

THE NETHERLANDS: PART I



By Charles Lewis

A Planned Country

In September, 1986, Charles Lewis joined Dr. Herbert Schroeder, Environmental Psychologist with the U.S. Forest Service, for a two-week research visit to The Netherlands. This trip was the third in a series of interchanges between the countries, sponsored by the United States Department of Agriculture, Office of International Cooperation and Development. Funding for his portion of the trip was provided by a private American foundation.

The Netherlands State Institute for Research in Forestry and Landscape Planning in Wageningen organized the trip, arranging an itinerary which would allow them to meet with planners, psychologists, landscape architects, conservationists, urban foresters, and park managers. The Dutch hosts were exceedingly generous with their time and efforts, enabling the American visitors to gain a broad view of the role of vegetation in The Netherlands, and to compare it to the use of vegetation in land planning in the United States.

The Netherlands is a small country whose area is less than one-third that of Illinois, but its population of 14.4 million exceeds that of Illinois by 3.4 million. Population density in The Netherlands is 162/sq. mi., the highest in Europe (which otherwise ranges from 4/sq. mi. in the USSR to 124/sq. mi. in Belgium). Comparable density in Illinois would be achieved if all its citizens were crammed into the lower one-fourth of the state. Yet, the general appearance of this highly populated country is one of openness: rural landscapes and green fields interlaced with canals.

Dutch history is intimately tied to water. The North Sea borders Holland's west side, and the rivers Rhine, Maas, and Scheldt flow through it. Except for its eastern section, Holland lies below sea level, 30 feet below at its lowest point, and without carefully planned water control, one-half of the country would be under water at high tide. This fact is brought into startling focus when viewing a relief map of the country. It is disorienting to see that, contrary to our usual image of the land being higher than water, here, the level of the land

is lower than that of the water surrounding and running through the country. For example, one can be driving down a highway and see boats passing above the road on adjacent canals. Some canals (and boats) even cross over the highways.

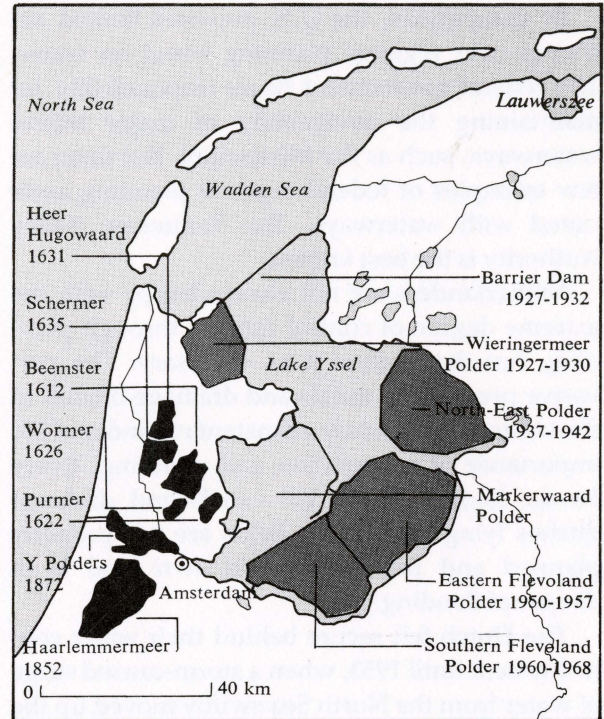
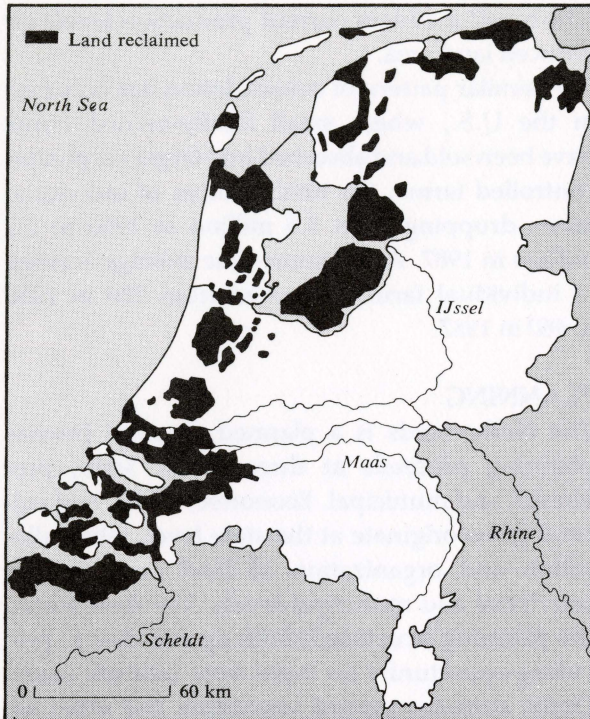
Constraints of high population and the constant threat of inundation have ever been facts of life for Hollanders. The entire history of The Netherlands is one of learning to control the threat of water. Land had to be wrested from the sea and is considered precious in a way that is beyond an American's comprehension. Hollanders first learned to survive floods by retreating to *terpen*—artificial mounds, usually with churches built upon them. Communication during flood periods was facilitated by connecting the *terpen* with long mounds of soil. In time the Dutch perceived that if existing land were enclosed by the mounds, it would be protected from floods. Thus were created the first dikes. Originally built to protect existing land, dikes later were extended to isolate areas of water which could be pumped out to create new land masses called *polders*.

