeding and planting. Experienced 'field' knowledge of specific plant requirements is necessary for the location of each species. Initially conditions within each zone are uniform and only a few general species can be planted (Table 6). Much later, when environmental stress has been established through competition for space and exclusion of light, the planting will become much more diverse though it will probably be ten years before such species as the Winter Greens (*Pyrola* spp.) and the rarer orchids can be established. The source of material for this planting comes from either seed collected in the older part of the Heempark, or material raised vegetatively in the Nursery. The 'handing-on' of seed from established Heemparks is an exceedingly important conservational aspect of this work. It helps to avoid collection from the already endangered wild species and keeps together a gene pool of native plants. To assist other Local Authorities to establish Heemparks, Amstelveen offers a seed distribution service based upon the 200 most commonly used native species. The seeds are supplied in small quantities so that the purchaser has to raise his own stock plant. This not only gives the Parks staff experience of native species, it also shows how the species will perform in the soil and other environmental conditions of the new locality. Seed can be collected from these stock plants for use in a Heempark or other locations in the town.



*Photo 34. Amstelveen - Garden  
for the old people's housing  
1987.*

TABLE 5

1. Forest Transplants

Trees

Acer campestre	Alnus glutinosa
Betula pubescens	Carpinus betulus
Crataegus monogyna	Mespilus germanica
Prunus avium	Pyrus communis
Pyrus malus	Quercus robur
Sorbus aucuparia	Ulmus procera

Shrubs

Amelanchier canadensis	Aronia prunifolia
Cornus sanguinea	Corylus avellana
Euonymus europaeus	Ilex aquifolium
Juniperus communis	Myrica gale
Prunus spinosa	Rhamnus carthartica
Taxus baccata	Salix repens
Rhamnus frangula	Viburnum opulus
Ulex eruopaeus	

#### 11. Standard Trees

<i>Betula verrucosa</i>	<i>Fraximus excelsior</i>
<i>Pinus sylvestris</i>	<i>Populus canescens</i>
<i>Populus tremula</i>	<i>Quercus robur</i>
<i>Salix alba</i>	<i>Sorbus aucuparia</i>

Work at Amstelveen has also shown that species unsuited to certain abiotic conditions of soil and water can be induced to adapt to changed conditions. A recent example of this has been Sea Kale (*Crambe maritima*). This plant from a coastal shingle habitat failed to establish itself by seed or plant in the damp peat soils of Amstelveen. So a parent plant plus soil was removed and established in a bag plunged in peat at the Amstelveen nursery. Seed from this plant was allowed to fall into the peat, and after several years, seedlings managed to establish themselves. Seed from these plants has provided a stock of Sea Kale which is now ready for planting in the Thijsse Park.

The only possible danger in using the Heempark as a seed source is that of mutation and hybridising, so that urban wild plants will differ from rural wild plants. Already hybridising has occurred in certain species of Floxglove (*Digitalis* spp.) normally geographically separated by many miles. At the moment, however, this is not considered a serious threat.

#### Maintenance

After planting comes the all-important maintenance. It is not possible with the use of so many species on a peat soil to impose stress through mowing, grazing or trampling, so the competitive species have to be removed by hand. These are either invading ruderal species, tree seedlings especially of alder and birch that find the moist peat favourable to germination, or self-seeding of vigorous species, like Heather. Later, species like Heather will be naturally controlled by competition for water, and other factors such as light. The intention of 'weeding' is to promote a natural appearance through allowing a free dynamic interplay between the species. This means that species will decline or increase in importance, season by season, and year by year. Experience at Amstelveen has shown that gardeners with

*Photo 35. Haarlem - Molenwijk  
Park 1987*

*Photo 36. Amstelveen  
Roadside verge management 1987*



some botanical knowledge tend to push vegetation towards a known ecological association, whilst landscape designers seek a preconceived aesthetic form. Both these situations are to be avoided in allowing the vegetation to develop its own aesthetic appearance. The 'eye' of the designer is essential, though, in the thinning of trees which means selecting the desirable for, even though it might be twisted or double stemmed.

TABLE 8

Jac. P Thijssse Park Extension - Plant Zoning

Zone 1	A - water depth 20 cms. Marsh Cinquefoil, Marsh Marigold
	B - water depth 20 cms. Brooklime, Gratiola
Zone 2	C - 50% Cranberry, 40% Bog Asphodel, Bog Myrtle, Royal Fern
	D - Marsh Gentian, Grass of Parnassus, Royal Fern, Bog Myrtle
	E - Bog Rosemary
Zone 3	F - Juniper, Broom, Petty Whin, Gorse Heather, Bell Heather, Bilberry, Cowberry, Strawberry
	G - Edge Zone: Juniper, Bog Myrtle, Red Currant, Rosa agrestis, R. dumetorum, R. arvensis
	H - Tree Zone: (see table 7); Yew, Holly, Hawthorn, Wild Apple, Bird Cherry, Rowan
Zone 4	I - Sunny Slope - flower rich: Maiden Pink, Carthusian Pink
	J - Colour effect, blue and purple e.g. Campanula, Veronica

In the absence of an overall Master Plan, communication between every member of the design and maintenance team is essential, so that everyone understands the design objectives appropriate to his level of working. This is repaid in a greater assumption of responsibility by the staff who find the work more rewarding than repetitious grass cutting or hoeing. It is also important that staff continue their interest outside of working hours, especially as recognition of seedlings can be exceedingly difficult.



An example of what can happen when this weeding is discontinued in a Heem park, can be seen in a landscape laid out around an office near to the Jacques Thijssse park. The Directors of the Company invited the Amstelveen Parks Department to create a Heempark around their offices. Then, in 1972, they asked for weeding to be discontinued at the back of the offices on account of the cost in the mistaken belief that the vegetation had become a stable community. In less than three years the area had been colonised by competitive Exploiter species - like Thistle, Couch Grass and Fireweed. The less competitive species, like Orchids and Gentians, had been displaced. This was an irreversible change, as the soil had been enriched and seed material introduced. To restore the vegetation, the top metre of the soil would have to be replaced and the process restarted.

#### 5.4 The extension of the Heempark Techniques

The significance of the Heemparks to the development of the ecological landscape came with the extension of its techniques to sites within the wider urban landscape. Although Landwehr had been experimentally recreating many rural communities, it was the changed atmosphere of the 1970's that enabled him to extend the scale of his work. By this time many people had recognised that the richness and variety of the flora seen, for example, on rural roads and dykesides was lacking in the urban open space. (Tables 7 & 8).

##### The Beneluxlaan

One important large-scale experiment was the making of urban meadows. This was first done along the broad central reservation of a main inter-city road. This land typified the thoughtless provision of landscape which was proving too costly to maintain.

The Beneluxlaan was in a part of Amstelveen that overlay sand and not peat. The surface was prepared by spreading a layer of inert sea-bed sand to a depth of one metre. This created the all-important stress conditions of low nutrient but with sufficient moisture retention to allow growth. Some plots were prepared with additional organic material to assess the effect on tree growth.

Since 1975, however, no cutting of the Beneluxlaan has been undertaken and there has been no deterioration in the community. Although the festucas and bents have taken on a tussock habit, the herb species like the Wind Flower (*Pulsatilla vulgaris*) have flourished.

The effect of this experiment has been to show conclusively that low maintenance, open grassland communities can be established in the urban environment, including the following:-

- i) Heempark or garden with as wide a range of species as possible and varied in its habitats
- ii) Heempark or gardens with a specific ecological function, e.g. fen, small lake, high turf, heather moor, dune valley, chalk down, etc.
- iii) New forests, bird woods or rough hedges with natural undergrowth
- iv) Flower-rich lean grasslands, wet or dry pastures
- v) Perennial flower pastures without grasses
- vi) Annual flower pastures, i.e. pasture and arable weeds like those of cornfields
- vii) Roadside and dykeside flora
- viii) Sand or pebble dykes, e.g. railway flora



*Photo 37. Haarlem - Molenwijk Park. The first year planting 1976.*

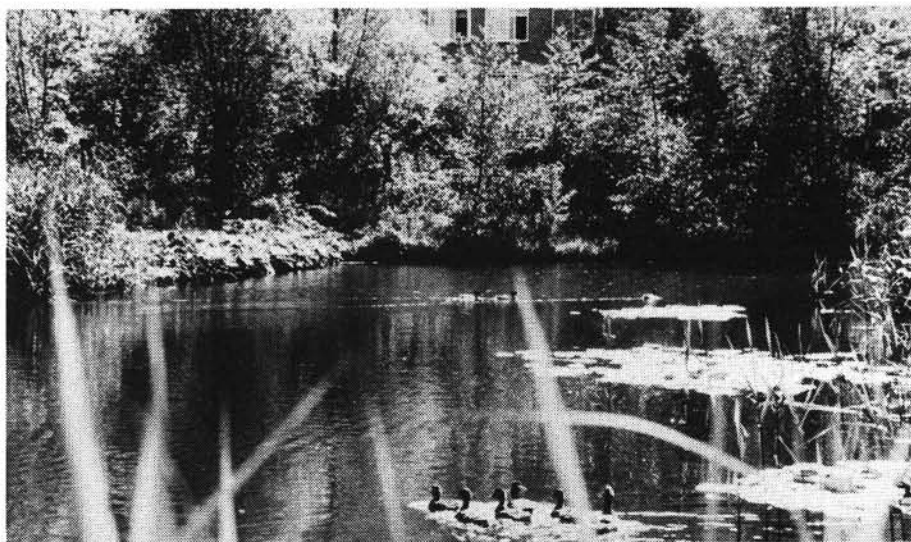


Photo 38. Haarlem - Molenwijk Park.

