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Papers and excursions presented by the Department of Historical Geography of DLO Winand Staring Centre at the 14th meeting of the Standing European Conference for the Study of the Rural Landscape (Baarn, The Netherlands / Ghent, Belgium; August 27th to September 1st, 1990).

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ABSTRACT

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The five papers and two excursion guides are reprints. The main theme is the historical geography of pleistocene landscapes of the Netherlands. This theme is used in the papers on the age of plaggen soils and on settlement dynamics in North-Brabant and in the excursions to the Gooi and the Utrecht Hills. The other papers discuss an archaeological excavation of a French merovingian cemetery and a new typology of the Dutch cultural landscape.

Keywords: historical geography, cultural landscape, The Netherlands

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PREFACE

The 14th meeting of the *Standing European Conference for the Study of the Rural Landscape* took place in Baarn (the Netherlands) and Ghent (Belgium) from August 27th to September 1st, 1990. It was jointly organised by the Laboratory of Regional Geography and Landscape Research of the University of Ghent (Belgium) and the Department of Historical Geography of DLO Winand Staring Centre at Wageningen (the Netherlands). The main theme was: *Methodology of landscape and settlement evolution*.

The papers presented at the conference were published in the *Tijdschrift van de Belgische Vereniging voor Aardrijkskundige Studies* (Vol. 61, 1992, nr 1), and in A. Verhoeve & J.A.J. Vervloet (eds). *The transformation of the European rural landscape: methodological issues and agrarian change 1770-1914; papers from the 1990 meeting of the Standing European Conference for the Study of the Rural Landscape*. National Fund for Scientific Research, Brussels ¹.

The papers and excursion guides presented by members of staff of the Department of Historical Geography of DLO Winand Staring Centre are reprinted here. This department is one of the leading centres of historical geography in the Netherlands, specializing in two topics:

- applied historical geography: inventories of evaluations of historic landscapes for physical planning. The results are used by national, provincial and local authorities.
- the historical geography of the pleistocene landscapes of the country.

The department consists of a permanent staff of six (four historical geographers, a soil scientist/ecologist and a landscape architect), and temporarily employed staff for special research projects. At the time of the conference, for example, there were two additional historical geographers as well as an archaeologist and two GIS-specialists engaged in short term projects.

This wide range of available knowledge makes the department ideally suited to interdisciplinary research. The traditional combination of historical landscape research with the results of soil survey has been well-developed. During the last few years combinations with ecology and palaeo-ecology has been growing in importance, for example in the new field of historical ecology.

The papers which are reprinted in this report, give an impression of the range of work covered by the department.

The report starts with the opening address at the conference given by J.A.J. Vervloet (head of the department) (chapter 2). The third chapter summarizes S. Barends'

¹ A limited number of copies of this volume is still available. It can be ordered by sending a cheque for Dfl. 32,50 (incl. postage) to DLO Winand Staring Centre, Wageningen.

research for a new landscape typology, based on historical-geographical features. This work is done with the use of GIS-methods.

In the next two chapters, two different aspects of the long-term research of the pleistocene landscapes are presented. Chr. de Bont (chapter 4) writes about an aspect of the dynamics of settlement locations. An extensive survey of the province of North Brabant laid the basis for this paper. Th. Spek (chapter 5) presents an evaluation of dating methods for plaggen soils in the Netherlands and Northern Germany. He concludes that the origin of plaggen manuring was probably later than previously supposed.

W.H. Wimmers, an archaeologist who, these past few years, has been working on a combined archaeological and historical geographical survey of the Gooi region, presents some methodological aspects of one of his earlier research projects: an excavation of the merovingian cemetery of Vicq (Yvelines, France) (chapter 6).

The last two chapters were originally written as guides to the two excursions. Chr. de Bont, H.H.M. Meyer and W.H. Wimmers describe the excursion to the Gooi region (chapter 7). J. Renes describes the excursion to the eastern side of the Utrecht hills and the western part of the Guelders valley (chapter 8).

Introduction to the Baarn-Ghent conference of the Standing Conference for the Study of the Rural Landscape.

Jelier A.J. Vervloet

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Introduction

During a rather long period the Standing European Conference for the study of the Rural Landscape has been attended by Dutch visitors. At first their number was limited but especially the last three assemblies, their number was growing.

The increased interest from the Low Countries has been an important motive to ask the Dutch representatives to organize this meeting. I hope we can give you a good understanding of our country. Because this conference, at least for the Dutch part, has been organized by historical geographers from Wageningen less emphasis has been given on the usually well known polders. We try to give more information of the cultural landscapes of the coversand area, the region lying above the sea-level, whose history certainly is as interesting as that of the low-lying parts of our country.

This meeting at this moment I consider as an award for the development of the whole Dutch historical geography of the past ten years.

During that period the academic historical geography has become widespread. No longer it is a discipline of a limited amount of some prominent individuals such as Heslinga and Gottschalk at Amsterdam; de Vooy at Utrecht; Keuning at Groningen and Edelman-Vlam at Wageningen.

Recently a rather extensive group of interested young people did arise. Seven years ago (1983) the "Historisch Geografisch Tijdschrift" was founded which now nearly has as much subscribers as the international Journal of Historical Geography. The Dutch Historical Geography lives through a flourishing period, at least a period of great activity. We are glad about this. A rather great number of Dutch papers will be presented at this meeting. Moreover we hope to give you an idea of the present state of art by the excursions and posters.

I am giving a rosy picture of how things are. Nevertheless there are of course problems: retrenchment and reduction did take their toll as everywhere in Europe.

The department of historical geography of the Free University of Amsterdam has been removed in 1984. In 1988 historical geography was terminated at the University at Groningen. Soon the education at the University of Nijmegen will stop.

Surviving units are only the Seminar of Historical Geography of the University of Amsterdam, directed by Dr Borger, together a group of four scientists; one scientist at the University of Utrecht (Dr. Harten) and the research group of the Staring Centre at Wageningen consisting of six staff members, including myself.

In contrast with the current opinion the Staring Centre is not a part of the University of Wageningen but an independent Research Institute under direction of the Ministry of Agriculture, Nature Conservation and Fisheries. The task of the department of historical geography of the Staring Centre is to advise the government, national, on country-scale and

local, on matters concerning the historical aspects of the cultural landscape. The department of historical geography produces inventories and studies in behalf of landscape-preservation and development.

My own position is a little bit complex spending a part of my time at the University of Wageningen as historical geographer at the Department of Rural History.

With respect to the scientific value of Dutch historical geography I must say that there is still a lot of work to do. Several valuable studies did appear. But much is still unknown and need a more profound elaboration. Without all due respect may be pointed out that we still can learn much of international meetings like this.

The main topics of this conference related to Dutch scientific tradition

Both main topics of this conference certainly are of a great interest to us. Comparatively little is known about the development of the cultural landscape of the seventeenth, eighteenth and nineteenth century. Except Dr. Harten, the Dutch historical geographers, for some years, were not really interested in that period. Most of them were and perhaps are preoccupied with the middle ages.

Indeed it is very attractive to go back to the roots, studying the medieval European pioneers. It is a period in which our ancestors energetically extended their settlements and fields. However it is supposed by too many scientists that after 1500 the splendour of this eruptive colonisation activity ended, and that a period of consolidation started with a gradual intensifying of landuse and only slow progressing reclamation-activities of small marginal areas. This incomplete idea partially has developed by a restricted historical perception. Often unconsciously it has been believed that the landscape-elements like roads and parcels principally show an obstinate persistence to change. In that context it is clear that the topographical and cadastral situation reflected on detailed maps of the nineteenth century had to be seen as a reflection of the 'original' medieval situation. This very restricted way of thinking does not give any perspectives for post medieval developments at all. Undoubtedly at this moment almost every historical geographer is aware of this trap. Nevertheless the influence of medievalism still is tremendous.

I think the exaggeration of this period predominantly is caused by differences in accessibility of the written sources. The old medieval charters are brought together in prestigious cartularies in which almost every character is described in detail.

In comparison to these medieval sources, the later sources are largely inaccessible. They generally have tremendous dimensions. Because the number of archivists is limited, inventories are lacking or mostly very rough.

Using a black-white comparison I should say that the dark ages are not limited to the period before 700 AD but start again after 1500 AD.

The only exception we have to make in this respect is the study of the changing water management by the introduction of windmills, the reclamation activities along the seaside and the peat-digging and dredging activities which are traditional issues of Dutch historical geography since about a century.

Certainly however our black/white comparison is only too true for the higher parts of the country: the sandy regions, originally characterised by small villages, with open fields and by dispersed farmsteads with small enclosures surrounded by wooded banks.

Dutch historical geography has long been controlled by hydraulic engineers from the province of Holland which were not interested in the higher peripheral, less populated, areas at all. Consequently a very limited number of settlements are described by the well known very successful "Rückschreibungs"-method invented by our German colleagues and practised by them also at the adjacent area of Western Germany which has a lot in common with most

of the Dutch sandy regions. There is an urgent need of catching up the arrears. The Staring Centre tries to do so by developing a research programme in which the historic-geographical problems of these regions are placed in a central position.

Nevertheless I don't want to say that we don't have any information at all. Concerning the last three centuries already a lot of work has been done by rural historians. In the fifties for instance Slicher van Bath stated that through the eighteenth century in the eastern part of the Netherlands an important extension of the cultivated area arose (Slicher van Bath, 1957). In this period especially the reclamation and enclosure of the wet parts of the cover-sand-area seem to have happened. If drained, these wet soils could be transformed in excellent pasture land on which more cattle could be kept and more dairy could be produced than before. Consequently by this extension more intensified cultures were introduced and more arable land could be reclaimed. Other, more recent, studies of Bieleman (1987) and of Kappelhof (1986) give the same impression in the north-eastern and southern parts of the cover sand-area.

The dry waste-lands lying high above the watertable and characterised by a low natural fertility because of a steady leaching process, were reclaimed much more later. Their reclamation started about the middle of the nineteenth century, at first by application of guano and lime, later on by the introduction of artificial fertilizers.

Especially the development of the recent time and of the nineteenth century can be studied rather easy by comparison of the successive topographical maps. The exact location of the reclamations of the eighteenth century and before is a much more difficult job and an important challenge to the present generation of Dutch historical geographers.

Of course this challenge must not be limited to the question how the reclamation proceeded but most important also why. By this question we enter the domain of the other theme of this conference, namely the methodology. It is a hot potato badly needing a profound discussion.

Too easy the historical-geographers in the Netherlands get bogged in the study of maps. I believe real new results only can be obtained by application of the skills of several other disciplines.

From the historians we have to adopt the drive of patient research in the records. Especially socio-economic history, rural as well as urban, is of great importance to us. I welcome the valuable initiative of Dr. Nitz organizing a conference in which transformation of old and formation of new structures in the cultural landscape are studied under the impact of early modern economy, using "Wallerstein's concept of the Modern European World System" (Wallerstein 1974, 1980) and Von Thünen's location theory of agricultural production. (Von Thünen, 1842)

Otherwise we have to make moves in the direction of archaeology. In particular I expect a fruitful dialogue with representatives of the so called New Archaeologists like Hodder and Orton who are using modern techniques of spatial analysis. (1976) These also should be introduced in historical geography.

The archaeological contribution in the Netherlands cannot be denied for a second reason. Archaeologists such as Waterbolk (1982), Heidinga (1987) and Theuws (1988) clearly showed that many villages are replaced several times, especially in the period between 500 and 1000 AD. In that way they did give an important still growing impulse in the debate about settlement continuity and continuity of place.

Like archaeology, historical geography is a discipline in which the combined action or the mutual reaction of nature and man are expressed. This means that not only socio-economic aspects are important to us but also the natural framework.

In this respect a satisfying development is the growing interest of physical geographers and biologists in the human factor.

This interest is clearly expressed in a book recording the international symposium, organized by the Botanical Institute of the University of Bergen (Norway), entitled *The Cultural Landscape- Past, Present and Future* (Birks et.al 1988) in which the human involvement in vegetation-history is strongly emphasized. Very important to me is the fact that in this book history and future are linked in such a clear way.

Methodology and the future of the cultural landscapes

Also historical geographers have to discuss about the future of our cultural landscapes. Much of the traditional European cultural landscapes are rapidly disappearing as a result of changes toward intensive modern agriculture or silviculture.

Yet only a very limited number of historical geographers are trying to think about possibilities to preserve the most valuable phenomena of the cultural landscape.

Methodology means that also a strategy has to be developed in the indication and allocation of regions which are important from an historic-geographical point of view.

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A landscape typology based on historical-geographical features

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Abstract

In the last few years, when planning rural areas, much more emphasis has been placed on the significance of the landscape and its historical-geographical values. This has created the need for a national typology of the cultural landscape, both with the planners and the historical-geographers. Such a typology is not only important for the planning policy, as a framework for judging modifications, but is also of scientific value. It is essential to understand how the different landscape elements are related. In this paper, the progress of the work done so far on this subject is reported. Attention has been paid to the method of making a systematic landscape typology on a national scale, based on historical-geographical features. An inventory of the landscape features, some of the results and finally the application possibilities of the results are also discussed.

Keywords: landscape, typology, historical-geographical features, inventory, the Netherlands

Introduction

When planning rural areas, historical-geographical values are being taken more and more into account. Preservation and restoration of the landscape is becoming a recurrent theme in government papers. By the term historical-geographical valuable elements is understood all elements in the landscape that give information about the historical development of the area, for example parcellation, village form, high vegetation - such as hedgerows and trees - dikes, embankments, water courses with mills or small pumping plants, and special sorts of roads.

These should all be preserved wherever possible, and in some cases even restored or reinforced. These features should also be considered as much as possible when impinging upon the landscape. It is essential, therefore, to know something about their origins, where certain valuable elements are to be found and which features are typical of certain areas. Even though more studies have been done over the past few years, much information is still missing. There is, therefore, a need for more information concerning these valuable historical-geographical features. In particular, there is a need for a national survey and a typology of the landscape on a national scale based on these features, which will give the rarity, characteristic features and intactness of the various elements.

The aim of the research project 'Typology based on historical-geographical features of the landscape' is to review the features of the Dutch landscape and to use the information for a classification of the Netherlands. This typology must be polythematic, which means based on the various landscape elements in their relationship to each other. It is this relationship that largely determines the character and therefore the value of the landscape. The landscape in its totality must be expressed in the typology.

Polythematic typologies have been made in the past for the Dutch landscape (e.g. by Keuning, Atlas van Nederland, 1977; by Bijhouwer, 1971; by the 'Werkgroep

Landschapstypologie', in: Barends, et al, 1988). In practice, these typologies have proved to be inadequate. Investigations have shown that the types drawn up did not always agree with the true situation (Renes, 1982). They refer to ideal types, which only apply to a limited part of the area mentioned. Transitional types occurring in the rest of the area are not mentioned.

A further reason why existing polythematic classifications are not satisfactory is the inconsistent handling of the classification criteria. Some types are based on settlement forms and others on parcellation or on land use. The existing national typologies are also not detailed enough to be used for planning.

On a regional or local scale, however, more methodical studies have been made. More systematic typologies made for smaller areas are often better, but cannot be applied on a national scale.

The aim of the research is to develop a method whereby a more systematic typology of the Dutch landscape can be made. This typology must be based on all the elements present in the landscape. But the relationships between them must also be expressed in the typology. A method has therefore been devised whereby an inventory of the individual features can be made systematically. These data can then be combined in order to make a typology.

In this paper, I want to discuss the method of the inventory, the features that have been surveyed, some of the results, and finally the application possibilities. Because the research has not yet been completed, I can only present the current state of affairs. The results are therefore only provisional.

Inventory

The historical-geographical features can be divided into three groups: parcellation, settlements and patterns of roads, dikes and water courses. The character of the landscape is largely determined by these three aspects. They give information about how an area looked and was used in the past.

There can be a great deal of difference between how an area looked then and what it looks like now. This is why, when investigating the historical-geographical features of an area, we cannot always start from the present landscape, but must be able to compare the present situation with the one from the past. Using only a typology of the present landscape, the genesis of an area would not be expressed satisfactorily. For the typology we want to draw up, we have chosen to compare the present situation with that of about 1900. This was before the great landscape changes of the twentieth century which, among other things, were a result of reclamation of uncultivated land, the use of artificial fertilisers, more efficient drainage techniques and agricultural mechanisation.

One advantage of making a typology for around the year 1900 is that the landscape for that time is constant, so the typology can also be used in the future. It is important, however, that together with the situation in 1900, the changes which have taken place since then should also be considered, making it possible to apply the typology when making planning policies for the present landscape.

A parcellation inventory was made during the first phase of the research project (Barends, 1987, 1989). In this inventory, which was made using a sampling method, many features of parcellation in the Netherlands were investigated. Because of the good results, we decided to use this data to make the typology and attempt to make inventories of settlements and patterns of roads, dikes and water courses in the same way, using the same sampling method.

The advantages of this sampling method are that the work can be done relatively quickly, and that the features can be determined more precisely than with a complete inventory, without any previous subjective interpretations and generalisations of the investigator, and that the data can be processed automatically. It is fed into a Geographical Information System

(GIS), which offers the possibility of extensive processing. One disadvantage is the degree of inaccuracy inherent in a sampling method.

For the sampling method, the whole of the Netherlands is divided into blocks of five by five kilometres. In each block, using sixteen points, sixteen parcels are selected on the map using the unaligned systematic sampling method. With a completely random test there could be the danger of a too irregular spread of the sampling points over the block. Using the unaligned systematic sampling method the points lie at rather regular distances from each other but not on a definite grid. Using this method, the block is divided into sixteen smaller squares, in four rows and four columns (see figure 1). There is one sampling point in each of the sixteen small squares. The x-coordinate of the points is always the same and the y-coordinate always different in each row of small squares. Per column, the x-coordinate is different but the y-coordinate of the points is the same. The x- and y-coordinates are determined at random. Investigations have shown that this method of sampling gives the most accurate estimations (Oude Voshaar, 1981).

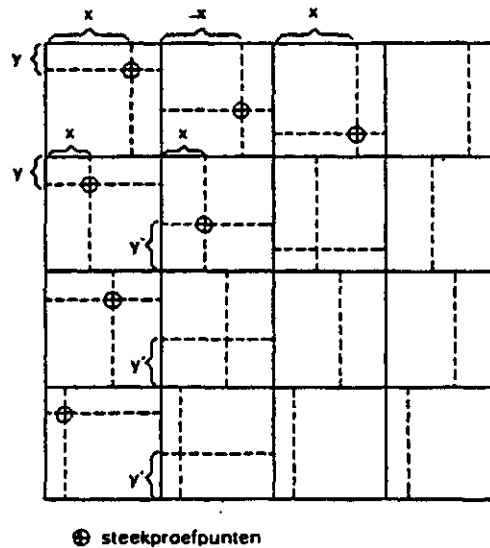


Fig. 1: The unaligned systematic sampling method.

Many features are investigated in the selected parcels. First, the form of the parcel is determined, divided into squares, rectangles and strips; the strips are sub-divided into length and breadth. Second, the parcels are divided according to regularity into six classes: from very regular - i.e. with four straight and parallel sides and four right angles - to absolutely irregular, with more than two curved sides. Parcel boundaries are also determined: the presence of wet or dry ditches and the presence of high vegetation. A distinction is made in the vegetation, i.e. raised, broad or narrow hedgerows and rows of trees. A category of embankments without vegetation is also distinguished. Division of the high vegetation is based on the legend of the topographical map. The size of the parcels, ground use and any peculiarities of the parcel are also noted. All the data from the mentioned features have been documented from around 1900 as well as from 1980, together with any changes, for example the splitting or joining of parcels or whole or partial changes in parcel boundaries. Finally, the fact of whether or not the investigated parcel is in an area where land consolidation is or has taken place is also considered, so that the relationship between the degree of change and land consolidation can be investigated.

Using the data from these sixteen blocks, the features of the whole block were estimated

in the form of an area percentage.

The inventory of parcellation using the sampling method has supplied useful information. However, for a typology based on historical-geographical features, parcellation alone is too limited. Work is therefore now being done on extending the survey to include settlements and patterns of roads, dikes and watercourses. First, a method is designed using the same sampling technique to enter settlements, roads, dikes and watercourses in the survey. In order to combine this satisfactorily with parcellation, the same sixteen sampling points are used. However, parcels can be selected using just points because they are plane elements. Settlements and roads, dikes and water courses are respectively point and line elements and are more difficult to select by means of only a point on the map. For this reason, circles have been drawn around the points within which the features of settlements and roads, dikes and water courses can be inventorised.

Settlement features are distinguished into sorts (nucleus, linear settlements or scattered settlements), size, shape of the plan, divided into categories such as regular grid, irregular grid, long or radial, the presence of high vegetation around the individual houses or elevated village sites.

The types of roads are indicated (roads, railways, footpaths, cycle paths, etc.), the degree of surfacing and the presence of high wayside vegetation. Their shape is determined by the number of bends. The height, shape and function of the dikes are indicated - a damming dike along a watercourse or along an expanse of water, or a dry embankment. For water courses, the breadth is given as well as the shape. The presences of bridges or locks is also indicated.

As well as showing the features of the various individual elements, attention is also paid to possible relationships, between settlements and the various line elements, between the roads, water courses and dikes and parcellation and between the roads, dikes and water courses with each other. As with parcellation, all features were inventorised for both 1900 and 1980.

This method of surveying was tested in six trial areas, and the tests demonstrated that it produced satisfactory results. The data can be used to indicate connections between various landscape features and when classifying a typology. The changes in the landscape since 1900 are also well represented (Barends, 1988). A survey of the whole of the Netherlands is now being done using this method.

Reliability

A significant part of the research is to investigate the reliability of this sampling method. Using the sampling data, the features of the whole block could be estimated using the sixteen points or circles. The degree of accuracy can be determined by means of the confidence limits. For the unaligned systematic sampling method used here, however, there are no formulae available for calculating the confidence limits. Therefore, use is made of the formula relating to the random sampling method. Investigations have shown that the unaligned systematic sampling method is, in any case, more accurate than a random sampling method (Oude Voshaar, 1981). The maximum deviation of the results calculated using this formula for a sample of sixteen points is about twenty per cent.

In the project 'Parcellation inventory using a sampling method', these results were tested against the true situation. The true areas of the parcels were measured for a limited area, and these measurements were then compared to the estimated values obtained from the sampling method. The deviations using the sampling method were much smaller than the theoretical deviations, based on the calculated confidence limits (Barends, 1987).

To what degree the results of the random test agree with the results of other parcellation inventories was also considered for a few areas (Barends, 1987). It was concluded that the

sampling method, in spite of the confidence factor, gave a very satisfactory reproduction of the true situation, with very usable results, certainly when considering the scale being worked upon.

In order to assess the accuracy of the results of the inventory of settlements and patterns of roads, dikes and watercourses, the same calculations and tests have been done (Barends, 1988). From this tests it was also concluded that this sampling method gave accurate results.

Results

The parcellation features, settlements and roads, dikes and watercourses, surveyed in the way described give us a great deal of information. The data have been put into a GIS (Geographical Information System). In addition to analysing the connections between various features and the changes that have occurred, distribution maps can be made of each feature. Many have already been constructed with the help of a computer.

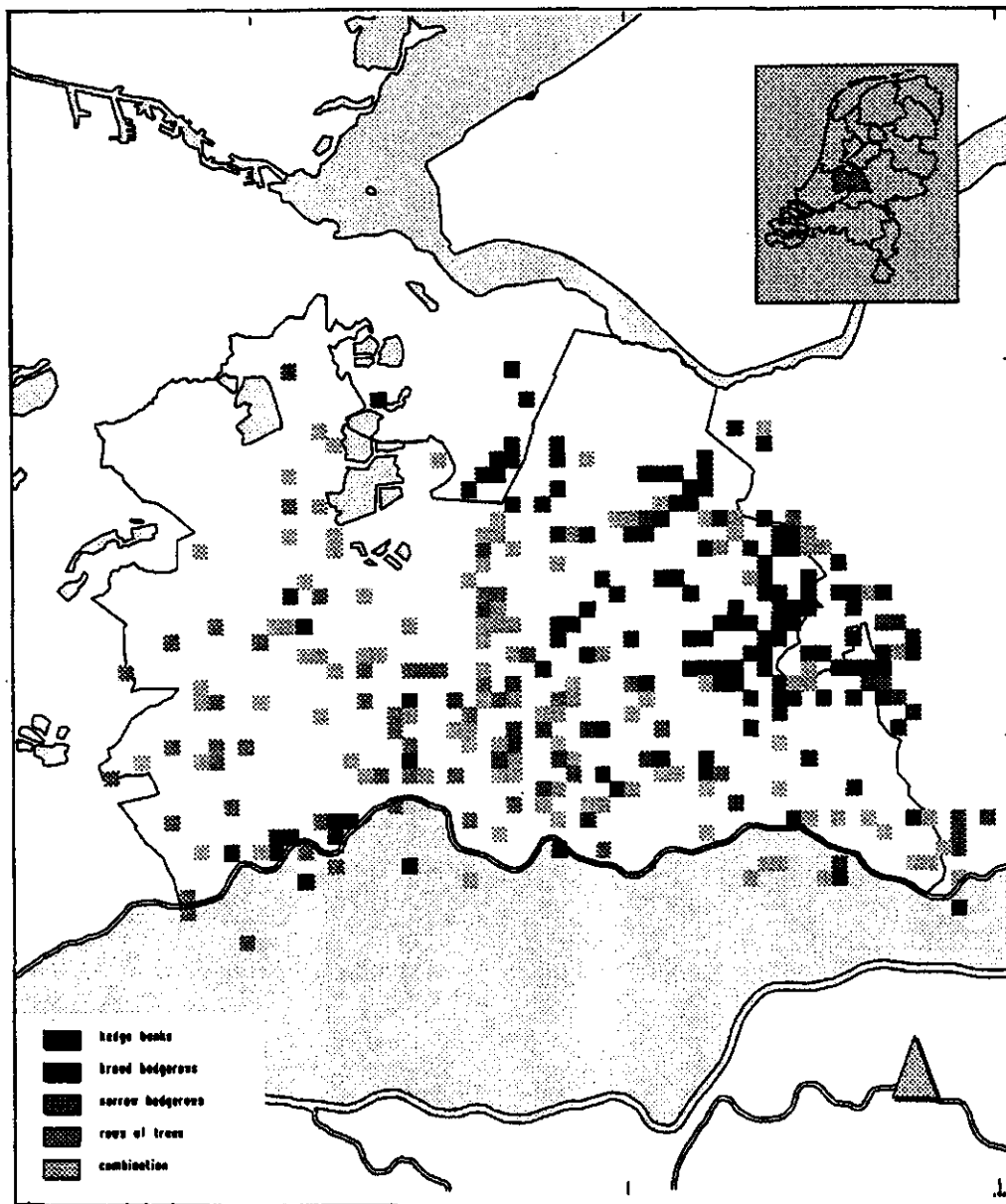


Fig. 2: Parcels with high boundary vegetation in Utrecht in 1900.

It was originally assumed that only the data surveyed per area of five square kilometres

could be represented. However, studies have been made to see whether representation for other, smaller, units are possible. Compiling maps on which the data are shown per sampling point/sampling circle or per square kilometre has been tried, and the possibility of making maps with 'flowing lines' is also being investigated. Research into the various presentation possibilities and the resulting statistical consequences has not yet been completed. For the maps shown here a combined presentation is chosen, namely per sampling point/sampling circle and per square kilometre, because to date these maps give the most detailed picture.

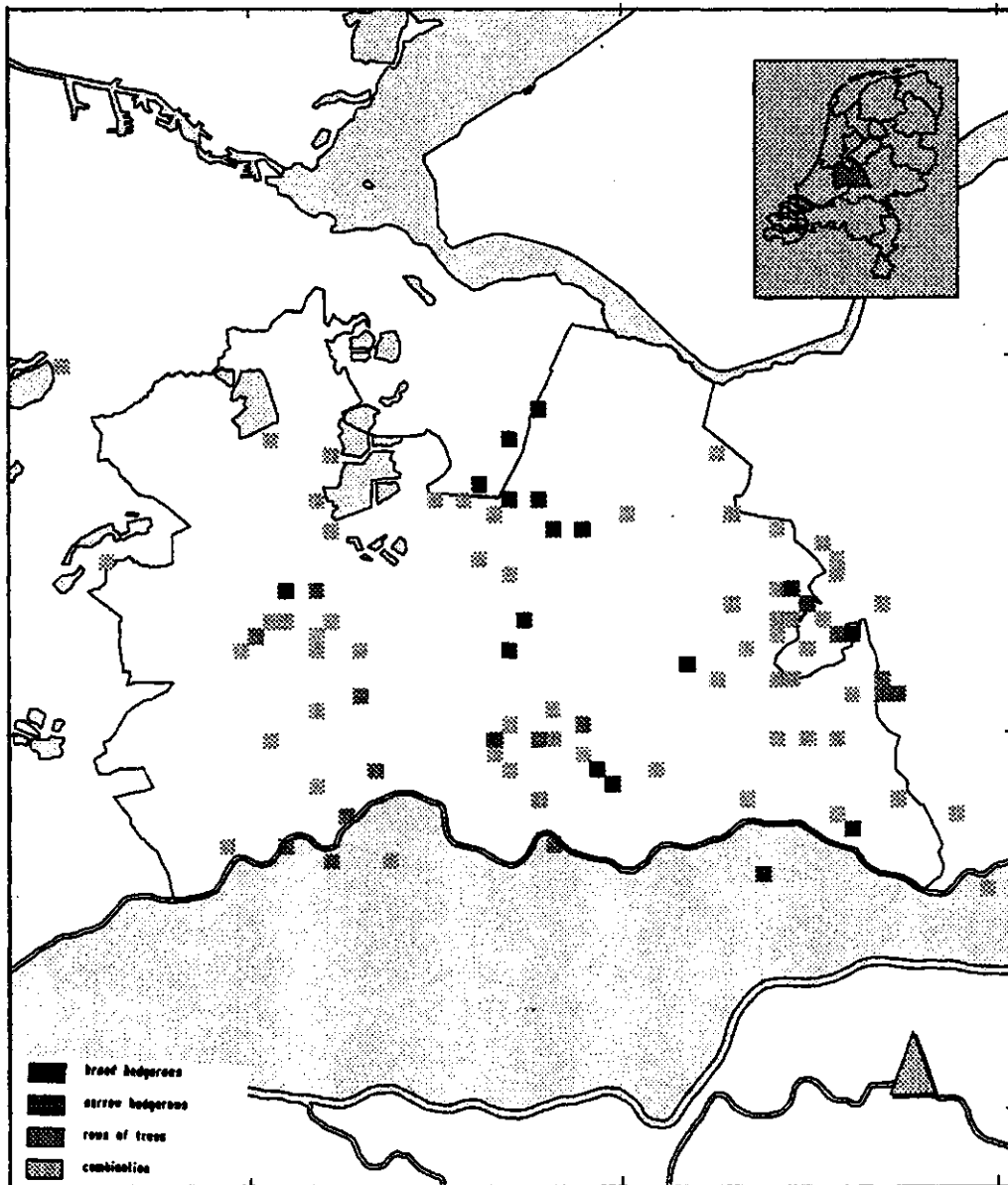


Fig. 3: Parcels with high boundary vegetation in Utrecht in 1980.