Dike construction has trimmed the undulating coastline of The Netherlands from about 2,000 miles in 1500 A.D. to its present length of 1,212 miles. Water enclosed by dikes at first was removed by windmills, later by steam pumps, and today by electric pumps. Benefits resulting from this reduced shoreline include lower maintenance costs and new lakes for fresh water supply.

Water controls at such a grand scale require a high degree of cooperation among the population. On farms joined together by drainage canal systems, individuals cede their personal rights to regional authorities which manage the water control system. The idea of planning for water control, for the creation of new land, and for the use of that land, is inherent in the Dutch culture. It is a recurrent theme that can be documented at many different levels.



A relief map clearly shows that the land lies below water level.



Left: Land gained through reclamation. Right: Areas drained 1612-1968.

Terp—an artificial hill constructed as a refuge from floods. Connecting terpen with raised earthen paths permitted communication in times of flooding and also created the first dikes.



By comparison, the U.S. exercises limited authority over regional planning based on water. The federal government bears responsibility for maintaining the navigability of major inland waterways, such as the Mississippi. But there are few examples of federal regional planning associated with waterways. The Tennessee Valley Authority is the best known.

Netherlanders are not always happy with the extreme degree of control exerted through planning, but they accept it as necessary. The pervasive presence of canals and drainage ditches in the western lowlands is a constant reminder of the importance of cooperation and planning. Every farmer knows that if the canals and drainage ditches lying beyond his fields are not properly planned and maintained, his own land is in danger of flooding.

The Dutch felt secure behind their water control system until 1953, when a storm-caused surge of water from the North Sea swiftly moved up the River Scheldt. The wall of water smashed dikes, causing a catastrophic flood, taking the lives of 1,800 people and destroying 47,000 homes and farm buildings. The Dutch responded with the massive Delta Project, an incredible engineering effort to close and control several river-arms with dikes, locks, and sluices. The final phase was spanning the mouth of the Scheldt with a line of control gates spanning two miles, which may be closed if a storm surge threatens the eastern Scheldt River. The project was completed in November 1986.

Agriculture and forestry traditionally have commanded use of approximately 78% of the land. However, the increasing population is currently creating greater demands for urban and recreational use of land. To accommodate these needs the government is planning to decrease the amount of land available for agriculture, consolidating small farms into larger, more efficient tracts

which will maintain current production levels on reduced land area.

A similar pattern of consolidation has occurred in the U.S., where small family-owned farms have been sold and absorbed into larger corporate-controlled farms, the total number of individual farms dropping from 5.6 million in 1950 to 2.2 million in 1987. At the same time average acreage of individual farms increased from 220 in 1950 to 460 in 1987.

PLANNING

The Netherlands is a planned country! Intense planning proceeds at three levels: state, provincial, and municipal. Economic, social, and cultural plans originate at the state level, while allocation and organization of land occur at the provincial and municipal levels. The flow within the planning structure is both up and down, providing opportunity for input from ultimate users. Dutch attitudes toward vegetation and other aspects of nature reflect their pervasive planning.

Our first stop was a visit to De Dorschkamp, The Netherlands Institute for Research in Forestry and Landscape Planning at Wageningen. Staffing of this governmental institute reflects its broad interdisciplinary approach to forestry and landscape planning. Established about fourteen years ago as a loose association of landscape planning, research, and forestry research, the Institute's staff has expanded to include foresters, landscape architects, psychologists, sociologists, geographers, geneticists, and ecologists. From these diverse viewpoints, large state projects are studied and planned.

A major project now under consideration is greening of the Randstad, a heavily urbanized western area which includes Amsterdam, Rotterdam, Utrecht, and The Hague, where population density reaches 259,000 people per square mile. The government is trying to contain the high

density within city boundaries, preventing its spilling over into adjacent rural and forested areas, thereby reaping the benefits of reduced transportation needs of people living close to where they work. In surveys of the Randstad, residents show a strong desire for natural recreation areas within easy distance of their residences, and planners hope to provide it. While visiting a new windsurfing and dune recreational area north of Amsterdam, we were greeted by a myriad of colorful sails skittering across the water's surface, a visual confirmation of the popularity of this facility.