- ix) Natural undergrowth in existing woods
- x) Instructive collections, e.g. near schools

The herb and grass seed species were mixed in a ratio of 50:50. The grass species were *Festuca ovina* 'tenuifolia' and *Agrostis canina* 'arida'. A range of tree and shrub species was used, principally Sea Buckthorn (*Hippophae thamnoides*), Birch (*Betula pendula*), Thorn (*Crataegus monogyna*) and Oak (*Quercus robur*). Germination of grass species was satisfactory though the herbs were more variable. Some species did not germinate until the second season and others were delayed until conditions of soil and/or climate were favourable. At the present time, causes for variability in the germination of wild flower seed are little understood. After germination, ruderal species were removed by hand and in the second season the mechanical stress of mowing was introduced. A 'finger-type' mower was used to recreate the action of scything. The timing of this operation was considered essential and, again guidance came from pre-industrial agrarian practice. The farmer traditionally allowed the grass to ripen before cutting which equally applied to weed seeds of the meadow. When the grass was cut and turned, the seeds were returned to the soil. This operation was carried out between the end of May and

early June and this is the time for cutting the meadow. Afterwards the herbage has to be lifted by hand. This raises the cost to a level comparable with conventional grass cutting. This problem will be overcome by the development of appropriate small scale agricultural equipment. It is reported, for example, that a mini haybaler has already been developed which makes bales the size of a cornflakes packet.

TABLE 7

## Grass Species for different ground conditions

- A. Poor, damp-to-wet peat or sand soils, possibly with a temporary cover of water in winter.
- |                      |  |
|----------------------|--|
| Sweet Vernal Grass   | <i>Anthoxanthum odoratum</i>                   |
| Velvet Bent          | <i>Agrostis canina</i><br>subsp. <i>canina</i> |
| Common Quaking Grass | <i>Briza media</i>                             |
| Mat Grass            | <i>Nardus stricta</i>                          |
| Bog Hair Grass       | <i>Deschampsia setacea</i>                     |
- B. Poor, dry, sand soils
- B1 Naturally occurring sand soils
- |                            |                             |
|----------------------------|-----------------------------|
| Wavy Hair Grass            | <i>Deschampsia flexuosa</i> |
| Fine-Leaved Sheep's Fescue | <i>Festuca tenuifolia</i>   |
- B2 Artificially prepared material
- |                |   |
|----------------|---|
| Brown Bent     | <i>Agrostis canina</i><br>subsp. <i>montana</i> |
| Sheep's Fescue | <i>Festuca ovina</i>                            |
- C. Nitrogen poor, dry, chalk-rich soil
- |                     |   |
|---------------------|---|
| Upright Brome       | <i>Bromus erectus</i>                           |
| Creeping Red Fescue | <i>Festuca rubra</i><br>var. <i>rubra</i>       |
| Hairy Oat Grass     | <i>Helictotrichon pubescens</i>                 |
| Brown Bent          | <i>Agrostis canina</i><br>subsp. <i>montana</i> |
| Crested Hair Grass  | <i>Koeleria cristata</i>                        |
- D. Chalk-rich dune sand
- |                    |  |
|--------------------|--|
| Crested Hair Grass | <i>Koeleria cristata</i> ( <i>albescens</i> )<br>(a sand dune variant) |
| Drooping Brome     | <i>Bromus tectorum</i>   |
- E. Shady sand soils
- |                   |                             |
|-------------------|-----------------------------|
| Wood Meadow Grass | <i>Poa nemoralis</i>        |
| Wavy Hair Grass   | <i>Deschampsia flexuosa</i> |
- F. Damp, sandy loam soils
- |                      |                              |
|----------------------|------------------------------|
| Sweet Vernal Grass   | <i>Anthoxanthum odoratum</i> |
| Swamp Meadow Grass   | <i>Poa palustris</i>         |
| Common Quaking Grass | <i>Briza media</i>           |
| Brown Top            | <i>Agrostis tenuis</i>       |
- (Source: Wildepläntentuinen - Landwehr and Sipkes)

TABLE 8

Suitable herb species for flower-rich verges and meadows.

(The categories A-F refer to the soil types and grass species listed in Table 7)

Bistort	<i>Polygonum bistorta</i>	AF
Field Scabious	<i>Knautia arvensis</i>	C
Meadow Cranesbill	<i>Geranium pratense</i>	CF
Devils Bit	<i>Succisa pratensis</i>	AF
Tansy	<i>Tanacetum vulgare</i>	BCD
	<i>Hieracium sabaudum</i>	E
Cypress Spurge	<i>Euphorbia cyparissias</i>	BC
Small Scabious	<i>Scabious columbaria</i>	C
Ragged Robin	<i>Lychnis flos-cuculi</i>	A
Lady's Bedstraw	<i>Galium verum</i>	D
Yellow Chamomile	<i>Anthemis tinctoria</i>	BC
Goat's Beard	<i>Tragopogon pratensis</i>	C
Spotted Hawkweed	<i>Hieracium maculatum</i>	E
Self Heal	<i>Prunella vulgaris</i>	AEF
Yarrow	<i>Achillea millefolium</i>	ABCD
	<i>Centaurea pratensis</i>	AF
Harebell	<i>Campanula rotundifolia</i>	BCF
Greater Knapweed	<i>Centaurea scabiosa</i>	ABC
Great Burnet	<i>Sanguisorba officinalis</i>	BDF
Large-flowered evening Primrose	<i>Oenothera erythrosepala</i>	BD
Ragwort	<i>Senecia jacobaea</i>	CDF
Imperforate	<i>Hypericum maculatum</i>	BF
St John's Wort		
Spiny Rest Harrow	<i>Ononis spinosa</i>	CD
Burnet Saxifrage	<i>Pimpinella saxifraga</i>	F
Great Mullein	<i>Verbascum thapsus</i>	ABD
Whorled Clary	<i>Salvia verticillata</i>	CD
Ox-Eye Daisy	<i>Leucanthemum vulgare</i>	BF
Musk Mallow	<i>Malva moschata</i>	BC
Salsify	<i>Tragopogon porrifolius</i>	C
Wild Parsnip	<i>Pastinaca sativa</i>	CF
Wild Carrot	<i>Daucus carota</i>	BCDF
Lady's Smock	<i>Cardamine pratensis</i>	AF
Nettle-leaved Bellflower	<i>Campanula trachelium</i>	CE

Perforate St John's Wort	<i>Hypericum perforatum</i>	B
Viper's Bugloss	<i>Echium vulgare</i>	D
Meadow Thistle	<i>Cirsium dissectum</i>	A
Wood Sage	<i>Teucrium scorodonia</i>	E
Meadow Clary	<i>Salvia pratensis</i>	C
Marsh Ragwort	<i>Senecio aquaticus</i>	A
	<i>Hieracium caespitosum</i>	F
Marjoram	<i>Origanum vulgare</i>	CD
Kidney Vetch	<i>Saponaria officinalis</i>	CD
Dark Mullein	<i>Verbascum nigrum</i>	BC

(Source: Wildeplantentuin - Landwehr and Sipkes)





## 6.0 HAARLEM

The Haarlem Parks Department had made little contribution to the experimental landscapes of the 1960's. This changed in the early 1970's with the arrival of a new Parks Director, Dr Ir Guldemond, who had formerly been responsible for Urban Forest research at the State University Wageningen. Guldemond was looking for an opportunity to implement his theories of woodland establishment, whilst the Senior Landscape Architect at Haarlem was Nic Brink who had been influenced by the ideas of social change during his time as a student in Amsterdam. With other members of the Parks Staff, these two formed an ideal management team for implementing an ecological landscape. The opportunity to develop such an approach came in the suburb of Schalkwijk.

