

LANCEWAD

Landscape and Cultural Heritage
in the Wadden Sea Region



WADDEN SEA ECOSYSTEM No. 12 – 2001



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**Landscape and Cultural Heritage
in the Wadden Sea Region
Project Report**

Colophon

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Manfred Vollmer
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Dré van Marrewijk
Gregor Schlicksbier

2001
Common Wadden Sea Secretariat
Working Group on Landscape and Cultural Heritage
in the Wadden Sea Region

Folded Maps

Folded Maps Included in the Report

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1. Introduction

1. Introduction

1.1 Landscape and cultural heritage

This report is about the landscape and cultural heritage values or characteristics of the Wadden Sea Region. What exactly do we mean by cultural heritage values? 'Culture' can be defined as 'the state of civilization of a particular society or a particular time'. Cultural heritage is what remains from the past and can give us insight into the development of that civilization.

However, this is a very broad description. Traditional costume, folk tales, church organs, paintings by Emil Nolde, the songs of Ede Staal: these are all well known expressions which provide insight into the development of our culture. But there are also more simple activities which reflect the culture, such as the organization of one's leisure time, celebrations, etc. We do not intend to take such a broad approach in this report. We are interested in tangible cultural heritage objects, which we come across in our ordinary surroundings, in urban and rural areas. Actually, perhaps it would be better to talk about the 'cultural landscape; but for the purposes of the report, we will stick with the more current term 'cultural heritage'. Since these elements and structures show something of our history, and contribute to the uniqueness of an area, village or urban district, we attribute a value to them. Hence, we talk about cultural heritage values.

This refers to old farms, churches, castles and forts, but also archaeological sites such as ancient dwelling mounds, castle grounds, urban structures, dykes, waterways and forms of land division. It has also to do with contextual relationships, such as the dwelling mounds with the division of the surrounding land. In short, it refers to all elements and structures which give a picture of the history of human settlement in the Wadden Sea Region, which are still present now and which can play a role in future in the development of the urban and rural areas. These cultural heritage values can be subdivided into three categories of specialization: archaeology, the history of architecture and historical geography.

Archaeology studies finds and organic deposits from former times, from prehistory to the recent past. Archaeological digs often attract considerable attention, such as the excavation of the artificial mound of Ezinge in the nineteen thirties by Van Giffen, or – more recently – the excavation

of the 'king's terp' of Wijnaldum in The Netherlands or the excavations of the Feddersen Wierde in Lower Saxony. These excavations not only appeal to the imagination, they also add to our knowledge of the history of human settlement. Yet archaeologists are not always equally happy with an excavation: excavation means disturbing the site of a find, sometimes even completely destroying it so that future research, with even more advanced methods, will no longer be possible.

The history of architecture examines both individual buildings and urban planning structures. The large numbers of visitors attracted by Architectural Heritage Days show just how much popular interest there is in historical buildings. Architectural research is carried out to discover as much as possible about the history of a property. However, it is not only the individual buildings which are important, the structure of the town or village is also interesting. Narrow winding streets in the center of medieval towns like Leeuwarden show that there was no planning behind the layout of the town. The towns of Esbjerg and Wilhelmshaven, which were laid out according to a plan, show the other side of the coin.

Historical geography studies the development of the use of space. Urban and rural areas are shaped (and continually re-shaped) by Man, depending on the functions the area is to fulfil. The residential function led to concentrated building on the dwelling mounds; ditches were dug to facilitate agriculture, dividing the old cultural landscape into irregular blocks. Villages devoted to trade and industry often had an elongated or oval shape.

The battle against the water led to the construction of dykes and later to the construction of mills and pumping stations. Roads, canals, waterways and railways were created for transportation.

It is often these three specialist fields which are concerned with studying the history of the cultural landscape, but we should not see them in isolation. Together they tell the tale of the creation of our surroundings. Of course, the story never ends, and it is continually being adapted. New finds, new discoveries and new insights fill out and help to complete the story.

1.2 Background

The Wadden Sea is a marine wetland area on the North Sea coast of major international importance shared by The Netherlands, Germany and Denmark. The joint area of cooperation as delimited by the Trilateral Wadden Sea Cooperation – the Wadden Sea Area – covers an area of about 13,500 km². The vast majority of the area has been designated as nature reserves, national parks, Ramsar areas and Special Protection Areas according to the EC Bird Directive by the national authorities. In order to ensure that the area is conserved and managed as an ecological entity, the three Wadden Sea countries commenced a joint cooperation on the governmental level twenty years ago. According to the Joint Declaration, concluded between the parties at the Third Governmental Wadden Sea Conference in 1982, the countries declared their intention to coordinate their activities and measures to implement a number of international agreements and conventions for the comprehensive protection of the Wadden Sea region as a whole.

Whereas the trilateral Wadden Sea Cooperation, until the beginning of the 90s, focused on the natural and environmental values of the Wadden Sea, at that point, it was acknowledged that the contemporary landscape had been, to a large degree, determined by the way it was shaped by Man. The Wadden Sea landscape is characterized as wide open, with the seawall as the delimitation between the dynamic processes of the tidal flats and salt marshes and the cultural landscape of the island and mainland marshes and polders.

The cultural-historic and landscape heritage is essential for the comprehension of the area's development and identity and the inhabitants' identification with the landscape. It entails a distinctive international dimension comparable to its natural values. The cultural historic and landscape values are equivalent to the area's natural values. These need to be better understood and perceived to enable an appropriate protection and development according to the specific values including tourism purposes. Therefore, at the Wadden Sea Conference in Leeuwarden, The Netherlands, in 1994, it was agreed to pay attention to this aspect as the third dimension in the trilateral Wadden Sea cooperation, in addition to the natural and environmental dimensions. The integration of all three dimensions into a coherent policy and

management is essential to ensure a sustainable development.

In September 1997, a workshop on the landscape and cultural heritage of the Wadden Sea Region was held in Ribe, Denmark, with the participation of experts, policy-makers and planners of the three countries. The aim of the workshop was to consider the heritage in its entirety and to develop recommendations for the 1997 Wadden Sea Conference.

At this Conference, the Trilateral Wadden Sea Plan (WSP), which is a framework for the overall Wadden Sea management, was adopted. It is a statement on how the three countries envisage the future coordinated and integrated management of the Wadden Sea Area.

The policy and management of the WSP with regard to landscape and culture entails the following relevant agreements:

- a) The nomination of the Wadden Sea, or parts thereof, as a World Heritage Site will be striven for, taking into account the natural and cultural historic values of the area.
- b) The cultural-historic and landscape elements of the Wadden Sea Area will be protected and conserved through appropriate planning and management.
- c) The awareness of the area's cultural-historic and landscape values will be enhanced, where possible and appropriate, on a joint basis.

In order to implement these agreements, it was acknowledged that, as a first step, it was necessary to enhance the knowledge in this field to ensure that the available information would be on the same level as with regard to natural heritage. This would entail an inventory of the landscape and cultural heritage including an appreciation of the values. To make this information available, the implementation of a new project was agreed upon in the WSP.

The project should entail an inventory and a map of the most important cultural-historical and landscape elements of the Wadden Sea area, including an assessment of which elements should be maintained and developed, and recommendations for the protection, taking into account the recommendations of the 1997 workshop on cultural-historical and landscape values.

Since the WSP is principally confined to the above-mentioned Wadden Sea Area, which is primarily delimited according to ecological criteria and in recognition of the circumstance that a substantial part of the landscape and cultural heritage of the Wadden Sea region is outside the

Wadden Sea Area, the ministers decided that the planned mapping of cultural heritage in the Wadden Sea Area would be extended to relevant adjacent parts of the Wadden Sea Area (§37 Stade Declaration). The area which is subject to the mapping of the landscape and cultural heritage and use throughout the joint work plan is defined the Wadden Sea Region.