New forested areas will also be created within the Randstad to provide a different type of recreational base for the residents. In planning for the forest, De Dorschkamp considers much more than planting trees; all aspects of the forest are investigated. We met with an ecologist studying how distance between forest stands might restrict the ability of bird species to move between them as continuous habitat. The new forests will be dispersed into what is now almost exclusively farmland, creating problems for farmers who have been on their land for generations and now must make way for recreation and forestry needs. A sociologist is studying the social impact of the new forests and their recreation users.

Forests are also needed as a source of lumber. In The Netherlands, one of the least wooded countries in Europe, productive forests supply only 8% of its lumber needs. (By comparison, the U.S. supplies approximately 75% of its own lumber needs.) For The Netherlands, additional trees can provide economic as well as aesthetic and recreational opportunities. At present, 65% of all trees are less than 40 years old. With land at so high a premium, 40% of the forests are planted on soils unsuited to tree growth. On these sites, the Dutch first plant pioneer species such as poplar, and add quality lumber species as improved forest

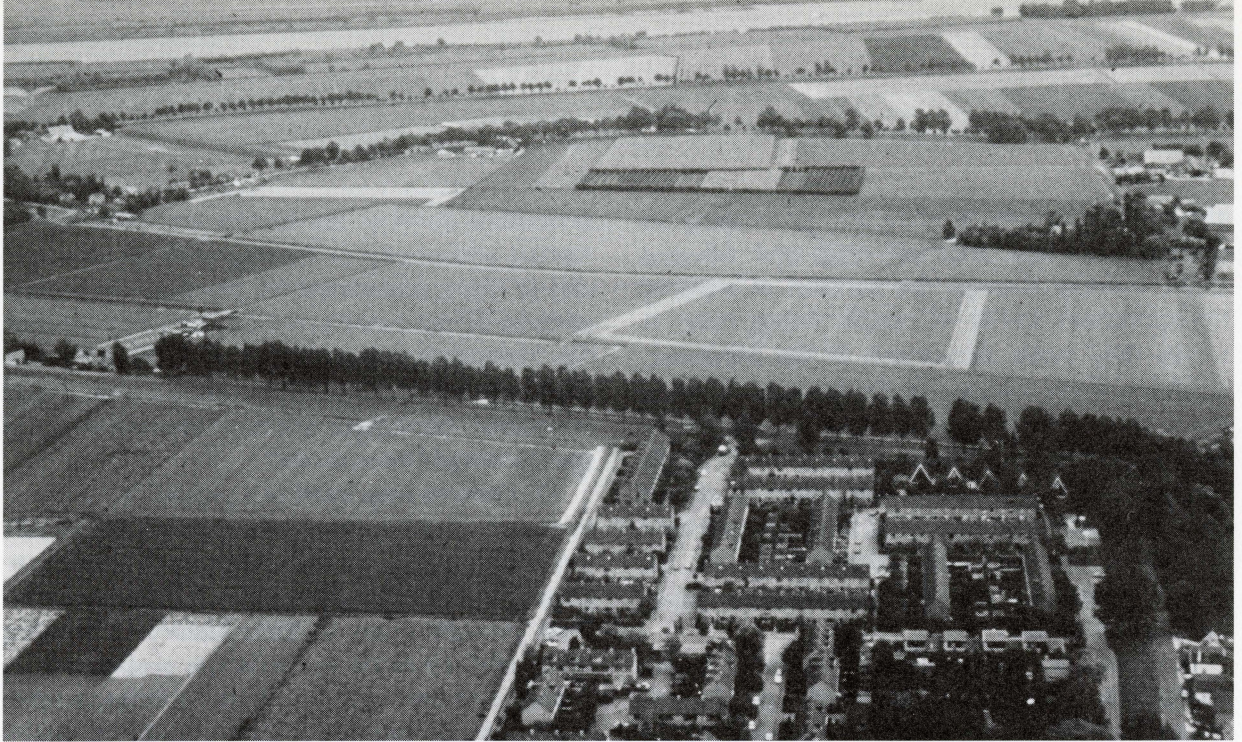
conditions develop. At the Morton Arboretum, a similar philosophy of starting with pioneer species is being considered for planting of the new earthen berms constructed on our south perimeter. The Dutch anticipate that after 100–200 years, the forest will stabilize and produce a steady yield of lumber. All of these issues are studied as part of the Randstad Green project.

De Dorschkamp itself has proved to be an experiment, testing how researchers (inherently analytical) and landscape architects (who are synthesizers), might work together. Landscape architects proudly point to their history of creating successful solutions to landscape problems long before research was available. Unlike mathematics, design allows for the possibility of multiple solutions; just as many different computers may be designed around the same computer chip. Researchers, however, are convinced of the importance of their scientific approach. Can the two views meld together at De Dorschkamp?