### 6.1 The Molenwijk District

Haarlem, like the other Randstad cities, is ringed by post-war housing suburbs. The Schalkwijk suburb lies to the south of the old city and is the final suburb under development. The Molenwijk district had been planned as an extensive highrise development around an 'open green heart' (21). In the early 1970's, however, there was general disenchantment with highrise building throughout western Europe and a return to more conventional housing. This was reflected in the District of Molenwijk where the eventual site plan showed the central park partly surrounded by two storey terraced housing, each with a small private garden. The difference in scale between the more intimate detailing of the housing and the making of a five and a half hectare park gave the design team a good opportunity to try out the feasibility of their ideas for a new approach to urban landscaping.

It is useful, in examining the new approach, to divide the operations into a consideration of the social and ecological aspects. Although no such division existed in practice, this reflects the overall objectives of the new approach. The social objectives were not only to ensure public involvement in planning the landscape but also to gain acceptance of the landscape by the community, as an integral part of their personal external space,

while the technical objectives were to restore as viable a natural ecosystem as was possible in the circumstances. Whilst some measure of public acceptance for the urban landscape had always been sought in traditional approaches, this was usually retrospective, that is to say, after construction. At Haarlem and generally in the Randstad suburbs, after 1970, public approval was sought, not just before development, but before detailed planning. This made public consultation an extremely important part of the planning process.

#### Consultation

The design team at Haarlem found advice about Public Consultation difficult to come by. Reports like the Skeffington report published in England had generated considerable discussion but little practical development. An immediate difficulty, as at Delft, was to restore public confidence in the integrity of the Local Authority. In many instances, the public had rightly suspected the Local Authority of presenting only selected material and would not, in any case, substantially change its proposals. These circumstances bred further suspicion and apathy. The Landscape Architect, Brink, gave the following verbal account of how he thought a change in attitude had been achieved by events which had occurred earlier in another suburb.

In this suburb the housing came close to the city boundary which was marked by a motorway. Between the housing and the road was farmland which presented a landscape scene of old Holland - long, narrow fields with rich green grass, Friesian cattle, groves of alders and a windmill. The Parks Department proposed that this land should be afforested as a recreational woodland. The community rejected these proposals in favour of retaining the farmland as it was. In accepting this decision, the City Council allocated part of the project money to subsidising the farmers. The proposals were pigeon-holed by the Parks Department in case future generations changed their minds and wished to implement them.

The other difficulty with consultation was that of timing. Experience at Haarlem had shown that if the process of consultation were to be successful, it must begin shortly after

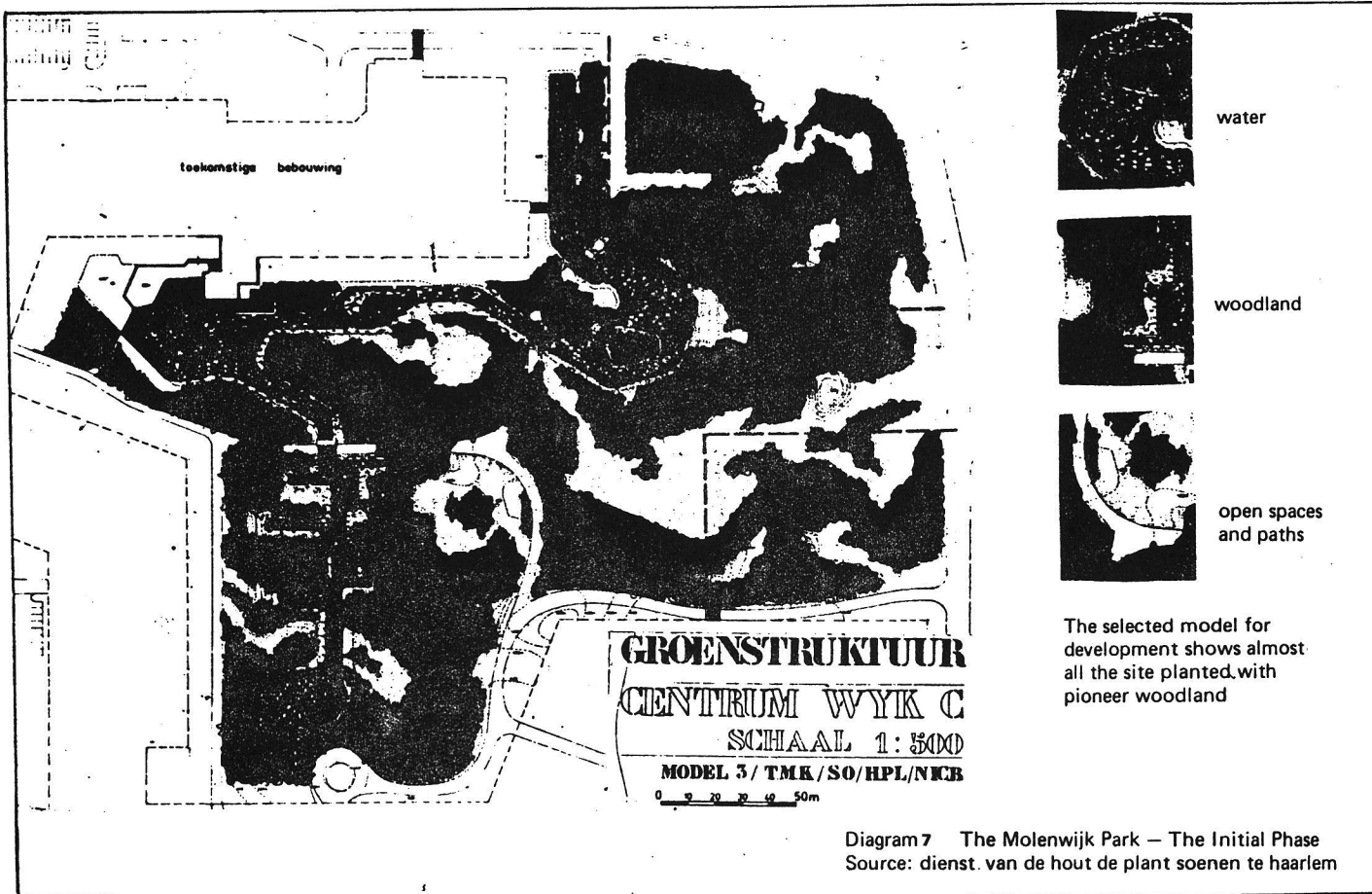


Diagram 7 The Molenwijk Park – The Initial Phase  
 Source: dienst. van de hout de plant soenen te haarlem