As a result of the agreements of the Stade Conference in 1998, the trilateral Working Group on the Landscape and Cultural Heritage of the Wadden Sea Region (WADCULT) was established by the Trilateral Working Group (TWG), which is the permanent policy working group within the trilateral Wadden Sea Cooperation with the primary task to implement the above projects of the WSP.

1.3 Project objectives

The aim of the project was, to contribute to the protection as well as to a sustainable development of the landscape and cultural heritage of the Wadden Sea Region. This included proposals on how heritage can be addressed in physical planning, and how to make use of it in developing economic activities such as cultural tourism. The objectives of the project were:

- a) to describe and characterize the landscape and cultural heritage of the Wadden Sea Region in the framework of a geographical information system (GIS) based on an inventory and valuation of the most important elements, themes and categories including an assessment of the values.
- b) to outline the development possibilities, conflict issues and decision-making demands with regard to the rural area of the Wadden Sea Region; and in conjunction with the transfer of knowledge on landscape and cultural heritage, planning and management, to contribute to the development of a spatial vision including land use and proposals for spatial planning to also ensure the integration of the landscape and cultural heritage in the overall spatial planning on levels of government in the Wadden Sea Region.
- c) to initiate the development of proposals for promoting the future sustainable use of the landscape and cultural heritage of the Wadden Sea Region including proposals for policy and management concepts and measures to further protect and manage the landscape and cultural heritage and the promotion and strengthening of, e.g., cultural tourism.

- d) to contribute to promoting the integrated management of the landscape and cultural heritage within a long-term spatial vision of the North Sea region.
- e) to contribute to raising the awareness of the landscape and cultural heritage of the Wadden Sea region throughout the project and the publication of the results in a report comprehensible for a wider audience.

1.4 Contents

The implementation of the project was designed to be based primarily on existing knowledge on the landscape and cultural heritage of the Wadden Sea Region. This knowledge, however, was and still is scattered over several institutions, organizations and authorities in the countries. It was moreover in a different state of detail, completeness and quality, which, to a major extent, causes inconsistency and incomparability of the existing state of information between the countries. The project therefore demanded the collection of information according to a harmonized approach within an overall framework to be comparable and consistent and to enable a comprehensive assessment. As a result, a trilateral harmonized data base was implemented, but gaps in information did occur due to the differences in data sources and availability.

The mapping of the landscape and cultural heritage has most appropriately and effectively been undertaken in the framework of a geographical information system (GIS) which took account of both the overall and the regional heritage. It warranted the consistency and comparability of the information and the reuse and future extension of the information.

A detailed description of the data base structure, the data sources, the mapped elements and its types as well as the registration of the elements in the four regions is given further down in this report.

2. The Wadden Sea Region

2. The Wadden Sea Region: A Unique Cultural Landscape

by Otto S. Knottnerus, Zuidbroek

2.1 Summary

The Wadden Sea Region is one of Europe's outstanding wetland areas, stretching from Blåvandshuk in Denmark to Den Helder in the Netherlands. It consists of tidal mud flats and shoals, barrier islands and fertile marshlands, the latter mostly lying behind the dykes. The coastal zone is bordered by upland villages and towns. As such, it forms a natural hinterland for the urban centers in the interior.

Because of its characteristic natural values, the region is regarded as an area of national and international importance. Moreover, the rich cultural heritage gives evidence of centuries of interaction between men and nature. Step by step men have conquered the amphibious landscape and transformed its salt marshes, dune valleys and peat-moors into a fertile niche amidst largely unspoiled natural reserves. As a consequence, human intervention created a whole series of new environments, characterized by the combination of natural diversity and cultural richness. Anthropogenic landscape elements serve as a major impetus for the surrounding natural reserves as well.

Yet, in contrast to other wetland areas where men held out at the edges of civilization, the impact of urban culture in the Wadden Sea Region has always been considerable. These circumstances have resulted in a remarkable mix of traditionalism and readiness to change, typical of maritime societies. With regard to its cultural heritage, the area can even be compared with other centers of civilization, such as Île de France, Rhineland, and the Po river-valley.

The element of tradition is especially represented by the Frisian language and identity, which have been accredited by the EU minority language program. Low Saxon (Low German), the native tongue of the Hanseatic cities, is widely spoken in Northern Germany and the adjoining parts of the Netherlands. Its use is often associated with regional pride and egalitarian sentiments. Southern Jutland has its own dialect and regional identity as well, shaped by centuries of neglect and subsequent attempts to redirect the economy of the peninsula towards Copenhagen.

Urban orientated culture and cosmopolitanism were the result of centuries of maritime traffic. Though coasting trade stagnated after about 1870, the region kept close ties with the urban centers by supplying them with quality food-stuffs. Now the Wadden Sea Region is appreciated as a natural resource area and a tourism destination for the population of the urbanized areas in the interior.

Men's sustained interaction with nature has resulted in a great diversity of geographical landscapes and a wealth of natural values. In contrast to the well-known survey on natural values (Abrahamse 1976), the underlying report focuses on the cultural values of the Wadden Sea Region.

The remnants and reminders of the past can be traced in the actual landscape. They make up layers of cultural deposits with each layer representing different stages of development, ranging from permanently buried archeological remains to transient vernacular architecture and vulnerable cultural artifacts. The five main periods can be characterized shortly:

1. Prehistoric settlements on natural elevations and artificial dwelling mounds (before 400 AD)
2. Medieval long distance trade (400-1050 AD)
3. Village life behind the dykes (1050-1500 AD)
4. Maritime commerce (1500-1800 AD)
5. Modern agriculture (1800-1900 AD) and the recent transformation of rural societies (1900-2000 AD).

The archaeological value of the area is widely recognized, because of the excellent state of conservation due to the humid soil conditions. The large number of artificial dwelling mounds (værfter, Wurten, terpen) is extraordinary: subsequent layers of human settlement have been well preserved as the mounds were raised in order to overcome the effects of rising sea-levels. Hundreds of shipwrecks remain hidden in the shoals. Medieval field patterns, ditches, roads and dwelling mounds are often remarkably well preserved. The Romanesque and Roman-Gothic churches are among the finest in Europe, whereas the multitude and quality of church organs is virtually unique. Sluices, canals, entrenchments, harbors, dykes, duck-decoys and windmills document the rise of modern engineering and the success of Renaissance architecture. The abundance of monumental 18th- and 19th-century farmhouses with contemporary gardens and orchards is astonishing, whereas many villages still maintain an early 20th-century atmosphere.

2.2 State of knowledge

Shipyards, fishing harbors, dairy and fish factories, grain warehouses, brick-works, pumping stations and characteristic lighthouses exemplify the most recent developments.

Additionally, there is a strong awareness of the immaterial heritage, the techniques of coping with nature in a highly dynamic natural environment, the skills and tools, as well as the actual experiences, handed down from previous generations.

The importance of the area's cultural heritage goes far beyond the Wadden Sea Region itself. Few areas in the world have comparable physical circumstances. The amphibious landscape with its inherent dynamics required equally flexible strategies of survival. The adaptive strategies developed here provided a model for the reclamation of wetland areas all over Europe and beyond. Agricultural innovations, specialized crops, and novel breeds of domestic animals have gone all over the world. The indigenous traditions of self-government can be reckoned among the forerunners of modern democracy. Local pride and self-awareness have been admired by a wide range of writers and novelists (e.g. Theodor Storm's *Der Schimmelreiter*, Gustav Frenssen, Theun de Vries), whereas the landscape has inspired many artists as well (e.g. Emil Nolde).

The future of the area's cultural heritage is jeopardized by a host of environmental, social-economic and demographical problems. Sea level rise, coastal erosion, hydrological changes, feeble economic potentials, unemployment, intellectual brain-drain and an aging population threaten the survival of typical landscape elements as well as the continuity of the immaterial legacy. Coherence and integrity of the rural area is disturbed by housing programs, industrial settlements, oil- and gas-extraction, dredging operations, highway construction, large-scale tourism and nature development schemes. Current agricultural and technical scaling up is detrimental for soil-related objects. Standing constructions are dependent on regular maintenance schemes, due to the effects of frequent storms and humid climatic conditions.