NATURE AND THE LANDSCAPE

The work at De Dorschkamp is but one reflection of respect and concern for nature. The Dutch equate "nature" with "native", and though there is very little that is natural in The Netherlands, they continually search for plants and settings that are or appear to be natural. The pervasive agricultural landscape, green fields interlaced with canals, is an important ingredient in Dutch life. The two elements, water and land, are in juxtaposition everywhere, a kind of yin and yang for The Netherlands. In constant tension throughout Dutch history, the land was wrested from the water with great effort; the water remains as an ever-present threat to land if water controls are not in place.

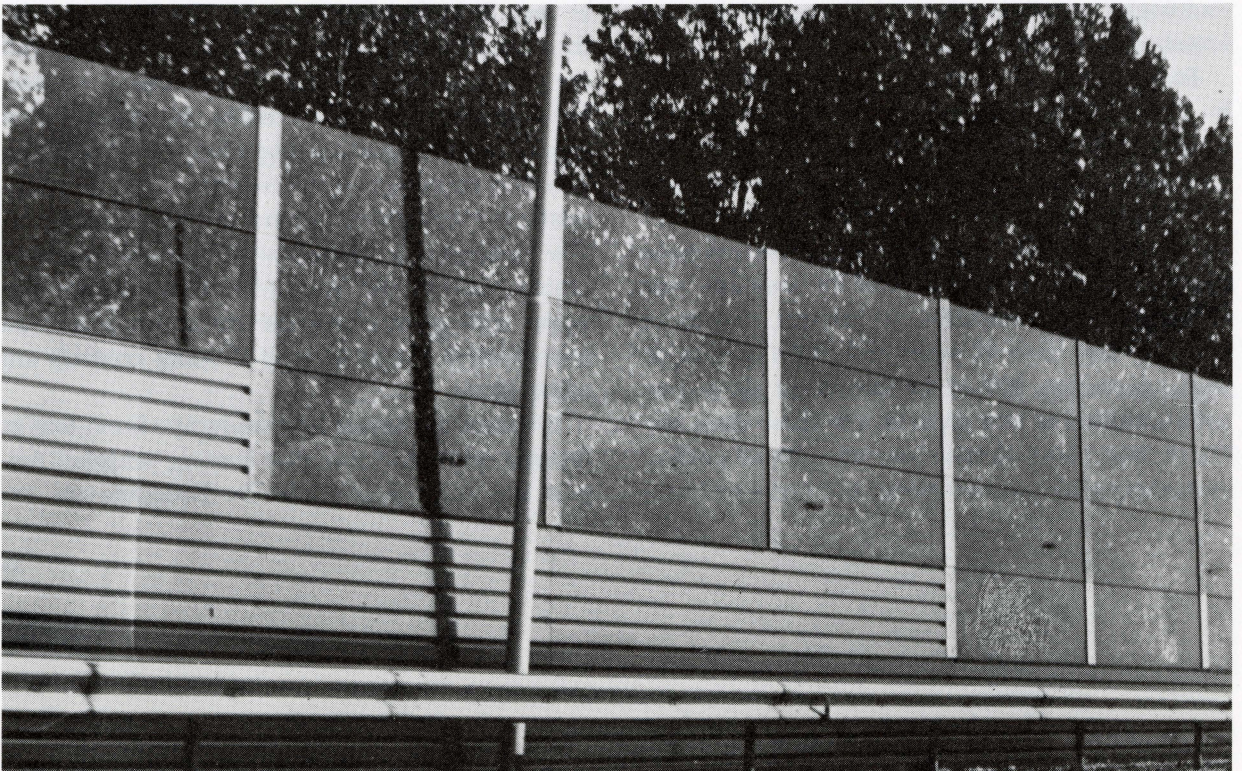
Concern for nature and landscape is evident in diverse settings. Soon after leaving Schiphol Airport for Wageningen and De Dorschkamp, we



A typical agricultural landscape matrix with canals, fields, and a road lined with trees atop a dike.

saw sound barriers at the highway edge. In the U.S. sound barriers are typically solid structures constructed of wood or concrete, which block both highway noise and the view adjacent to the road, but in The Netherlands, barriers are constructed with large sections of clear plexiglass to permit a view of trees planted immediately behind the bar-

rier. In some other places the sound barriers are constructed entirely of plexiglass. We learned that the unusual design resulted from a survey of travelers who said that they did not want to be visually separated from the natural landscape. The “see-through” sound barriers illustrate the interaction between the people and the planning process, and



the almost fanatical Dutch desire to see nature expressed in their surroundings.

We found another difference about the Dutch in the placement of tree plantings along roads. Rows of uniform, evenly spaced trees stretch not only along major highways and in urban areas as one might expect, but along small country roads as well. Typically each planting is of a single clone or cultivar, placed in a single line. The effect is very formal. One feels as though one is passing through a royal entrance, yet the experience occurs on a rural road.