The distribution of parcels with high vegetation on the parcel boundaries in the province of Utrecht is shown for 1900 and 1980 (see figures 2 and 3). The various categories - hedgerows, rows of trees and hedges are indicated. The contrast in 1900 between those areas with plenty of high vegetation and those with no vegetation at all can be seen clearly. The strong decrease in parcel boundary vegetation between 1900 and 1980 is striking. Because of this decrease, the contrast between the various areas also strongly decreases. The

disappearance of the high vegetation of the parcel boundaries can be explained by the changes in these boundaries resulting in the clearing of the vegetation and its loss of function as a supplier of wood.

Applications

The collected data offer the possibility of a better approach to policies regarding the landscape and will allow future developments to be considered in a better light.

On a national scale, the data can be used to indicate specific areas for preservation or for special management. Using the results, the historical-geographical features and values within these areas can be determined. This concerns, for example, the presence of specific features, the connections between the various landscape elements, the extent of change or stability in the areas with regard to the situation in 1900, the rarity of features or connections, both for the whole of the Netherlands as for the era. The special features of the types distinguished, and the connections between the features can now be determined and used in future development projects. The structures already present in the landscape can be considered in future planning. In the survey, attention has been paid to changes that have taken place since 1900, so we can determine which areas have changed the most and which historical-geographical features are still clearly recognizable. Using the national survey, the rarity of certain features can be determined on a national scale. The little changed areas, together with those containing rare phenomena, should be considered for preservation. But also in the changed areas, proposed new developments could be more adapted to the original features.

On a local or regional scale, this national survey can serve as a reference, to indicate how certain phenomena in the rest of the Netherlands are represented, especially where the rarity with regard to the whole of the Netherlands is concerned.

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Leaving the church behind

A model for predicting early mediaeval settlement locations in the sandy areas of the Dutch province of North Brabant

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Abstract

This article describes a model for predicting early mediaeval settlement locations in the sandy areas of the Dutch province of North Brabant. This model was developed in consequence of new archaeological data. Excavations during the last decade made it clear that some early mediaeval settlements were relocated during the High Middle Ages. For the present-day provincial planning process a model for predicting (still unknown) deserted early mediaeval village sites has been developed. The model is mainly based on strong correlations between hydrological, pedological, ecclesiastical-historical and architectural data. The typically North-Brabant phenomenon of old churches or church towers standing solitarily in the open field played a key-role in this model.

Keywords: The Netherlands, North Brabant, Early Middle Ages, settlement location, church history.

Introduction

Backgrounds

When, not so long ago, a historical geographer was asked something about the history of the cultural landscape of the Dutch province of North Brabant, he would have analysed some nineteenth-century cadastral and topographical maps after which he would start telling about the old villages in the Early Middle Ages, or even what the remnants of Roman land use, the so-called centuriation, looked like. It was common knowledge, or rather common believe, that many landscape elements dating from the Early Middle Ages could be recognized on nineteenth-century maps.

This rather static view on the development of the cultural landscape, *forced* the historical geographer to explain a striking, typically North-Brabant topographical phenomenon on the nineteenth-century map, namely the old church or church tower standing solitarily in the open field, from a homo-economic point of view: *some early mediaeval villagers deliberated upon where to build a parish church, so that neither of them would have to walk too far. It was believed that they built their church just central.*

It is, however, very unlikely that inhabitants of different villages could ever agree on such an important matter. They would rather cut each other's throat, also an old phenomenon in this area. Schopenhauer stated already that during the centuries circumstances could change,

but human behaviour could not. Besides, this whole theory is based on just one mediaeval charter text, which has even been misinterpreted.

Recent archaeological investigations have made it clear that important changes in settlement location took place during the High Middle Ages. Moreover, the cultural landscape in this region was in constant change. In our research the solitary churches became the guide fossils in understanding, writing and mapping the historical geography since the Early Middle Ages of this highly dynamic cultural landscape.

The study area

The Dutch province of North Brabant is situated in the southern part of the Netherlands, bordering on Belgium. The region contains several historical landscapes. I will concentrate on the coversand landscape (*Zand-Brabant*, which includes 'Alphen', *Dommel*, and *Kempen*) in the south (Figure 1). This sandy region slopes down from south to north.

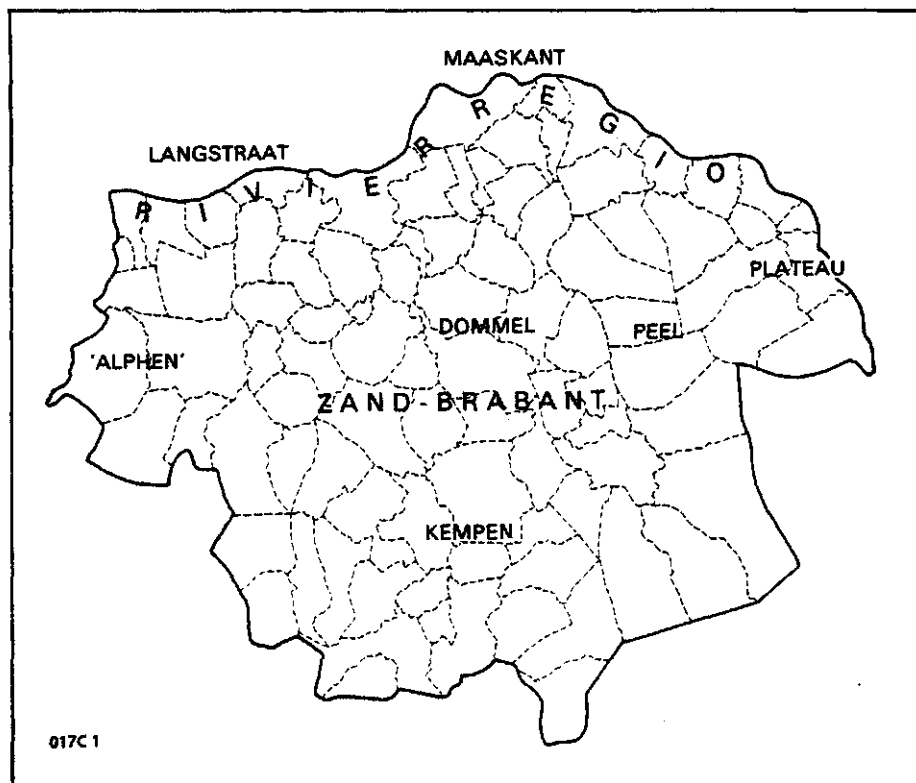


Fig. 1: Historical-geographical regions and sub-regions in the study area.

Questions of research and basic assumptions

The development of a model for predicting early mediaeval settlement locations in the sandy areas of the Dutch province of North Brabant was part of a research project that was carried out as contract research by order of the Provincial Government (De Bont 1989). One of the main purposes of this research was to provide historical-geographical information on an area of over 350 000 ha for the present-day provincial planning proces (De Bont 1991).

For the Early Middle Ages there were two main questions of research:

1. which locations in the region were suitable for permanent habitation and intensive agricultural land use in the Early Middle Ages;
2. was it possible to be even more explicit about the real habitation sites, in other words what kind of factual evidence was there of early mediaeval habitation?

The reconstruction of the potential habitation is based on two assumptions:

1. an area that was too wet (mean water table 40 cm or less below surface) was not suitable for permanent habitation and intensive agricultural land use (there are good reasons to believe that before 1000 AD the North-Brabant region had a wet optimum);
2. the land had to be fertile and workable.

In the next paragraph I shall work out the first assumption. I wanted to map the land that was too wet for permanent habitation and intensive agricultural land use in the Early Middle Ages. In the following paragraphs I shall outline a more specific model which helps us to understand and locate many early mediaeval settlements in the sandy areas of North Brabant.

Reconstruction of habitable areas during the Early Middle Ages

Methodology

The marshes, fens, swamps and peatbogs that were present around 800 AD made permanent habitation and intensive agricultural land use impossible. The first indications of systematic peat reclamations in Flanders and the Netherlands date from the end of the ninth century. After such a reclamation it was quite possible that the originally wet conditions of the environment changed in a short period of time. Although this is an important aspect of the Dutch historical geography, I can only touch on the subject within the framework of this short article. Very dry areas in the present-day landscape may have been very wet a thousand years ago and large areas may have been covered with a peat layer of substantial thickness (Leenders 1989).

First I mapped all the wet parts of the present-day North-Brabant landscape by using hydrological data from 1:50 000 soil maps. Using the so-called retrospective method of historical-geographical research I could ignore the drying up of the landscape due to modern agriculture by analysing the mid-nineteenth-century topographical maps. Owing to their military background, the information on wet soil conditions on these maps is very reliable. The reconstructed wet areas were then *pushed back into the past* using toponymic and other historical evidence. For instance, for the north-western part of the study area there was convincing historical evidence of a thick peat layer in the High Middle Ages, although in the nineteenth century there was hardly a trace left of it. On the other hand the nineteenth-century landscape contained still enough clues for mapping the former peat area. So all the wet parts of North Brabant were unsuitable for permanent habitation or intensive agricultural land use in the Early Middle Ages. The other areas were *at least* dry enough for it.

Results

On the reconstruction map of the landscape around 800 AD (Figure 2), the dry areas with potential habitation (dark on the map) were mainly situated on the west-east running cover sand ridges. These ridges forced the streams to find their way to the north (to the river Maas) by a roundabout route. In the west, cover sand plateaus and ridges formed large habitable areas. In the central part of the region the situation was more dispersed and in the south there were also some larger areas of habitable land. In the easternmost part the completely different landscape of the Maas plateau was situated, which I shall not discuss here.

Archaeological evidence of early mediaeval habitation

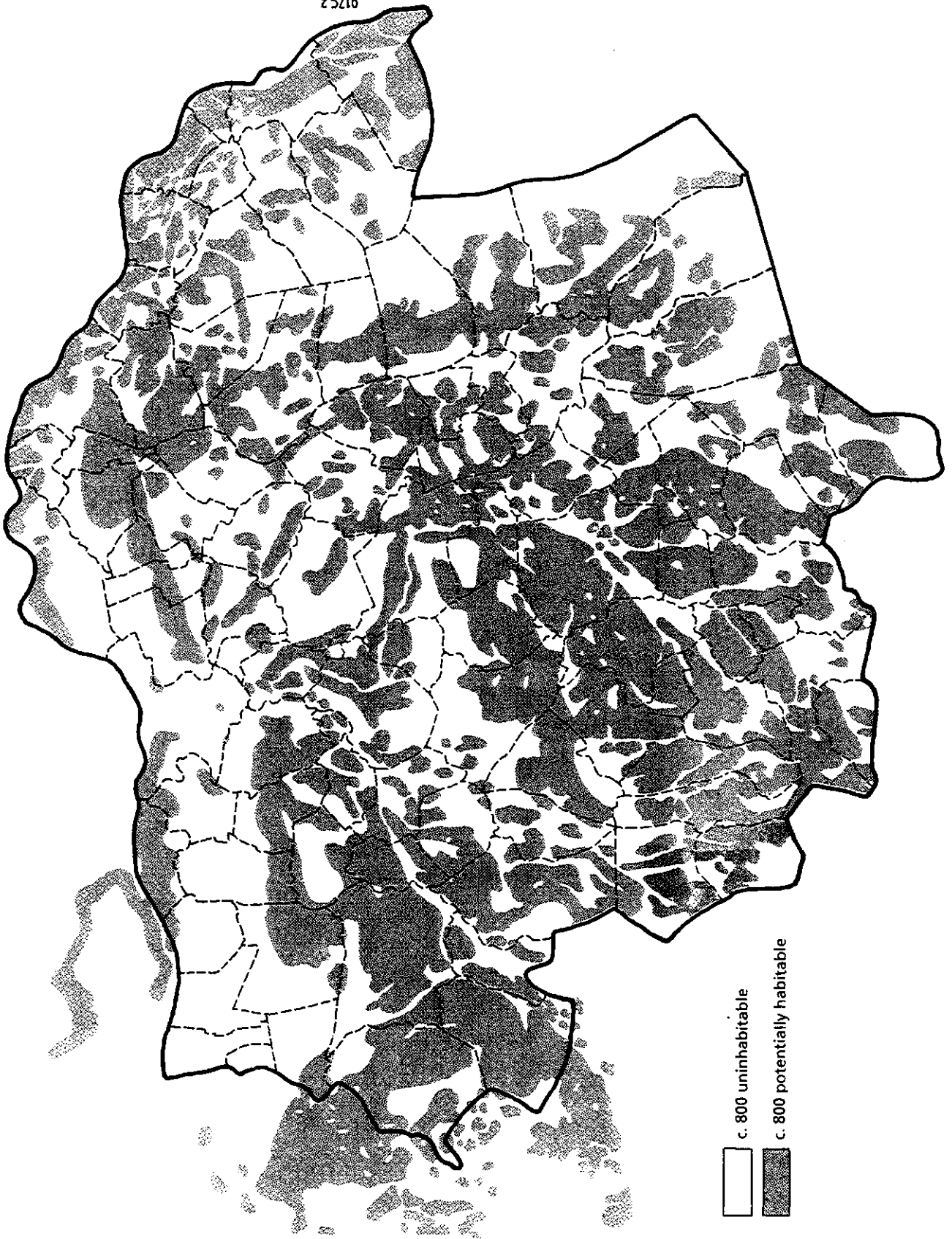
From archaeological finds we know quite a lot about human activity in this region during the Roman period (Slofstra and Bazelmans 1985). Most of the finds point to a native habitation. In those settlements the local chief wore, as it were, a Roman jacket.

I plotted these archaeological data (Beex 1973, with some minor completions) on the reconstruction map of potential habitation in the Early Middle Ages (Figure 3). However we must bear in mind that this area had probably been somewhat drier in Roman times. It is striking that most of the settlements were lying along the stream valleys or in the immediate neighbourhood of small depressions on the higher grounds, the latter being too small to be mapped.

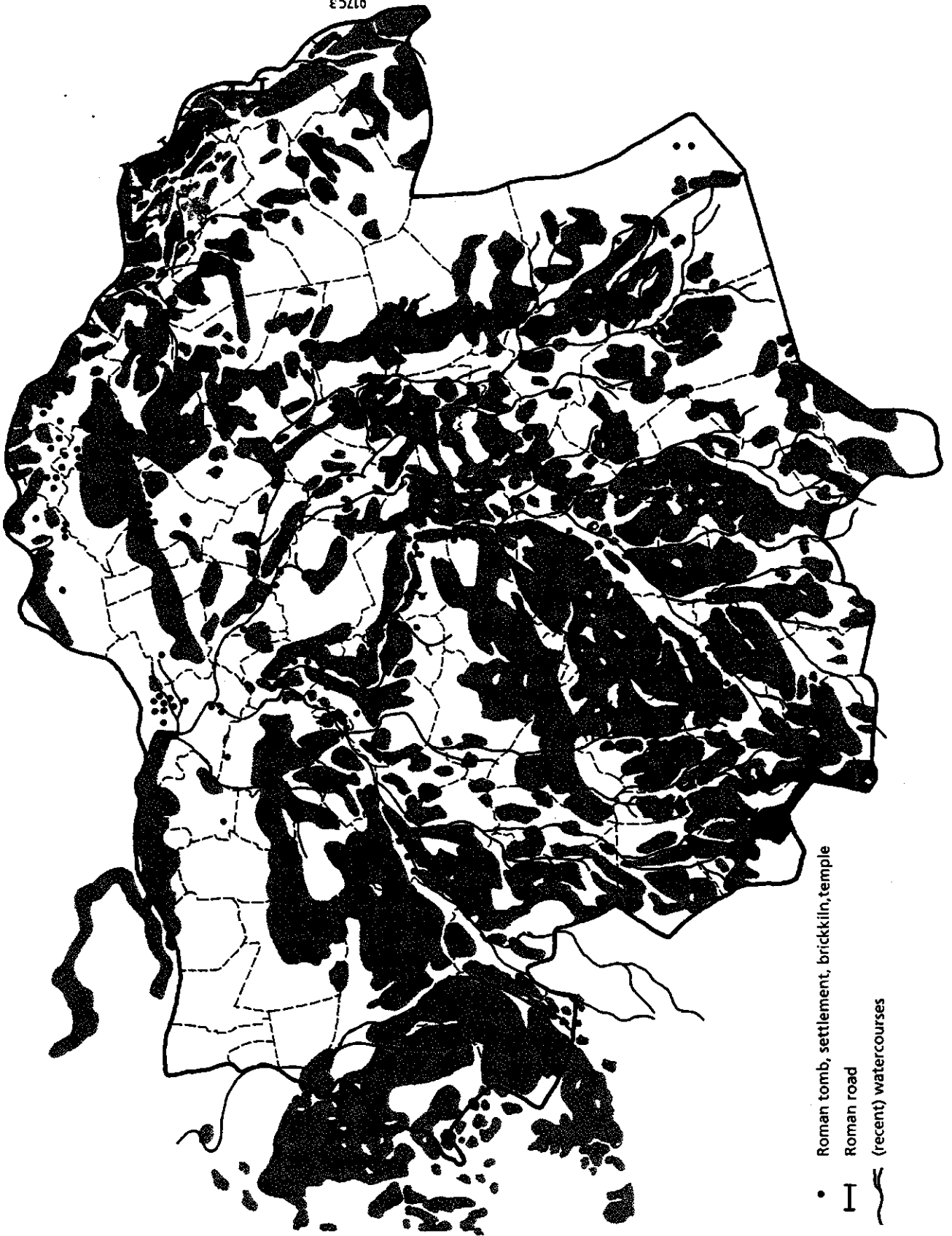
After the fall of the Roman Empire much arable land was abandoned and turned into forest again. Later in the Early Middle Ages many new reclamations took place (Theuws 1988b). Besides archaeological data we find evidence of this recovery of the forest in many place names from that period and in old charter texts. In this period the region became christianized in the wake of the Frankish conquest. One of the most striking elements in this process was the building of churches. But I shall return to those houses of God later.

Fig. 2: Potential habitation in the Early Middle Ages.

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Some years ago excavations were carried out in the centre of the village of Bergeijk in the southern part of North Brabant (Theuws 1988b; Theuws and Bijsterveld 1991). The archaeologists expected to find some traces of an early mediaeval *villa*, for they had *recognized* its form on nineteenth-century cadastral maps. One can imagine their astonishment when they found out that the oldest traces of habitation on the spot dated from no earlier than the High Middle Ages. Eventually they found traces of the early mediaeval settlement much higher on the sandy ridge, completely covered by a thick *plaggen* layer. Their conclusion was that continuity of habitation on the spot near the stream, as they had assumed earlier, was out of the question.

Archaeologists are slow diggers, and although some new excavations on other sites also indicated a discontinuity of habitation, their data were still insufficient for my (contract research) investigations. I had to write and to map the historical geography of an area of 350 000 ha. But I had been alerted: it was quite possible that many early mediaeval settlements had been relocated during the High Middle Ages. The assumed old forms in the mid-nineteenth-century landscape, which I mentioned earlier, rather date from the High Middle Ages or an even younger period. They are certainly not Roman or early mediaeval.

Fig. 3: Roman finds plotted on the reconstruction map of the potential habitation in the Early Middle Ages.

Reconstruction of early mediaeval settlement locations

Introduction

The archaeological evidence was, owing to a lack of archaeological finds, not sufficient to indicate locations of future excavation sites. But fortunately there were other useful sources. I mentioned above that the early mediaeval settlers looked for fertile and workable land. We also know that the whole region became christianized in that period. And I already mentioned the strange phenomenon of the old solitary churches in the nineteenth-century and present-day landscape. Was there a spatial correlation between pedology, ecclesiastical history and these solitary churches? Archaeologists had already excavated (traces of) one or two early mediaeval settlements at the feet of some lonely church towers (Theuws, Verhoeven and Van Regteren Altena 1988).

Pedological data

I already made a distinction between areas that were too wet for permanent habitation, and those suited for habitation (Figure 2). In the cover sand region the brown forest soils (German: Rostbraunerde) met the settlers' requirements best. These soils were not too dry and easy to work on (De Bakker 1979).

After several centuries of *plaggen* manuring, the brown forest soils became covered by a thick anthropogenic *plaggen* layer (Pape 1970). Figure 4 shows the development of the open fields from the Early Middle Ages until recent times: brown forest soils developed into open fields with a thick *plaggen* layer.

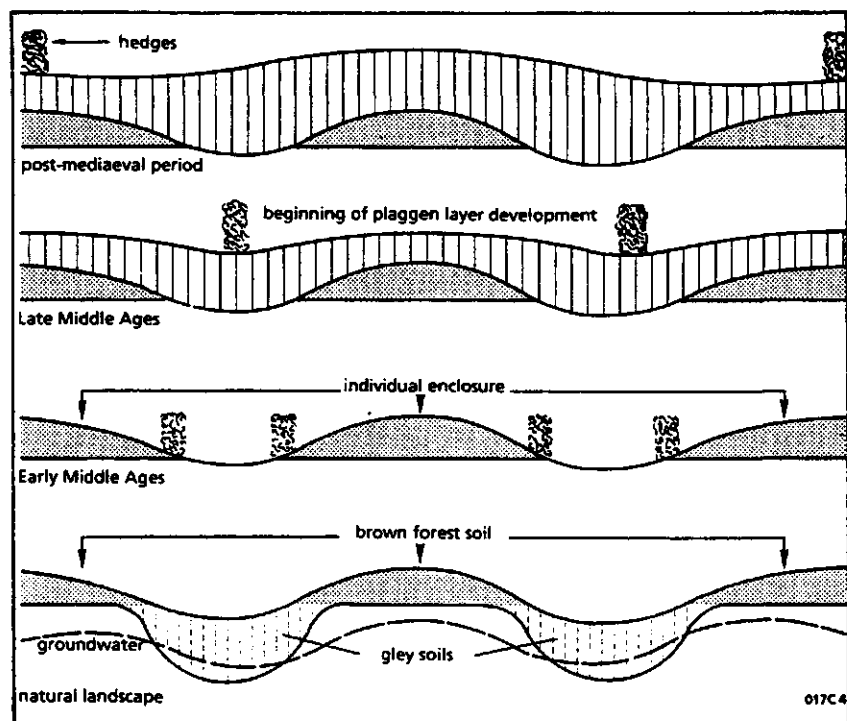


Fig. 4 : Development of the open fields.

On modern soil maps, these covered brown forest soils are classified as *plaggen* soils. Still it was possible to map the brown forest soils under the *plaggen* layers on a scale of 1:50 000. While analysing the first results of this mapping, I was suprised to find out that many (once) solitary churches or church towers, were situated upon these brown forest soils. Was this the key to the early mediaeval habitation in the area?

Ecclesiastical and architectural evidence

The problem was that we had not enough knowledge of these old churches and their original locations. Many of the old parish churches were demolished before or during the nineteenth century. Figure 5 shows (rather simplified) the architectural and religious changes that took place in the study area. These changes often affected the concentration of habitation within the settlement.

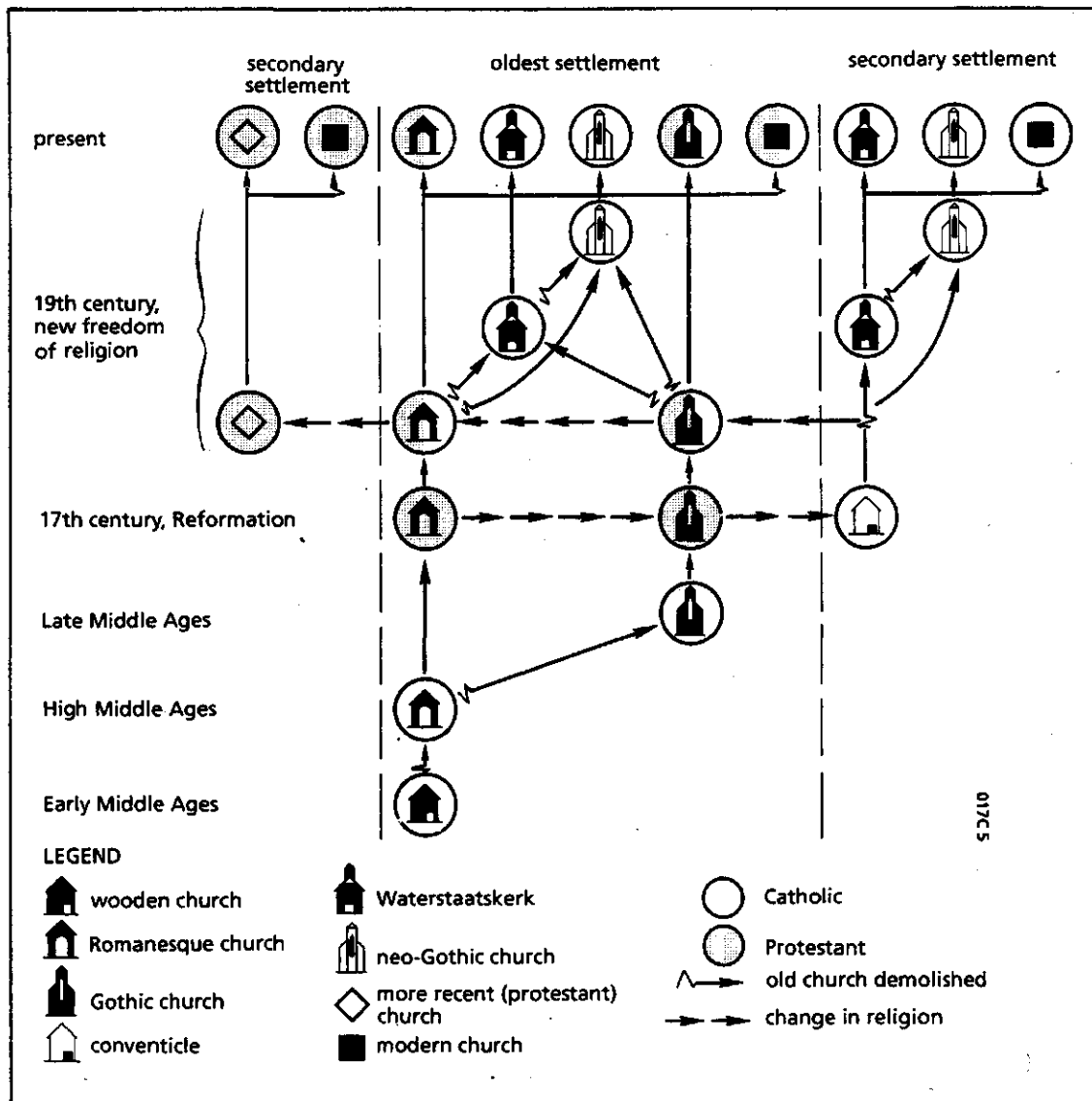


Fig. 5: Architectural and religious changes in relation to settlement location.

The centre column shows the changes in the oldest settlement centre, the outer columns show the more recent changes in the secondary settlements. The lower part of the figure, concerning the Early Middle Ages, shows the first little wooden church of the settlement, being of course a Roman Catholic one. In the High Middle Ages this small church was replaced by a Romanesque one. During the Late Middle Ages some of these churches were replaced by Gothic ones, all still being Roman Catholic. In the seventeenth century Protestantism became the official religion in the Netherlands. Although Protestants were a minority in this southern part of the country, they claimed the old churches. The many Catholics had to build new churches, so-called conventicles, in stables etc. outside the old settlement. During the the Napoleonic period, with its new freedom of religion, some of the old churches were given back to the Catholics. They sometimes replaced their newly gained old church, but also some of their conventicles, by new churches, the so-called *waterstaatskerken*. These churches were built by engineers of the Public Works Department (*Waterstaat*). The Protestants who had lost their old churches had to build new ones, which they also often located outside the old settlement centre. The Catholic Romanesque or Gothic church in the old settlement centre, as well as the younger former conventicles in the secondary settlement were often replaced by neo-Gothic churches during the nineteenth and the twentieth centuries. A neo-Gothic church may therefore mark either the location of the oldest parish church in the centre of the old settlement, or a secondary settlement. The primary and secondary settlements mostly grew together to one settlement in modern times.