In conclusion, the cultural heritage of the Wadden Sea Region is rich and diverse. Its survival, however, is dependent on the willingness of future urban generations to invest in the remnants and reminders of their rural past. Caution and care are the most effective ingredients of any proposed strategy fostering the legacy of a unique cultural and natural landscape.

2.2 State of knowledge

It is surprising that the interest for the region's cultural heritage did not start before the 1970s. The importance of the Wadden Sea as a unique cultural landscape has already been recognized by 19th-century German writers such as Johann Georg Kohl, Hermann Allmers and Wilhelm Heinrich Riehl. Others such as Fridrich Arends and Karl von Richthofen stressed the geological peculiarities of the area and the richness of its medieval sources. In fact, they continued a long tradition going back to the 17th-century historian Ubbo Emmius and his predecessors.

In the Netherlands, however, the Wadden Sea Region has mainly been perceived as an annex to the Zuider Zee culture, or, alternatively, as the ethnic homeland of the ancient Frisians. Up to the 1930s, the Dutch did not even perceive the Wadden Sea as a separate entity. The shoals and mudflats east of Ameland were considered an extension of the mainland salt marshes. Only philologists such as Johan Winkler paid full attention to the cultural affinities in the area.

Whereas the idea of a Zuider Zee culture relates to 17th-century urban civilization in Holland, there is no corresponding conception linking the Wadden Sea culture to the heritage of the Hanseatic cities. Among the folklore museums, which began to collect items of regional culture around 1900, however, the Altonaer Museum in Hamburg-Altona attained the most extensive collection. The Wadden Sea islands have been described by Christian Peter Hansen and Francis Allan from a more or less folkloristic point of view since the 1850s.

Twentieth-century German authors primarily focused on the coastal marshland ('Nordseemarschen'). The idea that the marshes should be treated as a distinctive geographical, historical and cultural unit has been widely accepted (Tacke & Lehmann 1924; Wiemann 1964; Aubin 1965; Rohde 1976; Fischer 1997). During the 1950s, the University of Münster even considered making an 'Atlas of the North Sea Area' as a counterpart to Westphalia area studies. Dutch and Danish contributions from this perspective are relatively rare (Keuning 1957; Knottnerus 1996; cf. Wagret 1966).

Alternatively, several authors have stressed the common heritage of the Frisian areas as a *pars pro toto* for the whole region (Borchling & Muuß 1931; Woebcken 1932; Folkers 1956). These ideas were very current up to the 1930s, when right-wing extremists went great efforts to

2.3 Delimitation area

monopolize the Frisian ethnic past (Heemskerck Düker & van der Molen 1941). Postwar authors largely restricted themselves to shared language features. International exchanges between the Frisian districts started in the 1820s and were intensified in the 20th century, culminating into the establishment of the Frisian Council (Friesenrat or Fryske Rea) in 1956. International conferences have been held in alternating towns since 1925.

Dutch interest in the Wadden Sea Region was further impeded by the closing of the Zuider Zee by means of the 30-km Afsluitdijk in 1932. Zuider Zee culture began to be perceived as the opposite of Wadden Sea nature. Most studies have been done by the Zuiderzeemuseum in Enkhuizen, which was extended in 1983 with a large open-air museum, covering the western parts of the Wadden Sea as well.

Similar developments occurred in Denmark. Most Danes were ambiguous about the region's common heritage due to the 19th-century hostilities with Prussia. Their identification with other coastal districts was largely restricted to the Frisian and Danish minority groups in Schleswig ('Sønderjylland'). Renewed interest in maritime culture resulted in the foundation of the Fiskeri- og Søfartmuseet (1968) and the Center for Maritime and Regional History (1994) in Esbjerg.

Hence, up to the 1970s archaeologists were virtually the only ones studying the coastal area as a cultural unity (Kossack 1984). Modern archaeological research started in the Netherlands with the foundation of the Vereniging voor Terpenonderzoek in 1916. Soon German scholars followed the Dutch example. The pioneers of modern marshland archaeology Albert Egges van Giffen, Werner Haarnagel and Albert Bantelmann maintained close working relations. Important contributions to the study of coastal geology have been made by Dodo Wildvang and Heinrich Schütte.

Nevertheless, several tourist guides and popular history books tended to describe the region as a coherent territory (cf. Homann 1983). The establishment in the 1950s of the Green Coast Road, a 1200-km tourist highway from Cape Skagen to Amsterdam, invited many people to explore the region and to experience its common heritage. The growth of mass tourism since the 1960s promoted wide public interest in local culture and history, particularly in Germany, where publications on this topic have a considerable sale.

Most decisive for reevaluation of the cultural heritage was the discovery of the Wadden Sea Region as an outstanding natural zone, induced by the growing awareness of the detrimental effects of unbridled economic growth (Waddenboek 1964). The Dutch Society for Preservation of the Wadden Sea, founded in 1965, gained massive support from intellectuals and members of the urban middle class. As a consequence, the interest in the cultural heritage of the Wadden Sea Region was growing as well. The first important volume on the Wadden Sea as an international nature area, published 1976 in Danish, German and Dutch, contained seven minor contributions on archaeology and history (Abrahamse 1976). Since then, public as well as scientific interest in the cultural heritage of the Wadden Sea Region has been growing steadily (Abrahamse & van der Wal 1989; Workshop 1997; Knottnerus 1999).

2.3 Delimitation area

The Wadden Sea Region is defined as a coherent area stretching from Blåvandshuk in Denmark to Den Helder in the Netherlands. The area's outer limits are somewhat arbitrary. Traditionally, German and Danish scholars take a broader view than their Dutch colleagues (Tacke & Lehmann 1924; Stewig 1978; Seedorf & Meyer 1992-96; cf. Barends 1986; Grau Møller 1997). In our report, the Danish part of the Wadden Sea Region is to include the Pleistocene fringe from Blåvandshuk to Højer, as settlement in the salt marsh area is scarce. In Schleswig-Holstein, on the other hand, the Pleistocene fringe (including the district of Stapelholm) is generally left out. In Lower Saxony a range of complete political districts are covered, supplemented by marshland villages of Süder-Osterstade (Gemeinde Schwanewede). As a consequence, large parts of the Stader Geest and the whole Pleistocene area of Ostfriesland have been included as well.

The tidal-river marshes are only partially covered, though tide and marine clay coverage extend beyond the cities of Hamburg, Bremen and Papenburg. The saltwater border has retreated and is presently located off Glückstadt, Elsfleth, and Leer. For practical reasons, the geographical districts of Wilster and Krempner Marsch (Kreis Steinburg), Seesterdüher, Haseldorfer and Wedeler Marsch (Kreis Pinneberg), Land Kehdingen and Altes Land (Landkreis Stade) could not be studied. The marshes

2.4 Diversity of landscapes

around the cities of Hamburg and Bremen as well as the city of Bremerhaven fall beyond the scope of this study.

In the Netherlands, demarcation is complicated by the huge extent of the fenland districts around the former Zuider Zee. For this reason, the scope of the underlying survey is restricted to the islands and the former salt marshes, leaving the former bogs, peat-moors, and upland villages mostly uncovered. As a consequence, the 'upland' villages of the Dollard marshes (provincie Groningen) above MOD are not included as well.¹ In the province of Fryslân the town of Hindeloopen has been chosen as the southern limit. In the province of Noord-Holland only the most northern parts could be covered. The polder Wieringermeer (1932) and the medieval fenland districts of West-Friesland and Kennemerland (south of the Westfriese Omringsdijk and the Hondsbossche Zeewering) are excluded. However, in our area description (Chapter 5.1.) we will pay sufficient attention to those districts that have been left out in the rest of the study.