Repeated lines of canals and rows of trees create a pervasive rectilinear matrix. Perhaps these elements served as a subjective inspiration for the grid-like paintings of Piet Mondrian, a Dutchman.

Linear tree plantings serve many purposes. Along roads built on top of dikes, they act as windbreaks, while trees planted along highways as visual barriers block unwanted views of industrial facilities. Larger forest plots, often comprised of one or two cultivars, are planted by machine with very regular spacing. When seen from an aerial view, the uniformity of cultivars and regularity of spacing produces a feeling of artificiality. Separate from the visual aspect is the inherent ecological weakness in large plantings of a single type of tree. Such plantings are susceptible to attack by insects and fungi. In the U.S. the overplanting of elms and their subsequent destruction is an example. In The Netherlands large willow plantings are similarly threatened by Watermark, a bacterial disease.

In the U.S. we are accustomed to diversity: trees, shrubs, and herbaceous plants spontaneously occurring in a random arrangement, dictated by the site. The Dutch are now departing from the planned look of forestry plantings to create a more diverse aspect. Initially, mixed species of trees are planted. After they are well established, shrubby understory plants are added, then



Lines of identical trees planted even along country roads are a significant element of the Dutch landscape.

herbaceous groundcovers. The final effect is very pleasing with little indication of its artificial origin.

As superb horticulturists, the Dutch skillfully manipulate site, soil, and water to create natural looking settings for public enjoyment. Outstanding examples of these nature re-creations are to be found in several different kinds of parks. Once every ten years the Floriade, a large horticultural exhibition, is created. The site selected, often a wasteland, is transformed into a spectacular living horticultural exhibit which becomes a permanent park after the exhibition is concluded. In



A wetland constructed for a Floriade exposition; the tall poplars were planted as 30' unrooted cuttings; the windmill controls the water level.

the Floriade and resultant park, the Dutch display their prowess with flowers, trees, and shrubs, as well as their incredible ability to re-create natural sites.

They combine extraordinary ecological knowledge with horticultural skill to provide the precise conditions required for each habitat. To simulate an appearance of age in these constructed landscapes, 15–20-year-old poplars, 30–40 feet high are cut off and planted as unrooted cuttings at the site. The same is done with pollarded willows, which are part of many rural landscapes. The pollard pruning encourages growth of willow shoots which are used for baskets and mats to line the dikes. However, such horticultural shortcuts can produce problems in the long run: these instant ecosystems require intense weeding to prevent invasion by plants whose seeds occur in the soil

added to the site. The oversized willow and poplar cuttings do indeed root and grow; however, the structure of their over-all root system is not always large enough to support these tall trees, and blow-overs occur.

While the Floriade, as a major exposition, might warrant such displays, the same kinds of ecological restorations can be found in many city parks, particularly in a Heempark, a park displaying native plants. In Amsterdam, the H.J. Bos Heempark includes a series of regional landscapes: chalk dunes, beach dunes, peat meadows, dry forests, and wet meadows with heather. To visit the island bird sanctuary, one approaches over drawbridges which are raised during breeding season to prevent disturbance of the nesting birds. In the wet tidal setting, a windmill periodically raises the water level to simulate tides. Another realistic setting includes a path on top of a dike. The array of typically Dutch nature settings provides a travelogue experience for anyone strolling through the park.

Nature has deep meaning for Netherlanders. Heemparks serve not only as nature centers for education, but also to satisfy the strong need of people to experience what appear to be natural landscapes. A friend of mine whose business requires frequent trips out of the country, away from his home in the seaside town of Noordwijk, will quickly seek out the great dune areas with their special vegetation when he returns. It reestablishes his connection with home.

Heempark entrance sign, map, and listing of constructed ecological settings.



We found this intense reverence and longing for nature expressed in many ways during our trip. It is obvious in neat gardens and yards. The Dutch attitude toward recreation in forested parks again reveals differences with the U.S. Records of park attendance show a decrease during the meal hours and an increase afterwards. People do not go to parks to picnic under the trees; eating is done at home. Our hosts explained that just as one would not picnic in the middle of an art gallery, similarly one would not picnic in a park; the forest is to be admired like a painting or jewel. If indeed they did eat in a natural area, the preferred setting would be in an open field at the edge of the forest, rather than under the trees.

Parks, considered as cultural institutions, are frequently the setting for community affairs. In Arnhem we visited Sonsbeek, a large park within the city comprised of two parcels of land which had been private estates. The sculpture show, which occurs every 10 years, was in progress, and throughout the park pieces of sculpture were displayed among the trees and fields. In several cases elaborate pavilions had been erected to provide exhibit space; sculpture was displayed in a greenhouse structure and a large glass hall floating on a lake.