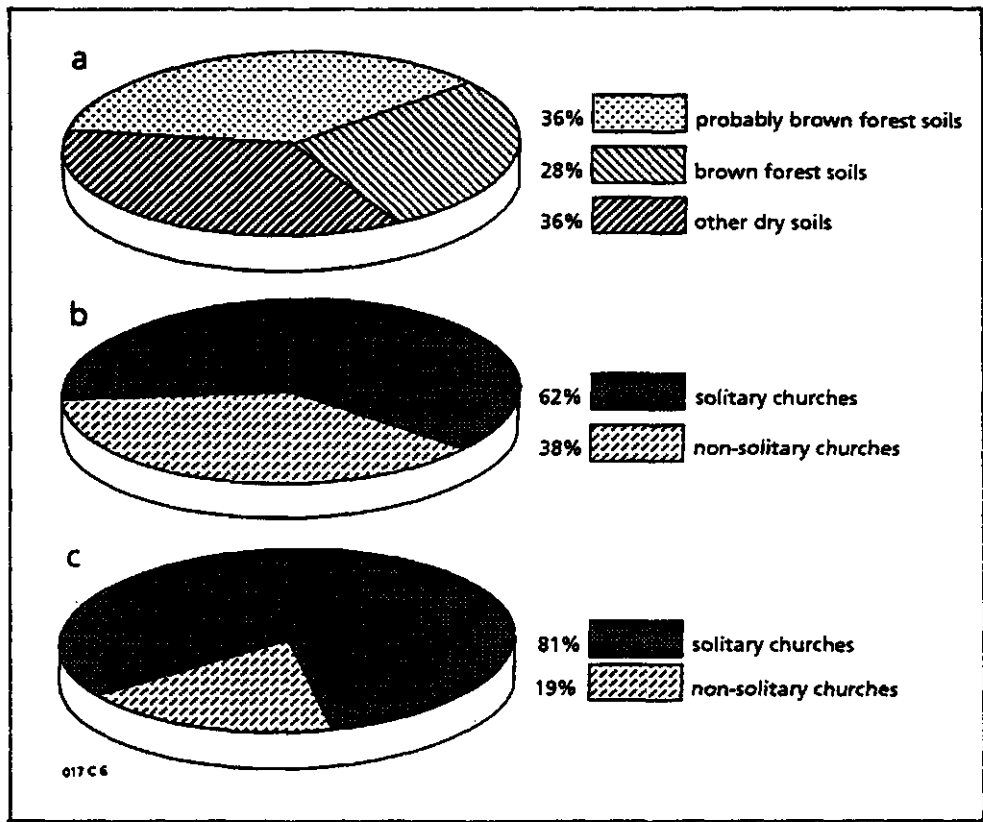


Fig. 6: Mediaeval parish churches
 a. Pedological situation
 b. Solitary churches up to 1840
 c. Churches on brown forest soils

Results

After combining historical-pedological, architectural and religious evidences, an astonishing spatial correlation appeared (Figure 6a-c). Out of the 144 mapped parish churches in the whole study area, 108 are located in the sandy region. Of these 108 parish churches, 28% appeared to be situated on brown forest soils. Another 36% are most probably situated on such soils, but this was difficult to determine because new houses have been built on the spot. Out of the 108 old parish churches 62% were located outside the mid-nineteenth-century built-up areas, and 81% of these churches were located on brown forest soils.

By using hydrological and pedological data I have traced many locations that were very suitable for early mediaeval habitation (Figure 7). Many of the mediaeval parish churches were situated on these brown forest soils and many of these churches were still located outside the built-up areas in the mid-nineteenth century. And last but not least, the archaeologists have already been *scratching* at the feet of some solitary church towers: they found much early mediaeval material.

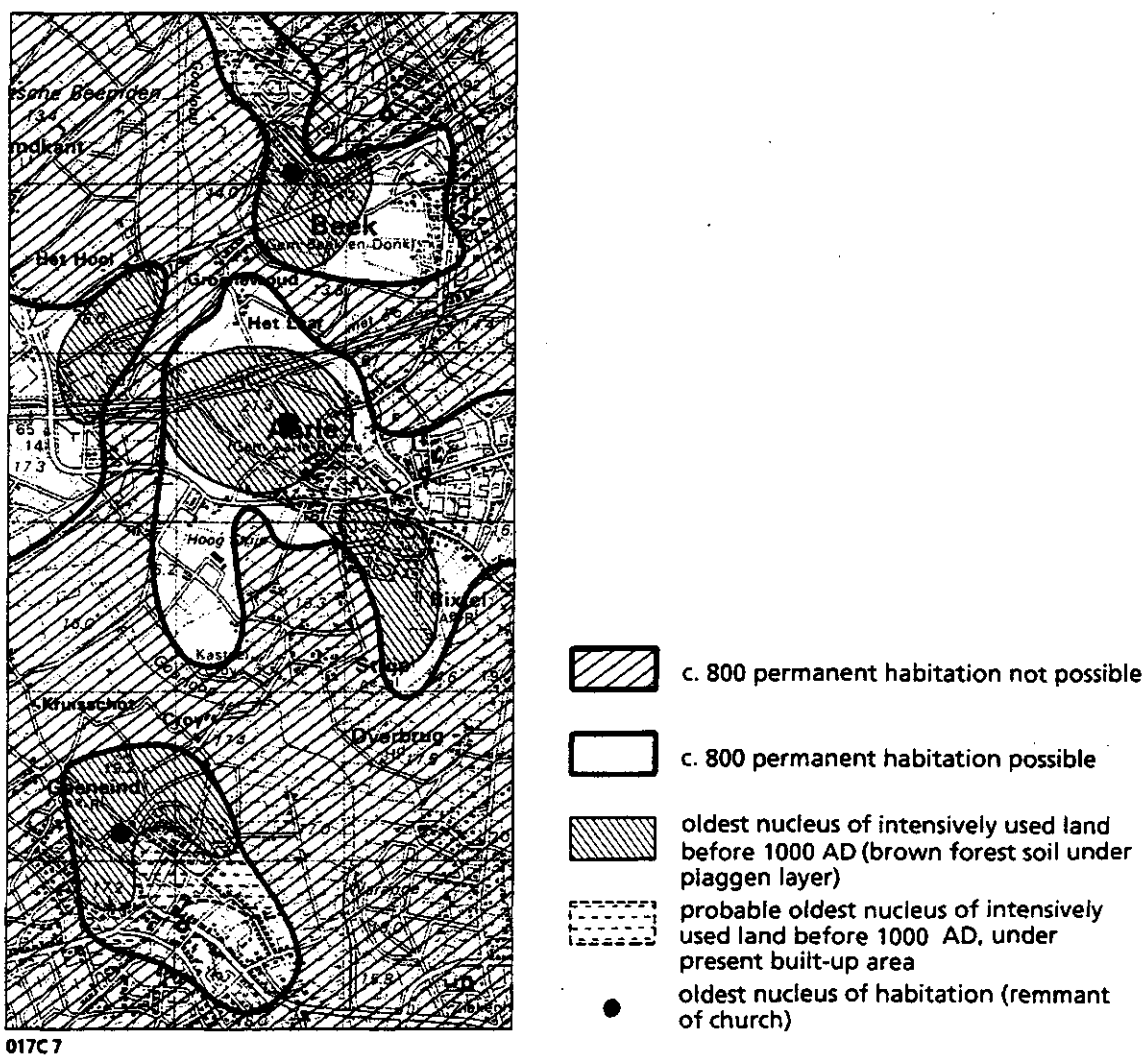


Fig. 7: Mediaeval habitation in the villages of Beek, Aarle-Rixtel and Stiphout (Geeneind).

With this knowledge I was able to make a diagram of the development of the habitation in North Brabant. At the bottom of Figure 8 we see the original landscape (I) with beech and oak forests on the brown forest soil. In the Roman period (II) there was some habitation but most of it disappeared during the so-called Dark Ages (III). During the Merovingian and Carolingian periods (IV) new reclamations came into being and the first Catholic churches were built. From that period onwards there are two different developments to be distinguished:

1. some settlements were relocated in due course, leaving their church behind in the open field;
2. other settlements were sprawling slowly, and the church was, and remained, the centre of the village.

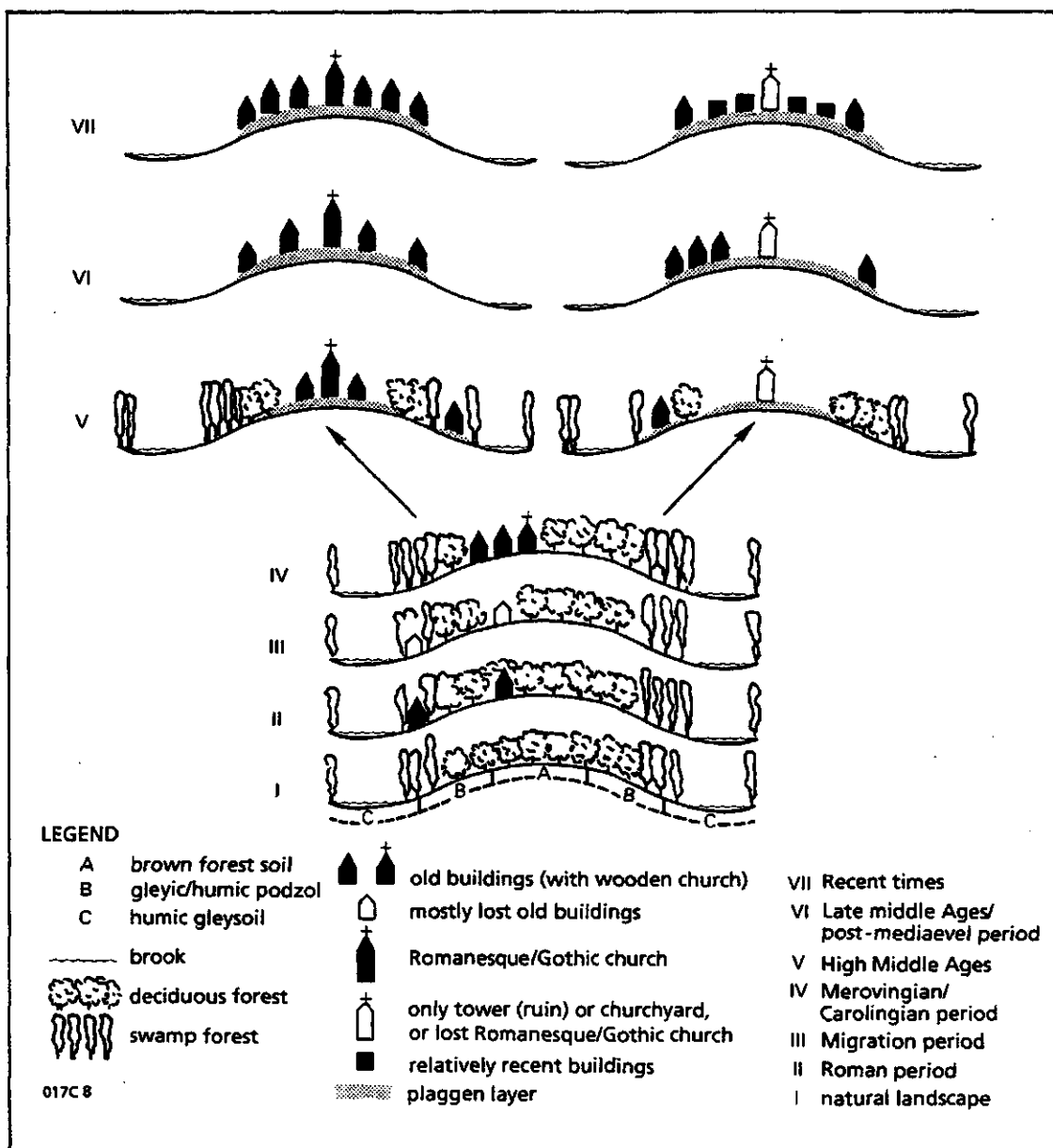


Fig. 8: Development of habitation in the province of North Brabant.



Fig. 9. Recent excavations at the foot of the solitary church tower in the village of Beek in the southeastern part of the study area. (R.O.B. excavation by W.J.H. Verwers and T. Huybers; photo: T.Huybers)

Conclusions

I have tried to prove that the history of the solitary churches plays an important role in understanding the mediaeval changes in habitation in this area. They appeared to be reliable guide fossils in our search for traces of early mediaeval settlements. By using the reconstruction of the potential habitation in the Early Middle Ages, which is based on very different data from several disciplines of science, it is possible to indicate future archaeological excavation sites for the mediaeval archaeologist (Figure 7 and 9). Archaeology is what archaeologists do: digging. The historical geographer lets them dig, but he can tell them where to start digging.

We do not know enough yet about the course of new reclamations in this region during the Late Middle Ages. Much toilsome examination of the records still has to be executed. We do know that over 60% of the area was reclaimed between the sixteenth and nineteenth centuries (Kappelhof 1985). This indicates how wrong it is to believe the nineteenth-century maps to reflect the mediaeval world. That world was in many respects much smaller.

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The age of plaggen soils

An evaluation of dating methods for plaggen soils in the Netherlands and Northern Germany

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Abstract

Plaggen soils contain important historical information. Research into their origin and development has therefore been drawing more and more attention over the last few years. Until recently, these soils were thought to have had their origin in the Early Middle Ages, especially the 8th to 10th centuries AD. In this review the various methods for dating plaggen soils are evaluated. Three categories of dating methods are dealt with: (1) Radiocarbon dating of humus and charcoal, (2) pollen analytical dating and (3) archaeological dating. Each method has considerable methodological and interpretational sources of error. Many datings are unreliable for determining the origin of the plaggen manuring system. After a critical evaluation the conclusion is drawn that there are no reliable early mediaeval datings of plaggen soils and that it is far more plausible to date the origin of the widespread use of plaggen manure not earlier than the 13th century. Due to the differentiated economic development of the various sandy regions in the Netherlands and Northern Germany we should consider a phased introduction of plaggen manuring, which also explains the morphological differences in plaggen soils between these regions. Finally a model is presented for the origin and development speed of plaggen soils.

Keywords: plaggen soils, dating methods, sandy areas, The Netherlands, Germany, Middle Ages

Introduction

Object of research

A plaggen soil is a specific anthropogenic soil type which is bound to mediaeval and early modern arable land on sandy soil (1). Characteristic of this soil type is an appreciably thickened man-made surface layer that has been produced by the long-continued application of plaggen manure. Plaggen soils are widely distributed throughout the sandy landscapes of Northwestern Europe in a vast area, stretching from Denmark and Schleswig-Holstein to the northern part of Belgium (2) (Fig. 1). The age of these soils is thought to be early mediaeval (3). The plaggen manuring system ended with the introduction of artificial fertilizers at the beginning of the 20th century.



Fig. 1 : Aerial photograph of a typical "plaggen soil landscape" near Gasteren, province of Drenthe, Northern Netherlands. Large open fields (E) are situated around the settlement. These arable lands with their characteristic complexes of furlongs (German: *Gewannflur*) all contain plaggen soils. In the foreground we see the remainders of the former extensive heathlands (H), which used to be the source areas for the plaggen digging. In the background, on the right, these heathlands were afforested (F) (Photo : KLM Aerocarto).

Relevance

Areas with plaggen soils are being regarded more and more as historical treasures. Archaeological research has revealed that the thick plaggen layers have had a strong preserving effect on the underlying archaeological finds. A substantial number of undisturbed prehistoric and early historic villages and cemeteries lies under plaggen layers (4). As plaggen soils are usually in the direct vicinity of present-day villages, many of them have been destroyed by house-building or by infrastructural works during recent decades. This poses a serious threat to the cultural heritage of the rural landscape. These soils have, therefore, been given more and more attention by landscape planners and scientists over the last few years.

In addition, soil properties and pollen contents of the plaggen soils themselves reflect, to a certain extent, the history of human occupation and reclamation in the sandy areas. A thorough investigation of these properties and contents provides important information on the history of the rural landscape.

From a more historical point of view the study of the introduction and diffusion of plaggen manuring is an interesting object of research for those investigating the economic transformation of a feudal peasant society into a market-orientated society.

The above-mentioned arguments have stirred the discussion on the origin and formation history of plaggen soils, a debate that started about fifty years ago. This publication will give

a summary of this discussion and will evaluate the various dating methods that have been applied to determine the age of this particular soil type.

State of the art

The age of plaggen soils became a real point of discussion for the first time in the years just before the second World War. Scientists such as Steeger and Niemeier in Germany and Oosting and Van Giffen in the Netherlands debated the age of these remarkable anthropogenic soils, using the depth of the plaggen layers (5) and the archaeological finds beneath these layers as a guideline (6). These discussions did not lead to explicit answers. Plaggen soils were assumed to date from prehistoric times as well as from the Middle Ages.

Although prehistoric datings of plaggen soils were to reappear regularly during the next thirty years (7), the introduction of radiocarbon dating in the late fifties resulted in a more well defined introduction period of plaggen manuring, namely in the 6th to 11th centuries AD (8). In 1972 Niemeier published an outstanding review on the datings of plaggen soils up to that year (9).

In the mid-seventies these early mediaeval datings were specified even more by pollen analytical research done by Behre (10). He published a pollen diagram of a kettle hole in Dunum which in his opinion indicated a 10th century origin of plaggen manuring in northwestern Germany. This 10th century evidence, supported by investigations of Kramm (11) and related by Heidinga to a climatologically dry period (12), has been widely accepted in the historical and archaeological world.

Recent archaeological and historical research in the Netherlands disputes these 10th century datings and opts for an even younger origin of plaggen soils, namely in the 13th or 14th century (13). These latest discussions will be covered in the following paragraphs.

Definition of research problems

Research queries

The main queries when researching plaggen soils in our sandy landscapes are:

- 1) In which period did reclamations of the open fields in the sandy areas of Northwestern Europe take place?
- 2) When was plaggen manuring introduced in the various regions of Northwestern Europe and during which period did the formation of plaggen soils take place?
- 3) In what economic context did these reclamations and the application of plaggen manure arise?

In this paper we particularly want to focus on the second question, although the other two are closely connected.

During the last fifty years many soil scientists, historical geographers and archaeologists have developed various dating methods for plaggen soils and have reached very different conclusions. If we study the vast number of publications on this subject we see an enormous variation in dating the origin of plaggen soils. The oldest datings indicate Iron Age, whereas the youngest datings mention the 13th and 14th centuries AD.

This paper will try to explain the origins of this huge variation. Is it a representation of the real spatial and chronological variation in the introduction time of plaggen manuring or are there methodological explanations for the wide range of datings?

Spatial variability as expression of chronological variation

Plaggen soils in our sandy landscapes can have a quite different age and development, due to chronological and spatial differences in formation conditions. As a result the morphology of plaggen soils varies considerably between different geographical areas (14).

Spatial variability in introduction time and plaggen soil formation can be observed on various scale levels. We can distinguish variation between the different sandy regions, variation within these regions and variation on a more local scale.

Concerning the intraregional variation it seems obvious that the various sandy regions of Belgium, the Netherlands and Germany underwent very different economic developments during mediaeval and early modern times. According to the locational model of Von Thünen and elements of the centre-periphery model of Wallerstein we can expect substantial differences during the Middle Ages between the sandy regions around the large mediaeval towns of Flanders and the (semi)peripheral areas hundreds of kilometres away from these centres, such as the Veluwe and Drenthe (15). Different dating results of plaggen soils or open field reclamations can be caused by this differentiation in economic development. Because economic development in the centre starts sooner and advances more rapidly than in the more peripheral regions, the intraregional variability of plaggen soils reflects to a certain extent their various stages of development. The expression of chronological variation in the intraregional variability of landscape features forms a very interesting theme in the research into the historical geography of the sandy landscapes in Northwestern Europe (16).

On a local scale, within village territories, we can also observe variations in the age and formation of plaggen soils, due to differences in reclamation time or arable farming methods on the open fields (17). According to Bieleman the open fields in the sandy areas of the Netherlands used to be cultivated in an infield-outfield system in which only part of the arable land was fertilized intensively with plaggen manure, whereas other parts were cultivated in a more extensive fallow system (18). This results in spatial variability on a local scale.

It is clear that the introduction, diffusion and widespread application of plaggen manuring cannot be detached from the economic development of the sandy regions. The use of plaggen is a very intensive form of manuring and these high inputs cannot exist without an economic breeding ground or the economic necessity to intensify arable cultivation. As a consequence, research into the genesis of plaggen soils should be placed in a broader economic and historic-geographical context.

The difference between reclamation time and introduction time of plaggen manuring

In Dutch and German literature the mediaeval reclamation of the open fields in the sandy areas is thought to be closely connected with the use of plaggen manuring (19). As a result no difference has been made between reclamation time of these open fields and the introduction time of plaggen manuring. This intermingling has caused considerable confusion and is one explanation for the existence of the various, quite differing, theories on the introduction time of plaggen manuring. As long as we don't know the exact chronology of the various farming and fertilization systems during the Middle Ages, it is better to make a clear distinction between the reclamation itself and the way in which this reclamation was exploited. As plaggen manuring is one of the many possible forms of exploitation it is incorrect to think of the two as one and the same thing.

In the following paragraphs I want to discuss the methodology and results of three different types of dating methods for plaggen soils.

- Method 1) Radiocarbon dating of humus and charcoal
- Method 2) Pollen analysis combined with radiocarbon dating
- Method 3) Archaeological dating methods

For all three methods I will briefly explain the methodology itself, review the results obtained so far and discuss some sources of error.

Radiocarbon dating of humus and charcoal

Methods

In order to date the origin of the plaggen layers small pieces of charcoal or a few hundred grams of soil material can be collected in the field. The samples are taken from the base of the plaggen layer. The radiocarbon age of these samples is measured in an isotope laboratory. The resulting age should be a good indication of the beginning of plaggen manuring in that particular place.

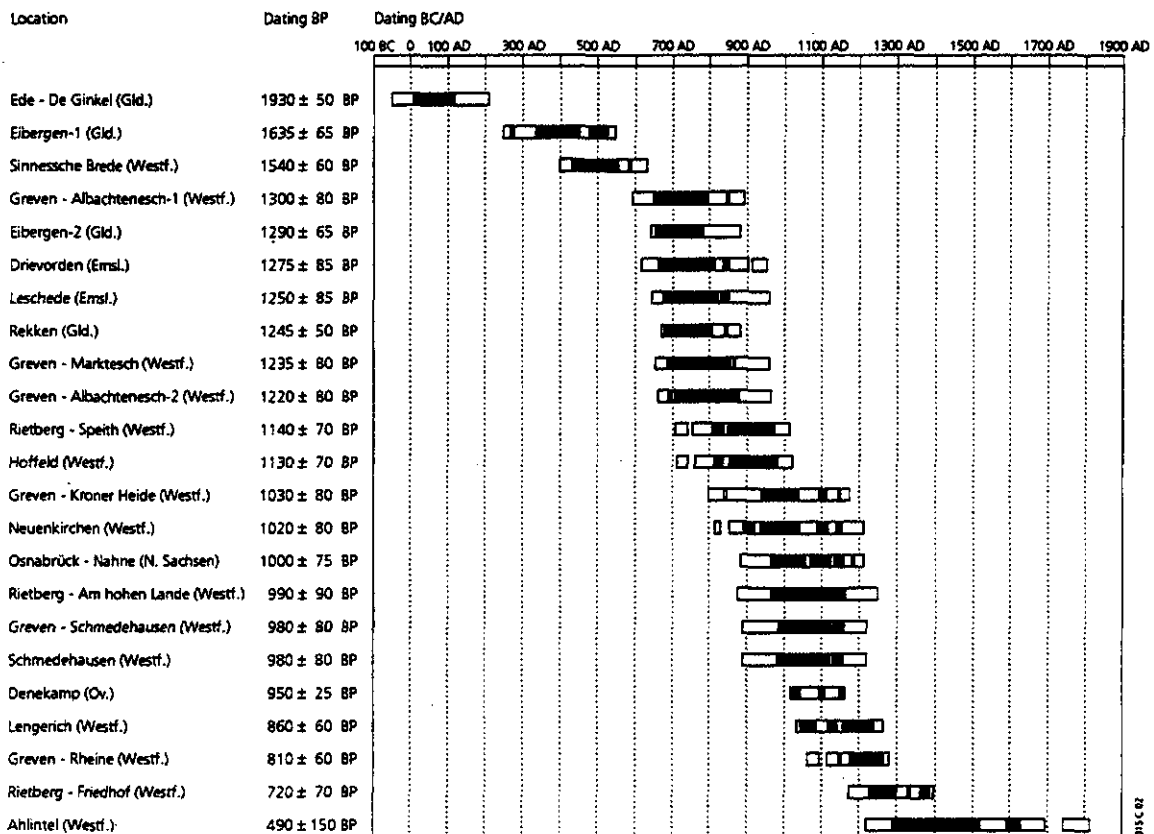


Fig. 2 : Results of radiocarbon datings of plaggen soils on 23 sites in the Netherlands and Northern Germany. Each BP-dating was calibrated according to Van der Plicht & Mook (1990) to real calendar years (AD). The black beams mark the 68% probability-interval of these calibrated datings; the white beams mark the 95%-probability interval.

Results

During a short literature search we collected more than twenty references from scientists in the Netherlands and Germany (20). Nearly all these data were obtained during the sixties or early seventies. This means that they usually were not originally calibrated for variations in the carbon-dioxide content of the atmosphere. We calibrated all the uncalibrated BP-datings into real calendar years AD (21). The results are presented in Figure 2. On the horizontal axis we see a real calendar timescale, running from 200 BC to 1900 AD. On the vertical axis the twenty-three sites are plotted. All the samples were taken in Northern Germany and Eastern Netherlands. The widths of the black beams mark the 68%-probability intervals of the radiocarbon measurements, the white beams mark the 95%-probability interval (22).

Most of the samples date from the 8th to the 12th century, so we are inclined to date the plaggen soils in these centuries. A second striking phenomenon is the vast range of the datings. The oldest sample dates from the first centuries AD, the youngest from the 17th to the 19th century.

Discussion

How can this range of fifteen centuries be explained? It is hardly imaginable that the introduction of plaggen manuring in Western Europe took so long. It is likely that there are some methodological and interpretation problems. I will discuss some of them.

Geographical and chronological representativeness of the samples

Some of the variation can be explained by the selection of the sample locations. In most cases only one or two samples were taken from a particular open field. It is clear that this is not enough for reliable conclusions to be drawn. The variation, both vertically in the plaggen layer as well as horizontally in the different parts of the open fields can be considerable, as shown in studies by Mückenhausen and Niemeier (23). Only a larger number of samples from one location can lead to reliable results and conclusions.

It seems prudent to leave the most extreme datings aside. Samples with the oldest datings (Denekamp, Ede and Eibergen) were probably taken from locations where arable fields from the Iron Age underly the mediaeval open field (24). The youngest datings probably indicate the youngest parts of the open fields and do not give a good indication of the introduction time of plaggen manuring.

Geographical origin of the charcoal and humus

It is not certain where the sampled charcoal or humus comes from. Is it charcoal from the natural vegetation on the sampling spot, which was there before reclamation to arable land? In this case the obtained radiocarbon age is an indication of the reclamation period of that particular place. It could, however, also be charcoal from the wastelands which was carried to the arable field with the plaggen sods. In this case the radiocarbon age of the charcoal gives an indication of the early periods of plaggen manuring.

Chronological errors caused by ploughing of the arable soil

It is not certain whether the sample from the base of the plaggen layer is a good indication of the early beginning of plaggen manuring. Because the topsoil of the arable field was intensively ploughed for many years the charcoal pieces could easily have been removed to layers to which they originally did not belong. Mückenhausen et al. give a very striking example of this vertical mixing of soil material (25). The sampled charcoal or humus could originate from the natural soil profile before reclamation, or from younger plaggen

manure applied long after the introduction of plaggen manuring at that particular place. In neither case will the datings give a correct idea of the age of the plaggen layer. The heterogeneity of, especially, the humus samples is also shown by the relatively high standard deviations of the radiocarbon datings.

Interpretation problems of radiocarbon dating of organic matter of terrestrial soils

Radiocarbon datings of humus samples of terrestrial soils give some interpretation problems. Humus consists of many different components which all have their specific disintegration speed (26). All samples mentioned in Figure 2 are bulk samples, which means that they are not fractionated. It is not yet clear which humus fraction should be used in order to estimate the real age of the sample most accurately. Various investigations have shown that there can be a difference of many centuries between the datings of the different fractions and bulk samples (27). Therefore, it is uncertain whether the measured radiocarbon dating can be used as the real age of the sampled layer.

Conclusion

Radiocarbon datings of humus and charcoal from the basic layer of plaggen soils do not give a reliable age of the plaggen layer on the sampled spot, because of the uncertain origin of the sampling material, the vertical mixing of soil material and interpretation problems with humus samples. Because arable land could have been cultivated with various kinds of extensive fallow systems and the deepest plaggen layer is a mixture of the original natural soil profile and the relics of early cultivation, it is possible that the above-mentioned datings give a rough idea about the reclamation period of the open fields rather than of the introduction time of plaggen manuring. Leaving aside the most extreme datings, the majority of the datings possibly indicate a 7th to 13th century reclamation of open fields in the sandy areas, although the given samples are too few and of too low a representativeness to give a reliable result on this point.

Pollen analytical dating

Methods

Pollen analysis can be used to date the origin of open field reclamations indirectly. Samples are taken not from the plaggen soils but from peat profiles in the direct vicinity of the open fields. Having constructed a pollen profile the most interesting changes can be dated more exactly by radiocarbon dating.