The present study covers (parts of) the following administrative districts:

Denmark

Ribe Amt

Sønderjyllands Amt

Schleswig-Holstein

Kreis Nordfriesland

Kreis Dithmarschen

Freie und Hansestadt Hamburg

Bezirk Hamburg-Mitte (Neuwerk)

Lower Saxony

Regierungsbezirk Lüneburg

Landkreis Cuxhaven

Landkreis Osterholz

Regierungsbezirk Oldenburg

Landkreis Wesermarsch

Landkreis Friesland

Kreisfreie Stadt Wilhelmshaven

Landkreis Wittmund

Landkreis Aurich

Kreisfreie Stadt Emden

Landkreis Leer

The Netherlands

Provincie Groningen

Provincie Fryslân

Provincie Noord-Holland

2.4 Diversity of landscapes

2.4.1 Geographical landscape types

The Wadden Sea Region contains very distinct geographical landscape types with a high level of regional variation. But their identification is complicated by the different classifications used in historical geography, geomorphology, and soil science. Moreover, national classifications are diverging as well. Sticking to North-West European and British terminology we propose a distinction between (1) dunes and moraine islands, (2) littoral landscapes, (3) coastal and tidal-river marshes, (4) polder lands and drained lakes, (5) fenlands and cut-over raised bogs, and (6) upland moors.

Table 2.1:
Landscape types and dominant soil types in the Wadden Sea Region

	Calcareous gley-soils (sandy clay)	Predominantly non-calcareous gley-soils (heavy clay)	Peat-soils	Podzols & brown soils (sand and loam)
1. Dunes & moraine islands	((Embanked) salt marshes)			Barrier islands Beach barriers Moraine islands
2. Littoral landscape	(Salt marshes) (Halligen)			(Sandbanks)
3. Embanked coastal marshes & tidal river marshes	Younger coastal marshes	Older coastal marshes		
	Tidal riverine landscape	Tidal-river marshes (River banks)	(River Back swamps)	
4. Polder lands & drained lakes	Younger polders Former salt marshes Recent seapolders	Older polders	Drained lakes Drained broad lands & meres	
5. Fenlands & cut-over raised bogs		Reclaimed fenland marshes	Wet fenlands Black fens (Squatter colonies)	Reclaimed fenland moors Cut-over raised bogs
6. Upland moors		(Brook valleys) (Marshland meadows)		Moraine plateaus Sandy plains Moraine hillocks (Squatter settlements) (Reclaimed brecklands)

2.4.1.1 Dunes and moraine islands

The dunes (klit, Dünen or duin landscapes) mainly consist of barrier islands and beach barriers, in most cases with embanked salt marshes at their lee-side. Several islands incorporate a moraine outcropping. It is a highly dynamic landscape, continuously reshaped by storm surges and tide movements. The dunes have been accumulated

Table 2.2:
Landscape types and sea level
in the Wadden Sea Region

Mainly below MOD	Mainly above MOD
	Dunes and moraine islands
Littoral landscape (Sandbanks & Mudflats)	Littoral landscape (Halligen & Salt marshes)
Older coastal marshes Tidal-river marshes (Reclaimed fens or river back swamps)	Younger coastal marshes Tidal-river marshes (River banks) Tidal riverine landscape
Older polders Recent sea-polders	Younger polders
Wet fenlands Reclaimed fenland marshes Drained lakes	Black fens Reclaimed fenland moors Cut-over raised bogs
	Upland moors

by the wind, locally reaching a height of 20 to 30 m. These dunes has been formed in the High Middle Ages, covering the remnants of relatively low fossil beach ridges, dating from the fourth or third millennium BC. The original dune landscape on these beach ridges was characterized by humid brown soils (Geest soils), due to the initial woodland vegetation. It can still be observed in a narrow belt of nucleated villages with unenclosed fields stretching from Alkmaar to the south (Kennemerland). In the first half of the 20th century parts of the recent dune landscape have been planted with pinewoods in order to prevent blowouts.

- a. On the true barrier islands, recent dunes and raw sands predominate. Villages, fields and meadows are usually concentrated at the lee-side of the dunes or in dune valleys with podzolic or stagnogleyic ranker-soils. Only the islands of Terschelling and Ameland have settlements reaching back as far as the Early Middle Ages. Most houses are situated on dune-ridges in the former salt marsh area, in linear respectively green villages (around a village green). Settlement patters are quite diverse. Rømø is characterized by irregular linear villages, whereas Fanø, Mandø, and Borkum have irregular clustered villages. More recent settlements such as Keitum, Wyk-auf-Föhr, Spiekeroog, Schiermonnikoog, Midsland and Oost-Vlieland have a typical Dutch main street with side-alleys.
- b. The existing beach barriers define the outer limits of the Wadden Sea Region. The Jutland ridge reaches as far as Blåvandshuk and the

Skallingen peninsula. It covers the remnants of a fossil ridge, underlying the island of Rømø. The Eiderstedt beach ridge overlaps with a system of fossil ridges (Nehrungen, Donns) extending from Sylt and Amrum down to Dithmarschen. The Noord-Holland beach barrier includes the former islands of Huisduinen and Callantsoog. Its prehistoric predecessors were to be found several kilometers offshore.

- c. The moraine islands of Sylt, Föhr, Amrum, Texel and Wieringen have a Pleistocene core, consisting of boulder clay outcroppings with its highest points at MOD 10 to 15 m. They have podzolic soils, partly with a man-made humid cover due to the addition of mineral material to the fields. Original settlement is concentrated in green villages (Texel, Wieringen) or in linear villages with side-alleys located along the Pleistocene edge (Föhr). Sylt and Amrum have irregular clustered villages. The moraine outcroppings of Dangast and Gaasterland belong to the same sub-type, fairly comparable to the upland moraine plateaus (type 6a).

2.4.1.2 Littoral landscape

The littoral landscape (vade, Watt or Wadden landscape) is constituted by canals, shoals, sandbanks, mudflats and unembanked salt marshes (marskforland, Vorland, Heller, Groden, kwelders). Approximately two thirds of the area runs dry twice a day. Raw sands, raw alluvial and unripened gley-soils predominate. The remaining inhabited salt marsh islands or Halligen occupy

the place of former mires that have been demolished by the sea. The area is culturally valuable because of the remains of numerous wrecked ships and former settlements that have been buried in the mudflats. The sandbanks and uninhabited dune islands (e.g. Scharhörn, Rot-tumeroog, Griend) serve as bird sanctuaries. The coastal estuaries and river mouths have a special hydrological regime with many transitional stages from brackish to fresh-water environments.

2.4.1.3 Embanked coastal marshes and tidal river marshes

The embanked coastal marshes (marsk, Marsch or zeeklei landscape) are characterized by medieval settlement on artificial dwelling mounds, raised up to MOD +6.0 m (in the case of Hegebeintum even up to MOD + 8.8 m). Hence, the official classification as terpen or wierden landscape. Nonetheless, many villages are located on drumlins, beach ridges or natural levees. The coastal marshes are the most widespread landscape type in the Wadden Sea Region, dominated by marine clay deposits (klæg, Marsch, klei or poldervaag soils) ranging from sandy calcareous to stiff pelo-alluvial gley-soils, with man-made humid soils on the dwelling mounds. Essentially, it is a handmade landscape, molded by centuries of piecemeal human intervention. The typical scenery of the coastal marshes, with its nucleated villages, scattered farmsteads, winding roads, meandering canals and numerous irregular ditches largely resulted from the process of embankment (hence the alternative classification as older polder lands). Most of these ditches were remnants of previous tidal creeks and gullies. Occupation is concentrated on former beach barriers and salt marsh ridges with lighter soils, contrasting with grassland depressions in which fine textured material was deposited. Each new beach ridge that developed was slightly higher than the previous one behind it. Former gullies and creeks often left depressions and boggy meres between the village territories.