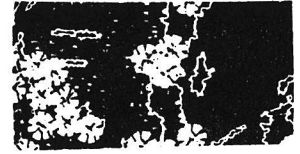
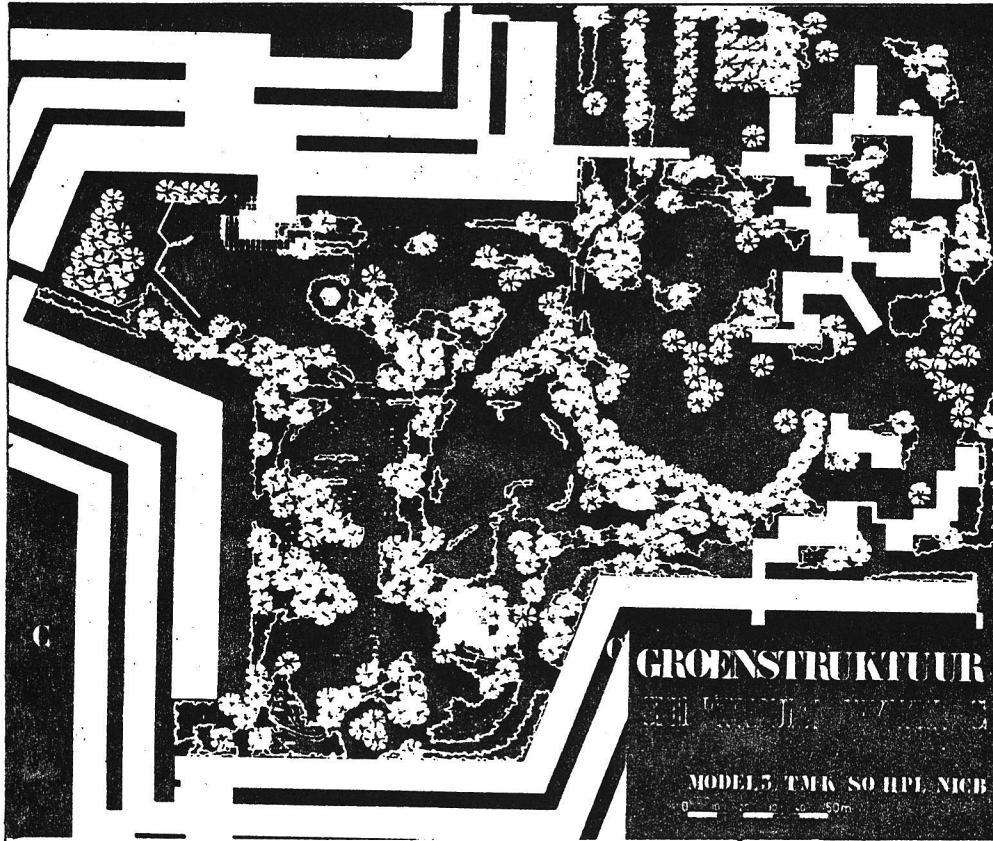
people moved into their homes. At this time, people are prepared to communicate with each other and the Local Authority. If it is delayed there is an opportunity for mistrust of neighbour and Local Authority to develop and attachments to be made outside the immediate neighbourhood. In instances where a year or more had elapsed since people moved into their houses, it was found impossible to involve all the residents, and the results were much less satisfactory. So at Molenwijk, each household received a Consultative Document for the new park shortly after arrival. This included all the technical information - details of the survey and analysis, alternative models for development and the reasons for recommending a particular proposal. In addition, each household also received two simple questionnaires. One outlined the proposals, asked a number of straightforward 'yes/no' questions and included space for written comment. The other had a series of bird's-eye sketches for those who had difficulty in reading plans or who wished to make graphic comment. The sketches could be drawn over or alternative proposals made in a space provided. Both these forms were designed to be folded into a pre-addressed and stamped letter for return to the Parks Department.

After an interval to allow time for consideration of the Report, the first public meeting was held. At this meeting a small committee was formed from representatives of the local residents and the Parks Department, including the Landscape Architect. This committee then met outside working hours in a private house to consider suggestions and alternative proposals. Once the committee had reached agreement on the final proposals, these were circulated, discussed and approved at a further public meeting.

#### Woodland Management

In an earlier chapter, it was mentioned that the method of building construction in western Netherlands left the site covered with a thick layer of inert sea-bred sand.

Previously in landscape areas this material had been covered with a metre thick layer of black soil before planting with a mixture of trees, grass and shrubs. Guldemond, however, recognised that



a b c

- a = woodland
- b = water
- c = grass

After ten years the management of the pioneer woodland has led to a clear differential between the woodland, water and grassland zones

Diagram 8 The Molenwijk Park – After Ten Years

these sterile surfaces represented the earliest stage of primary or secondary sere. When left alone they would colonise naturally, otherwise the landscaper designer's first task on such sites must be to restore the ecosystem through a planned succession. Guldemond had been concerned with finding a way in which woodland could be more systematically achieved as had been the case at either the Bos or Bijlmermeer, for example. Histograms, prepared by Guldemond, show the initial pioneer planting divided into four blocks of equal proportions. Three of these are planted with poplar, though other pioneers, like alder, willow or birch, may be used depending upon specific site and soil conditions. In the fourth block, a mid-climax species, like maple, is used with a very small percentage of forest climax species, like oak, ash or beech. These latter species are used to give an indication of the soil suitability and the rate of growth. In addition, they provide a measure of visual diversity though they are not intended to be part of the eventual climax woodland. After ten years the first block of poplar is clear felled and replanted in the same overall ratio of pioneers, mid-climax and climax species. This practice is repeated at ten year intervals in the other blocks. Subsequently, the reduced plantings of pioneer species are then felled and replanted in this way. So that progressively the character of a truly mixed age, mixed species woodland will emerge. This process, Guldemond estimates could take up to 120 years to complete, though the landscape would be fully used before that date.

## 6.2 Molenwijk Park

At Molenwijk the community accepted the concept of restoring the natural ecosystem through the use of pioneer woodland which, initially, would cover almost the entire site. This involved considerable sacrifice, for during that period the landscape would have only a limited, if growing, function. After ten years thinning would create three principal zones within the site. A waterside zone was also a transition into the parkland zone. Eventually, these zones would contain activities suited to the community and others associated with the individual and the garden. However, no specific proposals or facilities were shown

on the model, as these would be discussed by the community at a later date (Diagrams 7 & 8).

With public approval for the outline policy, detail plans for the Park could be prepared and Guldemond's theories of woodland establishment applied to the planting of the waterside, transition and parkland zones (Diagram 9).

#### The Waterside Zones

In this zone the soil level has been reduced to 0.06 metres above the water table and is liable to winter flooding. This will allow a fen-type vegetation to develop from the scrub planting which is dominated by willow species (*Salix triandra*, *S. penandra* and *S. viminalis*). A further 25% of the planting is divided between the other pioneer species of alder (*Alnus glutinosa*) and hairy birch (*Betula pubescens*). On the very wet ground alongside the water bog myrtle (*Myrica gale*) is used whilst elder (*Sambucus nigra*) has been used on the drier rising ground. All the planting in this zone is to be kept as fen scrub and natural succession will be prevented by management. Later, species-rich herb vegetation is to be established within the scrub, using Heempark techniques.

#### Transition Zone

In the transition zone between wet and dry areas, the percentage of willow is reduced to 44% with the species of the wetter ground being replaced by those more suited to dry ground, *Salix aurita* and *S. viminalis*. A further 45% is made up of light demanding species associated with the woodland edge, elder, currant (*Ribes sylvestris*), guelder rose (*Viburnum opulus*) and hazel (*Corylus avellana*). In the areas of low-lying ground bog myrtle is retained.

#### Parkland Zone

In the sloping zone, the vegetation is used to establish a succession towards a moist oakwood. In the ecotone between the two Zones, the willow species are replaced by hazel, privet (*Ligustrum vulgare*), thorn (*Crataegus oxyacantha*), cornelian (*Cornus mas*) and maple (*Acer campestre*) used as a shrub. The principal pioneer species at this stage is alder with a small number of mid-climax species like bird cherry (*Prunus padus*) and

the climax species of oak (*Quercus robur*). As the ground becomes higher and drier, rowan (*Sorbus aucuparis*) and Austrian pine (*Pinus nigra austriaca*) are introduced.

In the parkland zone, a complete forest development is intended. Spindle tree (*Euonymus europaea*) and blackberry (*Rubus fruticosus* spp.) are added to the shrubs and ash (*Fraxinus excelsior*) and *Populus serotina* to the trees, whilst the drier oakwood is strengthened with hornbeam (*Carpinus betulus*) and sweet chestnut (*Castanea sativa*)

#### TABLE 9

Principles of the Plan for Establishment and Maintenance of the Molenwijk Park

##### Zone 1 Waterside

Appearance: Dark colours and rough  
Woodland Planting: *Alnus glutinosa*, *A. cordata*, *Salix pentandra*, *S. alba*, *Acer pseudoplatanus*  
Maintenance: + 10% of the *Alnus glutinosa* and *Salix pentandra* to grow up as trees, the remainder will be removed or maintained in bushform. *Salix alba* can later be treated as pollarded willows.

##### Zone 2 Transition

Appearance: Dark colours as a transition from marsh area to open zone.  
Woodland Planting: *Quercus robur*, *Betula verrucosa*, *Pinus nigra Austriaca*, *Acer Pseudoplatanus*  
Maintenance: Most oaks and birches are mixed with the pines. These must be inspected regularly and where necessary cut back in order to keep the pines low branched.

##### Zone 3 Open Parkland

Appearance: Light colours, transparent species and way of planting.  
Woodland Planting: *Salix alba* c.v., *Populus canescens*, *Alnus glutinosa*, *Fraxinus excelsior* c.v.