In Sonsbeek the forest was primarily of beech, an old, even-aged stand in need of renewal. Although park users object to the removal of trees even for forest renewal, there is steady progress toward refurbishing the plantings. Future plantings will move away from monocultures toward forests of mixed species.

ENVIRONMENTAL EDUCATION— CONSERVATION

The strong emphasis on forestry and landscape planning is formalized at each of the three political levels: state, provincial, and municipal. The Staatsbosbeheer, SBB (State Forest Service) has

responsibility for establishing and operating state forests and nature preserves. Recreation and environmental education are an important aspect of this work.

In its forest areas, the SBB, similar to the U.S. Forest Service, encourages camping, nature walks, hiking, and nature study, and produces a series of printed guides for these activities. The 131 state forest and nature preserves sample all of the different kinds of extant natural areas in the country. Detailed maps describe the natural features available in 38 of the areas. In so small a country with so high a population, the natural areas are highly prized. Visits there are considered as special occasions.

Environmental education starts early in The Netherlands. Since trees represent the restoration of nature and are important for education and recreation, the SBB has developed a remarkable Boomfeestdag (Arbor Day) program that reaches school children nationwide. Their program, alive and vibrant, is produced by Mr. P.J. Steltman, who for the past eleven years has hosted his own very popular TV program on environmental education. Steltman provides a series of creative graded lesson plans concerning trees which are incorporated into the curriculum throughout the year. The program builds to a climax for Boomfeestdag, March 25, when approximately 100,000 students participate in major tree-planting activities. In the 82 years of this program about 3 million trees have been planted by children, making the day important in itself, and adding significantly to the natural resources of the country.

Perhaps the difference between our Arbor Day and Boomfeestdag lies in the meaning of trees in each culture. During the early days of this country, particularly in Nebraska and Colorado—treeless regions—Arbor Day and the planting of trees were highly significant. Our Arbor Day was launched by J. Sterling Morton in Nebraska as a

way of emphasizing the importance of tree plantings. Today the difference in amount of lumber produced within the country may have an effect on the importance of Arbor Day. In The Netherlands, the shortage of trees is felt economically and culturally, and Boomfeestdag takes on a vital significance. For a country such as ours, with ample evidence of nature and trees, the holiday is largely symbolic and feels a bit old-fashioned. Through a high degree of government planning, the Dutch are able to focus the program on clearly set goals. Mr. Steltman firmly believes in the importance of instilling a passion for nature in the youth of his nation, and I think his views and methods should be of interest to our own Arbor Day organizations.

Despite the high degree of environmental awareness and planning, intense land use can produce unfavorable repercussions. Such is the case with Holland's large cattle and swine industry, producing meat and dairy products for export to the Common Market. In traditional farming practice, the manure produced is spread over farm

fields as fertilizer. Recently, however, nitrate levels in both soil and ground water have risen steadily in response to this heavy use of manure. Farms are switching to new crops such as corn, which can tolerate the high nitrate levels, but nitrates are now starting to appear in the drinking water supply.

Manure also releases ammonia into the atmosphere, where it affects the growth of trees. Concentrated airborne ammonia enters the needles of evergreens through stomata and upsets the nutrient balance. We were shown Douglas Fir trees with needles bright green in September, signaling immaturity at a time when they should have been mature. This problem, seen on a number of species, poses a serious threat to Holland's tree plantings. It portends a coming struggle between agriculture and the SBB, both strong forces within the government.

HOUSING AND NATURE

Love of nature and a strong planning viewpoint join together in Dutch attempts to solve their



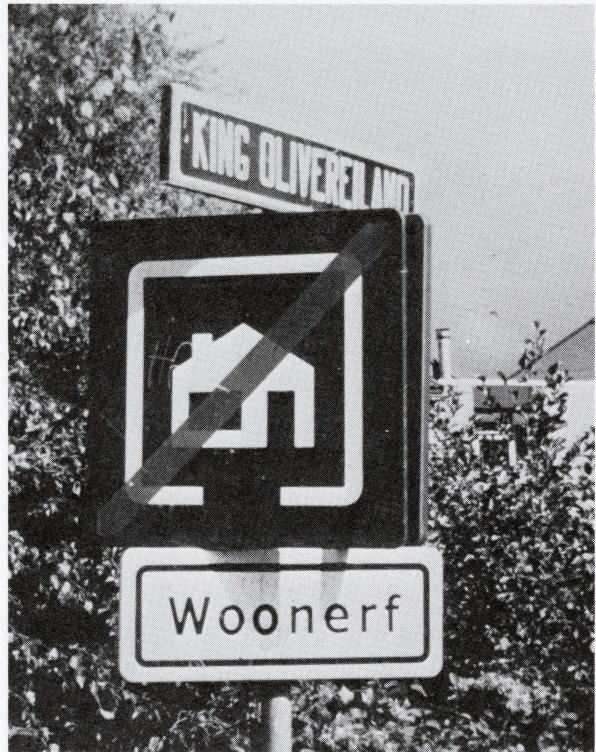
housing shortage. With total government control over land use, there is no spontaneous urban sprawl as in the U.S. The division between rural field and housing development is crisp: houses stop abruptly and uniformly at the edge of the farmer's fields. When land use is changed from agriculture to residential development, the municipal government dictates to the builder the kinds of housing that might be erected on the land. The local government often requires a stated mix of high, middle, and low-cost housing units, with the greatest number of homes in such projects being low-cost. In effect, the high-priced houses subsidize the lower-cost ones. Though there are some objections, this carefully planned system offers no other choice.