The coastal marshes constitute a flat, open landscape with wide views to level horizons and huge skies. Shrubs and trees, primarily poplars, ashes and Dutch elms, are mainly found as shelter belts around the farmsteads and along the roads. Typical elements are former dykes, circular pools resulting from dyke-breaches (høl, Wehl, Brack, Kölke, kolk, wiel, waai) and clay-pits

(Späthingen, Kleipütten, kleiputten) from which the earth for dyke-repairs has been dug out. Recently, the original parceling has often disappeared due to large-scale re-allocation programs.

A distinction can be made between the older coastal marshes, the younger coastal marshes, the tidal-river marshes, and the remnants of a tidal riverine landscape.

- a. The older coastal marshes or grazing marsh districts (Sietland, kleiweide area) are located in a belt behind the more recent ones. Their territories are usually waterlogged and originally parceled out in irregular, small-sized blocks, sometimes around a radial structured core. The heavy leached-out gley-soils (Brack- or Kleimarsch, zware klei), particularly the ferruginous zones (Knick-Brackmarsch or knip-klei), are best suited to pastoral farming. Their surface is lying considerably below the present Mean High Tide Level at MOD -1.5 to +0.5 m. This is hardly enough for natural drainage during low tide. The older marshes are bordered by the fenland area (type 5b).



- b. In contrast, the younger coastal marshes or arable marsh districts (Hochland, klei-bouw area) date from the High or Late Middle Ages. They have well-drained relatively light soils (See or Kalkmarsch, zavel) that are best suited to arable farming. Elevated farmsteads are often dispersed in the fields or located along winding dykes and roads. Regular, medium-sized block field-systems prevail. The younger marshes are located slightly below or around the present High Tide Level at MOD 0 to +2.0 m.

Fig. 2.1:
Old marsh, Lower Saxony
Photo: G. Schlicksbier

- c. The tidal-river marshes (Flußmarschen) along the Elbe, Weser, and Ems Rivers constitute a diverse landscape, reaching from the former sea-marshes through the brackish riverbanks into a genuine fresh water marsh. The levees are usually 1 to 3 km in width and bordered by back swamps that largely consist of reclaimed fenlands previously covered by wood-peat bogs or sphagnum-peat moors (type 5b). Heavy soils prevail, ranging from the calcareous gley-soils (Kalkbrackmarsch) downstream to alluvial-alluvial gleys in the rear. Fossil river courses (roddons) are a prominent feature, due to the reclamation of the surrounding fenlands. As a rule, however, the clustered villages on the levees have been incorporated into the linear structured fenland landscape. Especially on the Elbe River banks most of the original block parceling has been destroyed.

The riverbanks are lying slightly below the high tide at MOD 0 to +1.5 m, but the surface is rising upstream. Nowadays, tidal movements are quite pronounced (3 to 4 m) due to extensive dredging activities, thereby enabling the low-lying back swamps to be drained effectively. Up to the 19th century, however, circumstances were worse, as the Weser and Ems River had been silting up due to upland erosion. The low tide near Bremen got stuck at MOD +2,7 m, urging steep dykes and causing the inundation of the surrounding marshes. As late as the 17th and 18th century most houses had to be built on platforms or dykes. The back swamps of the Elbe River were far better off. Though low tide in Hamburg was 1.5 to 2 m higher than today (MOD 0 to +0.5 m), in the Elbmarschen it must have been fairly comparable with today's figures (MOD -1.2 m). Most river marshes reverted to grazing, except for the Elbe River banks, where arable farming prevailed.

The inland river districts south of Hamburg, Bremen, and Papenburg have a different landscape characterized by alluvial plains, ridges, and depressions (Aueböden, rivierklei).

- d. The river estuaries comprise the remnants of a tidal riverine landscape with reed-marshes, brooks, wash lands, shoals, reaches, and partly embanked islands. Until the 20th century, the embanked estuaries of the Oste and Leda River were irrigated each winter with highly eutrophic river-water. Several riverine islands have recently been embanked.

2.4.1.4 Polder lands and drained lakes

Polder lands or dyke landscapes (kog, Kög, Groden, (kust) polder) have been reclaimed systematically. The farms surrounded by shelterbelts are located along dykes and roads, whereas parceling has taken place in blocks or strips according to geometrical rules. It is an extremely open landscape, dominated by firm dykes, vast fields and huge skies.

Generally, the maritime polders (large-scale zeekleipolders) consist of former salt marsh ridges and tidal plains, covered by calcareous or sandy gley-soils (polder- and vlakvaag soils). Most of the polders are suited to arable farming. Estuarine plains, such as the Jade, Dollard and Middelzee bay have heavier soils that are only suited to arable farming when specific hydrological measures are taken. Often they remained pastures. Embanked sandbanks, such as Dieksand and Zijpe have lighter soils that need extensive maturing. In most cases, each subsequent polder had a slightly higher level than the previous one, leading to substantial drainage problems. Older dykes, however, were not always leveled. Often they maintained for security reasons, leading to compartmentalizing of the landscape.

A distinction can be made between older and younger polders, drained lakes and recent sea-polders.

- The older polders were embanked by local communities from the 13th century onward. They had a small-scale parceling, often in parallel strips extending from the adjoining areas. Farms and cottages were located in linear settlements near or on the dykes. As their soils became leached-out and drainage was blocked by subsequent embankments, they often reverted to pastoral farming. Most older polder lands lie between MOD -1.0 to + 1.0 m, partly due to the subsidence of underground peat layers.
- Since the 16th century embankment often took place under the direction of foreign entrepreneurs. These younger polders were designed and parceled out in a Renaissance chessboard fashion. The farms were dispersed along dykes, roads, and canals, villages were situated near tidal harbors or at crossroads. As a rule, the younger polders lie between MOD 1.0 and +2.5 m, due to the fact that the former salt marshes have been raised up until 1.0 m above the Mean High Tide. Yet, several polders that have been embanked prematurely are lying below MOD. The Zijpe and

Wieringerwaard polders in Noord-Holland, lying at MOD -2.0 to 0.0 m, were completely dependent on artificial drainage from the onset.

The most recently embanked former salt marshes are largely uninhabited and used for pastoral farming. They are located in Jutland, on the coastal islands and along the Eider, Elbe, and Weser Rivers. A typical element in these former salt marshes are 18th and 19th-century drinking-water pits for cattle, often surrounded by a dyke. A 19th-century summer-polder in Oostergo has recently been reconnected with the sea.

- c. Drained lakes and meres (older droogmakerijen) are the remains of eroded fenlands and peat-moors beneath which old marine clay or Pleistocene sand was uncovered. The drained lakes are completely dependent on artificial drainage, as their bottoms are ranging from MOD -0.5 to -3.0 m, in Holland even going down to -5.0 m. Their humid-alluvial gleysoils (plas-, tocht- and leekeerd soils) were mostly suited to pastoral as well as arable farming. From the 16th century onwards, the lakes have been reclaimed under the direction of foreign entrepreneurs, who conducted the project in a modern Renaissance fashion. The 7,200 ha Beemster Lake in Noord-Holland (1612) served as a model to many other projects. As a rule, the lakes was surrounded by a dyke, rationally parceled out and drained by windmills or pumping-engines that siphoned off the water into a circular canal. Villages were usually situated along the roads or at crossroads, sometimes in a chessboard fashion (Staverse Meer, Wargaster Meer, and Sensmeer). Whenever artificial drainage was unsuccessful farmers had to restrict themselves to extensive cattle farming. Here we find dispersed farms on dwelling mounds (Gotteskoog, Stapelholm). Other drained lakes were largely uninhabited and used as haymeadows (Meggerkoog, Wieseder Meer, Freepsumer Meer, Huningameer). In the 19th-century extensive areas of broad land resulting from peat dredging, have been reclaimed. These so-called peat-polders (veenpolders) are largely restricted to Holland and Fryslân. In the latter case, there was a legal obligation to reclaim the peateries after dredging (1822).
- d. Recent sea-polders (newer droogmakerijen) are the product of 20th-century large-scale engineering. Some of them are completely

dependent on artificial drainage, which is the case with the Wieringermeer, lying at MOD -5.0 m. Others have developed behind modern dams that were constructed for the sake of coastal protection and as drainage reservoirs, such as Beltringharderkoog, Speicherkoog and the embankments of the Lauwerszee. These areas are important as bird sanctuaries.