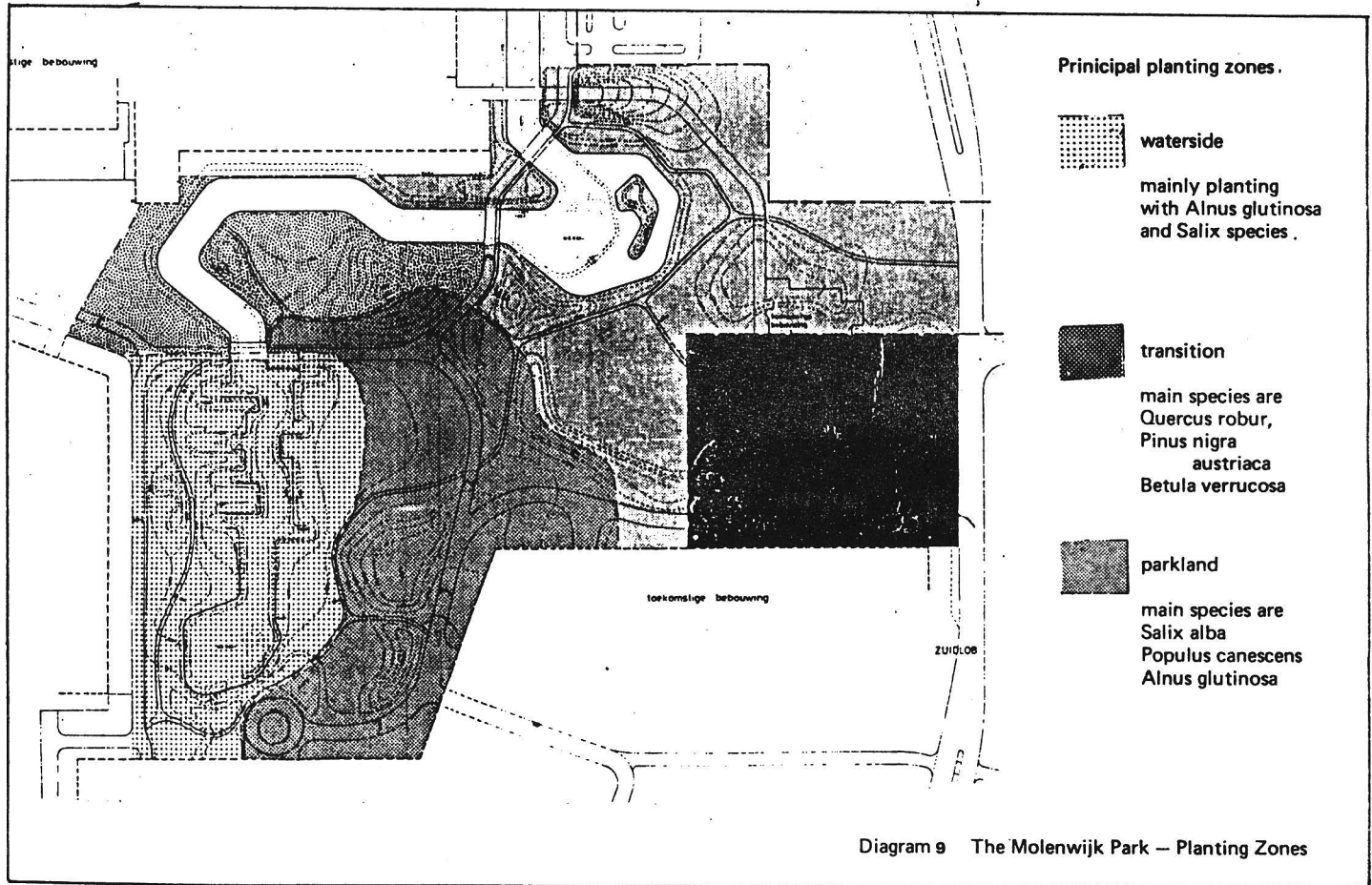


Diagram 9 The Molenwijk Park – Planting Zones

Maintenance: 90% of *Alnus glutinosa* must be cut down later to bush form

General: The maintaining of different species will mainly have to be decided upon by the growing results and the future use of the areas.

General Maintenance: *Alnus glutinosa* is considered to be a species for early removal, although some specimens can be allowed to become a tree (for instance in the marsh area). Shrubs which will have to be cut back are mostly *Alnus glutinosa*, *Crataegus monogyna* + *oxyacantha*, *Betula pubescens*, *Populus alba*, *Acer campestre*, *Carpinus betulus*, *Prunus serotina* and *Rhamnus Frangula*.

Planting distance: 1 x 1 metre.

#### Implementation

The planting of Molenwijk took place in the winter of 1973/4 using 1 + 2 year old forest transplants with a few standards to give added variety and interest.

A single implementation drawing was used which included a plant schedule for each area along with specific instructions and guidelines for the establishment and maintenance of the park.

After only two years there are encouraging signs that a new attitude towards the landscape is developing, as footpaths are trodden out and people gather the berries and flowers. This is an indication perhaps that people regard the Molenwijk park as part of their urban countryside, rather than a municipal landscape.

## 7.0 APPRAISAL

### 1. BIJLMERMEER - Recent Developments

Although the Bijlmermeer satisfied the initial brief, the extensive forest planting created problems in terms of management, both socially and with the vegetation. Even by the mid 1970s it was being appreciated that the extent of the thinning and the operations was on such a scale that it was becoming uneconomic. A large part of this problem was caused by the fact that the initial planting mixes contained too high a proportion of fast growing pioneer species, in some cases up to 65%. In the favourable growing conditions at the Bijlmermeer, these required thinning from the fifth year onwards. The planting was also being criticised by some residents for being monotonous, and its uniformity made it difficult to identify one's own 'block'. It was suggested that the most popular housing blocks were those that had some diversity, such as Scots Pine, which gave additional interest in winter.

It was said in the earlier Report that even planting on such an extensive scale could not overcome the social problems at the Bijlmermeer. From the beginning the blocks were used to house immigrants and the families of guest workers. Such people were transient and had different cultural values from those for whom the Bijlmermeer was first conceived. In these circumstances it was inevitable that an unstable and high risk society would develop, in which some members and groups within the community would feel to be vulnerable. In such a situation some people felt threatened by the encircling forest and pressed for its removal. In 1986 the Amsterdam authorities took the decision to 'experiment' with the removal of the woodland over two thirds of the area. The buffer planting which had been designed to break-up the turbulence and filter dust was reduced to knee height. Its effectiveness was thereby eliminated. Further out the planting was greatly reduced and in places, the land was regraded. The occupants of the blocks were also allowed to bring their cars closer to their 'front doors'. Any new planting utilised low-growing exotic shrubs and trees, with the leaders carefully removed. All of this helped to allow greater surveillance of the area around the flats, though it is doubtful

whether this did anything to remove the monotony and uniformity of the surroundings.

By contrast the remaining remnants of the woodland planting shows the richness and diversity that has emerged in the planting. This has been accentuated by introduction of careful management in the past twelve months which will help to greatly reduce the cost of maintenance. It is all the more regrettable that the authorities have felt it necessary to eradicate the potential offered by this vegetation, rather than adopt a more sensitive approach to the management of the vegetation.

## 2. LE ROI - Recent Developments

### Heerenveen

The Kennedylaan, as expected, has lost its initial spontaneity and attraction. Though used by people to walk their dogs, it has a generally neglected appearance - the small intimate sitting areas have fallen into disrepair, the wetter areas are strewn with rubbish and there is barbed wire to prevent criss-crossing, much against the Le Roi ideas. The vegetation has become dominated by coarser competitive species, like Nettle and Creeping Thistle (*Urtica uvens*, *Cirsium arvense*) or reverted to an undistinguished scrub dominated by such species as birch or sycamore (*Betula pendula*, *Acer pseudo-platanus*). Altogether, the Kennedylaan looks like any part of a run-down municipal park.

zou this evidence, it could be said that Kennedylaan, and more specifically the ideas of Le Roi, have proved to be a failure, but this would be to judge it by conventional norms. Le Roi's approach was certainly not an alternative to conventional horticulture but it proved itself as a means of releasing the creativity that is latent within an individual or a community. Clearly this has not been sustained at the Kennedylaan. The area has been maintained by the local Parks Department, who have their own horticultural and aesthetic standards, whilst local involvement appears to have ceased. The size of the Kennedylaan always meant that this would be an 'experimental' site and it required a larger area to test Le Roi's ideas more comprehensively.

### Lewenborg

In 1972 Le Roi was offered a ten year contract to develop 6 hectares of open space at the new estate of Lewenborg, a suburb of the north-eastern city of Gronigen. The Council's motivation was a mixture of idealism and financial stringency - Le Roi asked for only 100,000 guilders compared to the 1.2 million guilders that would have been otherwise required to lay out the site. In 1982 Le Roi's association with the project was terminated and responsibility for the open space was taken over by a local committee, including two representatives from the municipality.