Larger high-cost homes are located at the periphery of the development, while the other homes are arranged in mixed groups throughout the site. The whole area may be designated by the municipal government as a "Woonerf", a residential precinct which by law regulates the speed of traffic and the location of parking and other features. This regulation helps to create a feeling of an intimate village within the Woonerf.

Visually, the dense housing is softened through a green matrix of thoughtful landscaping in the development. In common areas, tree and shrub plantings which grow quickly in The Netherlands are designed to create an appearance of natural mixed groves. Each house is usually provided with a private garden area where residents can express their individuality.

At Groningen we saw an example of a housing landscape scheme that radically departed from the strong government emphasis on planning. In the early seventies, a liberal government in Lewenborg (a suburb of Groningen) selected a participatory approach to landscaping for a newly constructed housing development. Under the direction of Louis Le Roy, a radical self-taught land-

scape architect, residents would design and execute the plantings themselves. Le Roy suggests that originally all landscapes were designed by the farmers who lived in them. People did not require a professional landscape plan to guide the planting of trees, shrubs, and flowers that established the early landscapes.



Though Le Roy would be available at the site to act as facilitator, the initial impetus had to come from the residents. For the first three years of the program, nothing happened. Finally, a man who had experienced a heart attack started landscaping behind his house, and Le Roy helped the resident achieve his goal. At that point, more residents joined in, usually beginning with the area directly adjacent to their houses. Gradually individuals joined together to cooperate on projects beyond their immediate residences. Paths were

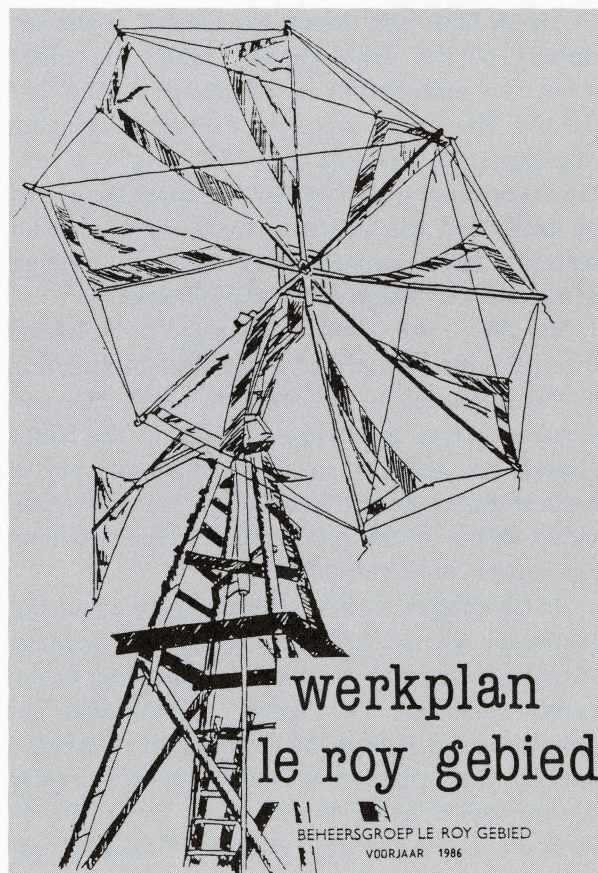
installed to connect the houses and join separate neighborhoods. Le Roy served as facilitator, often participating in digging or laying bricks.



Residents' ideas were the impetus for new projects. A small animal farm and a center for bee-keeping grew out of their suggestions. Children's playgrounds were designed by the children and constructed in joint participation with their parents.

After five years, a council was organized of residents and two municipal officials to oversee the project. However, all did not proceed smoothly, and resident disagreements halted projects before completion. The animal farm was discontinued after animals wandered through the village. Vacationing residents in charge of the animals failed to provide care for them while away. The route of the common path system was often obstructed where residents extended their personal gardens to usurp common lands.

Positive aspects of the project include creation of a sense of community and reduced municipal



maintenance costs, since residents maintain all landscaped areas. For example, when grass is to be mowed, residents request mowers from the municipal park department and mow the grass themselves.