The most interesting results using this method were obtained by Behre (28). He sampled a small kettle hole filled with peat that was situated in the centre of the large open field of Dunum, Northern Germany. Behre believes in a strong causal relationship between the introduction of plaggen manuring and the rapid increase in winter rye at the end of the Early Middle Ages. He claims that the shift of summer crops (such as barley and oats) to the wintercrop rye was only possible if manuring was intensified. Introducing plaggen dunging was such an intensification. The cultivation of winter rye (*Secale cereale*) could expand rapidly because of this new fertilization technique. This means that if a radiocarbon dating has been made of the point where the rye-curve increases explosively, we would have an indication of the origin of plaggen soils.

Results

Pollen analytical investigations by Behre and Kramm lead to three datings of a rapid rise in the rye-curve (29). After calibrating, these datings indicate a 10th to 12th century rise of the rye-curve. Behre concluded a 10th century origin of plaggen manuring in Northwestern Europe. This 10th century dating is widely accepted among historians, historical-geographers and archaeologists (30).

Discussion

However, if we study the investigations of Behre more thoroughly a few questions still remain.

The first question concerns the expressiveness of the 10th century radiocarbon dating. Unfortunately this *terminus post quem* dating has not been accompanied by a *terminus ante quem* dating, which would make it possible to date the explosive increase of winter rye more accurately. It is unacceptable to conclude a 10th century increase in winter rye cultivation on the basis of one single *post quem* dating.

A second question can be raised on the accuracy of the 10th century dating. As previously stated, a radiocarbon dating has a certain standard deviation which, after calibrating, leads to quite a large age range. On the basis of the above-mentioned data it is unacceptable to decide on a 10th century dating. It is better to speak of a 10th to 12th century dating.

A third question can be raised on the representativeness of the Dunum case. Various palaeoecological studies have shown that a widespread cultivation of winter rye in Dutch and German sandy areas dates as far back as Roman, Merovingian and Carolingian Times and that changes in crop cultivation can be quite different from the concept of Behre. Rye seems to have been the main crop on sandy soils during the Early Middle Ages and was apparently cultivated without plaggen manure. During the 8th or 9th century this dominant rye cultivation was substituted by crop rotations in which rye, barley and oats were grown (31). These data are not in accordance with Behre's theory, which queries the representativeness of the Dunum case.

A fourth problem concerns the interpretation of the Dunum pollen curves. If we study the pollen profile of the kettle hole and take a special look at the curve of rye (*Secale*) and the curve of the other cereals (*Cerealia*) it is hard to discover a change from summer cereals to winter rye. The evidence is otherwise: the curves of rye and other cereals rise in exactly the same period. Curves of accompanying weeds, such as *Spergula* and *Scleranthus*, rise from nothing over the same period. So all indications of arable farming rise only in the 10th century AD. In my opinion this joint increase in all anthropogenic pollen curves indicates a reclamation phase rather than a change in arable farming methods. I believe that 10th to 12th century reclamations in the vicinity of the kettle hole is a better explanation of the obtained pollen curves. This is in accordance with the historic-geographical investigations made by Reinhardt, who found that the area around the Hilliges Moor was one of the youngest reclamation phases of the early mediaeval settlement of Dunum (32). In his publication, Reinhardt states that the youngest archaeological finds at the bottom of the plaggen layer date from the 12th and 13th centuries AD, indicating a much younger introduction date of plaggen manuring.

Conclusions

My conclusion is that investigations made by Behre do not prove a 10th century origin of plaggen soils in Dunum. They only prove that there was a rapid rise in the cultivation of

arable crops (winter rye as well as summer cereals) around the Hilleges Moor after the 10th century AD. A post 10th century reclamation phase of the open fields around the kettle hole seems a more likely explanation. Plaggen manuring in Dunum possibly dates only from the 12th or 13th century.

Methodologically, it is very difficult to use pollen analysis for dating plaggen manuring, although palaeoecological research can offer useful ideas on reclamation history and crop cultivation in the past.

Archaeological dating

Methods

Archaeological finds in and beneath the plaggen layer can reveal much about the development of plaggen soils. Three different types of archaeological dating (A, B, C) can be distinguished (Figure 3), which all have their own significance.

- A Firstly, the distribution of sherds in the plaggen layer can be investigated. The plaggen soil is sieved in slices of 10 cm. Having dated the sherds the results are entered into a frequency diagram. This diagram offers useful insight into the development of the plaggen soil.
- B Secondly, undisturbed archaeological finds which have been found in plaggen layers and buildings that were built on plaggen soils give us a *terminus ante quem* for the origin of the plaggen layer. The formation of the plaggen layer must have been started before the period from which either the finds or the buildings date.
- C Thirdly, one can study undisturbed archaeological finds beneath plaggen layers. At many locations in Germany and the Netherlands archaeologists have excavated settlements and cemeteries that were covered by plaggen layers. As the plaggen layer was built up after the period in which the underlying settlement or cemetery was in use, we get a *terminus post quem* for the origin of the plaggen layer at that particular place.

Results and discussion

Method A was used by Bakels in a study of three plaggen soils in Southern Netherlands (33). She concluded a 10th to 11th century origin of these soils. Heidinga mentions the occurrence of 14th century sherds in the bottom plaggen layer of Horst (Central Netherlands) (34). The deepest plaggen layer of Dunum contains 12th to 13th century sherds (35). For the Dutch province of Drenthe, Waterbolk mentions that the oldest sherds in plaggen layers date from the High or even Late Middle Ages (36).

These results seem to indicate a high or late mediaeval origin of plaggen manuring, although it is difficult to distinguish sherds that are ploughed up from the buried soil profile from those which belong to the applied plaggen sods. It is clear that we need to be careful in interpreting the results obtained with method A. A statistical approach based on large numbers of sherds may however lead to reliable results.

The only published result obtained with method B ("*ante quem* dating") comes from the German cemetery at Krefeld-Gellep (37). A 4th century urn was found in the centre of a 60 cm thick anthropogenic layer. This figure would suggest an origin of plaggen manuring in Roman times or even earlier. I wonder whether that soil profile was in fact a plaggen soil. A black anthropogenic soil is not necessarily a plaggen-formed soil.

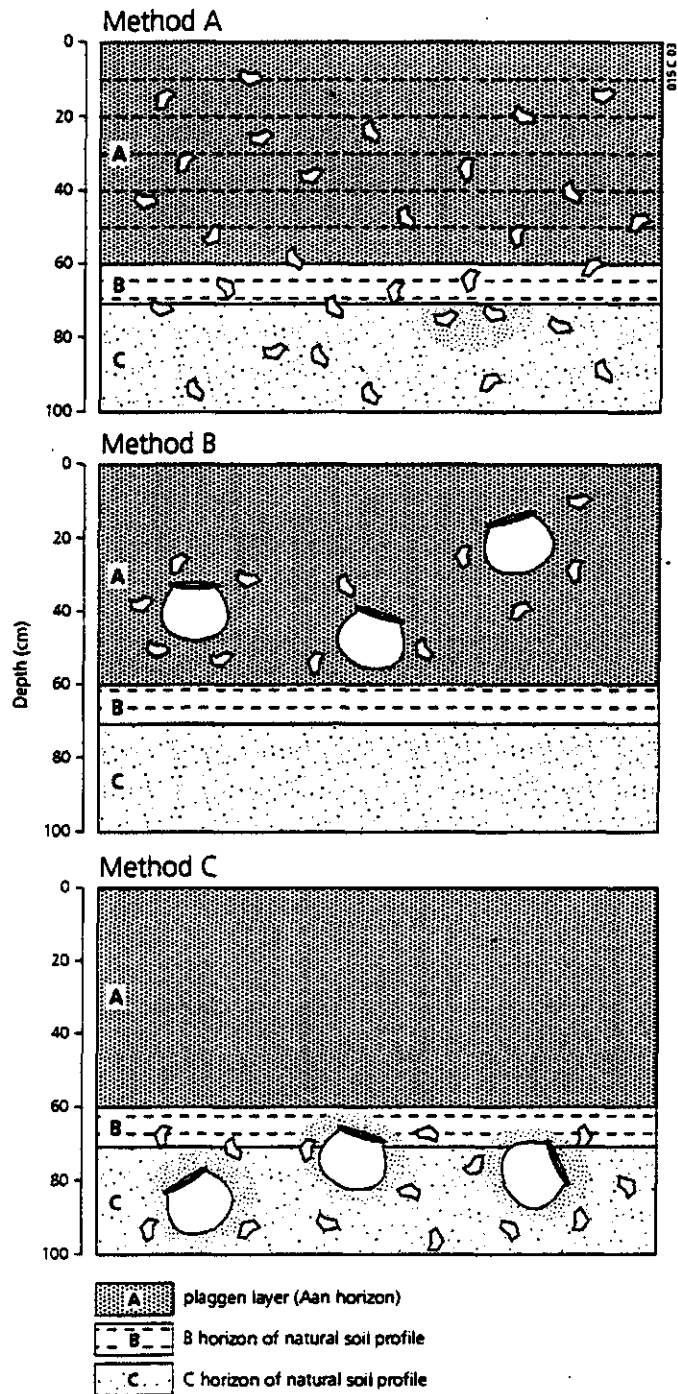


Fig. 3 : Three methods of dating plaggen soils by the location of archaeological finds.

Method A: The distribution of sherds in the various plaggen layers gives an indication of the dating sequence of these plaggen layers

Method B: Undisturbed archaeological finds that are put in or on the plaggen layer give a *terminus ante quem* for the age of the plaggen layer at that particular place

Method C: Archaeological finds underneath the plaggen layer give a *terminus post quem* for the age of plaggen manuring at that particular place

Table 1. Review of archaeological findings covered by plaggen layers

<u>Location</u>	<u>Region</u>	<u>Country</u>	<u>Archaeological finds</u>	<u>Dating/Reference</u>
Gristede	Ammerland	Germany	settlement	Zoller, 1972
Wijster	Drenthe	Netherlands	settlement	Van Es, 1967
Eursinge	Drenthe	Netherlands	settlement	Waterbolk, 1982
Sleen	Drenthe	Netherlands	settlement	Bruyn et al., 1965
Drantum	Cloppenburg	Germany	cemetery	Zoller, 1965
Odoorn	Drenthe	Netherlands	settlement	Waterbolk, 1973a
Dunum	Ostfriesland	Germany	cemetery	Schmid, 1970
Various places	Münsterland	Germany	sherds	Niemeier, 1959
Kootwijk	Gelderland	Netherlands	settlement	Heidinga, 1987
Schortens	?	Germany	cemetery	Rötting, 1974
Gasselte	Drenthe	Netherlands	settlement	Waterbolk, 1979
Pesse	Drenthe	Netherlands	settlement	Harsema, 1984
Baalder	Overijssel	Netherlands	settlement	Verlinde, 1983
Colmschate	Overijssel	Netherlands	settlement	Schotten, 1991
Ermelo-Horst	Gelderland	Netherlands	settlement	Heidinga, 1987
Hulsel	Noord-Brabant	Netherlands	settlement	Theuws, 1988
Bladel	Noord-Brabant	Netherlands	settlement	Theuws, 1988
Olland	Noord-Brabant	Netherlands	settlement	Heesters, 1976
Peelo	Drenthe	Netherlands	settlement	Bardet et al., 1983
Goirle	Noord-Brabant	Netherlands	wells	Theuws, 1988
St.Oedenrode	Noord-Brabant	Netherlands	settlement	Heesters, 1973
Dommelen	Noord-Brabant	Netherlands	settlement	Theuws, 1988

The majority of archaeological datings of plaggen soils were obtained by Method C ("*post quem* dating") (38). The results of about twenty excavations beneath plaggen layers are presented in Table 1. If we overlook the various datings it is surprising that the majority of these *terminus post quem* datings are from the 12th and 13th centuries. Especially in the south of the Netherlands complete settlement patterns have been buried under plaggen layers, which means that the layers at that particular place were formed after the 12th or 13th century. This suggests a late mediaeval origin of plaggen manuring, a concept which differs considerably from previous ideas (39).

The only serious criticism on this kind of *post quem* dating is the possible occurrence of older plaggen soils outside the archaeological sites. The excavated early and high mediaeval villages certainly had arable land and it is likely that these are not included in the excavation. Up to now thorough investigations of mediaeval arable land are lacking, so it is not quite certain whether these fields were manured with plaggen dung or not and could be cultivated in for instance an infield-outfield system. From this point of view plaggen manuring might be older, although there seems to be no doubt about the widespread use of plaggen manuring from the 13th century onwards.

Conclusions

According to various archaeological datings the widespread use of plaggen manuring occurred during the High and Late Middle Ages. It is possible that some parts of the arable fields were manured with plaggen before this period, but large-scale application seems relatively young. As only the Southern Netherlands contains enough archaeological data for definitive conclusions, it is not clear how old plaggen manuring is in other parts of Northwest Europe. The limited results available in other regions also indicate a younger age than the early mediaeval origin of plaggen manuring that was formerly accepted.

Towards a historical model for the development of plaggen soils

Introduction

Having evaluated the different dating methods for plaggen soils it would be desirable to construct a model on the development of plaggen soils (Figure 4). When making such a model we should emphasize the differences between central, semi-peripheral and peripheral areas. In my model I assume a phased introduction of intensive plaggen manuring. I believe that widespread application of plaggen manuring in those areas close to mediaeval economic centres (especially Flanders) took place much earlier than it did in the peripheral areas, where a much more extensive agricultural system remained until the reallocation of the economic centre to the northern part of the Netherlands in the 16th and 17th centuries.

The differences in the thickness of the plaggen layers between centre, semi-periphery and periphery (40) can also be explained by assuming a phased introduction of plaggen manuring and differences in the speed of development.

The introduction of plaggen manuring in central and semi-peripheral areas

Various Belgian studies on the agricultural history of rural Flanders during the Middle Ages have illustrated that the 13th century was a period of great demographic, agricultural and geographical change (41). These changes in the economic centre have surely had their effect on economic changes in the semi-peripheral areas. Theuws justifies the introduction of

the widespread application of plaggen manure in the province of North Brabant (Southern Netherlands) by an economic transition from arable production to sheep breeding (42). These agricultural reformations were stimulated by the increasing demand for wool by the Flemish textile industry in that period. The new farming methods required extensive adaptations of the old cultural landscape, which explains the replacement of settlements and the creation of many new field patterns. The old settlement locations were turned into arable fields and successively buried by plaggen layers. Although this theory is based on very few historical sources and the economic backgrounds are still presented too simply, it seems to be a useful and conceivably way of explaining the origin of the intensive plaggen manuring system in the Southern Netherlands.

The introduction of plaggen manuring in peripheral areas

The widespread application of plaggen manuring in more peripheral areas such as the Central and Northern Netherlands and Northern Germany probably dates back to an even younger period. Bieleman suggests that the widespread application of plaggen manuring in the province of Drenthe (Northern Netherlands) did not take place before the 16th or 17th century (43). Before this, plaggen manuring certainly existed (44), but was probably only deployed on an intensively used small part of the arable field in the immediate vicinity of the village, the so-called infield. The arable soils of the much larger outfield were used in an extensive fallow system during the High and Late Middle Ages. From the second half of the 16th century this outfield became more and more part of the intensively used arable land. Plaggen manuring was extended to the total arable area. The former difference between the intensively used infield and extensively used outfield disappeared more and more.

As a result, it is likely that a significant part of the plaggen layers of these peripheral areas were formed after the Middle Ages and can be connected with the reallocation of the economic world centre from Flanders to towns in the north of the Netherlands, especially Amsterdam. Intensification of plaggen manuring and therefore the increase in the development speed of plaggen layers should be seen in close connection with the rise in animal husbandry in these peripheral areas during the 16th and 17th centuries.

A non-linear model

In the Netherlands, Germany and Denmark various 18th and 19th century reclamations have plaggen layers of 40 to 80 cm thick (45). Together with the above-mentioned relation with population growth and agricultural intensification this clearly indicates that the main part of the plaggen layers was formed during the last few centuries. As a result, in our model (Figure 4) we have constructed a non-linear curve for the development speed of plaggen layers. Plaggen soil formation accelerated from the 16th century onwards.

Figure 4 gives only a very rough model. A more thorough examination of agricultural processes in different parts of Northwestern Europe will lead to a more precise geographical and chronological model.

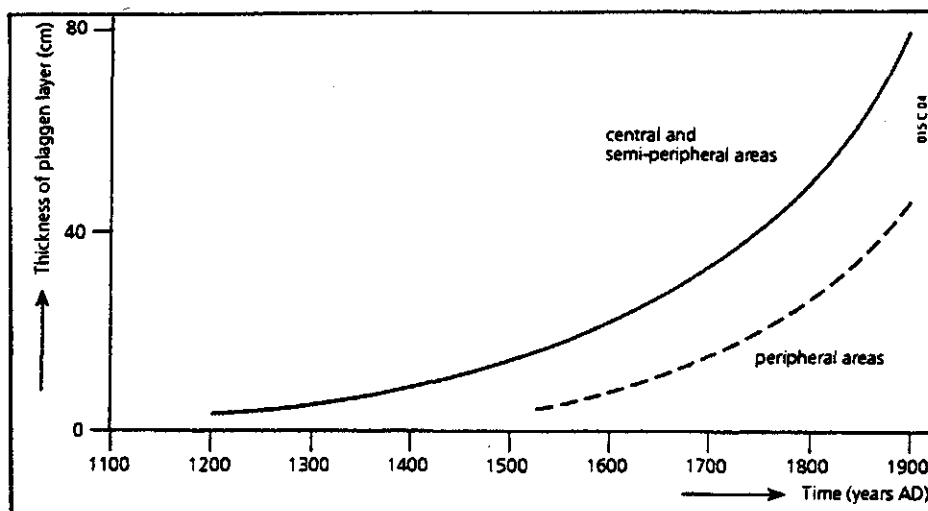


Fig. 4: Model for the development of plaggen soils.

Conclusions

- The substantial variation in the datings of plaggen layers can partly be explained by real spatial and chronological variation in introduction time and partly by serious methodological and interpretational errors.
- The plaggen manuring system should not be considered to be the oldest and only exploitation-form of open field reclamations on the sandy soils of the Netherlands and Germany.
- Because many scientists intermingle mediaeval reclamations of open fields and the way of its exploitation, many datings of plaggen layers are in fact datings of reclamation time.
- Radiocarbon dating of plaggen soils does not give reliable results because of the uncertain origin of the sample, the vertical mixing of soil material and because of interpretation problems of radiocarbon datings on humus samples.
- The 10th-century datings of plaggen manuring obtained with pollen analysis by Behre is unreliable, because of serious methodological and interpretational problems.
- Dating of plaggen manuring by archaeological finds in and beneath plaggen layers leads to the most reliable results.
- These results indicate at a late mediaeval origin of plaggen manuring in the south of the Netherlands. This differs considerably from previous points of view. The widespread application of plaggen in other sandy areas might be even later, namely the 16th or 17th century.
- Differences between the average thickness of plaggen layers between the various sandy areas of Northwestern Europe can be explained by a phased introduction of large-scale plaggen manuring.
- The main part of plaggen layers does not date from the Middle Ages, but from postmediaeval times.

Notes

- (1) These open arable fields are known in Dutch literature as *essen, engen, akkers, velden* or *kouters* and in German literature as *Esschen*.
- (2) In 1970 Pape published a distribution map of *plaggen* soils in the sandy landscapes of Northwestern Europe. Investigations by Corny (1971) and Eckelmann (1980) indicated that *plaggen* soils also occur in the coastal areas of Ireland, England and Scotland and on the loamy soils of Central Germany, including the former DDR.
- (3) Fastabend & Von Raupach, 1962; Mückenhausen et al., 1968; Behre, 1976.
- (4) Zoller, 1969; 1972; Schmid, 1970; Bardet et al., 1983, Kortlang, 1987; Theuws, 1988; 1989.
- (5) After Staring (1860) the raising speed of the *plaggen* layer was assumed to be 1 or 1.5 mm/yr. Niemeier (1939) as well as Oosting (1940) mentioned the risks of this approach, but they used this method to obtain a first impression of the age of the man-made layer.
- (6) Steeger, 1939; Niemeier, 1939; Oosting, 1940.
- (7) Ehrenberg (1942) mentioned a dating of 2000 to 1000 BC for *plaggen* soils in Northern Germany. *Plaggen* soils on the North Frisian island of Föhr originate from the last centuries BC according to Johannsen & Stremme (1954). The earliest radiocarbon dating of Niemeier (1959) in the German Hümmling-area dated from the fourth century BC. According to Van der Hammen (1965) the origin of a *plaggen* soil in Denekamp (Eastern Netherlands) would date from 500 BC to 100 AD. Wortman (1971) described a *plaggen* soil in Fortheim (Westfalen) that had a radiocarbon age of 2900 -75 BP and Kroll (1975) had reliable indications of *plaggen* manuring on the Isle of Sylt in Roman times.
- (8) Niemeier, 1959; Fastabend & Von Raupach, 1962; Mückenhausen et al., 1968; Heinemann, 1973.
- (9) Niemeier, 1972.
- (10) Behre, 1976; 1980.
- (11) Kramm, 1978.
- (12) Heidinga, 1987; 1988.
- (13) Bieleman, 1987; Theuws, 1989; 1990.
- (14) Niemeier & Taschenmacher, 1939; Fastabend & Von Raupach, 1961; Pape, 1972; Maes, 1976; Eckelmann, 1980; Spek, 1988.
- (15) Bieleman, 1989.
- (16) For a theoretical framework on these aspects see Wallerstein, 1974; 1980; 1987; Yi-Fu Tuan, 1978; Nitz, 1989; Estaville, 1991.
- (17) Niemeier, 1972.
- (18) Bieleman, 1987; 1990.
- (19) The German word *Plaggenesch* is a striking example of this intermingling of conceptions.
- (20) Niemeier, 1959; Fastabend & Von Raupach, 1962; Van der Hammen, 1965; Mückenhausen et al., 1968; Pape, 1972; Niemeier, 1972; Heinemann, 1973; Maes, 1976; Spek, in prep.
- (21) For this purpose we used a computer programme from the University of Groningen (Van der Plicht & Mook, 1990).
- (22) It is important to realize that each radiocarbon dating has a certain standard deviation (e.g. 1295 BP -60) which after calibration to real calendar-age does not result in one clear age, but in probability range, which can stretch over one or two ages.
- (23) Mückenhausen et al., 1968; Niemeier, 1972.

- (24) Van der Hammen & Bakker, 1971.
- (25) Mückenhausen et al., 1968.
- (26) Duchauffour, 1982; Stevenson, 1985.
- (27) Goh & Molloy, 1978; Van Mourik et al., 1988; Castel, 1991.
- (28) Behre, 1976; 1980.
- (29) Behre (1976) mentioned for Dunum a dating of 940 -60 AD; Kramm (1978) mentioned for the Vinter Moor a dating of 955 -60 BP and for the Speller Dose 1030 -45 BP.
- (30) Eland & Pals, 1985; Van Mourik, 1987; 1988; Heidinga, 1987; 1988; Lienemann, 1989; Castel et al., 1989.
- (31) Van Zeist, 1970; Isenberg, 1979; Van Zeist & Palfenier-Vegter, 1979; Van Vilsteren, 1985; Van Zeist et al., 1986; Pals, 1987; Groenman-Van Waateringe & Van Wijngaarden-Bakker, 1990.
- (32) Reinhardt, 1967.
- (33) Bakels, 1988.
- (34) Heidinga, 1987.
- (35) Reinhardt, 1967.
- (36) Waterbolk, 1973b.
- (37) Pirling, 1966 (cited by Niemeier, 1972).
- (38) Niemeier, 1959; Van Es, 1965; Bruyn et al., 1967; Schmid, 1970; Zoller, 1963; 1972; Waterbolk, 1973a; 1979; Heesters, 1973; 1976; Rötting, 1974; Verlinde, 1983; Bardet et al., 1983; Harsema, 1984; Heidinga, 1987; Theuws, 1988; Schotten, 1990.
- (39) This idea was first mentioned by the Dutch archaeologist Theuws (Theuws, 1989).
- (40) The plaggen layers in Flanders and the Dutch province of North-Brabant (centre and semi-periphery) have a mean thickness of the plaggen layer of 70 - 100 cm, whereas the plaggen layers in the more peripheric areas of the Veluwe and Drenthe are 60 - 80 cm, respectively 40 - 50 cm thick (Pape, 1970; Maes, 1976).
- (41) For a review of the immense amount of references see Verhulst, 1982; 1989; Thoen, 1988.
- (42) Theuws, 1988; 1990.
- (43) Bieleman, 1987; 1989.
- (44) There are various written sources about 15th century plaggen digging in the common wastelands of Drenthe.
- (45) Marsman, 1968; Eckelmann, 1980; Dalsgaard et al., 1991.

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The merovingian cemetery of Vicq (Yvelines, France) in a regional setting

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Abstract

Near a small village in the western part of the Paris agglomeration a large merovingian cemetery has been unearthed. This paper tries to answer the question "why was this huge cemetery situated there?". It studies its place in the settlement-system and shows that the settlement associated with this cemetery must have been a regional centre of some kind. Some methodological problems relating to the reconstruction of merovingian settlement patterns are also discussed.

Keywords: merovingian, cemetery, settlement-system, France

Introduction

The present-day village of Vicq lies in the western part of the Paris agglomeration, thirty-eight kilometres from the church of Notre-Dame (fig. 1) (1). Its "commune" covers 443 ha and contains about two hundred fifty inhabitants. Vicq is mentioned for the first time in the beginning of the 12th century, when it is named as "Vi" in a number of charters from the abbey of Saint-Père at Chartres (2). In a parish-list of the diocese of Chartres, dating from the third quarter of the 13th century, Vicq possesses eighty-six parishioners (3). In tax-rolls dressed in 1711 Vicq contains forty hearths (4).

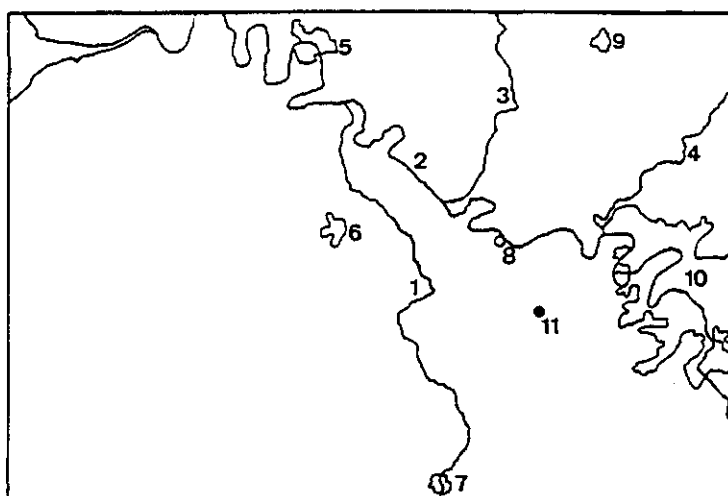


Fig. 1: The situation of Vicq. 1: Eure-river; 2: Seine-river; 3: Epte-river (border of Normandy); 4: Oise-river; 5: Rouen; 6: Evreux; 7: Chartres; 8: Mantes; 9: Beauvais; 10: Paris-agglomeration; 11: Vicq. In the north-west corner a part of the sea is visible.

Vicq lies in the northern part of the valley of the stream the Lieutel. This stream flows eastwards into the Mauldre, who flows northwards into the Seine. There are heights to its north, covered with fertile loess-soils, and a flatter, lower lying area to the south. Its church, dedicated to Saint Martin, lies on the northern boundary of the village, with the actual graveyard immediately north of the churchbuilding.

The merovingian cemetery of Vicq

Since the end of the 18th century at least the existence of a large merovingian cemetery in the region of the actual graveyard, but especially to its north is known. The first documented excavations here took place in the middle of the 19th century (5). Although the total area that was excavated remained rather small, by the 1970s it was recognized that there existed an enormous merovingian cemetery at this site. The construction of a number of houses to the north of the actual graveyard therefore led to a rescue excavation, undertaken between 1976 and 1981 by a team of volunteers under the direction of Edmond Servat. Although a number of graves had to be sacrificed due to the construction-work about 2000 graves could be documented. This represents only a part of the site: no boundaries have been reached (6).

The merovingian cemetery of Vicq lies on a slope exposed to the south, between a plateau covered with loess and the swampy valley of the Lieutel. Its subsoil is composed of chalk. This situation is characteristic for merovingian cemeteries in the northern part of Gaul (7). In the cemetery itself four types of inhumations have been unearthed: about one hundred sarcophagi made of stone, about three hundred sarcophagi made of plaster and some sixteen-hundred-seventy graves dug out in the earth, a number of which contained constructions of wood. Because the wood itself has disappeared their exact number must remain unknown. No evidence for cremation burials has been found on this site.

As in other merovingian cemeteries, the burial-rite in Vicq proscribed that the deceased was buried in his or her traditional costume. Although textiles rarely survive accessories such as weapons, belt-buckles, brooches or pins have been found in large quantities. Archaeologists have invested a large body of research into the dating of these accessories, and most of these objects can be dated within one generation. A substantial number of food-offerings contained in earthen vessels has also been found in the tombs of Vicq, but in general pottery is more difficult to date because of its more limited distribution (8).

Some ninety percent of these burials have been violated, mostly in the period of utilisation of the cemetery (9). Violation can therefore be interpreted as a systematic undertaking on this site. Sarcophagi are usually violated completely, whilst tombs dug out in the earth have only been disturbed in the upper part. Therefore a substantial number of tombs still can be dated by the objects that have been found in them. This gives us an opportunity to study the plan of the cemetery (fig. 2) in some detail.