2.4.1.5 Fenlands and cut-over raised bogs

The fenlands or the peat reclamation landscape (mose, Moor or veen landscape) constitute the remainders of a belt of former back swamps and peat-moors lying between the coastal marshes and the inland districts. They were systematically drained and reclaimed since the 9th or 10th century AD. The individual holdings were parceled out in parallel, tapering, fish-bone or fen-shaped strips (Hufen, stroken, slagen), separated by ditches and intersected by roads and canals at which the farms and cottages were located. Each strip constituted a farmstead. Linear settlements along the roads or canals (Hufen- or Reihendörfer, rijen- or streekdorpen) were the rule. Partially uninhabited irregular strips (wischen, mieden, or blok-stroken) at the edges of the older coastal marsh districts (type 3a) result from the initial reed swamp reclamation, preceding the development of linear settlements in the rear. More recent villages sometimes take the form of squatter settlements (Kolonistsiedlungen).

We can distinguish between wet fenlands, reclaimed fenlands, reclaimed peat-moors, black fens and cut-over raised bogs.

- a. The wet fenlands, grazing fens or broad lands (Sietland, veenweide or veenplassen landscape) are waterlogged and reserved to pastoral farming. Most of the original bogs and moors have been reclaimed during the Middle Ages. Often 15 to 25% of the area are taken in by ditches, sometimes intersected by meres and lakes. Their soil consist of earthy peat (Nevermore, laagveen = koopveen and madeveen) or raw peat covered by a gleyic layer (Moormarsch, klei-op-veen = weideveen) due to inundations after initial reclamation. The fields are usually treeless, except for some rows of willow pollards. Several districts close to the former peat-moors have a more intimate character due to alder hedgerows and copses; others are dominated by lakes, waterways, and canal settlements. The surface is lying far below the present sea level at MOD -

2.0 to 0.0 m. Several districts are completely dependent on artificial drainage.

- b. The reclaimed fenlands (Marschhufen or Deichreihen settlements) consist of former bogs and sphagnum peat-moors that have been largely transformed into fertile marshes, due to the fact that the peat cover has eroded at an early age. The fenland marshes are partly overlapping with the tidal-river marshes (type 3c), whose back swamps had initially been covered by eutrophic wood peat rising just above the fresh water level (open landscape). If drained sufficiently, the ranker-like or humid gley-soils (woudeerd and leekeerd soils) were perfectly suited to arable farming and horticulture. Locally, extensive dredging and maturing provided a thick humus cover (tuineerd soils). This is particularly the case in West-Friesland and the Elbe River marshes. The latter are characterized by ridge and furrow agriculture (vaulted fields). The surface varies from MOD -2.0 (West-Friesland) to +1.0 m (Elbe River marshes), making the lowest parts completely dependent on artificial drainage.

In the brackish area behind the older marshes, the initial peat-cover largely consisting of reed peat hardly left a trace. These areas are mainly used for grazing. The dominant soils are humid pelo-alluvial gley soils (Brackmarsch or tochteerd soils) more or less comparable to the older marshland surface (type 3a). Locally, these gley soils rest on humus substratum (Organomarsch, plaseerd soils).

- c. The reclaimed peat-moors (Geestrandmoore, Aufstrecksiedlungen, or wouden) resulted from systematic colonization of the raised bogs on the Pleistocene fringe. We find them on the western plains (including the western Pleistocene fringe of Ostfriesland) as well as in Nordfriesland and Dithmarschen. The colonists usually proceeded from the coastal marshes up to the Pleistocene fringe, reclaiming one village after another. As soon as the 2-3 m thick peat cover began to subside, settlement was concentrated on Pleistocene ridges emerging above the sinking fields. Yet, the original field-system was maintained. The parallel strips (opstreckende heerden) stretched from the green brook valleys up to the remaining peat-moors, often reaching a length of several kilometers. As a rule, the individual strips were separated by hedgerows and sod banks (Wallhecken, Knicks, houtwallen), giving the impression of an enclosed boscaje land-

scape. The dominant soils are podzolic sand-rankers. The fully reclaimed peat-moors are often classified as 'upland' moors (type 6), though they are lying between MOD 0.0 and +5.0 m.

- d. Partly reclaimed peat-moors or black fens (højmose, Hochmoor or hoogveen) constitute a transitional stage in the reclamation of raised bogs. Parts of the dark earthy peat-soil (meer- and vlierveen soils) are still present. Drainage, cultivation, and amelioration will eventually result in the full disappearance of the humus peat-cover, unless the water table cannot be lowered further. Their extension is largely restricted to the eastern districts (e.g. Kornkoog, Dithmarschen, Elbmarschen, Kehdinger Moor, Hadelner Sietland, Moorriem, Bollenhager Moor). Settlement is usually concentrated in linear villages at the edge of the former raised bog (Moolland and Moorhufen settlements). Each colonist extended his strips of land (either dispersed or concentrated around the farmstead) into the peat-moor. Parts of the bog have been cut for fuel, whereas the remaining inferior peat-soils were improved by marling with the help of the underlying sand or clay soil. Arable farming has been the rule until the 20th century, mostly buckwheat cultivation in a slash-and-burn system, alternated with rye and potatoes. Nowadays most reclaimed black fens are used for pastoral farming. Erosion often took a swift course: the Kehdinger Moor has subsided more than 1.5 m during the last century. The 19th-century cultivation of the Schweiburg peat-moors led to its reduction by two-thirds.

Additionally, cotters and smallholders were recruited after 1750 to settle down on state property in squatter colonies and planned peat-moor colonies (Moorkolonien, see also type 6). These were parceled out in a small-scale geometrical fashion or in parallel strips. Most of them can be found in Ostfriesland. More recent reclamation efforts usually resulted in larger farms. Most of these colonies are lying several meters above sea level.

- e. The cut-over raised bogs or genuine peat-moor colonies (Moorhufen or Fehn settlements, veenkoloniën) can be compared with large-scale polder lands and drained lakes. During the 16th and 17th centuries modern entrepreneurs in the northern Netherlands started to reclaim the 'upland' peat-moors below MOD +5.0 m in order sell the peat to

the urban population (hence the classification as turfwinings or hoogveen-ontginings landscape). A web of waterways and sluices connected the peat-moors to the neighboring coastal harbors. Farms and cottages were located along the canals, from where individual strips stretched out geometrically into the hinterland. By middle of the 20th century, most of the peat-reserves had been used up. This landscape type is largely restricted to the western districts (including Ostfriesland and Papenburg), but after 1750 it was imitated near Bremen (Teufelsmoor), in Oldenburg (Augustfehn and Elisabethfehn) and in the Wilster Marsch (Vaalermoer).

During the 18th- and 19th-centuries more or less systematic peat dredging below the water-level resulted in the creation of amphibious broad lands with pits (petten) and ribs (hence the classification as veenplassen landscape). In our area, their extension is limited.