It is difficult to describe the appearance of Lewenborg as it has more of the more traditional horticultural elements whilst maintenance in the conventional sense does not take place. Such necessary operations as the coppicing of willows or the cutting of long grass is undertaken by members of the community where and when necessary. Elsewhere the landscape is allowed to develop, and groups or individuals within the community have, or are in the process of, constructing the many facilities they require - including children's playgrounds designed and largely built by the users, community meeting places, allotments and farms, neighbourhood gardens, plus other features like walls, paths, duck boarding for fishing etc.

For local authorities used to a 'finished landscape' the appearance of the Le Roi gardens at Lewenborg pose a considerable dilemma. It derives its aesthetic, not from the usual visual sense but the sense of vitality that comes from such a diverse and dynamic environment. One in which many people are actively involved in shaping their surroundings according to their own specific needs. In so doing the green-space has become a urban village with its own common land used for the benefit of the community.

Lewenborg is possibly one of the most exciting projects to come out of the 1970s and could prove to have a profound influence on the future of green space planning and management. At a time of less state involvement, community responsibility for the greenspace is an attractive alternative. For the moment its further successful development poses a challenge to both the community and the municipality.

### 3. DELFT - Recent Developments

By the end of the seventies the Gillis experiment was largely forgotten; the Hadynlaan ceased to be monitored by the Department of Preventative Medicine at Leiden and the intention to keep the vegetation as a 'scrub' was not pursued. The landscape itself continued to be used by children for building dens and other play activities up to the 1980s, though the low-lying wet areas had been filled in much earlier, following complaints from parents. As the decade progressed the absence of management became increasingly apparent; the fences and seats were left in a broken condition, whilst the trees and shrubs remained unthinned. As a result, pioneer or nurse species like poplar and white willow were allowed to dominate the vegetation and suppress the longer-term climax species. At the ground level, the shade inhibited the growth of herbs and recreation became increasingly unpleasant. Thinning of the more dominant vegetation in the late 1970s at last gave an opportunity to create a very attractive 'woodscape'; to open up glades, create vistas and encourage the growth of the woodland edge but in the event this opportunity was not taken. Instead a drastic thinning of the understorey was started in 1986 which removed many of the longer-term species and left the pioneer trees. Along with these went the woodland edge and the understorey shrubs. At the same time the ground was regraded and grass seeded. The result not surprisingly has been to destroy much of the woodland character that had developed over the previous fifteen years and severely limited the opportunity for the kind of creative children's play which had been a feature of those years.

The reasons given for this treatment were the same as those at the Bijlmermeer, though the Gillis housing is the subject of an extensive and expensive renovation. In general, however, one suspects that creative woodland management which has been such a feature of the English landscape for the past 1,000 years, is not so developed in the western Netherlands.

## HAARLEM - the Molenwijk Park

### Recent Developments

The success of the Molenwijk Park, which is clear from the photographs, demonstrates clearly the importance of a team approach to management, combining a knowledge of ecology, urban forestry and landscape design. The flexibility of the original concept has allowed certain changes to be made in the years since 1975. Firstly, the overall aim is no longer to achieve a more conventional parkland, with open spaces and trees. Molenwijk is being managed as a nature park. Secondly, it has been appreciated that the development of the vegetation towards woodland with mature forest trees is not the preferred direction. A woodland climax creates problems of scale in such areas and has the effect of 'opening up' the structure for the purposes of wildlife and recreating a tall shrub community is preferred in the confined space of high density housing. So the ratio of trees and shrubs has been reversed in favour of the shrubs; and as the above ground photograph shows, the majority of the pioneer trees, like white willow, have been removed. These were taken down once they began to dominate the canopy. Elsewhere species like the Bog Myrtle failed to establish in the early planting and has had to be introduced now that conditions are more favourable. Similarly the initial planting and seeding of herbs was not successful, and in general more satisfactory results are achieved through the management of the spontaneous vegetation. Suitable species can either be introduced or will naturally colonise, as in the case of orchid species.





## 8.0 SUMMARY AND CONCLUSIONS

The landscape of the Randstad suburbs described in this study show conclusively that where ecological principles are adopted as the basis of design a new and exciting landscape can be created efficiently and economically. Such ecological landscapes make it possible to integrate passive and active recreation, environmental hygiene and education and assist the conservation of flora and fauna. In the words of Dr J R Smidt of the Institute of Systematic Botany, State University of Utrecht, 'by paying attention to the desires and needs of the users in landscape areas - human, plants and animals, it has proved possible to create quality. To design spaces where it is possible to live and exist, instead of increasing estrangement with the natural environment' (22).

From these landscapes it is possible to draw up the following summary of technical considerations.

### 7.1 Technical Summary

#### 1. Preparation

a) As poor a substratum as possible should be chosen; for example, unfertilised clay, sand or peat. Soil may be impoverished by cultivating a productive crop for a few years and harvesting as often as possible. Herbage should be removed to avoid enriching the soil or smothering the underlying vegetation. On infertile or dry soils, water retention can be improved in the planting holes for trees and shrubs, by adding peat or other inert organic materials.

b) Soil improvements, such as fertiliser treatments, land drainage, etc. should be avoided. Surface tilling should also be omitted, except for the purposes of earth moving or obtaining a poor soil.

c) Surface works, such as deep ploughing, land modelling, digging ponds or ditches, should be carried out as early as possible. Compact areas can be retained to give variation to the vegetation.

d) Any important soil must be low in nutrient status, especially available Nitrogen. Subsoil and other less common materials, like brick rubble and cinder may be considered. Although diversity in the soil can be achieved by a variation in the composition, the additional expense has to be considered. On flat sites greater variation can be achieved by altering the relationship between soil/water; or by varying the height of the substrata and the thickness of the upper layer. Localised variations can be made to simulate conditions, for example, the bottom of the slopes can be enriched to simulate conditions of leaching.

e) Diversity in relief can be achieved through accentuating existing land forms or making hollows or small ponds. These should reflect the surrounding terrain and be avoided in areas of low relief or no water.

f) Accidental occurrences - features that exist before or appear during site works - should be watched for as these will strengthen the diversity and character of the resulting vegetation. This applies to such features as wet areas, natural stone paving, wall vegetation, etc.

g) Introduced artifacts, such as paths, bridges, seats, etc. should be simple in design; natural materials should be used, like unpainted wood, crushed stone, etc.

## 2. Plant Material

a) Most common species of trees and shrubs can be obtained commercially as 1 + 2 year old forest transplants. Small quantities of these species can be raised from seed by the user.

b) Herb seeds for initial plantings or later introductions are raised in Heem Parks or have been collected from the wild material in the same geographical zone as the new landscape. Taking seed from wild sources is not recommended, except for the commonest species, as this depletes the natural stock.

c) Most Local Authorities have established their own seed nurseries modelled on Amstelveen. At Haarlem, five years of trial and error was necessary to bring the Nursery into production. As with so much work involving native species, it depended on the right sort of person to develop the necessary techniques as it involved study outside official hours. Experience at Haarlem has shown that seed production is an all-year-round activity involving seed collection, drying, packeting, as well as raising plants.

### 3. Implementation

a) Planting Grids or Plant Schedules can be used for implementation, though in cases where experienced Contractors or Direct Labour Organisations are involved the Schedule often achieves a more natural effect. Forest transplants are used at a spacing of 1 to 1.5 metres.

b) In the pioneer stage, the woodland has a general appearance of a scrub or thicket. Separate edge planting is not necessary although the overall appearance of the edge is important. Species with specific interest, such as flower, leaf variation, berry or edible fruit should be located to the outside for people's enjoyment. Planting areas should have a regular outline and can be larger in extent than the eventual woodland.

c) After planting, unwanted ruderal weeds frequently invade the planted areas and these should be removed by hand or chemical cultivations. In the year after planting, an annual treatment may be adopted using a contact herbicide in the early spring (Grammoxone) followed by a soil residual herbicide, in granular form (Simazine).

d) Woodland thinning commences sometime after the eighth year when leaves and branches come into contact and compete for available light, soil nutrients, water, etc.