As is the case with all published plans in archaeology this plan does not depict an historical reality. It only gives the final stage of a couple of centuries of deposition in the area that has been mapped. It represents a completely different reality than a plan of, say, a present-day cemetery would show: the mapped features never existed side-by-side. Using the distributions of dated objects in the cemetery we can study the way this deposition process took place. A large number of tombs cannot be dated because of a lack of finds in them. Therefore we can only give an outline of this process.

In fig. 3 the distributions of belt-buckles and brooches that can be dated to the 6th century are depicted. One can discern a development from a core area outwards. 7th Century finds (not shown in fig. 3), on the other hand, are found in this same area. It can therefore be supposed that the users of this cemetery for one reason or another decided not to enlarge the

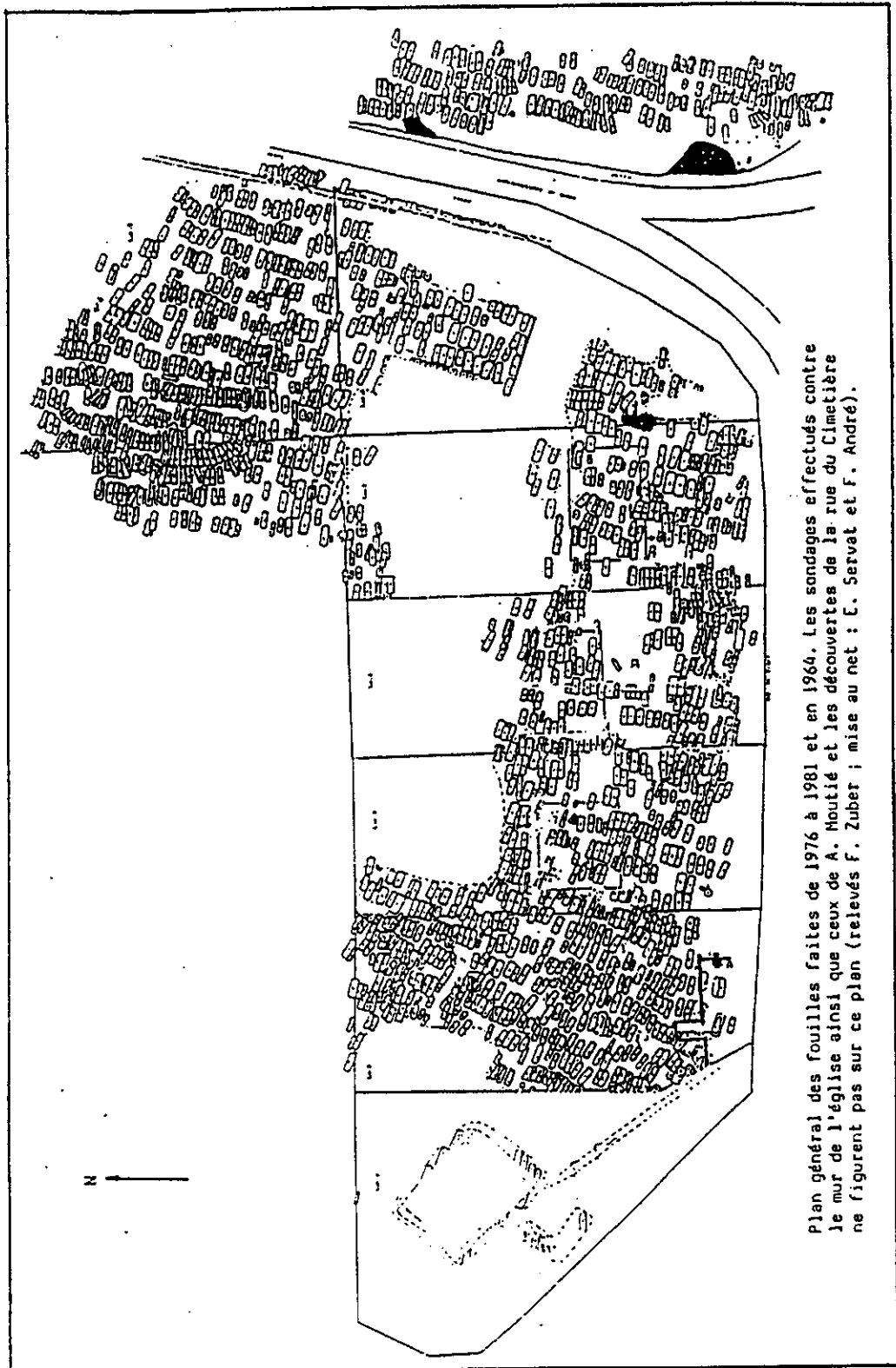


Fig. 2: Plan of the cemetery of Vicq (Servat, 1984, 20-21).

area already in use, but to reuse it. This implies the existence of a kind of boundary that has not been reached as yet by the excavations.

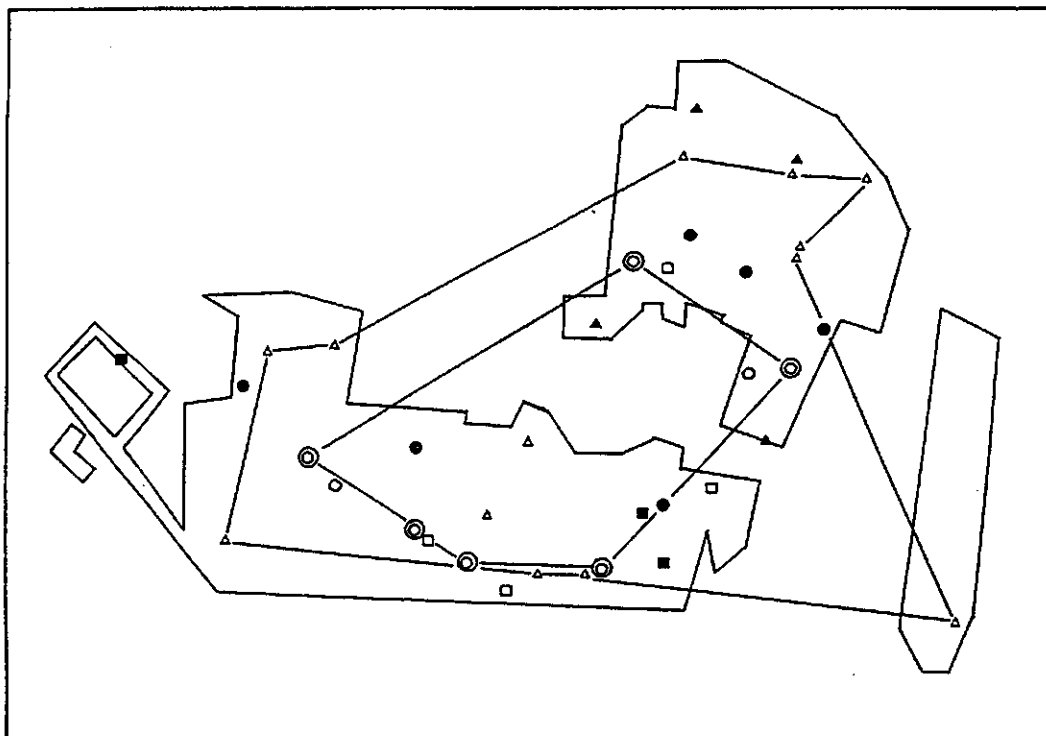


Fig. 3: Distribution of some finds of the end of the Vth and the VIth century in the cemetery. Open rounds: samian ware of Argonne-type (after Gaborieau 1984); dark rounds: late-roman materials (that have been re-used), double rounds: finds of the end of the Vth century; black squares: finds of the beginning of the VIth century; open squares: finds from the first half of the VIth century; open triangles: finds of the second half of the VIth century; dark triangles: finds the end of the VIth century. Bird-brooches have not been depicted in this figure.

One implication of the above mentioned problems is that it is impossible to state the number of tombs used in a certain time-span. This hampers essays to calculate the number of users of this cemetery. Only the total number of tombs and the complete period during which the cemetery was operated can be used. Given the uncertainties concerning the total number of graves (that may have been up to 4000) these calculations have to stay very rough. But one might advance a number between 450 and 900 for the community of people that used this cemetery (10). This is a very considerable number, and leads more or less automatically to the question "why is there such a huge cemetery at Vicq in the merovingian period?". This question shall be discussed in the rest of this paper.

An explanation for its size

Our first observation must be the complete absence of finds from the roman period in Vicq. Some fragments of decorated stone have been reused in stone coffins, but their origin should be sought in the roman township of *Diodurum* that will be discussed later. The nearest site from which roman finds are known is situated more than a kilometer to the south-west, on the other end of the swampy valley of the Pontoux brook that leads into the Lieutel. It lies

in the actual municipality of Méré. During the construction of an oil-pipeline traces of ditches and some sherds from the first and second century AD have been found here (11). This site should probably be interpreted as a farm, and need not have any connection with the later merovingian cemetery. Vicq seems to have been a new creation from the end of the Vth century.

This is the period during which the northern part of Gaul was overtaken by Franks, some of whom stood under the direction of Clovis. In the cemetery of Vicq an important number of arms has been found, mostly throwing-axes ("*francisques*"). Their existence could lead to the conclusion that a band of warriors was implanted here (12). But this can only reflect an aspect of some of the people who were buried there. Not everybody was necessarily a warrior, or just a warrior, and their warrior-outlook need not have any connection with their implantation at Vicq.

What has been the role of this site in the centuries at least 400 people used this cemetery? No settlement-traces from the merovingian period have been found in the vicinity of Vicq. Therefore it was decided to widen our research to include a larger area and to study the early-medieval population in this region.

A regional perspective

To delimit this area we looked for natural boundaries. To the north the Seine river was chosen, as was the Vaucouleurs to the west. In the east the Mauldre river was situated too close to Vicq, so we drew an arbitrary line some five kilometers east of this river. As southern border we used the wood of the Yvelines as described in a charter of 768 (13). For convenience present-day municipality-boundaries were used. This gives us a territory between the "communes" of Mantes-la-Ville, Verneuil-sur-Seine, Coignières and Gambais, totalling seventy-four municipalities and 56.367 hectares.

Geologically this region is a part of the Paris Basin. The subsoil is composed of tertiary deposits on a bed of chalk. This gives a regular alternation of harder and softer layers. The regularity has been breached by tectonical incidents, mostly aligned northwest-southeast. In these faults a hydrological system has developed, cutting the tertiary layers. This leads to a landscape composed of northwest-southeast stretching platforms cut by rivers and small streams. On these platforms the wind has deposited loess, thus providing very fertile soils (14).

In this landscape man has constructed an infrastructure. We assume that the rivers as well as the roman roads that existed continued to be used in the merovingian period (15). When one studies these rivers and roads (fig. 4) it becomes clear that when roads and rivers meet one finds an important site: a village with usually a gallic name, that can in theory be dated before the roman invasion in Gaul, with roman finds in it and with a merovingian cemetery nearby. The only exception is the south-east: nothing is known from one crossing, Vicq is not directly associated to a crossing, and near another crossing lies the early roman township of *Diodurum* (mun. of Jouars-Ponchartrain), already mentioned in the *Itinerarium Antonini*. This township seems not to have survived the troubles of the late 3d century, although some later finds are present (16).

Thus the infrastructural framework of this region, dating at least from the roman occupation, has survived more or less intact into the merovingian period. It is possible that Vicq has overtaken some of the functions previously situated at the site of *Diodurum*. Now it is time to look into the early-medieval population of this region in some more detail.

In order to study this population we have used four types of information that can indicate where people lived in the merovingian period. These are: sites mentioned in historical documents from the period, placenames that can be assigned to name-types that date from this

period, patron-saints of churches that can indicate a dedication of that church in the period concerned, and archaeological findspots with early-medieval finds. All these types of information bring with them their specific problems and uncertainties. Therefore it is their combination that will be used to study early-medieval population in our region (17).

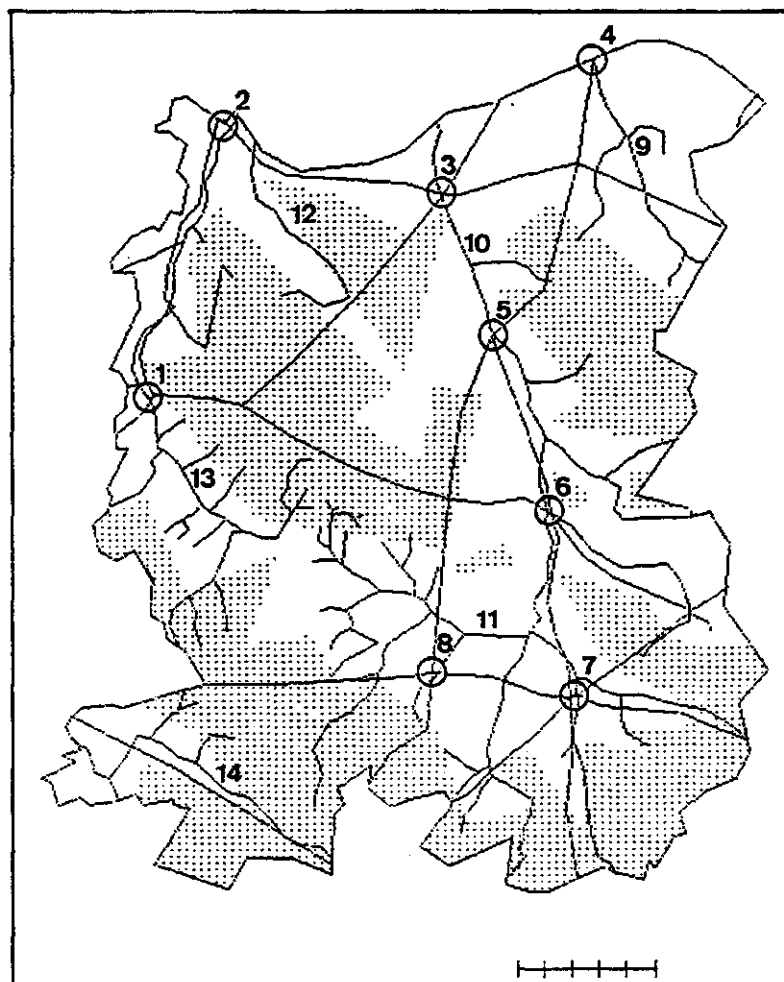


Fig. 4: Rivers and roman roads in the working-area. 1: Septeuil; 2: Mantes-la-ville; 3: Epône; 4: les Mureaux; 5: Maule; 6: Beynes; 7: DIODVRVM; 8: inconnu, near Méré; 9: Orgeval-stream; 10: the Mauldre; 11: the Lieutel (Vicq lies at this spot); 12: the Senneville-stream; 13: the Vaucouleurs; 14: a part of the Eure stream-system. The 120m contour line has been indicated.

Only eight sites are mentioned before 800, three of which are used to delimit the Yvelines-wood. When we take into account that *Diodurum* only features in the *Ininerarium Antonini* and therefore cannot be considered a mention in the merovingian period, whilst Plaisir is only known as a monastery (18), this does not give us a large body of information at all (19). This number augments considerably when we add places mentioned in the *Polyptichon* of St. Germain des Prés, also known as the *Polyptichon* of Irminon. This list of goods belonging to the Paris monastery can be dated shortly before 830 (20). But when we plot these sites it becomes clear that they are clustered around central places used by the

monastery. This distribution therefore only gives us insight into the economic organisation of the possessions of the monastery of St. Germain des Prés.

Our second body of information is derived from the study of place-names. We have tried to distinguish some name-types that possess a terminus-ante-quem somewhere near the period concerned. This also indicates the main problem with the use of place-names as a source for early-medieval population: one can never be one hundred percent sure that a placename of a type that might have originated in that period also indicates that a particular site was used at that time. Names can wander, names can change, an old name can be reused for a number of reasons, rural dialects may not be all that different from older languages but may continue to use the same denominations etc. But the global picture derived from the study of place-names need not be deceptive, although the value of individual sites can be criticized on various grounds.

We have used the following types of place-names, following the studies of M. Roblin (21): Gallic names, names with a latin component and names with a frankish/germanic component. They have been collected by using existing literature (22) and by studying modern maps. The Napoleonic cadastral maps have also been consulted in the departemental archives in Versailles. Before we present our results we will first discuss the different types of place-names used in some detail.

Gallic names can - in theory at least - originate before the roman occupation of Gaul. Their terminus-ante-quem must be found around the Xth century (23). In our region we have found twelve Gallic names, eleven of whom are situated in river valleys. It is possible that three field-names included in this list are of a much younger origin, but this hardly changes the over-all picture.

The second group is formed by names with a latin word followed by -euil or -y. They must date from the roman invasion onwards, with a terminus-ante-quem around the 10th century, when the latin transformed into old french (24). Especially the origin of the names on -y, interpreted as a shorter form of -iacum, is rather controversial. A lot of these names seem to have been derived from old french words ending on -y, and not from words ending on -iacum. We have retained twelve names on -y and six on -euil. Their distributions are also linked to the rivers and streams, but less strict than the gallic names mentioned above.

Three names seem to have been derived from latin words and have therefore the same chronology as those on -y and -euil. One of them is Vicq, derived from the word "*vicus*", indicating a place with some specialized function.

Then we arrive at the names composed of a name with a latin suffix -ville, -villiers, -court, -mont, -val or -cella. When they are composed with a name of a person we can usually recognize a germanic name. Also the sequence (name - "ville") is different from modern french ("ville" - name). Therefore these names can be dated between the VIth (general adoption of germanic names in Gaul) and the Xth century (25). It must be noted that not all of these names need to indicate places where people actually lived: -mont and -val mean mountain and valley. In total we have traced seventy of these names in our region. Some of these names mentioned in the Polyptichon of St. Germain der Prés cannot be placed, so that the actual number of places with these names was higher. Their distribution differs from the former groups: they are concentrated more on the higher parts, and are more or less absent in the central part of the region. This could be interpreted as a colonisation of these regions from the rivervalleys, but one has to be very carefull because of the large overlapping time-span of the use of these name-types.

Now we turn our attention to the patron-saints of the churches in our region. The biography of the patron-saint (26) gives information about the earliest date that his name might have been used. His death gives a terminus-post-quem for the dedication of "his" church. A terminus-ante-quem is usually not available, leaving a large margin for error. By far the most

widespread dedication is to Saint Martin. This dedication has been used from the beginning of the merovingian era up until the 11th century (27). "*Sainte Croix*" has even been used from the VIth century to the present (28). And the existence of a church need not indicate the existence of an inhabited site. In the diocese of Auxerre the places of worship seemed to be rather isolated and removed from the villages in the merovingian era (29).

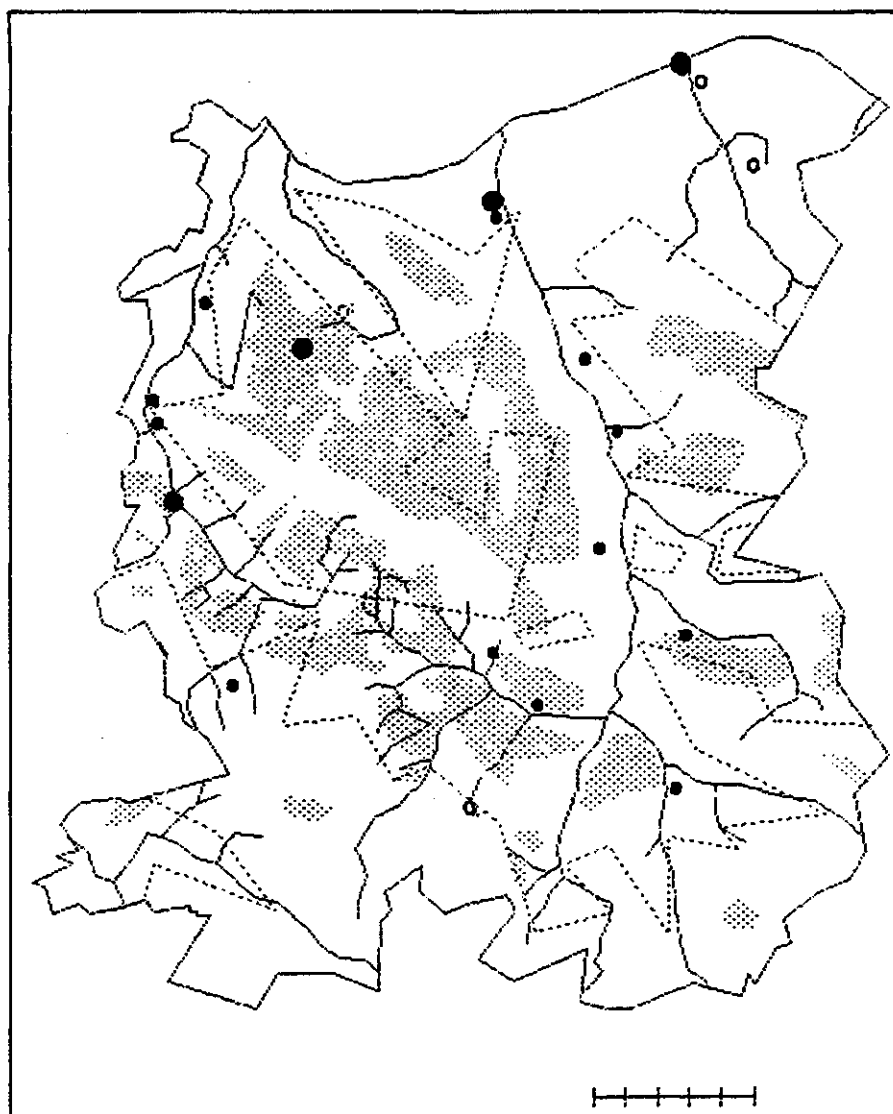


Fig. 5: Archaeological finds from the Early Middle Ages in the working area. Large dark rounds: settlement-sites; small dark rounds: cemeteries; small open circles: cemeteries whose position is not very well known. The 120m contour line, as well as the loess-soils are indicated.

We have traced sixty-nine churches whose dedication may have taken place in merovingian times. Forty-nine of them may be as old as the 5th century. Their distribution is remarkably even, covering most of the region. With one exception they do not stand on the more fertile loess-soils, but are next to these grounds. One can also discern some rows of old churches that seem to indicate the existence of roads.

Our last source are the archaeological findspots dating from the merovingian period. As can be seen on their distribution-map (fig. 5) not many of them are known (30). The alignment of merovingian cemeteries along the rivers Mauldre and Vaucouleurs is remarkable.

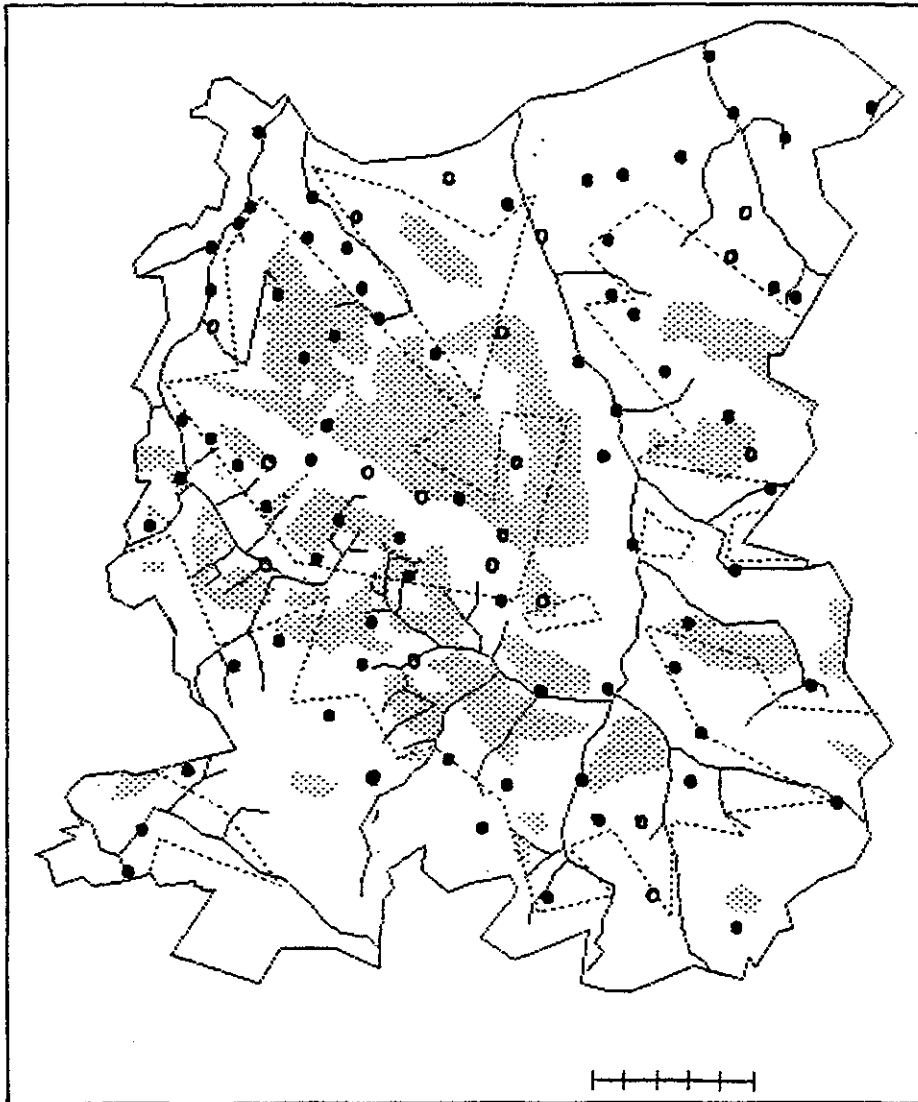


Fig. 6: Population-indicators for the Early Middle Ages in our region. Open rounds: doubtful cases. The 120m contour line and the loess-soil are indicated.

We have seen that the four kinds of information used in this paper do not give by themselves enough information to study the early-medieval population of our region. We have to combine all these data in order to extract a maximum of information from them. We decided to design a scale to be able to judge the value of the evidence for early-medieval habitation one site at a time. The scale is composed of three categories: accepted, doubtful and rejected. Every site mentioned in one of our four surveys was put to this test. A site is classified as doubtful when it only contains an old place-name or only an old patron-saint, or when it was only mentioned in the Polyptichon of St. Germain des Prés. Rejected were sites with only a name on -y, the name "Folleville" (31), single names on -mont and -val (indicating natural spots), and names that indicated habitation in their vicinity without further

evidence (32). And sometimes additional evidence has tipped the balance one way or another.

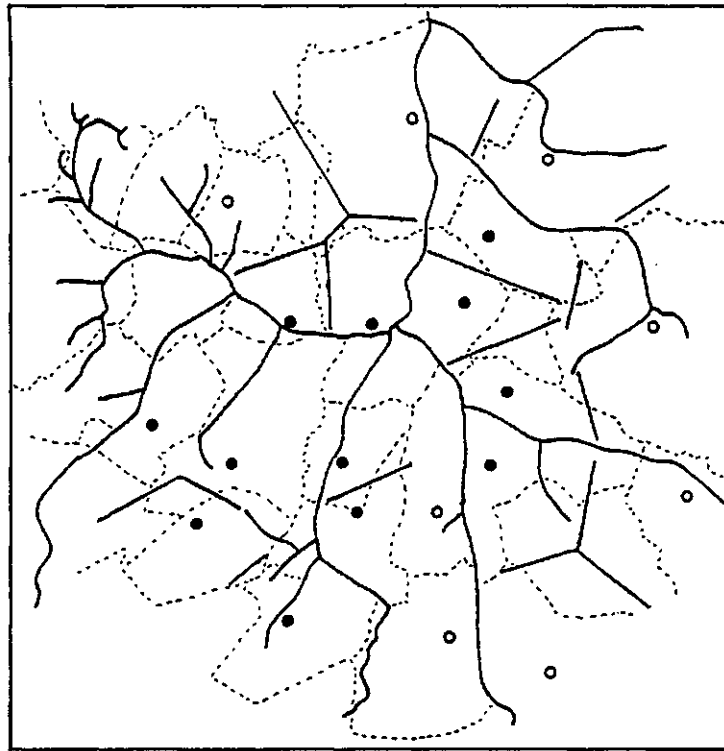


Fig. 7: Reconstructed village-territories for Early Medieval sites in the region to the southwest of Vicq. Present-day commune-boundaries are shown as well.

This approach gives us seventy-one sites, with an additional twenty doubtful sites (fig. 6). They are almost always situated near a river or a stream in a valley. Three parts are more densely occupied: one situated in the northwest near the river Vaucouleurs, one around the village Maule near the valleys of Seine and Mauldre, and one situated in the flatter, lower area in the southeast around Mareil-le-Guyon. They all have one central place, a "vicus" as a centre: Mantes, Maule (33) and Vicq. In our opinion they represent one level up into the regional hierarchy after the individual villages. They are centered around one place that forms a linkage to (a part of) the outer world. And this can explain why there is such a huge merovingian cemetery in Vicq (34): Vicq was not just a country village, but functioned as a central place for a region to its southeast.

Having a closer look at the regional unity to which Vicq belonged we made a reconstruction of village territory boundaries as they may have been in the Early Middle Ages (fig. 7). We used rivers, streams and brooks as natural boundaries. To complete our picture we used "Thyssen-polygons", a well-known exercise in regional archaeology (35). When we compare the result to the present-day municipalities one sees a remarkable coincidence between the two. It can therefore be argued that these "modern" territories do descend in a direct line from the Early Medieval village territories. Some of the sites that are contained in this region can only be dated with a terminus-ante-quem in the 10th century. Therefore we believe that the system will have been "completed" in the Carolingian rather than the Merovingian period. But its roots must stem from the Early Medieval rather than from the

Roman period. To what extent this conclusion is valid for other parts of Gaul needs to be seen by investigation.