The participatory design process moves slowly since residents do not have the expertise of a landscape architect, whose skills enable him/her to see and solve problems more quickly. Le Roy sees his technique as a way (at a time of greater population density) to return to the earlier method when landscapes were designed by the people who lived in them. His participatory design process might also be seen as a reaction to the intense governmental control on landscape planning, an idea which was not lost on the government.

After ten years, a conservative government in Lewenborg, deciding the experiment too radical and lacking in control, did not renew Le Roy's contract. However, residents, wishing to continue the program themselves, prepared a very professional plan of projects for the coming year and submitted it to the city council.

Though the Le Roy method is no longer being implemented in new housing developments, it made an impact on planners. Later in Zwolle we would see how resident participation in design could be accomplished within a more structured process.

Not all attempts at sophisticated planning of housing and associated landscapes are necessarily successful. In the '60s the Dutch brought the full forces of their planning expertise to solve the acute housing shortage. In Bijlmermeer, outside Amsterdam, a new town was planned. The design called for replication of nine-story hexagonal clusters of apartment buildings to create 20,000 apartment units on 2,500 acres, a mega-plan contrasting sharply with the usual, more modest housing schemes. Fifty percent of the land would support buildings, and fifty percent would be

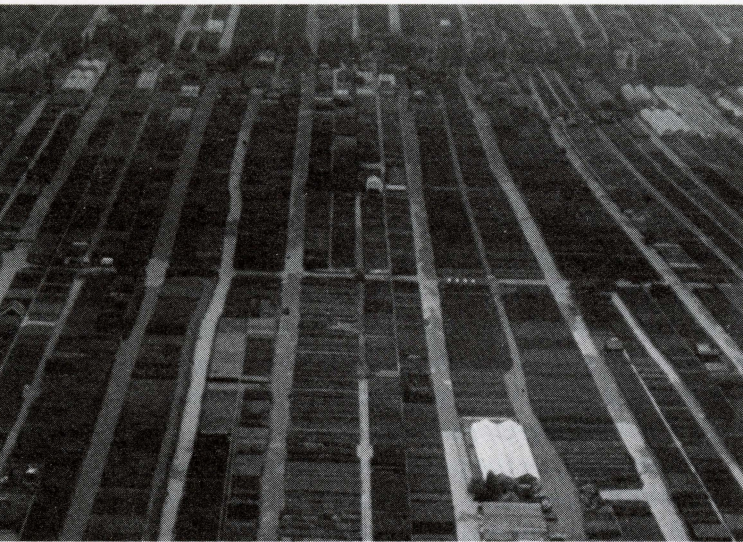
dedicated to open space for use by residents.

Buildings were sited with consideration of wind and sun patterns to provide the greatest amenity for the residents. Open courtyard areas between the buildings—which would serve as communal recreation—received intense study. Vehicular traffic was eliminated from the ground by establishing parking garages at the perimeters of the apartment clusters. Residents would walk from the garages to their apartments through landscaped open areas. Here would be a comprehensively planned town in a country where planning is a highly developed profession.

Landscaping for the project was designed with sophisticated precision. Tree plantings on berms would serve to deflect wind gusts as well as divide the grounds into smaller units of more human scale. Fast growing trees such as poplar and willow would be planted among slower-growing elm, oak, beech, ash, and maple, to create quickly a visual impact until the slower growing major trees became established. At a later date the pioneer species would be removed to allow room for growth of the permanent trees. Understory plants would complete the natural effect, with areas set aside to permit growth of weeds.

Residents were satisfied with the project initially, but in time problems arose. Walkways followed the angular perimeter of the hexagonal building clusters, imposing a long circuitous route between garage and apartment. With all buildings and landscapes appearing exactly alike, way-finding was difficult for residents and often impossible for visitors. The landscapes became overcrowded when lack of funds and objections of residents prevented removal of the fully grown willows and poplars.

The arrival of a large number of Surinamese whose cultural values differed from the Dutch residents created new social problems. The population became polarized, with both Surinamese



Grid pattern of canals and fields of nurseries dominates the landscape.

and Dutch residents no longer feeling safe. Graffiti appeared on the walls as the vacancy rate started to climb to its present 40%.

Government planners are trying to address these problems. They are painting buildings different colors to aid in identification, constructing straight walkways from garage to residence, and making large scale changes in landscape, such as the creation of recreation lakes to create visually distinctive settings for each group of buildings. If the redesign does not achieve a higher occupancy rate, they will consider more drastic steps such as removal of top floors, or removal of some of the buildings.

Part II of this article will appear in the next issue of *The Morton Arboretum Quarterly*.

"Composition in Line and Color" by Piet Mondrian reflects the rectilinear patterns of the Dutch landscape.