2.4.1.6 Upland moors

The upland moors or brecklands (hede, Geest, zand landscape) are a quite diverse region, ranging from picturesque hamlets, enclosed fields and copses along the Pleistocene fringe to large-scale modern villages, vast pastures and maize fields, endless windbreaks and dull pinewoods in the hinterland. Up to the 19th century, however, the picture was quite different. The upland districts were characterized by endless tracts of heath, peat-moors, and sand blow-outs. Woods were scarce, except for Holstein, the Stader Geest, and a few moraine outcroppings. Villages and fields concentrated near brook valleys and marshland edges. Only villages with sufficient hay-meadows and pastures could attain a certain wealth. Green villages and hamlets clustered around a central green prevailed (forte, Forta, Esch, es, brink or plein settlements), augmented with star-shaped settlements along the main roads towards the commons. The unenclosed infields were carefully protected by sod banks and hedgerows and fertilized with a mixture of heath sods and manure, resulting in a cover of man-made humid soil (humus, Plaggen or enkeerd soils). The original brown and podzolic soils were rather poor (sand, Geest, zand soil) and have locally been transformed into inland dunes. Due to continuous reclamation efforts the cultivated area had been enlarged with enclosed fields (kampen), whereas the

remaining commons were enclosed in the 19th century. Since then, artificial fertilizers and rising urban demand have made an end to centuries of heath land poverty. Most of the area is now devoted to pastoral farming, pig breeding, or potato cultivation.

During the 18th and 19th century, cotters began to settle down in scattered huts in the village outskirts, sometimes leading to specific squatter settlements (Kolonistensiedlungen, heidedorpen). Many older settlements developed into nucleated row villages (Straßendörfer, straatdorpen) or irregular clustered villages (Haufendörfer, nevelvlek- or eszwermdorpen). The squatter settlements usually acted as labor reserve for the surrounding districts. In Jutland and Schleswig, refugees from the Palatinate were settled down in state-owned moorland colonies (Heidekolonien). More recent planned settlement resulted in a specific type of reclaimed breckland landscape (heide-ontginings landscape), parceled out geometrically and its most unrewarding zones planted with pinewoods. Typical landscape elements are megalithic graves, barrows, circular forts, defensive dykes, loam pits, and pingo scars. The latter are circular pools surrounded by copses on a natural rim, remaining from a glacial ice-dome. Sudden transitions from moraine outcroppings to marshland are often marked by steep cliffs (Klev, klif).

A distinction can be made between moraine plateaus, sandy plains and moraine hillocks.

- a. The billowing moraine plateaus (bakkeøer, Geestplatten, Börden, middelhoge zandgronden) harbored the bulk of the population. They had loamy, relatively fertile brown podzolic soils, whereas they were surrounded by productive brook lands (hence the name beekdal landscape) and unsurpassable raised-bogs. Their height reaches from MOD +5 to +25 m in The Netherlands to 10-40 m in Schleswig-Holstein and on the Stader Geest. Several districts had some deciduous forest. The low-lying moraine plateaus in Ostfriesland and The Netherlands were overgrown by peat-moor and reclaimed by fenland colonists during the 11th to 14th centuries (type 5c).
- b. The relatively low-lying sandy plains (hedeslette, Vorgeest, Sander, lage zandgronden) consisted of sterile aeolian or fluvio-glacial sands, largely treeless and partly overgrown by peat-moor because their podzolic soils were insufficiently drained. The subsoil often contained bog-iron. These areas, mostly

lying at MOD +10 to 15 m, were scarcely populated until the 19th century.

- c. The moraine hillocks (*randmoræne*, *hohe Geest*, *hoge zandgronden*) were largely uninhabited for long, as their podzolic soils were arid and unrewarding. They were deforested at an early age.

2.4.2 Regions and sub regions

The geographical landscapes or regions and sub regions of the Wadden Sea Region can be arranged as follows:

2.4.2.1 Denmark

The Danish part of the Wadden Sea Region consists of the Jutland Pleistocene fringe and the green meadows of the former salt marshes along the Varde Å, Sneum Å, Kongeå, Ribe Å, Brede Å and Vidå. Only the marshes of the Brede Å and Vidå (Tønder Marsk) are characterized by medieval dwelling mounds. The Tønder Marsk was embanked in the 16th century, together with the adjoining parts of Nordfriesland. The other marshes remained unembanked until the 20th century. The uplands are dominated by former tracts of heath, recently planted up with hedgerows, whereas the settlements are concentrated at the edge of the marshland. The coastal villages were relatively prosperous, due to their in shipping and commerce. The harbor of Esbjerg was founded in 1868 and opened for traffic six years later. Off the coast we find the dune ridges of the Skallingen peninsula as well as the barrier islands of Fanø, Mandø, Rømø and the sandbank Koresand. The marshland island of Gammel

Mandø has been abandoned in the 16th century, the Hallig island of Jordsand in the 17th century, the tiny island of Langli in the Hobugt in 1911. The remnants of Jordsand have recently disappeared.

2.4.2.2 Schleswig-Holstein

Nordfriesland is patterned around former peat-moors that were destroyed during the Late Middle Ages. Its central part consists of the reem-banked marshland islands of Nordstrand and Pellworm and the inhabited salt marsh islands or Halligen. Another ancient peat-moor district is the Bökingharde with the former Risummoor island (Kornkoog) and several embanked Halligen (formerly known as the Westermarsch). The Bökingharde, Wiedingharde (formerly Horsbüllharde), and the Hattstedter Marsch form the medieval centers of a large-scale modern polder district. The spacious polder lands are surrounded by outstanding wetland areas, such as the Gotteskoog and the older polders bordering the Pleistocene fringe. The traditional farms have often thatched roofs. The upland districts (not included here) are divided into the Lecker Geest (Karrharde), Schleswiger Vorgeest, Bredstedter Geest (Nordergoesharde) and Ostfelder Geest (Südergoesharde) with the Wiedau (Vidå), Süder Au, Lecker Au, Soholmer Au and Arlau as minor rivers. The islands of Sylt, Föhr and Amrum contain a moraine core, bordered by dune ridges. The embanked salt marshes on Sylt and Föhr are largely uninhabited. The islands of Sylt and Nordstrand as well as the Hallig islands of Oland, Nordmarsch-Langeneß (with Butwehl), Hamburger Hallig and Nordstrandischmoor are connected to the mainland by recent dams. Among

the other islands, Gröde-Appelland and Hooge are still inhabited, but Habel, Norderoog, Süderoog, and Südfall have been abandoned. The dunes and sandbanks of Japsand, Norderoogsand, and Süderoogsand may have been partly constituted by the remains of former moraine islands. The recent dams connecting Nordstrand with the mainland contain a brackish wetland area.



Fig. 2.2:
Blavandshuk, Denmark
Photo: S. Tougaard



Fig. 2.3:
Church on Föhr,
Schleswig-Holstein
Photo: W. Raabe

The peninsula of Eiderstedt has been formed out of several embanked salt marsh islands (Eiderstedt, Everschop, Utholm) and dune ridges, bordered by early modern polders. It is a largely pastoral farming district with many stately farm-buildings dispersed along the dykes and substantial villages built on dwelling mounds. The wooded Pleistocene island of Stapelholm is surrounded by the green Eider and Treene River marsh. Dithmarschen is a stronghold of modern arable farming. Medieval dwelling mounds, linear settlements, small towns, and recent embankments are bordered by an extensive upland zone with deciduous woods. Large forelands have been embanked in the 19th century, beginning with the Kronprinzenkoog (1787). Many settlers came from Ostfriesland. The port of Büsum is the remnant of a submerged marshland island. The recent island of Trischen was embanked in the 1920s, but abandoned in 1942. Blauort, Tertius and Gelbsand are recent sandbanks, Dieksand and Helmsand have been united with the mainland. The Eider River mouth and the vast Dithmarschen salt marshes have recently been dammed, which created the wetland area of Katinger Watt and the Speicherkoog.

The Niederelbe-Marschen (not included here) are dominated by reclaimed fenland, picturesque linear villages and characteristic farmhouses behind the Elbe River banks, intersected by the

Stör River, Krückau and Pinnau, which recently have been dammed. The low-lying Wilster Marsch is only suited to pastoral farming, whereas the tidal-river marshes of the Kremper Marsch, Seestermüher and Haseldorfer Marsch are characterized by ridge and furrow agriculture, supplemented by grazing marshes and recent orchards near Haseldorf. The Wedeler Marsch consists of embanked river sands with meadows and willow-coppices. The riverbanks are an important bird sanctuary. Large parts of the picturesque river-marsh islands near Hamburg have recently been sacrificed to the enlargement of the harbor.