Conclusion

In conclusion we have seen that the very large cemetery of Vicq can be linked to the existence of a site of more than local importance, perhaps a successor to the Roman borough of Diodurum. This site functioned as a regional centre of some sort of the territories lying to its south-east, in a stretch of low-lying land adjacent to the Yvelines-wood to its south. Two more of these regional entities could be traced to the north of Vicq.

Notes

- (1) This paper presents some results of research undertaken whilst studying at the Ecole des Hautes Etudes en Sciences Sociales in Paris under the direction of prof. J.-M. Pesez. The author would like to thank dr. P. Périn (Rouen) and E. Servat (Paris) for their continuous support.
- (2) Guérard 1840, 262, 264, 360, 511, 679.
- (3) Guérard 1840, CCCXIII-CCCXXVIII; Chédeville 1973, 67.
- (4) Dupâquier et al. 1974.
- (5) Moutié 1857; Servat 1986, 78.
- (6) The first reports on this site have been published by Servat (1984 and 1986). Work on the final publication is proceeding. Studies on the ceramics (Gaborieau 1984) and the first part of the human skeletons that have been preserved (Vatteoni 1988) have been undertaken.
- (7) Salin 1952, 13.
- (8) Périn 1980 is a very good introduction to these problems.
- (9) Although a mean value of thirty-nine percent of violated tombs has been calculated for the total of the merovingian kingdom (Roth 1978, 73) it must be stressed that this percentage varies considerably from site to site.
- (10) This calculation uses the number of graves, the life-span of the cemetery and the mean age of those that have been buried in the cemetery. This mean age at death has been calculated between 35 and 45 years, using studies on other contemporary cemeteries. The life-span of the cemetery has been set to two centuries: the oldest finds date from the end of the 5th century, and there are virtually no finds from the second half of the 7th century onwards. This is a general pattern in the region, because of the introduction of a different burial rite: the burial in a special burial-costume that does not contain any datable accessories. This new burial-rite seems to originate under the influence of christianity. But the distributions of 7th century materials in the cemetery seem to point to a cessation in the use of the excavated part not too far removed from this point in time.
- (11) Zuber 1970, 50-51.
- (12) Périn and Feffer 1987, 200-201.
- (13) MGH Dipl. Karol. I n 28; see also Chédeville 1973, 153.
- (14) This brief outline has been based on Soyer and Cailleux 1960 and on Pomerol 1974.
- (15) In the "*Polyptique de St. Germain des Prés*", dated in the beginning of the 9th century, the use of roman roads can be found. Some localities in our region had to transport goods for the monastery using carts (Devroey 1974, 573).

- (16) On this site: Christmann 1970; Petit 1975; Zuber 1986; Morin 1989; Morin 1990. It must be stressed that the actual archaeological research has so far been very limited. It is possible that this site contains a number of surprises for future researchers.
- (17) An excellent example of this approach can be found in the thorough study by Henderikx of the Lower-Rhine area in the Early Middle Ages: Henderikx 1986.
- (18) "*Placicio monasthyrio, ... in pago Pinciace*" in a charter of Charlemagne dated in 775 : MGH Dipl. Karol. I n 102.
- (19) Those remaining are: Epône, Maule, Binanville (comm. Arnouville-les-Mantes), Coignièrès, Montfort-l'Amaury and Villiers-le-Mahieu.
- (20) Longnon 1886. The most recent study on this important source is Elmshäuser and Hedwig 1989.
- (21) Roblin 1971 and 1978.
- (22) Claise 1962, Blottièrè 1965-68, Guizard 1974, Dauzat and Rostaing 1978, Morlet 1985, Ricolfis 1985.
- (23) Falc'hun 1982, 167; Roblin 1978, 83.
- (24) Baudot 1953,161; Roblin 1978, 124.
- (25) Roblin 1978, 84 and 132-137.
- (26) To be found in the volumes of the *Acta Sanctorum*.
- (27) Ewig 1979, 355-370.
- (28) Moulin 1976.
- (29) Gaudemet 1973, 8.
- (30) These data do not stem from systematical fieldwalking. But there are some very active archaeological groups in the region, and there has been a lot of aerial photography. The relative absence of early-medieval sites cannot be explained by a lack of research, but can only be interpreted as the expression of a contemporary phenomenon, such as a lack of recognizable materials or an overlap with modern build-up areas.
- (31) There are a great number of places wearing this name in France. It probably depicts a haunted place, and cannot be interpreted as a germanic name with suffix -ville.
- (32) Like indications on the map "the wood of ...", "the valley of ...", with no finds or other evidence informing us about the habitation indicated by this name.
- (33) "*Mantela vicus*" in the 6th century (Sirat 1978).
- (34) In Maule another big merovingian cemetery had be found: Sirat 1978.
- (35) For instance Heidinga 1987,160.

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Excursion to Gooiland (1)

Chr. de Bont, H.H.M. Meyer, W.H. Wimmers

Summary

During the Baarn conference an afternoon-tour took the participants to Gooiland and its surroundings. This paper is a partly rewritten version of the guidebook distributed at the time. It contains general information on the area as well as some details on the sites visited.

Introduction

This excursion serves as an introduction to one of the densely built-up regions in the Central Netherlands. Despite large-scale village expansion in the 19th and 20th centuries, the appearance of residential areas and the overwhelming amount of modern motorways, the area still contains plenty of relics of earlier human activity. Amid all this suburban violence there are still some nature reserves to be found, brought together in the Gooi Nature Reserve.

For the most part the excursion leads through the central part of Gooiland, but the surrounding areas, most of which have been cultivated systematically, will also get some attention. The cultural landscape as a source of information about the past is more difficult to *read* in Gooiland than in these peripheral areas. Consequently, during the excursion we now and then have to close our eyes for a while in order not to disturb certain historical images. Yet peeping through the eyelashes, past and present seem to have more affinity with one another than historical-geographers or planners often tend or want to believe.

In this paper we first present a brief geological, archaeological and historical-geographical introduction to the area. Especially the reclamations are dealt with. Next the route is described, allowing for some more detailed information on selected subjects.

Natural landscape

Gooiland is situated on the southwestern embranchment of a belt of ice-pushed ridges which were formed in the last part of the Saalien glacial period. Alongside these ridges there are fluvio-glacial sediments, the so-called sands. Around the Aardjesberg, in between the big ridges in the central part of Gooiland, a boulder clay plateau has formed. Many boulders, as well as erratic flints, are to be found around here. In the last glacial period cover sands were deposited along the edges of the landscape. In the Holocene these were partly covered with peat. Because of this the area looks like a heap of sand situated amidst vast marshes and bogs. In the north the area was bounded by open water: the Almere which is the predecessor of the Zuiderzee (the present-day IJsselmeer).

Podzols have formed on the higher sands in Gooiland, acid brown soils on the more fertile parts of the ice-pushed ridges and humic podzols on the less fertile sands. On the lower parts of the aeolian cover sands gleyic podzols and humic gleysoil have been formed under wetter conditions. This condition of the soil, combined with other factors, gives an impression of the historical vegetation: forests of oaks and beeches (*Fago-Quercetum petraeae*) on the ice-pushed ridges; dry forests of oaks and birches (*Betulo-Quercetum roboris*) on the humic podzols of the ice-pushed ridges, on the *sands* and on the higher cover sands; and

damp forests of oaks and birches (*Betulo-Quercetum roboris molinietosum*) on the somewhat moister cover sands.

Prehistoric habitation

The earliest traces of human activity in the area are a number of middle-palaeolithic flint artefacts, dating back to both before and after the formation of the ice-pushed ridges. After the last glacial period the area was used by Mesolithic hunters/gatherers/fishermen. These people only had a slight influence on the landscape. Agriculture (and pottery) were introduced by representatives of the Middle Neolithic *Trechterbekercultuur* (TRB). Near Laren two settlement-sites have been excavated. Gooiland contains objects and monuments dating from all later archaeological periods. One can think of clusters of burial mounds in the Zuiderheide, the Westerheide and the Hoorneboegseheide, and urnfields in the Westerheide and on the Tafelberg. In the Netherlands, the Middle-Bronze Age is named after archaeological finds in Gooiland; the Hilversum-, Drakenstein- and Larencultures.

With the arrival of agriculture, the gradual disappearance of the original vegetation started. Palynological research has shown that the burial mounds were located on clearings in thick forest. Usually they were situated on grounds which had served as arable land or pasture. Specimen dating from the Bronze Age show that soil depletion as a result of agricultural activity caused a rapid increase in the total acreage of heathland. This development probably continued in later periods.

Middle Ages until 1280

At least two *Merovingian* cemeteries are known in Gooiland, both situated near Hilversum. Their existence points to human habitation in their direct vicinity. Other settlement-indicators are place-names of early mediaeval origin, such as Huizen (1382 *Huussem*), and the -heem type names Hilversum (1306 *Hilfercum*) and Blaricum (1306 *Blaricum*). Bussum (1306 *Bussen*, meaning *bossen* = forests) does not belong to this name-type. The earliest record of a location in Gooiland dates from the second part of the 9th century. It concerns the church of *Naruthi*, the predecessor of the present Naarden.

Gooiland contains some deserted mediaeval villages (*Wüstungen*). One is probably marked by the solitary chapel of Laren at the present Janskerkhof. On the Aardjesberg, a 12th-century settlement complete with wells and arable fields has been discovered. In the later Middle Ages habitation moved from these higher villages to the flanks of the ice-pushed ridges. This phenomenon is also known in other parts of the Dutch sandy soils.

In 968, Gooiland probably formed part of a separate administrative unit (Latin: *pagus*, Dutch: *gouw*) called Naardingland. From that date onwards the convent of Elten (Germany) was both the principal landowner and sovereign of this separate county, bordering the *Sticht* administered by the bishop of Utrecht.

The period 1280-1600

In 1280 the abbess of Elten sold her rights to Gooiland to the Count of Holland at a yearly interest. The count also laid claim to the surrounding peat reclamations which had been cultivated by the people from the *Sticht*. A period of border conflicts began. From the 14th till the 16th century a lot of peat areas were still being reclaimed; the elongated parcellation of the *Sticht* extended all the way to the higher grounds of Gooiland.

In the 16th century the borders got stabilized and they were marked by means of posts and ditches. However, this process of border formation decreased the size of Gooiland to quite some extent. This is illustrated by Eemnes and the Vuurse: though in the 16th century they

had been part of the Sticht for a long time, they once must have belonged to the Naardingland of Elten. In most cases, the border between Holland and the Sticht was a dividing line between communal land and the elongated peat parcellation.

Between 1280 and 1306 an arrangement was made concerning the use of pasture and - heathland by people from Gooiland. The surrounding pasture and heathlands were not to be used by individual settlements, but - roughly speaking - the inhabitants of all the settlements had to share the use of all these grounds. This then was in line with the system of government in Gooiland, that constituted a single administrative unit without any further subdivision. It appeared that after the arrangement only few pastures, e.g. the Hilversum Common (*Meent*), were still used by inhabitants of one particular settlement. The people of Gooiland were only entitled to the use of the land; they did not own it. The ownership remained in the hands of the Count of Holland. Later on (1442), we see that the use of the land was limited to those people whose ancestors came from Gooiland (the so-called Erfgooiers). They constituted an assembly called Stad en Lande van Gooiland, which had a great influence on the development of the landscape.

With the exception of a short period at the start, the Count of Holland explicitly intended the communal lands to remain undivided for perpetuity. This was also in the interest of the farmers in Gooiland. The sod cutting and the extensive grazing on these communal lands were indispensable to the arable farming on the less fertile sandy soils. Nevertheless, this whole system of communal use was to crumble eventually, especially on the edges of the area. Basically, this was the result of the way ownership and use were organized; to a lesser extent the nearness of the city of Amsterdam and its rich merchants also played a part in this process of disintegration. Anyway, this process would take more than 500 years. It started as early as 1339. With the approval of the inhabitants of Gooiland the Count of Holland offered some communal lands to the reclaimers of Eemnes (in the Sticht). They could start with the reclamation of those lands. These reclaimers, however, had to become subjects of the Count of Holland: new taxpayers were always welcome. The reclamation of the land was successful. However, in 1349 the cultivated area, Oost-Holland (Eastern Holland) as it was called, was taken over by the Bishop of Utrecht, so that the Count of Holland lost his new subjects again.

Disintegration also took place at the south-west edge of Gooiland. Here, the area bordered on the seigniorship of Loosdrecht which was part of Holland. In the Loosdrecht area we find radial elongated peat parcellation oriented towards the little river Drecht. In the 14th century, the line dividing these two areas tended to move eastwards at the cost of Gooiland.

In 1387, several villages in Gooiland received some pieces of peatland from the Count of Holland. In 1382 the city of Naarden was already in the possession of a piece of peatland which was probably situated near the border between Gooiland and the Loosdrecht area, next to the peatlands mentioned previously. These pieces of land were rented to farmers of Loosdrecht who extended their parcels into Gooiland. The revenues obtained from this newly cultivated land went to the churches of Naarden and of the villages in Gooiland. At present, these lands are still called the Kerkelanden (the churchlands).

In 1403, the Count declared that the communal lands were not to be further subdivided anymore. The land that had been subdivided before remained that way. The people of the Loosdrecht area were also subjects of the Count of Holland, so that this newly cultivated land, though situated in Gooiland, brought in more tax revenues. Some hundred years later, for the same reason, Charles the Fifth in his capacity as Count of Holland allowed the people of Loosdrecht to extend their reclamations southeastward.

The inhabitants of Hilversum did not take this lying down and prevented further land reclamation by force of arms. Consequently, only the western part of the Egelshoek was brought under cultivation. Here, the radial parcellation extended into the heathlands of Gooiland. The way in which this land reclamation was permitted and the way it was reacted

to by the people of Gooiland, was to become characteristic of the behaviour of both the landowner and those who asserted the right to the use of the land. Anyway, the reclamations that took place in this period as well as those of later ages typically occurred in the border regions, far away from the settlements in Gooiland.

The period 1600-1730

The structural weaknesses of the communal-use arrangement manifested themselves quite clearly in the 17th century. The landowner did not gain much from the property. Consequently, in the 16th century and after, when The States of Holland, which were dominated by the city of Amsterdam, took over this property, they denied the inhabitants of Gooiland the right to use the land and tried to grant vast areas of land under development. With regard to the various communal lands, the villages in Gooiland and the city of Naarden had conflicting interests. The farther the communal land was situated away from the village, the less interesting it was for the villagers.

Some villages were impeded more than others by allowing new reclamations. Such disadvantaged villages demanded recompense for the damage done. They were given the right of individual use of land. This way, the villagers could sell the land to the substantial reclaimers. This again caused envy among other villages which, in turn, also asked for recompense. All this set off a chain reaction of reclamation activities.

Reclamation activities were also stimulated by external factors, such as the funds of the merchants of Amsterdam and their tendency to invest this money in agricultural projects, the rise of the textile industry in Naarden and the villages of Gooiland (which made them less dependent on agriculture and the communal lands) and the rise of sand trading. We do not know to what extent the textile industry in Gooiland was funded by the merchants of Amsterdam, yet we do know that both Amsterdam and Gooiland itself were financially involved in the sand trading. Among other things, the sand was used for the expansion of the city of Amsterdam, in particular the construction of the famous ring of canals in the centre of the city.

All this activity led to the reclamation of 's-Graveland and the adjacent area, and to the attempt to reclaim the so-called Tweede Blok (Second Block). These two reclamations relate to one another.

In 1629 the States of Holland gave permission to cultivate heathlands in the west and south of Gooiland. They explicitly stated that the alleged rights the inhabitants of Gooiland had, were irrelevant. This provoked fierce resistance. Particularly the village of Hilversum resisted with such force that, despite military interference, the reclamation did not succeed. 's-Graveland (the First Block) could only come into existence after the States of Holland had come to an agreement with Gooiland. Hilversum got permission to dig a canal and got the special right to reclaim together with the other villages of Gooiland the Second Block.

Hilversum was favoured by this agreement. This brought about the kind of chain reaction mentioned previously. The inhabitants of Naarden felt they were put at a disadvantage. So they asked for, and got, the area east of the northern part of 's-Graveland. In turn, they sold this area to the (Amsterdam) owners of the adjacent plots in 's-Graveland.

The reclamation of the Tweede Blok by the Gooiland villages failed, probably due to lack of proper funding. All there is left of this unsuccessful attempt is one bank. In the end the southern part was rented to the inhabitants of Maartensdijk who turned it into pasture. Around 1667, the northern part, which had been sold to an Amsterdam citizen, was planted with trees by the new owner. This was the first forest park in Gooiland of which soon many more would follow. Those inhabitants of 's-Graveland that came from Amsterdam began to convert their farms into country estates with forest parks.

So, after first having dug a canal to take away the surplus of sand and peat, 's-Graveland got its present appearance. On one side of the road there are the country estates. On the other side, located on the narrow strip in between the road and the canal, there are middle class houses and servant accomodations. The whole area was surrounded by a bank to prevent the inhabitants of Gooiland from using the lands, which were part of 's-Graveland, as pasture for their cattle.

Other pieces of land in Gooiland were also used for digging sand. For reasons of defence the higher grounds around the town of Naarden were lowered. This inundation area was part of the extension of the well-known star-shaped fortifications of Naarden built after 1673. The resulting pattern of canals (used for sand transport) and the alternation between high and low remained unchanged to the present day.

The period 1730-1830

Around 1730 Gooiland and the States of Holland reached an agreement: the States acknowledged that the inhabitants of Gooiland had the right to use the land, and promised to consult Stad en Lande van Gooiland when new reclamations would be allowed. The revenues, in accordance with a certain distributive code, went to both the States and Gooiland.

Some larger reclamations starting in 's-Graveland arose behind the Trompenveld, such as the Corversbos (forest named after a rich family from Amsterdam) which in fact was more of a farming estate than a forest. The area contained many hedges, regular parcels of land, while sand had hardly been dug.

Smaller reclamations arose behind the Naarderveld; an area which, due to the presence of drift sand dunes, was not really suitable for cultivation. It is no surprise then, that here arable farming failed completely. As early as the beginning of the 19th century these grounds were converted into forest. Clearings in the forest mark the spots where the old plots of arable land used to be situated.

Though carried out in the same period, the reclamation of the Hoorneboeg (the highest part of southern Gooiland) by an Amsterdam patrician is somewhat different from the rest. This reclamation was located in heathland. It was quite small and it probably served for recreational purposes as well, for besides a farm house there had also been built a country house.

The period 1830-1900

This period was characterized by an increasing interest in a more scientific approach to agriculture. The communal use of pastureland and heathland was considered old-fashioned. The necessity to improve the infrastructure became more and more apparent, and industry became more important to the inhabitants of Gooiland.

Early in the 19th century an attempt was made to dig a canal from the river Vecht, straight across Gooiland, in the direction of Huizen. This Tienhoven canal should have stimulated further reclamation activities. All efforts ended when the higher parts near Hoorneboeg were reached.

Road construction was more successful. Some dignitaries of Gooiland together with wealthy people from Amsterdam initiated the construction of highroads between 's-Graveland, Hilversum and Amersfoort, and between Hilversum and Utrecht. Apart from this, a small reclamation company from Gooiland planted trees along the old sandy roads which made them less vulnerable to sand drifting.

This period was no exception regarding the ever recurring problem of land rights as the main factor in the development of the landscape. The state, which in 1815 had become owner

of the communal lands in Gooiland, first tried to dissolve Stad en Lande van Gooiland. Then, in 1836 and 1843 these lands were divided among the two of them. Stad en Lande came to be the owner of a large part of pasture and heathlands (the central heathland in Gooiland, a major part of the southern heathlands, and the common meadows). The state had its grounds sold by auction as soon as possible. The peripheral grounds in the southeast of Gooiland, the former Tweede Blok and the drift sand dunes region behind the Naarderveld went for the most part to wealthy people from Amsterdam.

Only communal lands that were conveniently situated because of the presence of roads and canals were converted into arable land and pastureland. This period, as well as the previous period, showed the appearance of country estates. However, most of the time the conversion of land into arable land or pastures did not succeed. It was therefore planted with trees.

It is remarkable that this tendency is also discernible in the area southeast of Gooiland (called the Vuurse). Early in the 19th century, after a period of extensive use of the land (grazing), this former peat reclamation of the Sticht with its elongated parcels was also planted with trees. In this forest remains of this parcellation are still to be found; the peat has long since disappeared through oxidation and peat digging.

After 1870 Gooiland became a residence for commuters from Amsterdam, because of local taxpolicies and the construction of train and tram lines. These villadoms arose on the ancient engen (open fields) that surrounded the villages and consequently disappeared almost entirely. The former common heathlands were transformed into a nature reserve in 1932.

Topographical map (1850)



Excursion route

The excursion route is indicated on the 1850 topographical map. The italic numbers on that map mark elements which are younger.

The excursion starts at Groeneveld Castle [1].

The oldest habitation in the Eemnes peat reclamations must have been near the river Eem. Eemnes means tongue of land in the river Eem. The original peat soil, which spread out westwards to the high grounds of the Gooi area, was drained by means of a very regular pattern of ditches and made suitable for habitation and agriculture (mixed farming) around 1000 A.D. As a result of the drainage (oxidation and subsidence) the surface level dropped. The environment became too wet for arable farming. A new area of peat was reclaimed and the habitation shifted to the new reclamations. The old fields with a high water-table were then used as pastures and meadows. The eastern part of Eemnes [2] is a remarkably empty area, which once used to be inhabited.

The Wakkerendijk [3] is the most recent settlement axis in the Eemnes peat reclamations. This dike marks the latest phase in the shifting habitation. It was only after the surface level had dropped to such a degree that the Zuiderzee became a serious threat to the safety of the farmers in Eemnes, that the original Wakkerenweg (road) was transformed into a dike. The old farmhouses are therefore situated at the safe west-side of the dike.

The Late-Gothic church of Eemnes-Binnen [4] is built on a naturally formed ridge, actually on the wrong side of the dike. Its predecessor was situated in Eembrugge. Some time after habitation had moved westward to the Wakkerenweg, the church must have been moved. The settlement axis was already occupied, but as there was this naturally formed cover sand ridge outside the dike, the church could be rebuilt there. The chancel dates back to the 15th century, so the church must have been moved earlier.

The Late-Gothic church of Eemnes-Buiten [5] and the surrounding older buildings are located on a so-called brede zijdwende [6], which divides the old peat reclamation in two. During the reclamation, which started from the river Eem, a broad strip of peatland was left undrained. The peaty soil of this brede zijdwende shrank much slower than the well-drained peatland: a broad pseudo-dike was created. Such an area was usually owned by the organizer of the reclamation (the *locator* in latin) and/or the Church. This may explain why the church was built on this strip of land. The church dates back to the 15th century. Whether there once was a predecessor closer to the river Eem is not known.

The last reclaimed part of the Eemnes fenlands was called Eastern Holland [7]. For a long time this area has been the apple of discord between the Bishop of Utrecht and the Count of Holland. As early as 1346 it was recorded that the border between Eemnes and Gooiland was marked by a stone. The final borderline between Holland and Utrecht was established in 1532. From the Zuiderzee coast the line was drawn to the south, using the cathedral tower in Utrecht for orientation.

A stone border post from the 18th century [8] is located on the side of the Gooiersgracht (canal), which is the border between Eemnes and the Gooiland, between the Sticht (Utrecht) and Holland.

The heathlands in Gooiland were divided up between the Erfgooiers and the state (Domains) in 1836. From then on these lands could be brought under cultivation. This was partly done by the Association for the Advancement of Culture in Gooiland. In the 19th century reclam-

ation farm [9] two rather different aspects are combined: a fine front and a simple working accommodation.

Laren is not very often mentioned in old documents, nevertheless we can deduce from its name what its environment must have looked like in the distant past: a laar is an intensively used forest. The oldest habitation of Laren is not found here, but near the St.-Janskerkhof [32] (St.-John's cemetery).

The village green of Laren [10] is well-preserved and has an old watering place. Many of the old farmhouses in this prosperous village now only serve as living quarters. The oldest stone farmhouses date back to the 17th century. The picturesque atmosphere attracted many artists around the turn of the century. The present-day church of Laren [11] is situated in the village green. Its spire and nave date from around 1500. The church was restored early this century.

The old church of Blaricum [12] was built around the year 1500 and was restored and renovated in the thirties. On the flank of the iced-pushed ridge of Laren-Blaricum still something of the eng (complex of open fields) can be seen. There are wooded borders at both sides of the road. During the afforestation in the sixties a great many finds from the Late Bronze Age and Iron Age were excavated, including urns with the remains of cremations. This, together with other finds in the area, points to substantial prehistoric habitation in these parts [13].

Crailo [14] is a town characterized by a 19th-century road system and building structure, with predominantly modern houses. Crailo is already mentioned in 1422 as a forest with crows. This might mean that the reclamations in Crailo are not so very old. On a map from around 1600 Crailo is indicated as a hamlet. Large-scale reclamations took place in the 17th century, which were regarded by merchants from Amsterdam as a sound investment. The settlement (with a mansion and some farmhouses) was altered considerably just before the turn of the century.

The next stop is at Huizen harbour [15]. Offshore fishing was an important source of income to the Gooi area in times past. As early as 1342 the right of trading fish in the area between the rivers Vecht and IJssel was assigned to the town of Naarden. Due to a siege in 1672 Naarden harbour had fallen into disuse and Huizen became a fishing village as well as a country village, even though it did not border the sea. The bidders (special fishing boats without keels) anchored in the roadsteads. It was not until 1853 that Huizen had its own harbour. In those days Huizen had a fleet of 106 bidders. This fishing trade ceased in 1932 when the Zuiderzee was closed off from the sea by the Afsluitdijk and no saltwater fish was left. The newly constructed lake was baptised "IJsselmeer".

At the end of the harbour [16] there are some remains of the former common pasturelands (meenten). These commons were pastures bordering the Gooi area and were used collectively by the Erfgooiers. The area consisted of about 1300 ha in 1843. Normally these lands were never hayed. Per hectare two cows were grazed.

The surface level of the open field of the Naarder Eng [17] is raised by long-continued manuring with plaggen (sods of heather, grass). As a result of ploughing the layer is somewhat thicker at the edges of the fields. This effect is increased by the natural relief of the subsoil. There are still remains of wooded banks along the road. The forests are fairly new phenomena here. They are the result of the demand for firewood and the landownership of non-farmers.

At the cliffs [18] of the former Zuiderzee coast it is clearly visible how great the changes have been that took place in the last sixty years. In the old days you could smell the salt of the sea at this spot; until 1932 seals were often seen here. The Eng bordered the sea, which is quite unique. The modern view of the polder and the town of Almere-Haven on the other side of the Gooimeer was created only recently. The cliff itself consists of drift sand. The

Zuiderzee was formed by the North Sea, which succeeded in breaking into the former Almere (lake) from the north. Through the years the sea washed away considerable parts of the coast: examinations of the old seaport of present-day Naarden have led to the conclusion that since the 17th century at least 150 m of coast must have been washed away.

Not far from a 19th-century tollhouse [19] the land lies somewhat lower at both sides of the road [20]. These depressions are the result of sand diggings around the fortress of Naarden. When after 1672 this fortress needed further fortification, it was decided to dig off the surrounding hills. As far as sand digging in Gooiland was concerned Naarden held the exclusive rights. These sand diggings went on until the 19th century, partly in order to create pretty parklands for the country houses that were built. There are now many nurseries and market gardens on the plots that were dug off.

Between this spot and the old fortifications of Naarden lies the area where the sand was dug. The measures taken to guarantee an open field of fire in case of war are still clearly visible, such as wooden houses [21] and a strip of land without buildings in front of the moat. The village of Naarden was granted town rights around 1320. After having been destroyed almost completely, it was rebuilt around 1350 on its present spot. Immediately fortifications were built to protect the new town. This was done because of its strategic position, situated on the border of Holland in between the high grounds of Gooiland and the city of Amsterdam. Despite further improvements of the fortifications, Naarden was taken in 1481, 1572, 1672, 1787, 1795 and 1814.

Amidst a less interesting new housing estate several old wooden houses [22] are situated. The fortified town of Naarden was the strategically important last link in the Nieuwe Hollandse Waterlinie (strip of land flooded as a defence line in case of war). The fortress was strengthened in the 1860s by building a ring of strongholds around Bussum. Building within a radius of 1000 m from these strongholds was limited in order to guarantee an open field of fire in times of war. It was only in 1926 that the fortifications lost their military function.

North of 's-Graveland still parts of the common haylands are visible [23]. 's-Graveland was reclaimed with the financial support of some rich merchants from Amsterdam between 1626 and 1657, for agricultural purposes and for sand digging (for which the 's-Gravelandse Vaart was dug in 1638). This sand digging was done in connection with the expansion of Amsterdam. It was only between 1670 and 1700 that the first country houses were built.

Nevertheless agricultural activities were carried on. Some manors were even demolished to create space for new pastures at the end of the 18th century. Almost every manor had its own farm. Within the village a unique division was created, with the main road as the dividing line: at the left some country estates [24a+24b] and the protestant church from the 17th century [24c], at the right the labourers' cottages. The country estate of Trompenburg [24d] was founded in the second half of the 17th century by Admiral Cornelis Tromp. It was rebuilt after it had been partly destroyed by the French in 1672. The manor is entirely surrounded by water, its walls almost completely covered with wood. In the 18th century bleacheries were founded in this village, which were succeeded by laundries for the citizens of Amsterdam.