Timing of these operations is probably more critical than had formerly been understood. In Amsterdam, for example, the thinning of a trial planting of alder and poplar was delayed by one year. In that time fifteen feet high alder was totally

suppressed by poplar. Whilst it had been appreciated that alder is a light demanding species, the surprising aspect was the speed at which suppression occurred.

e) The method of thinning is also crucial. Total removal of thinned species will result in full light penetrating to the woodland floor. This would encourage colonisation by unwanted ruderal herb species, so that during the first thinning of such species as alder, the overall height is reduced by two thirds. This allows light to reach the canopy but excludes it from the ground. When the canopy has closed together the remaining third can be taken out to near ground level, and the heavy shade discourages sucker growth. Experience has shown that it is uneconomic to re-use the thinned material, especially as the initial cost was low. Instead, thinnings are shredded and returned to the planted areas as a mulch to suppress weeds and reduce water loss. The only danger of this practice is the risk of encouraging fungal infections, like *Ammalaria*.

f) In ecological management, thinning is part of the creative process. It is important to use the 'eye of the designer' in recognising clumps or individual trees to be retained, glades to be opened up and the line of pathways. Whereas the forester is concerned with the health of the timber stand, the designer must be concerned with the overall aesthetic effect which has to be as natural as possible, so that the gnarled, the twisted or the double stemmed tree will often be more valuable than one with a straight stem.

g) After thinning of pioneer species, tree species of the stable environment, like oak and beech, have to be introduced. In instances where these climax species were included in the initial planting, care has to be exercised during maintenance in the pioneer phase. The planting circle, for example, should be kept free of weeds during the first 5-7 years, though it is not necessary to have bare earth throughout.

h) In woodlands, the introduction of herb species can begin sometime after the first thinning, though the selected species must be as carefully matched to the stage of woodland growth as

to the environmental conditions. Experience in introducing herbs into woodlands indicates that different techniques have to be adopted for marginal species to those found in the deeper shade. Species that set a fair quantity of viable seed like Red Campion (*Silene dioica*) and Sweet Woodruff (*Asperula odorata*) can be established through a random distribution. This practice cannot be used for species that set little viable seed or spread vegetatively, like Wild Garlic (*Allium usinum*). Instead a nucleus of plants has to be established from which it is hoped that natural colonisation will occur through the agencies of small mammals and birds etc.

i) In meadow grasslands, slow growing fescues and bents should be used in simple mixtures with herbs, as these will cause less problems of wear and tear and timing of cutting operations. Sowing should be preceded by trial experiments to find out which species are suited to the site. Only small quantities of herb seeds are necessary: 'If a gramme of seed does not do any good, a pound will neither' (23).

j) During the first years after sowing, the resulting open community will be subject to invasion by competitive species like Dock, Thistle and Dandelion. These have to be removed in their entirety, by hand. In the second and third years, mowing can be introduced. Depending on the species composition, cutting is carried out in late June/early July and repeated in late August/early September. Annual fluctuations in seasonal climate will affect the exact date of cutting. All cut material has to be removed to avoid damaging the underlying vegetation and enriching the soil.

k) As much of the work with native herb species is still experimental, particularly with regard to aspects of germination, establishment and rate of spread, a careful record should be kept of each sowing and planting. At Haarlem, Record Sheets are prepared for each area with entries made for rates of sowing and germination percentage. Later, aspects of maintenance, like time and frequency of cutting, can be added.

1) There are many problems associated with the use of commercially produced seed mixtures, due particularly to provenance and composition. Plants raised from seeds collected outside the region are likely to have a significant variation in form and colour. Also, only exploiter species produce sufficient quantities of seed to make commercial collection worthwhile. Wild flower mixtures incorporating such species are likely to include some which would become weeds with attendant maintenance problems.

#### 4. Management

a) Native species do not alone bring stability to the newly laid out ecosystem, even though a diverse range of habitats may have been included. For stability in the landscape there must be stability in management. The same team, including the designer, must be continuously responsible for management of the landscape, or at least follow a predetermined programme.

b) The absence of precise instructions or plans in much of this work means that maintenance personnel have to be more aware of the overall management objectives. There is also a need for additional skills, outside of horticultural practice, which may necessitate extra instruction and training. In the Netherlands, experience has shown that this is usually repaid with a greater assumption of responsibility. However, it should be stressed that not all members of the maintenance or design teams are prepared to accept the new approach.

c) As far as possible, the same maintenance personnel should carry out the same operations, in the same way, at the same time each year. This will establish the cyclical pattern of operations that existed in the pre-industrial agrarian landscape.

d) Community diversity can be established by carrying out different operations, in different places, within the same habitat. For example, in the woodland, some parts can be left unthinned whilst other places can be managed for coppice, with or without standards. In some locations, grass can be cut four times a year and in other places only once a year. Similar

variations can be achieved by allowing different degrees of trampling.

e) Species diversity can be increased in the course of time by introducing additional species to places which are always treated the same.

f) The natural appearance of the planting can be greatly enhanced by avoiding abrupt changes in the vegetation. This is particularly the case in the ecotone between woodland and grass areas. Specific instructions will be necessary for maintenance personnel.

g) The natural ambience is also enhanced by avoiding direct visual contact with human artifacts. In transition between the two, for example, paths should be oblique to avoid a direct view.

h) In urban landscape, water in ponds and ditches is usually rich in nutrients, especially where there are ducks. Eutrophic conditions, such as algal blooms, can be avoided to some extent by correct plantings but water areas tend to become overgrown with aquatic plants and reeds. Thinning of the shore and water plants should be carried out after the growing season. This avoids destroying aquatic birds' habitats along with the vegetation.

## 7.2 General Conclusions

### 1. Cost and Employment

Ecological management nearly always requires more manpower than technological action. Present-day machinery is usually designed for high productivity with low labour intensity, by performing uniform operations on a large scale. Such machinery is of high-energy consumption in terms of fuel, which is offset by the high yield of crop, encouraged by the use of artificial fertilisers. In the conventional urban landscape there is often little or no return, except in visual terms and so it can be described as a high energy, low return landscape.

The objective of ecological management is to reverse this ratio by creating a landscape which is low energy/high return. This should not, however, be taken to imply that these landscapes are low cost. In the pioneer stages, ecological landscapes are labour intensive, and so of high cost. As the ecosystem becomes more stable and the environment - in ecological terms - becomes poorer, human intervention in theory should become less. The experimental hay meadows at Amstelveen would seem to support this, as would the early woodlands like the Bos Park. As yet, though, there has been insufficient time or experience to prove whether this is universally so in practice. What is certain, is that as the landscape matures, the use, or return, progressively increases. It is also apparent from these studies that the layout and consultation preceding implementation will in general be labour intensive. The cost of the landscape will also depend a great deal on the prevailing situation and how much is to be changed by design or human influence. It is a good ecological starting point to make use of the existing system as far as possible. This will minimise costs, but where there has been considerable human interference, as at Schalkwijk, a lot of work will be necessary to overcome this and costs will be high. In summary, costs can be saved by:

- not levelling the surface area
- not filling in ponds and ditches
- not lowering the ground water level by drainage
- not importing fertile top soil
- using little or no fertiliser
- mowing less frequently
- using less expensive planting material, native as opposed to exotic species

Costs will rise from the reverse of these and also the following:

- weeding by hand or mechanically
- small-scale operation by hand or machinery, such as woodland thinning

## 2. Training and Education

Some adjustment in the present training and education of designers, horticulturalists and contractors is necessary if they



are to have the necessary ecological expertise. At present, it would seem that designers have progressed further than other members of the management team. A further problem is a great deal of ecological understanding and expertise is held by members of University and Research Departments which needs to be transferred into practice. Some people, like Dr Smidt of Utrecht University, believe that practice-orientated courses should be provided extra-murally for members of the landscape industry, both for those in initial training and others already in practice. These courses would cover such topics as:

- structure and function of ecosystems; cycle processes; succession; biological equilibrium; diversity and stability
- the mutual relationships between plants and animals in living communities
- the dependence of plants and animals upon environmental factors
- the effects of human action upon these systems and relationships

### 3. Research

Although ecological principles can contribute much to the solution of environmental problems, there is a great deal that is not known about the artificial re-establishment of ecosystems. Many practical questions revealed in the course of this study are unanswerable at the present time, on such topics as preparation of soil, its impoverishment by cultivation, times of grass cutting and tree thinning, etc. It is obvious that there is a need not only for more practice orientated research, but a close liaison between practitioners and research workers.

### 4. Education of the Public

The study has shown that the principal reason underlying the new approach is a social one, and this overrides any consideration of costs. Therefore, education of the public is now regarded as essential for all ages and sectors of society; especially as for many years people were not allowed to touch anything or walk anywhere, and now, in many places, the reverse is true. All the Parks Departments visited gave up time, in some cases as much as one day a week, to show groups of people - from schools, trade

unions, churches, etc. - the new landscapes like Schalkwijk, and explain the reason for them. These reasons may be related to the need for social contact or physical exercise, or a knowledge of the world of plants and animals and sense of responsibility for nature. But above all it has to be made clear to people that taking part in making the landscape can be fun.