An impression of the depth of the reclamations [25] gives the Gooische or Beerensteinse Vaart [26]. In 1635 the first tow barge service to Amsterdam was opened through this canal and the 's-Gravelandse Vaart. Originally this canal ended two kilometres before Hilversum. It was only in the 19th century that the canal was extended and that the harbour was made.

The Kromme Rade near Loosdrecht [27], where the parcellations of Kortenhoef and Loosdrecht meet, forms an important structural element in these 11th and 12th century landscapes. This line, in later periods marked by a small dike, was drawn through the unreclaimed peatland as a reclamation boundary.

The reclamation of Loosdrecht began at the banks of the river Vecht. Later reclamations were done starting from the little stream called the Drecht. The radial field pattern [28] in the eastern part, spreading out towards the high grounds of Gooiland were reclaimed last.

Between the Gooi border, near the Egelshoek, and the old city of Utrecht the peat reclamation area has an open character [29]. Since the 12th century it has taken the reclaimers of these Stichtse Venen 400 years to reach the sands of Gooiland. This resulted in elongated parcels with a total length of eight kilometers. In the distance the 112 m high cathedral tower of the Dom of Utrecht can be seen. This cathedral was built between 1321 and 1382. This old peat reclamation covers the stretch between the river Vecht and Gooiland.

The Tienhovens Kanaal [30] follows the southern Gooi border. It is part of a long ditch, the Weersloot, which possibly dates back to the times before the great reclamations. This ditch formed the border between the Sticht and Naardingland, administered by Elten. This canal had already been planned in 1661 and was to connect the rivers Vecht and Eem. Around 1800 the project was started up again, but it failed around 1850 when the high grounds of Gooiland were reached [31].

At the centre of Gooiland the Janskerkhof is located [32]. The St.-John's Chapel here is the former church of Laren, mentioned in 1306. It may be considerably older. Present-day Laren lies 1500 m northeast of the spot where the old chapel was situated. Up till now nothing is known of the mediaeval settlement which must have been near the chapel. The present church was renovated in 1844.

Between Janskerkhof and Aardjesberg [38] there are a great many gravel pits [33]. These pits are found along the gravel layers of the ice-pushed ridge. They therefore are absent in fluvioglacial sediments, which form the subsoil of most of the heathlands.

There are several straight roads across the heath that lead to Janskerkhof. Popular belief states that these were made to facilitate the transport of the dead to the churchyard. They are therefore called doodweg (deathway) [34]. These roads could also be used for orientation on the heath and date from the 16th century onwards.

Near the doodweg there are two plots where the sod has been removed for reasons of nature conservation [35]. The litter layer was removed to impoverish the soil so that heather - and not grass - would grow there again. The seeds of the heather fall in the soil and germinate after two years. In this way a new purple heath is created. In one of these plots a pot dating back to the Early Middle Ages was found, revealing a burial site. Another cemetery from the same period was discovered in 1934 at a place 1 km to the southwest. Here are also several restored burial mounds [36] located. These mounds were excavated in 1925. It proved that they were built up of sods and were surrounded by ditches. They date back to the Bronze Age.

At the bird sanctuary on the Aardjesberg [37] an archaeological monument is situated: the richest archaeological site in Gooiland. A test excavation took place in 1990 to see in what condition it was, revealing prehistoric flintworking, Bronze Age burials and a mediaeval field. The present-day field is part of a small reclamation dating from the 1930s. Up till World War II a sheepfold was situated here. There is still a pit in the reserve, where farmers used to dig for boulder clay.

Between the Aardjesberg and the border of the Hilversumse Eng lies a vast urnfield from the Late Bronze Age and Early Iron Age. Also visible is the embankment of the mediaeval banscheiding. This boundary between the villages of Laren and Hilversum was made around the year 1425. It does not coincide with the present municipal boundaries.

The Nieuwe Crailosche Weg [38] led to the country estate of Crailo, which was mentioned above. The trees along the side of the road were planted around 1840. These have altered the skyline of the heathland to a great extent.

At the end of the excursion route a large sand pit [39] is situated. This pit is part of the concession which the railway company obtained in exchange for the building of the Amsterdam-Hilversum railway. Without the railways, villadom would never have boomed.

Notes

- (1) This brief, historical-geographical outline of Gooiland was written by H.H.M. Meyer (Bunde, The Netherlands) who is preparing a dissertation on this area. W.H. Wimmers (Winand Staring Centre, Wageningen) was responsible for the archeological information. He is drawing up an inventory of archaeological and historical-geographical elements in the nature reserves of Gooiland. The excursion was prepared and the route described in cooperation with Chr. de Bont, historical-geographer at the Winand Staring Centre, Wageningen.

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Excursion to the eastern side of the Utrecht hills and the western part of the Guelders valley

Johannes Renes

Summary

The article is based on an excursion, which led along the eastern edge of the Utrecht Hills (an ice-pushed ridge) and through the adjoining parts of the Guelders Valley and which showed the large variation within the Dutch sandy landscapes. In a small area nucleated villages, regular row-villages and medieval dispersed settlement occur. The fenlands east of the hills are characterized by regular row-villages and strip-field-patterns, originally laid out in the first half of the 12th century. Later developments include the development of gardens, peat-exploitation in the southern part of the Valley, military fortresses and inundations in the Valley and in the 19th century, afforestation on the hills.

Introduction

The second excursion led from Baarn to Wageningen, through the sandy landscapes along the eastern edge of the Utrecht Hills. With this excursion we tried to give an impression of the cultural landscapes of the sandy regions, which occupy most of the southeastern half of the Netherlands. Although at first sight uniform, this region is in detail very varied. The excursion showed much of this variety. This article starts with some general characteristics of the Dutch sandy landscapes. In the second part the variation in (medieval) settlement patterns is shown. The third part is concerned with the main developments in the post-medieval period.

The landscape of the sandy regions: general characteristics

For many centuries the sandy regions of the Netherlands have been characterized by a very poor agriculture. There were two reasons for this: the hydrological situation (only a small part of the land was suitable for arable, as most land was either too dry or too wet) and the soil quality (most soils were very poor in minerals). The region is comparable to parts of Northwest-Germany (the "Geest") and England (the Brecklands of East-Anglia).

A landscape of mixed farming

The poor soils and the difficult hydrologic situation led to a system of mixed farming, in which only the best soils were used for arable. The pastures, which covered most of the area, were used to enrich the arable. The main function of cattle was to provide manure. Where the area of grassland pasture and haymeadows was insufficient, the heathlands formed an alternative. The heathlands were mainly grazed by sheep. These sheep formed a very poor alternative indeed, as one cow provides as much dung as ten sheep. The dung was mixed with sods (so-called "plaggen") before being brought onto the arable. This plaggen-soils retained

the soil-moisture better than the bare sand, and enabled extension of the arable to the drier parts of the ice-pushed ridges.

This system reached its zenith in the 19th century, when the whole arable was permanently used as infield, almost all the forests had been degraded to heathland and the dung was mixed with the sods in specialised stables. However, this picture may not be extrapolated to earlier centuries, as is often done. In the Middle Ages population size as well as the area of arable were much smaller, the arable was probably used in an infield-outfield system, cattle and sheep had a more autonomous position within the economy and agriculture as a whole was less intensive. The period in which plaggen-manuring came into use is still a matter of discussion, but somewhere between the 10th and 13th centuries seems probable (Spek, this issue).

Ownership and use of the commons

Originally the extensively used lands (heath, forests etc.) were in common use. In some regions of dispersed settlement most of the commons were divided long ago, and each farm owned its own heathland. Large parts of the ice-pushed ridges however remained in use as common grazings until the 19th century.

Almost everywhere the pressure on the commons grew in the period of growing population during the 12th and 13th centuries, and restrictions were proposed. The growth of the number of farms meant a decline of the area of common land and a growing pressure on the surviving commons. In many places the old established farms founded a "marke" organisation. Most of these organisations seem to have been founded around the 13th century, when pressure on the land reached a temporary maximum. Only members of the organisation were admitted to drive sheep and cattle and to win sods on the commons. The organisation also controlled, and mostly prohibited, new enclosures. These restrictions could take different forms, dependant on the local situation. In the course of time a growing differentiation occurred in ownership and organization of the commons. In the early Middle Ages the central government was the owner of the uncultivated lands. From the 11th century this ownership passed to regional lords, such as the bishops of Utrecht and the counts of Guelders. In regions where their influence was in practice very limited, as for example in the province of Drenthe, a number of large farmers succeeded in monopolising the commons, excluding newcomers. Sometimes a group of old-established farms was even recognized as the owner of the commons. In most cases the ownership of the commons passed to the local manor, and ended in the hands of the local government, which mostly meant that all villagers were allowed to use the commons. Even in the excursion area, small as it is, a number of different situations did occur.

Table 1 shows the various possibilities for ownership and use of the commons.

Table 1. Ownership and use of forests and heathlands

Use	Ownership				
	Regional lord	Local lord/manor	Village	Group of farmers	Individual farmer
Community (village)	1	2	3	4	5
Group of farmers (exclusive)	6	7	8	9	10
Individual farmer	11	12	13	14	15

———— Leusden
 = = = = Soest

In practice all these possibilities have existed. In our region in the Scherpenzeel and Renswoude belonged to type 15. Soest belonged to type 2 during the Middle Ages, but to type 3 in the 19th century. Leusden even changed twice, from type 1 to type 6 and ultimately to type 9.

In Leusden the commons were originally owned by the Utrecht bishop, but the old farms, having organised themselves in the 'marke' of the 'Leusderberg', succeeded in getting more and more influence and, at least from the 16th century onwards, excluded newcomers. New strict regulations were proclaimed in 1561, when drifting sands, caused by overgrazing, troubled the farmers. At that time the organisation of the Leusderberg had 26 participants. This number grew to 27 in 1682. Originally the organisation only regulated the use of the commons, the Utrecht bishop being the owner. After the Reformation the "Staten" (government) of Utrecht succeeded the bishop. However, the organisation acted more and more as owner and, in the 19th century, was recognized as such. Pressure on the commons had diminished by then, which led to a loosening of the rules. During the 19th century some farms, that claimed rights on the commons were recognized in the end, making the numbers of participants to grow from 27 to 28 (1825), 30 (1841) and ultimately 31 (1844). Most of the newly admitted farms were medieval in origin and were situated on the edge of the hills. Originally some of them seem to have had their own commons. The reasons for their admittance were not clear, but probably they profited from the existing confusion and got the benefit of the doubt. The end of the commons came in the 1880s. In 1887 a large area was sold to the Ministry of War for use as a military training ground and two years later the remaining commons were divided (Perks, 1984).

In Soest on the other hand, the commons were at first part of the manor. In later years they belonged to the village. Soest never knew some kind of organisation of the old established farms and there is no evidence of an exclusion of new farms.

In the highly individualised landscape of Scherpenzeel and Renswoude most commons were already enclosed during the Middle Ages, and each farmer owned some heathlands.

Medieval settlement

The sandy areas are not uniform. Important are differences in geomorphology, in scale, in historical development and in the organisation and ownership of the commons.

The main geomorphological difference is that between the so-called "high" and "low" sandy areas (fig. 1). The first can be found on the ice-pushed ridges (moraines). Here settlements and arable are located halfway on the hillslope, on the only part of the slope that is neither too dry nor too wet for arable. This landscape can be seen near Leusden-Heetveld and at Achterberg.



Fig. 1: Geomorphology of the Guelders Valley and surroundings. 1 Small ridges in low-lying coversand; 2 higher-lying coversands; 3 ice pushed ridge; 4 drift sand; 5 strip-field patterns of fen- and peatland-reclamations.

The landscape of the low sandy areas covers most of the Guelders Valley, the valley between the ice-pushed ridges of the Utrechtse Heuvelrug and the Veluwe. In these wet areas only the highest parts of the landscape, the coversand ridges, could be used as arable. Pasture and meadows were situated in small strips along the streams. The rest of the land consisted of wet heathland (dominated by erica), swampland and small peatbogs. Most of the ridges were so small that they only contained enough arable for one or two farms. The result is a landscape of dispersed farms. Most individual farms have names, many of which can be traced back to the Middle Ages. This is the typical landscape of the central parts of the Guelders Valley, near Scherpenzeel and Renswoude (see below). Soest is of an intermediate type: a low isolated ice-pushed ridge, which was in the 19th century completely in use as arable.

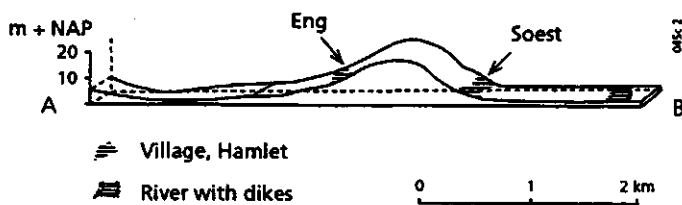
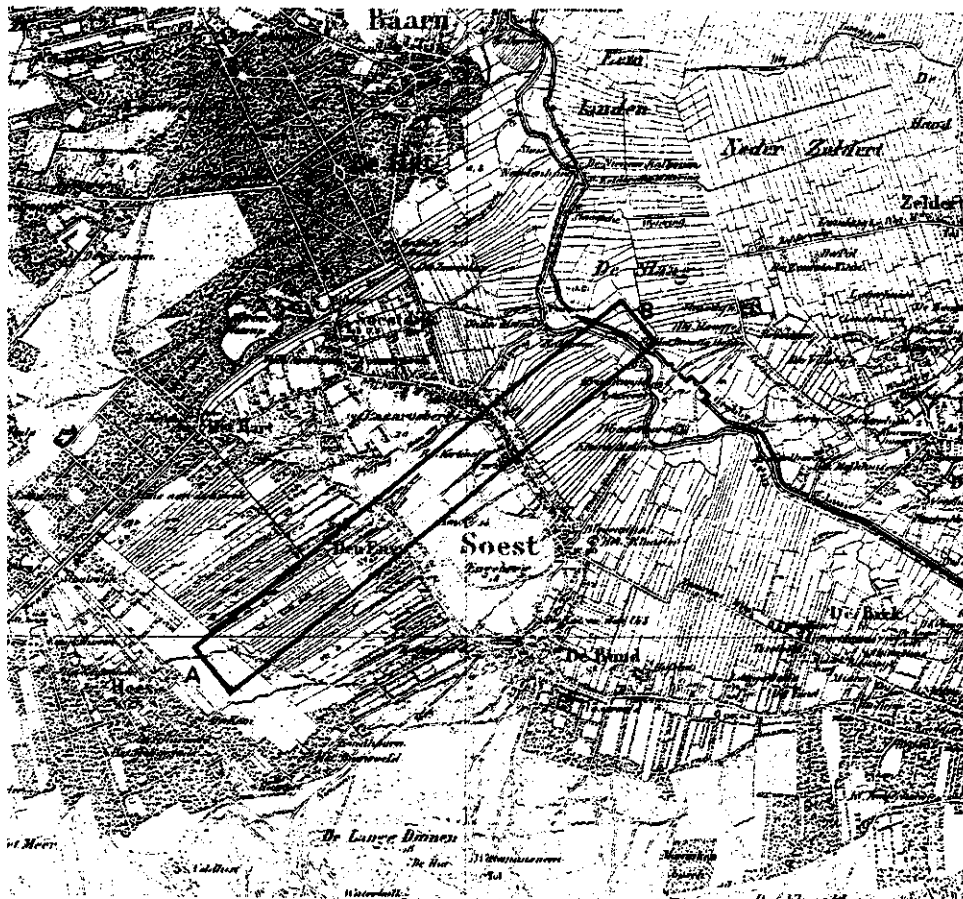
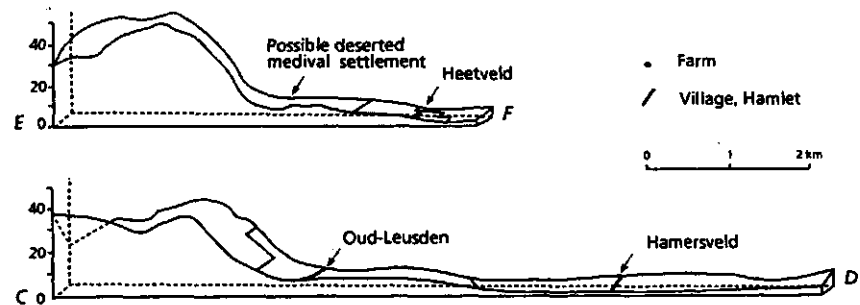


Fig. 2: Soest c. 1850. The map shows the village of Soest, with the medieval arable on the hill, the young reclamations and peat-bogs west of Den Eng and the meadows near the river. North of Soest the baroque garden layout of De Eult and the landscaped park of Soestdijk are shown.



- Farms with rights on Leusden commons
- Original 26 farms (shaded = "Het Pothsland", land without a farmhouse)
 - Later admitted farms
 - × Farm Wellom (not admitted)
- Churches
- ⊕ Original parish church (Oud-Leusden)
 - ⊕ New parish church 1828
 - ⊕ Monastery of Hohorst (11th century)
- Boundary of fenland reclamations
 - - - Main drainage ditch c. 1130 (Munnikewetering)
 - - - Later drainage ditch

Fig. 3: Leusden and Woudenberg c. 1850. The map shows the old farms on the (edge of the) ice-pushed ridge and the medieval fenland-reclamations east of the ridge.

Soest: settlement around an isolated hill

The settlement of Soest lies on a low hill, which was originally surrounded by fenlands. The village is situated on the northeast side of the hill. In the 19th century the whole hill was in use as permanent arable (open field), in the central part of the Netherlands known as an "eng" (fig. 2).

The old village consisted of three parallel roads, the main road to Baarn, the secondary road to Baarn (the Brinkweg, which in the 16th century was still known as the Doodweg, the way to the graveyard) and in between the "padde" or churchpath. Most of the farms stood in a row between the eastern road and the footpath. The rest of the space between the two roads was the village green or "brink". Around 1400 (and probably for centuries before) the village consisted of 21 farms. Only on the southeastern end of the row of farms, around the church, a small nucleated hamlet developed. The manor, which is mentioned in medieval written sources, must have stood in this part of Soest.

In the Middle Ages the east side of the eng was by far the best suited for settlement. Here the eng bordered the rich grasslands along the river Eem. On the north and westside of the eng large areas of poor fenlands separated Soest from the neighbouring villages of Baarn and Hees. Only in later centuries new settlements developed on this side of the eng: 't Hart, Eng and Bunt. The hamlets of 't Hart (= heathland) and Bunt (= poor grassland) originated in the 17th century. Both were squatter settlements, built on parts of the commons (Gottschalk, 1970, 1976).

Oud-Leusden: an old village on the ice-pushed ridge

Oud-Leusden (fig. 3) is a shrunken village, the remains of an old centre with a long history. Part of the village was excavated in the 1980s. The site was occupied by a small rural settlement during the Iron Age and, after a short interval, again during Roman times. About 300 AD a small wooden watchtower was built, of which the foundations and the surrounding ditch were found during the excavation. From the beginning of the 4th century the area seems to have been uninhabited for some time.

In the second half of the sixth century the place was occupied once again and the present village originated. Settlement as well as burial field were found during the excavation. From this period the first written sources date. In 777 "Lisiduna" was the centre of a large royal estate that included a number of "forests". In that year Charlemagne gave the estate to St Martins church of Utrecht (i.e. the bishop). Another person, a certain count Rodgar, who owned a small part of Leusden, gave that part to St Martins church in 838. From then on Leusden belonged to the bishops of Utrecht. The inhabitants had to perform some feudal duties for the bishop, such as transport of goods (mainly beer from Amersfoort) and keeping the bishop's hunting dogs. In the 16th century the bishop owned a rabbit warren on the heath.

The village grew during the 8th and following centuries and reached its largest extent during the 11th and 12th centuries. During the excavation two large 12th century farms were found. Large amounts of slags make clear that the production of iron formed part of the economic base of the village during these centuries. A third base was the central position of the village church. Leusden church was the centre for a huge parish, which included the later city of Amersfoort (which only got its own parish church in 1250) (Van Tent, 1985).

The decline must have started shortly afterwards, when the iron production declined and the parish shrank by the foundation of more and more daughterchurches. Agriculture was

threatened by drifting sands, resulting from overexploitation of the poor heathlandsoils. From the 16th century onwards we hear of complaints about growing dunes. Furthermore, the old village showed a relative decline as large parts of the lowlying territories were reclaimed during the 11th and following centuries. The fenland village of Nieuw-Leusden ('nieuw' = new) or Leusbroek (see below) became the centre of the (shrunken) parish. In 1826/1828 the parish church itself was moved to Leusbroek.

The cross-section (C-D) shows the situation of Oud-Leusden ('oud' = old), on the edge of a slight valley. This valley runs southward, parallel to ice-pushed ridge. Farther to the south the old village of Maarn is situated along the same valley. Geomorphology and soil suggest possible early medieval settlement elsewhere along this valley, for example west of Heetveld (see cross-section E-F).

Leusden/Heetveld: settlement on the edge of the hills

In the late Middle Ages a string of farms was situated on the eastern edges of the hills, between the well-drained arable on the slope and the wet pastures and meadows in the valley. Each farm owned arable-fields on the higher side, and grasslands on the lower side (fig. 3). The older farms also had a share in the commons, on the higher side of the arable. These commons, originally forested, in the course of time degraded to dry heathland, dominated by calluna.

The oldest indications for settlements on the edge date from about 1000 AD. Amersfoort was first mentioned in 1028. Around the year 1006 a small monastery was founded on the Hohorst (= high hill), an isolated mound surrounded by swamps. The mound is also called the Heiligenberg ("holy mountain"), perhaps after the founder, St Ansfried, but it is also possible that the hill was already considered holy before Ansfried. The monastery itself was moved to the town of Utrecht between 1126 and 1128, becoming St Paul's abbey. The abbey was probably responsible for the reclamation of the fenland-settlement of Hamersveld. On the old site a new chapel was built in the 13th century. The chapel fell into decay after the Reformation. The new owner of the site, the government of the province of Utrecht, sold Heiligenberg to an Amsterdam merchant. During the 17th and 18th centuries a large house with gardens was built. The hill was levelled as part of the garden-layout. The present house was built in the beginning of the 19th century.

The false foundation letter of the Hohorst monastery, dated 1006 but in fact a 12th or 13th century forgery (Henderikx, 1990), is more specific, mentioning newly reclaimed lands between Hohorst and Bachevorde (the present hamlet of Bavoort; the name means stream-ford). Of the farms in this region, Ruitenbeek, was mentioned 1381-1383. Lockhorst was also medieval in origin, the estate having originated as the dwelling place for the local representative of the abbey. In later years the hamlet of Bavoort had a central position within the parish, as the only mill stood here. Before 1594 the ford was replaced by a bridge. Farther to the south the manor of Henschoten, named after one of the royal forests that were mentioned in 777, existed in 1131.

The name of Heetveld, for the line of farms between Den Treek and Henschoten, indicates a secondary development of settlements on former heathland. The strip-field pattern of the Heetveld bears a strong resemblance to some planned landscapes (the German Waldhufen). However, the history of the farms shows that they were not founded in the same period. The following is known of the farms in fig. 3:

- 1 Den Treek: mentioned 1334.
- 2 Wellom: a young farm, possibly founded in the 17th century.

- 3, 4 & 5: Originally one farm. Loeft (5) is probably the oldest. A medieval division of this farm resulted in the new farm "Loevezijn", which took over Loeft's rights on the commons and was in turn (between 1693 en 1767) split into two farms again, Groot (=large) Loevezijn (3) and Klein (= small) Loevezijn (4).

- 6 & 7: Ravesloot, in the 17th century split into the present two farms. Originally only the medieval farms 1, 3, 5 and 6 had rights on the commons. In 1699 farm 2 received the rights of a farm in Oud-Leusden, but lost them again in later years. The rights of 5 seem to have been transferred for a short time to the new farm 4. This caused so much confusion that in 1825 both farms were admitted (Perks, 1984).

The strip-field pattern was the result of the growth of the number of farms. When a farm was split up, both new farms needed arable as well as grassland, and the dividing line was laid out crosswise to the contour lines.

The medieval fenland-settlements of Hamersveld, Leusbroek and Woudenberg

East of the hills a zone of fenland was probably in use as extensive (common) pasture around the 11th century. The land was owned by the bishop of Utrecht. Later he sold these fenlands to a group of settlers, led by a developer (in the historical literature known as a "locator"). This locator developed the infrastructure of dikes, large and small drainage ditches and roads, attracted the settlers and sold the land to them. These new settlements followed the pattern of fenland-settlements elsewhere in the Low Countries, with a field-pattern of long and broad strips and one farm on each strip. After the sales letter this settlement-type is known as "cope" (after the Dutch verb for selling). From north to south three separate reclamation blocks can be seen: Hamersveld, Leusbroek/Zuurbroek and Woudenberg (fig. 3).

Hamersveld consists of two blocks, separated by a triangle (after its shape called the "Torenakker", tower field). Probably the farm "Hakhorst", situated within the triangle and with a name indicating a slightly higher field, already existed before the reclamation of the rest of Hamersveld. The reclamation of Hamersveld may have been organised by the adjoining monastery of Hohorst.

The drainage ditches of *Leusbroek* end on the straight line of the side dike of Hamersveld, indicating that Leusbroek was the younger of the two. Different from Hamersveld, this reclamation must have been organized from the old village of Leusden. Not only does the name Leusbroek (=the wet forest of Leusden) point to this, but also the rights of the inhabitants of Leusbroek in the commons of the older village (Perks, 1984). The field-pattern of *Zuurbroek* (from Zuidbroek, the southern wet forest) forms a unity with that of Leusbroek. Probably the stream between them is a later man-made addition to the landscape, dug as part of the centuries-long struggle for a better drainage of the valley. Through this stream, Zuurbroek became isolated from Leusbroek and, in 1614, was transferred to the manor of Geerestein under the jurisdiction of Woudenberg (De Beaufort & Jansen, 1969).

Woudenberg. In 1131 the bishop sold the manor of Henschoten to the abbey of St Lawrence in Oostbroek (east of the town of Utrecht), as a base for reclamations in the adjoining wet forests of the "Westerwoud". These reclamations started in 1133, when the bishop sold an area of 40 "hoeven" (approx. 600 ha) in the "Westerwoud" to the abbey and three private persons. Probably the abbey supplied the capital, the other three the skill for the reclamation. Shortly afterwards a dike (the "Munnikendijk" or Monks dike) and a drainage canal (the "Munnikewetering", monks drainage canal) were built. These works were necessary, the canal to get rid of the excess water, the dike to keep out water from the higher parts of

the valley. Then probably all three men died and the abbey, being very busy with some reclamation schemes on their own doorstep, abandoned the "Westerwoud"-project. In 1200 the area still lay waste. A new start was made in 1240, when Filips van Rijnningen got the area in hereditary tenure. Using the old dike and canal, which were still recognizable, he succeeded in reclaiming the area, which received the name of Woudenberg (Dekker, 1987).

Of the three settlements only the date of Woudenberg is known: the selling-letter dates from 1133. The field pattern makes clear that Hamersveld is older than Leusbroek and that Leusbroek is older than Woudenberg. So the reclamation-movement went from north to south. A few kilometres north of Hamersveld a fourth settlement of this type (Hoevelaken) was founded in 1132. We may assume that the settlements of Hamersveld and Leusbroek date from shortly before 1133.

Scherpenzeel/Renswoude: regular villages and medieval dispersed settlement

East of this medieval fenland settlements the landschap is dominated by small sandy ridges. Although small and low (only a few metres higher than the surrounding lands), these ridges are very important for the settlement history of the region. Many of the ridges were already occupied in prehistoric times. Archaeological research of some comparable ridges north of Amersfoort showed that these ridges were settled from the neolithic to Roman and, after being deserted for some centuries, again from Carolingian times to the present day.

Only the ridges were suitable for arable land. The best pastures were found in the immediate vicinity of the small streams. Where these streams caused problems they were adapted to improve the drainage. The rest of the land was used as extensive pasture and wet coppiced woods. The small ridges were only big enough for the arable land of one or two farms. The result was a very dispersed settlement. Many farms were already in existence during the Middle Ages. In the course of time the number of farms grew as some of the old farms were divided. Fig. 4 shows many examples of farms with the same names, but with a different prefix (Kl. = klein, small; Gr. = groot, large) (Vervloet, 1986).

In this landscape of dispersed settlement, villages were a later addition. They served mainly as central places, with a church and a manor as the original nuclei. The manors themselves originated as normal farms, which grew for whatever reason into a larger unit. The villages of Renswoude (fig. 5) and Scherpenzeel are both regular two-row street-village. Scherpenzeel may be medieval in origin, Renswoude is even younger than Scherpenzeel, being a creation of the Van Reede family, the owners of the manor since 1623. In 1639-'41 they built the (protestant) church. As many other early protestant churches it is a centrally planned building, having the plan of a Greek cross. The building was probably designed by a foremost architect, but we don't know his name. The church is a typical manorial church and in fact belonged to the castle until 1922. In 1654 the present "castle" was built, to replace the old (and later demolished) manor house. The present village centre dates partly from 1774-'80, when four rows of cottages were built to house the castle's servants.

Achterberg: the southeastern edge

Where the raised peat-bog of Veenendaal almost reached the hills of the Utrechtse Heuvelrug no settlements existed. Only after the excavation of the turf some cottagers settled on the edge of the hills. In some places even the whole edge is covered by forests today.

A very different situation existed in the most southern part of the valley. Here the hills bordered rich riverine clay, deposited by the river Rhine. On the edge the hamlet of Achterberg is situated. Although in its location very similar to Leusden-Heetveld, Achterberg is a very different type of settlement, having a well-developed "eng".

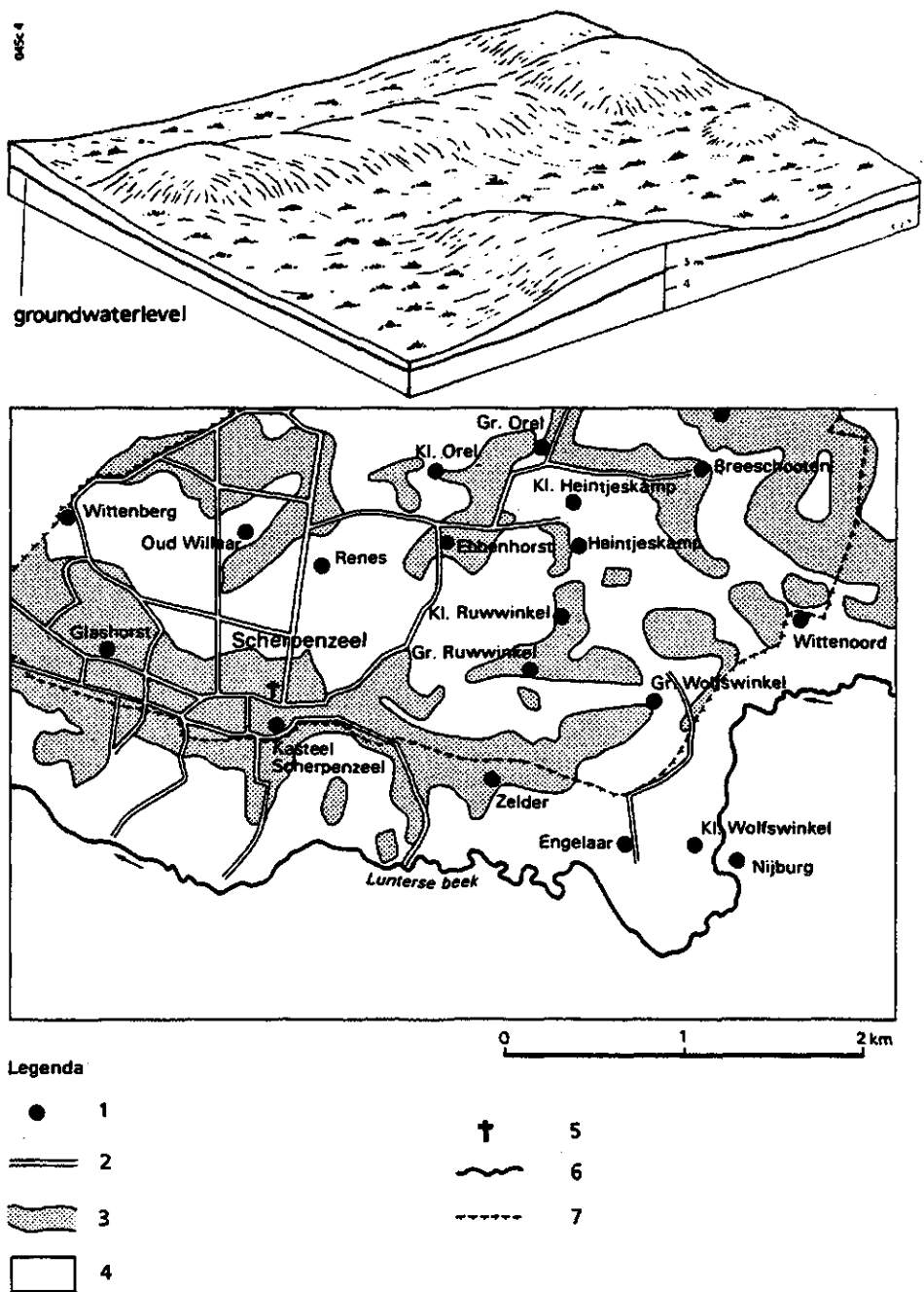


Fig. 4: The small-scale landscape near Scherpenzeel (Guelders Valley). A. Original situation (after Stiboka, 1975). B. Old farms, roads and streams (Vervloet, 1986): 1 medieval farm, 2 road (c. 1830), 3 coversand-ridge (mainly used as arable), 4 low-lying area (grassland), 5 church-village, 6 stream, 7 parish-boundary.

Some post-medieval developments

Gardens and forests

The landscape of the sandy regions is strongly influenced by parks and gardens. An important and interesting period in this respect was the 17th century, when the Dutch economy was booming and Holland became one of the most urbanised and prosperous parts of Europe. Compared with other parts of Europe the Dutch Republic was essentially a middle-class society, with politics and economy dominated by merchants and industrialists. In the course of the 17th century these people started to build houses in the countryside. In the layout of their gardens they followed the baroque style, with geometric patterns laid out between long straight lanes. Especially in the larger gardens French influence is clear. Examples are the gardens of Renswoude (with a Grand Canal in the French style) and De Eult. In other aspects however, the Dutch gardens differed from the French (Hunt & De Jong, 1988). They were smaller, reflecting the middle class society. Only the Oranje family, who tried to live to the standards of the royal families in some neighbouring countries, and the circles around them, laid out gardens in a really grand scale. Other typical aspects of Dutch gardens included the importance of exotic flowers, the use of topiary and trelliswork and the important role of water-filled ditches. Many houses grew out of fenland-farms and the long and narrow shape of their gardens still reflected the original strip-fields (fig. 6).

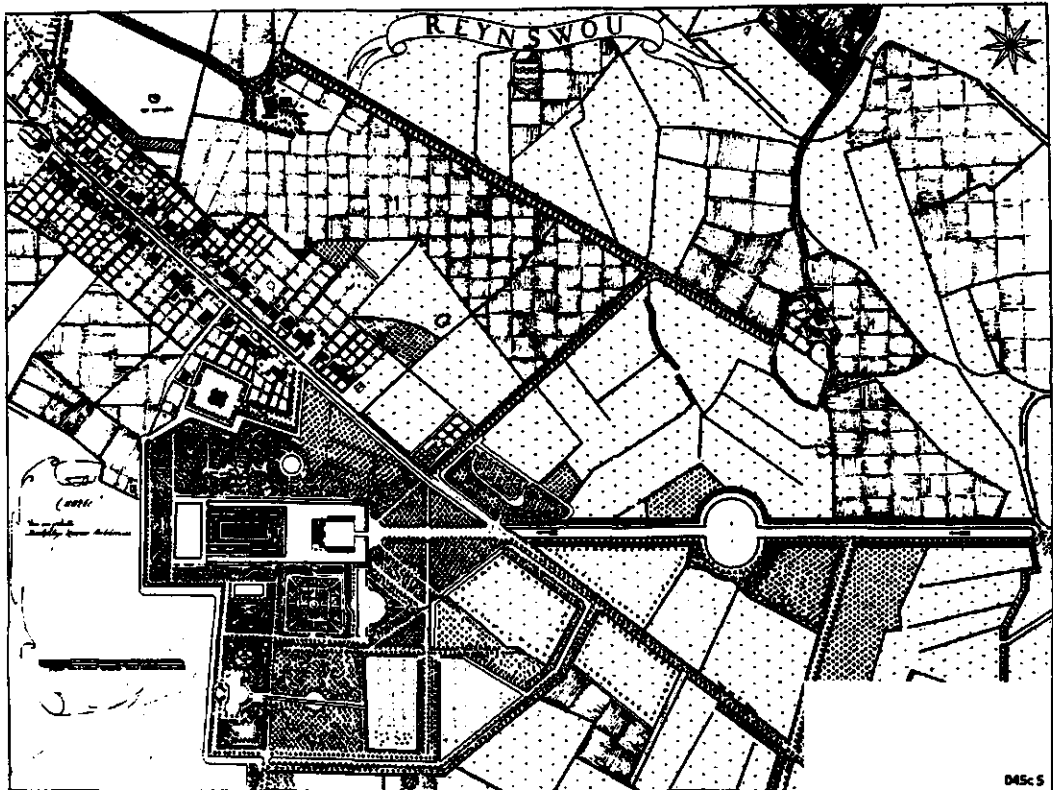


Fig. 5: The Renswoude estate in 1769 (map drawn 1975; original since lost) (Taets van Amerongen, 1987).

From the end of the 18th century the English style of landscaped gardens came into general use. Most of the surviving gardens were replanned in the new manner. Besides a number of new gardens were laid out. The difference in style also meant another preference in location. Whereas the flat landscape of the lower parts of the countries was ideally suited for the geometric formal gardens, the new landscape gardens were mainly situated on the edges of the dunes and the ice pushed ridges. Strings of country houses along these edges became the nuclei for the present forests in these regions. The different types of country seats and parks can be seen in this region.

The development of *Groeneveld* (fig. 6) is typical for many Dutch gardens. The original layout still reflects the strip-field-pattern of the medieval reclamations. Within this strip a pattern of alleys was laid out. The second map shows the estate in the 19th century, after landscaping and extension of the gardens. (Tromp, 1980).

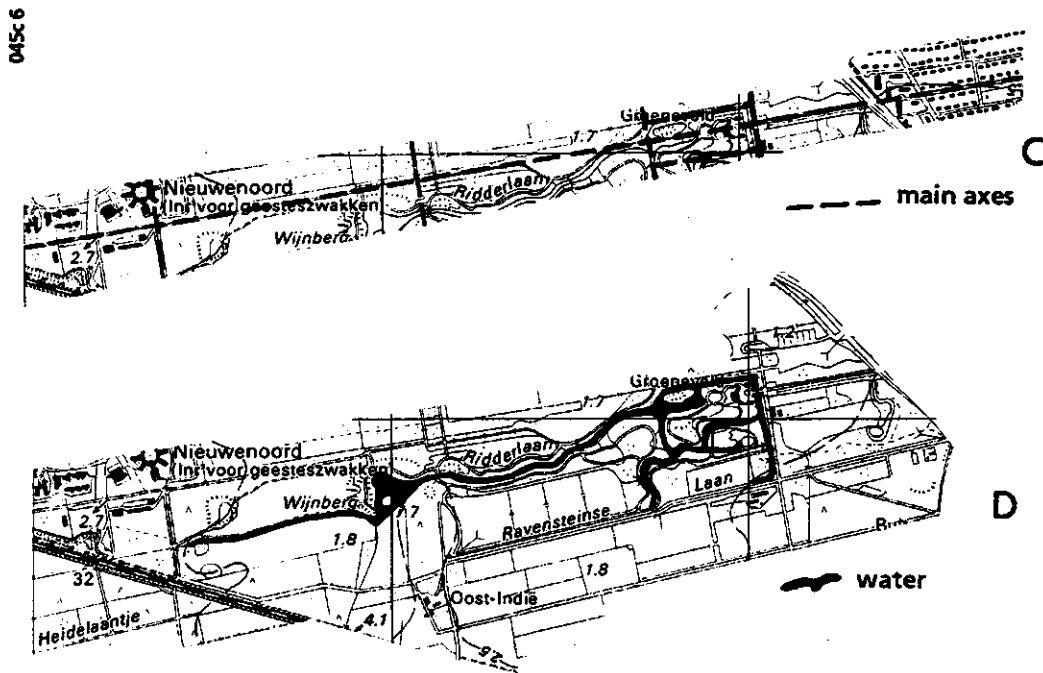


Fig. 6: Groeneveld-castle. A. Lane-structure in the original park (c. 1700-1730). B. The park after extension and landscaping (c. 1850-1880) (after Van der Jagt, 1981).

Around *Soestdijk* some parks of the Oranje family can be seen (fig. 2). The house of Soestdijk was originally built as a hunting lodge by William of Orange (William III) in 1674. Behind the house was an extensive park ("wiltbaan"), with deer parks as well as grassland and some arable, and traversed by a system of lanes (comparable with the park of William's palace at Hampton Court near London). The house was greatly extended and rebuilt and the garden was landscaped in the 19th century. The house served as Royal Palace under Queen Juliana. More interesting, although in a bad state, is the unfinished park layout of De Eult (now known as the Baamsche Bosch, Baarn forest) on the opposite side of the road. The main layout existed already when the estate was bought, possibly in 1774, by Ann of England for the later William V. A house, originally planned on the southern end of the main axis, was

never built. The garden became part of the Soestdijk estate, but the 18th century layout remained intact (Bijhouwer, 1942). It is now a very rare example of a park that, by neglect, escaped landscaping.

The manor of *Renswoude* (fig. 5) grew from a medieval farmstead. In 1526 this farm was recognized as a noble house, indicating that it was a moated site by then. In 1623 the manor was bought by the Van Reede family. They started a large building programme. Around the house a renaissance garden was laid out, traces of which can still be seen. In the end of the 17th century the renaissance layout was changed into a baroque garden by the addition of the "Nieuwe Werk" (new work), a grand canal which was copied from the Versailles gardens. The eastern side of the castle still looks in many ways as it did in the 18th century. The back (western side), on the other hand, has a strong 19th century appearance. On this side the gardens were replanned in the first half of the 19th century, by the Dutch landscape architect Zocher, following the style of the English landscape garden. Part of this garden is the artificial lake. The back of the castle was painted white to give a better reflection into the lake (Taets van Amerongen, 1987).

Den Treek (fig. 3) is another example of a large farm that grew during a long period into a country seat. The farm was first mentioned in 1334. Between 1712 and 1734 a "gentleman's room" was added. Additions like this reflect the earliest phase of the country-house. The urban landowner had his own quarters in the farm he owned, but he used them only for a part of the year. One step further is a separate house beside the farm. An example of this is the house Ooievaarshorst (north of Den Treek), built before 1680, the moat of which can still be seen. For some time Den Treek and Ooievaarshorst were two of the biggest farms in the parish, Ooievaarshorst even owning more than 160 hectares of land. In 1807 the farm was bought by W.H. de Beaufort, who built the present house and developed the large estate. A ban on building materials during the Napoleonic Age made it necessary to cannibalize two older houses, the house of Ooievaarshorst and one of the country-houses along the river Vecht (north of Utrecht) for the rebuilding of Den Treek. In the following years farm after farm was bought. In the middle of the 19th century the farmers who owned their farm were a minority (table 2).

Table 2. The owners of the old-established farms of Leusden					
	1765	1825	1850	1867	1886
Farmers	15	16	12	10	7
Others				21	24
- Investors	7	11	18		
- Institutions	4	1	1		
Total	26	28	31	31	31

In the middle of the 19th century forestation of the Leusden commons was less far advanced than in some of the neighbouring parishes. The reason was the organisational structure and the lack of capital of most farmers. When the commons were divided in 1889, 8 of the 31 participating farms belonged to the Den Treek estate, whereas other members of the De Beaufort family owned another 6 of the farms. With the exception of a few small fenlands the commons were unsuitable for reclamation. As the farmers were no longer interested in

heathland and were unable to invest in forestation, most of them sold their share to Den Treek. The estate started forestation on a large scale (Perks, 1984).

Peat-digging

In different parts of the Guelders Valley peatbogs existed. Around Soest (fig. 2) peat-digging started already in the 14th century. Shortly before 1378 the *Soestdijk* (Soest-dike) was built by the bishop of Utrecht, as a dry road through the fenlands, but also as a base for the development of the adjoining peatlands. Peat-digging started on a small scale, mainly for the bishop's own use. Half a century later the peatland was exploited by private entrepreneurs, probably on a larger scale and more systematically (Gottschalk, 1970).

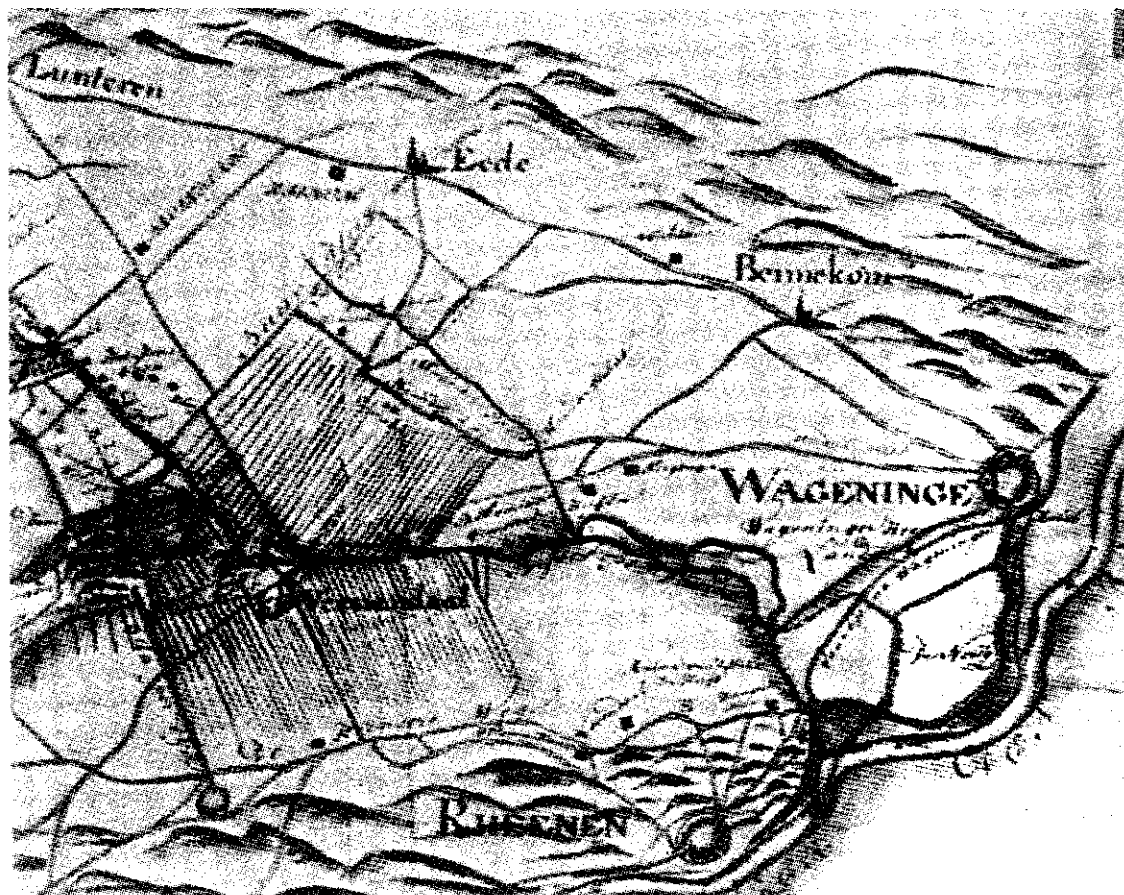


Fig. 7: Map of the southern part of the Guelders Valley (1712), showing the strip-field pattern around Veenendaal. This pattern of parallel ditches was originally laid out for peat-exploitation.

Whereas the *Soestdijk* fens belonged to the bishop, the *Soesterveen* (Soest fen), southwest of the eng, was part of the commons of Soest. In 1329 the Chapter of St John (Utrecht) dug a canal for the export of turf from these peatlands. In 1398 the Oude Gracht (old canal) was replaced by a new canal, later to be known as the Praamgracht (a praam was a barge, used

for the transport of turf). A trunkcanal, the Veensloot (fenditch) gave access to the peatlands of the Soesterveen. Peat-digging started on the northeastern side of the Veensloot. As early as the second half of the 15th century the peat was removed and cultivation of the lands started. Small farms were built and the hamlet of Eng developed (Gottschalk, 1970).

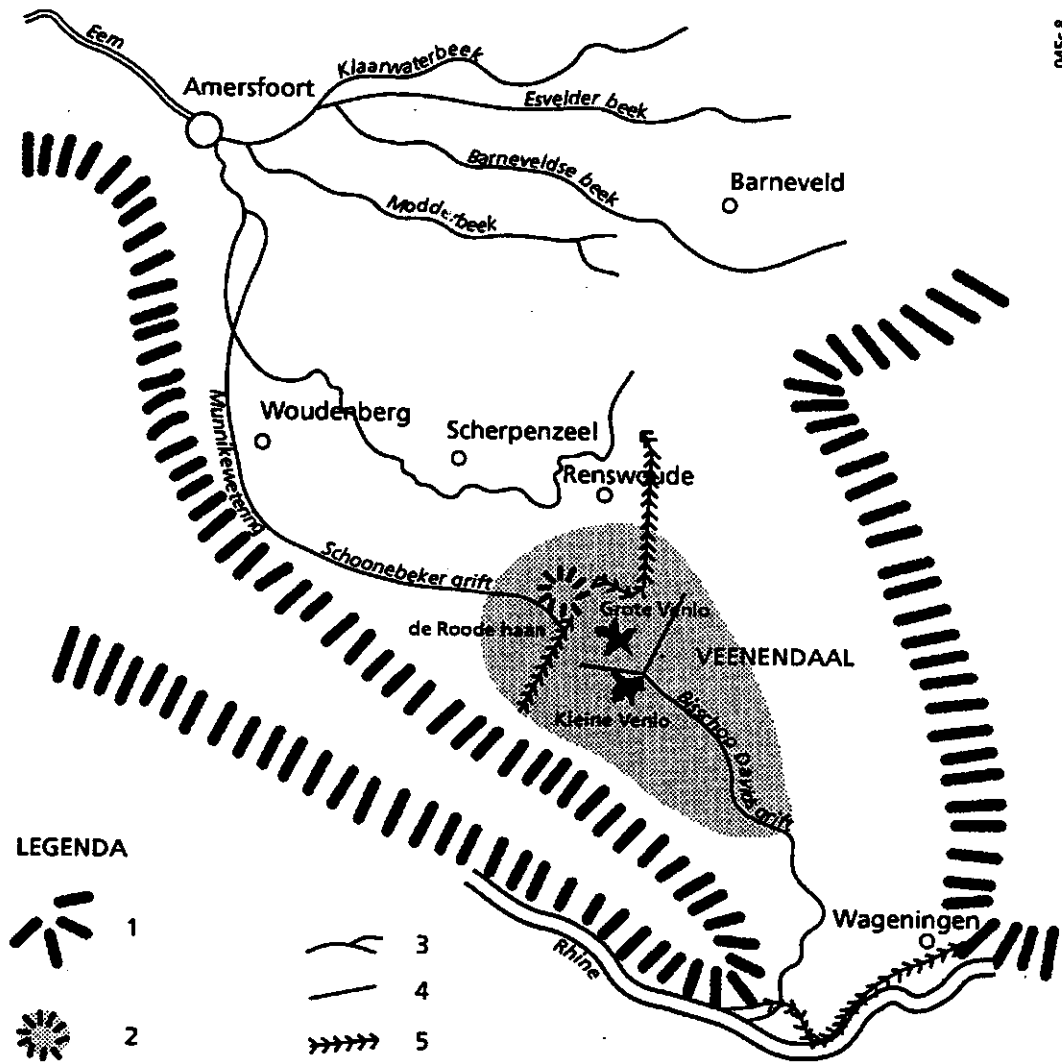


Fig. 8: The drainage pattern of the Guelders Valley after the removal of the peat (adapted from Stol, 1986). 1 Ice-pushed ridge; 2 original raised peat-bog; 3 stream; 4 canal; Slaperdijk (1652).

In the southern part of the valley a large raised peat-bog occupied the territory of the present town of Veenendaal (fig 7, 8). This peat-bog served as a main watershed, keeping the Rhinewater out of the northern part of the valley. Peat-digging started in 1473 with the building of the Bisschop Davidsgrift ("grift" comes from the verb "graven" = to dig), using

a small natural stream. Political problems stopped the exploitation almost immediately. A new start was made in the middle of the 16th century. In 1546 the Bisschop Davidsgrift was restored. Four years later some peatland on the northern side of the watershed was sold to a number of entrepreneurs, the most important of whom was the Antwerp merchant and industrialist Gilbert van Schoonbeke. To keep the watershed intact they had to dig their own shipping canal to the north. This new canal, called the Schoonebekergrift, used the old Munnikewetering near Woudenberg (see above). In 1714 both canals were joined. However, the excavation of a peatlayer with a thickness of 6 metres caused enormous changes in the drainage pattern.

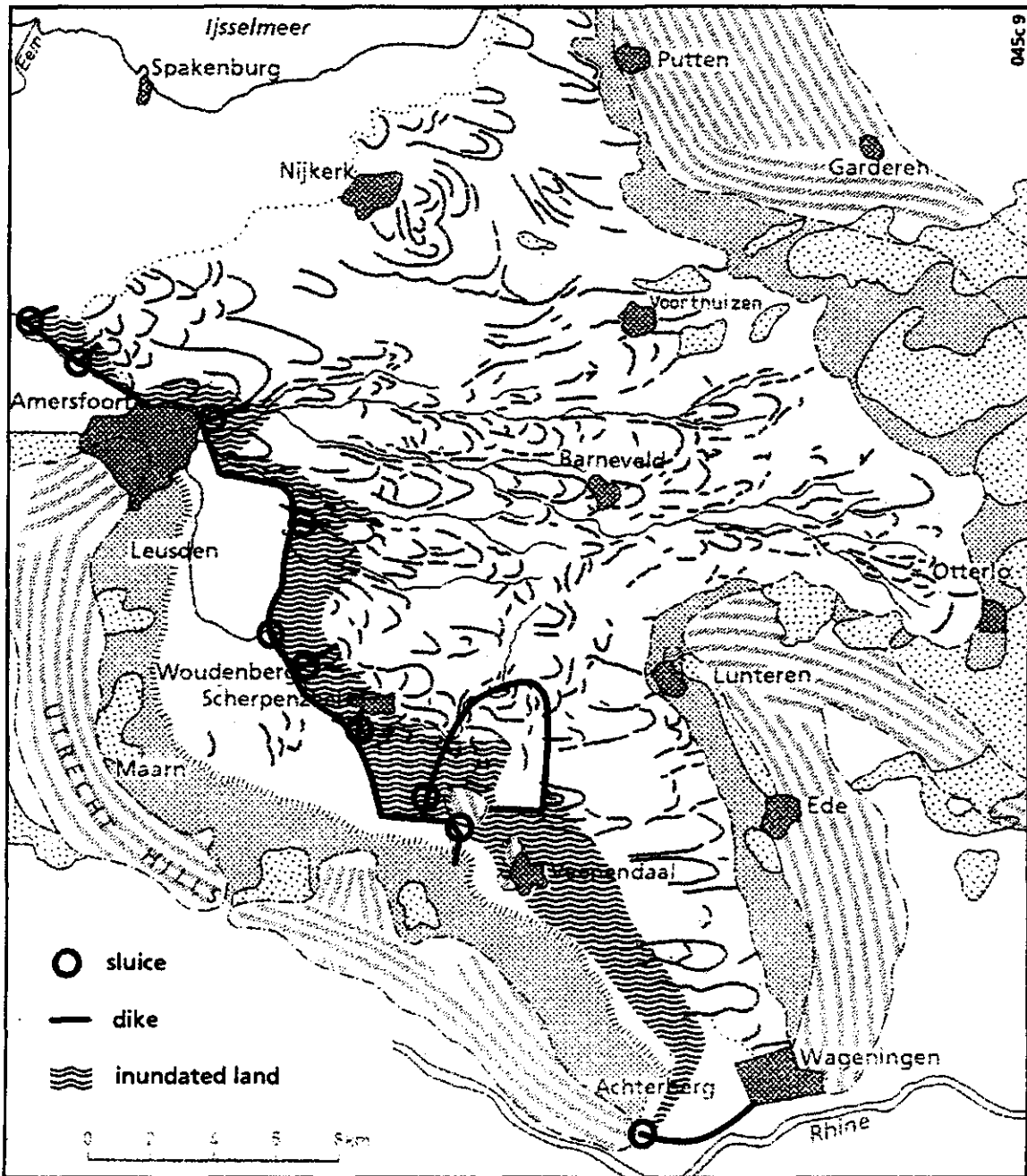


Fig. 9: The military inundations of the "Grebbelinie".

One of the main problems was the possibility of Rhinewater flowing northward through the whole valley. The Rhinedike between Wageningen and Rhenen was improved, but in 1595 this dike broke and Amersfoort was flooded. Therefore the Schoonebeeker grift was dammed in 1599 in an attempt to restore the watershed. This proved insufficient and in 1652, a year after a new flood, the Slaperdijk (= sleeping dike, a dike which is necessary only after another dike has broken) was built (Stol, 1990). The drainage problems were solved in the 1930s by the new Valleikanaal. In the meantime the village of Veenendaal developed. In 1566 a church was built. In later times the village became centre for textile and tobacco industries.

Military fortresses and inundations

In times of war the drainage problems of the valley turned into an advantage. Most of the valley was hard to cross by an enemy, and only the few east-west roads had to be defended. In later years crossing the valley was made even more difficult by the development of a system of military inundations.

As early as the Middle Ages some castles were built, notably by the bishop of Utrecht, on strategic points. New fortifications were built during the Eighty Years Liberation War (1568-1648). In the years 1582-'90 a small fortification was built in Woudenberg. This fortress was restored in 1629. Later wars, as in 1672 once again turned the attention of the military command to the valley, but only in the Austrian Succession War (1740-'48) action was taken. Between 1742 and 1755 the Grebbe-line was built. The line was strengthened in 1799, around 1866 and again in 1939-'40.

As it proved to be very difficult to inundate the whole valley, a dividing dike was built from south to north, leaving the western half of the valley dry. East of the dike a number of west-east running side dikes divided the valley in 11 inundation-basins (fig. 9). Each of the side dikes, as well as every other possible way through the line had to be fortified (Atlas; Blommestein, 1978; Deys, 1988).

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