In future, it is hoped by most Parks Directors and their staff that this involvement will develop into responsibility for urban green space management. This could be directed towards the more labour intensive and therefore expensive parts of management. The weeding of planting circles around trees, thinning out young afforestation, pulling out thistles from species-rich grassland, mowing ditch banks where conventional machinery cannot reach, etc. In this way it is hoped that people will learn about the natural environment and its plants and animals. They will see how difficult it is to obtain and establish certain species. People will gain an understanding of the complexity and vulnerability of ecosystems. By following the development of the ecosystem from year to year, people will also realise that nature is dynamic and reacts sensitively to seasonal changes in the environment. The landscape designers who share these hopes, believe that the success of the new landscape is essential to the continued survival of our urban society; the replacement of a parasitic exploitation of the environment with a symbiotic relationship that is mutually beneficial to all inhabitants of the city.

### 7.3 Future Developments

The achievements of the various Parks Department teams like those at Haarlem have already attracted the attention of architects, planners and engineers. In future developments it is hoped to involve all members of the environmental design team with representatives of the community in discussing not only the landscape but also the housing and site planning.

At present it is not possible to say how far this co-operation will extend or what it will achieve. Undoubtedly, there are many obstacles to overcome, particularly of an administrative nature.

But there is every reason to view the development with optimism, because they arise, not from the ideals of a few, but from the desire of many, professional and lay, for a new approach to making the urban environment. An editorial in the American journal 'Landscape' (Winter 1967/68) prophetically summarised the reason for the new attitude. The writer observed that the greatest contribution designers could make towards improving our environment would be to encourage people to look at their surroundings themselves, and give them the intellectual and physical tools to do their own shaping. This approach, he argued, would produce few dramatic renderings and models of sophisticated civic design. It might indeed change very little the large scale structure of our cities. But it is an approach compatible with a just and democratic society (24).

This is precisely what the designers described in this Study were trying to achieve, because the events of the silent revolution during the 1960's had made many people realise that in a modern technological society, with such organisations as the multi-national company and the welfare state, for example, the right of the individual and the community had become almost submerged. Any society which seeks to be just and democratic must restore the individual's right to participate in determining the form of his or her environment, as this will play a significant part in the psychological and physical well being of the individual. The environment must be free of uniformity and monotony and should restore the rich diversity of the natural, cultural landscape. In those same years, a small group of architects, builders, social workers and others including Dr Friedeldij Dop, one of the country's best known child psychiatrists, created an organisation - 'New Living Forms' - 'to build houses fit for people instead of houses in which people can fit'. This chapter can be appropriately concluded by part of the summary from their booklet, 'Living in the Netherlands':

'... it may well happen that the story of the Dutch efforts to create a new attitude towards the construction of new towns... will strengthen your feeling of being confronted with a universal problem. Shall we succeed in bridging the ever widening gap between the poor and the rich? Or shall we be

swallowed up in a wilderness of bricks and concrete? A fate which many people believe has already overtaken them.

In other words, shall we survive or go under, prosper or languish, in tomorrow's schemes, begotten of yesterday's planning? The future of the world will partly depend on how well we can utilise every inch of space remaining and the care and attention we are willing to devote to this space so seriously misused in the past.

The building world has a myriad of reasons why such dedication and attention are lacking but seldom is there a word of apology:  
in Amsterdam, it is population density  
in Calcutta, the population growth  
in Tel Aviv, emigration  
in New York, speculation  
in London, inflation  
in Moscow, nationalisation  
in Berlin, competition

And wherever imaginative man tries to make a contribution towards improving liveability they are in most cases prevented from doing so, for one thing because their ideas run counter to established practice. So the designer is looked upon as a practitioner of art for art's sake whose *cri de coeur* has nothing to do with the serious business of houses. Not that the establishment is against improvement. Indeed, it is in favour of it, but it lacks in many cases the vision and tolerance to give anything a chance that may deviate a little from the well worn path.

Nevertheless, in almost every country in the world the idea is gaining ground that there is more to living than a roof and four walls. Various experts are co-operating with the citizen, they are becoming increasingly receptive to his ideas, already expressed or unformed, regarding how he would like to live. People are becoming more and more aware that large scale building projects demand a combination of know-how and involvement.

For this reason, the layman, who may or may not be the future occupant himself, is being given a place in the interdisciplinary

team of experts formed to direct such projects. Once again, and certainly not for the first time in history, the first tentative steps are being taken towards democratising and humanising the places we live in.' (25)

Throughout the study any direct comparison with Britain has been avoided but in conclusion, it must be said that needs of land and people in this country demand a similar radical new approach to urban landscape. There are no technical reasons why this should not be adopted, although there are serious social and particularly administrative problems to be overcome. Perhaps the real reason why change will not occur was expressed by Nicolas Pevsner, in '... the English dislike of revolution, innovation or even logical thought' (26). As a result, the difference between the Netherlands and the UK may continue to remain, In Frazer Darling's words;

'a question of difference between an ecological approach, a very simple one linked with a romantic outlook and an unimaginative, unbiological one concerned only with keeping down the rates.'

Reith Lectures 1970 (27)



## *Postscript*

In taking a retrospective look at ecological landscapes it is important not to overplay their significance or the role that individuals played in achieving them. At no time did these ideas command the support of more than a minority and many planners (of all kinds) dismissed them as 'green-soup'. It is true that considerable debate surrounded the ideas of Louis Le Roi but little else was written or published by other proponents of these new ideas. However, these landscapes have had a continuing influence on landscape architects in many countries, where the same technological and materialistic culture has emerged. In many of these countries the level of ecological consciousness seen in the Netherlands during the 1970's has still to be reached, and there is a fundamental task of re-education still to be undertaken. It is regrettable, therefore, that some municipalities have been unable to continue the innovations begun in the late sixties, onwards. But it is hoped that those remaining 'landscapes' will be allowed to develop unhindered by changes in political or aesthetic fashion.

This Report began with a Dutch quotation and it is fitting that it should conclude with one that possibly could not have been written without the inspiration of Holland and its ecological landscape. An article by Ann Rosenberg, a Canadian landscape architect recently described the change in the cultural paradigm that controls man's relationship to the natural world. It is clear she writes, that our understanding of ecology is revealing a new understanding of the natural world. Firstly in our understanding that humans are not separate from nature, and in consequence, there is a transition from a fear engendered by the sense of alienation, to a feeling of integration and relationship. The consequence of that knowledge is to change the basic paradigm by which we have viewed our stewardship of nature, a philosophic concept that lies at the heart of landscape architecture. No longer, says Rosenberg, will Man care for all living things under Man's dominion rather a new paradigm which requires care for humans' physical and ethical impact on their surroundings from within the ecological continuum.

In their various ways the ecological landscapes at Amsterdam, Delft, Haarlem, Amstelveen and elsewhere demonstrated aspects of that changing paradigm and the new function of the landscape architecture.

The role of landscape architecture, said Rosenberg, '... is changing from that of the elite artist making a private "statement", to that of an interpreter, organizer, facilitator-though still an artist. The dichotomy that opened between the art and design during the Renaissance is being transformed by the change from the client-user as a single patron to a variety of users and multiple uses on public land. The role is expanding once again to include the integration of social responsibility with art. This requires an open-ended and participatory form of design that creates a medium in which the users can take responsibility for determining their own identity. The degree of success of such a form feeds back to the designer/artist enhancing his/her own identity. The designer's identity is based not on the landscape as a product of design but on these social relations. At the same time, the landscape becomes the physical manifestation of the designer's and user's values, thereby contributing to their identity and making that identity part of a larger scheme (Tudor 1984). The participation and involvement of the users with the designer as "form-makers" contributes to everyone's sense of responsibility for their design decisions, and yields new energy for the design process. Participatory design fosters a better understanding of "community" and is in itself a reflection of ecological processes evolving toward higher forms (Kaplan 1983).'

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UNESCO MAN AND THE BIOSPHERE PROJECT ON HUMAN SETTLEMENTS

In the post-war period the extension and re-development of towns and cities in Europe and elsewhere resulted in the creation of areas of open space. Often no more than an extensive expanse of close mown grass and isolated plantings of trees.

By the late 1960's a reaction to the formless uniformity of these new suburbs began to emerge in the Netherlands as part of a general reaction to post-war materialism. Out of this came a new approach to the design of urban green space, involving the use of native plants, woodland plantings, and community participation.

In 1979 the publication of "Holland and the Ecological Landscapes" brought these new approaches to the attention of a wide audience in Europe, North America and Australasia. This revised edition includes a brief account of how these landscapes have developed during the past 15 years.