2.4.2.3 Lower Saxony, Hamburg and Bremen

The coastal regions of Lower Saxony have often been compared with a tasteful crust around a dry pancake. The reclaimed fenland marshes of the southern Niederelbe-Marschen and the Unterweser-Marschen (Elbe-Weser district) are characterized by colorful rows of timber-framed farmhouses in a rustic setting, bordered by wet fenlands and black fens. The tidal-river marshes of Altes Land and the adjoining parts of Land Kehdingen (not included here) are known for their orchards. The coastal marshes of Nordkehdingen, the Ostemarsch (Neuhaus and Osten), Hadelner Hochland and Land Wursten are dominated by ridge and furrow arable farming. Linear villages and dwelling mounds alternate, intersected by the Este, Lühe, Schwinge, Oste and Medem Rivers. The Oste River has been dammed in 1968. The Wesermarsch is intersected by the Geeste, Lune, Hamme, and Wümme Rivers. Pastoral farming dominates the Hadelner Sietland, the villages of Lehe, Vieland and Stotel (now Bremerhaven, not included here), Landwürden, Osterstade and the wet fenlands around Bremen (Werderland or Vier Gohe). The former island of Landwürden (Loxstedt-Dedesdorf) has recently been united with the mainland. The extensive

sand-bank islands in the Elbe and Weser river at MOD +2.0 to +3.0 m (Bützflethersand, Hahnöfersand, Krautsand, Große Luneplatte, Harriersand, Hammelwardersand, Radersand) have recently been embanked and partly put under the plough. The island of Krautsand has many dispersed farms on platforms. Off the coast, we find the embanked marshland island of Neuwerk (Hamburg) and the dunes and sandbanks of Scharhörn and Großer Knechtsand.

The Unterweser and Jade districts in Oldenburg are mainly suited to pastoral farming, though in the past arable farming was widespread in the coastal villages. The dwelling-mound villages and dispersed red brick-built farms in the marshland districts of Butjadingen and Stadland resemble those in Ostfriesland. Part of the area is consisting of low-lying polderland (Seefeld) and black fens used for grazing (Schweiburg). A floating peat-moor outside the Jade Bay dyke (Schwimmendes Moor) recalls the former Wadden Sea mires. The mudflats north of Butjadingen (Hoher Weg) end with the dune-island of Mellum.

The typical river-marsh district of Stedingen is characterized by linear dyke-bound settlements (Lechterseite or Weserhochland) and rows of timber-framed farmhouses in low-lying districts with shrubs and hedgerows at the edges of the former peat-moor. The inner parts of the area (Moorriem, Wüstenlande, and Brookseite) consist of fenlands and black fens. The tide the Hunte River reaches as far as the city Oldenburg. The newly reclaimed Bollenhager peat-moor and the green polderlands of the Jader Marsch constitute a transitional zone towards the wooded upland villages of the Friesische Wehde (Varel) and the southern district of Ammerland (Oldenburgische Geest, the latter not included here). Jeverland has a wooded Pleistocene core, surrounded by pastures, ancient village mounds and at its western border vast arable polderlands with long rows of substantial East-Frisian farm-buildings. The naval harbor of Wilhelmshaven has been established in 1852.

The northern and western districts of Ostfriesland are dominated by arable or mixed farming. Harlingerland and the adjoining parts of Norderland (Dornum) have dozens of ancient village mounds around the branches of the former rivers Harle and Accumer Ae, bordered by early

Fig. 2.4:
Aerial photo of the
mound village Ziallens,
Lower Saxony
Photo: Wesemann



upland areas of the Stader Geest are characterized by billowing plateaus and attractive oak woods, alternating with green valleys and former peat-moors. The port of Bremerhaven at the Geeste River was founded in 1827. The elevated

modern polders, whereas the rest of Norderland (Hagermarsch, Ostermarsch, Westermarsch) is characterized by dispersed farmsteads in a treeless polder land. Dyke-lock fishing harbors are located at the mouth of the canals. Brookmerland consists of linear settlements in a varying boscaje landscape with pastures, fields, wetlands, lakes, and woods. The Leybucht is partly embanked. The district of Krummhörn is studded with large rustic marshland villages on dwelling mounds, of the same type as the villages on the other side of the Ems river. The modest villages in Moormerland, Overledingen, and Rheiderland are situated on the Ems and Leda riverbanks, separated from the upland villages by low-lying fenland pastures. The western part of Rheiderland is a fertile polder district, continuing on the other side of the German-Dutch border. Most of the Ostfriesische Geest consists of a flat boscaje landscape with brick-built villages, hedgerows, oak shrubs, and recent pinewoods. Typical elements, however, are the linear settlements along the canals intersecting former peatbogs and the untidy squatter settlements around Aurich and the district of Uplengen. The peat-moor colonies extend to the city of Papenburg (Landkreis Emsland, not included here). The barrier islands of Wangerooge, Spiekeroog, Langeoog, Baltrum, Norderney, Juist and Borkum are mainly composed of arid dunes. Minsener Oog and Lütje Hörn are no more than sandbanks, whereas Memmert has dunes.

2.4.2.4 The Netherlands

The Dollard marshes in Groningen are one of the most spacious polder land districts along the Wadden Sea coast. The fields are mainly used for arable farming. Settlement is concentrated in linear villages on the Pleistocene fringe and in hamlets on the reclaimed peatmoors. Together, polders and 'upland' villages make up the Oldambt district, well-known for its huge brick-built East-Frisian farm-buildings and working-class cottages. The borders with the upland districts of Westerwolde and Duurswold (not included here) are blurred. The latter is a typical reclaimed fenland district, bordering the reclaimed fenland marshes. The upland soils are mainly used for growing potatoes. The adjoining cut-over raised bogs of the Groninger Veenkoloniën (not included here) were an important center of peat

export, shipping, and agro-industrial production during the 18th, 19th and early 20th century. A system of 17th-century canals, supplemented by the 1876 Eemskanaal, connects the Groningen hinterlands with the dammed river mouths of the Westerwoldse A, Reitdiep, and Lauwers. The salt marshes, mudflats, and shoals of the Dollard Bay constitute an important bird sanctuary.

The ancient marshland districts of Fivelingo and Hunsingo consist of a low-lying core with pastoral and mixed farming, surrounded by an extensive arable zone known as Hogeland (highland). The inner districts consist of reclaimed fenland and older marshes with large village mounds. Population is concentrated in small towns and dyke-bound linear villages on the edges of the recent polder land along the coast. Characteristic farms with huge Frisian barns are dispersed all over the area. Dispersed farms and village mounds dominate the marshland districts of Middag and Humsterland (Noordelijk Westerkwartier), which are largely devoted to pastoral farming. Both districts have been nominated for inscription in the UNESCO World Heritage cultural list, because of its well-preserved medieval landscape. The adjoining polder lands around the village of Grijpskerk concentrate on arable farming. The rest of the 'upland' districts of Langewold and Vredewold (Zuidelijk Westerk-



Fig. 2.5:
Callantsoog, The Netherlands
Photo: D. Marrewijk

wartier, not included here) make up a boscaje landscape with wooded linear settlements. The bay of the Lauwerszee (Lauwersmeer) has been embanked in 1969. Since then, it has been used as military training-ground and bird sanctuary.

Lauwersoog has developed into a modern fishing port.

The contrast between coastal marshes and reclaimed moors continues in Fryslân. The boscape landscape of the Dokkumer Wouden (not included here) makes up the central part of the district of Oostergo. Its northern marshland zone is dominated by dozens of ancient village mounds and dispersed farms, confined by the Dokkumer Ee. To the West the older marshes are bordered by the embanked polder lands of Het Bildt and the former Middelzee (Nieuwlanden). Here, villages and farmsteads are located along linear main roads. The adjoining district of Westergo is literally stunned with maritime towns, village mounds, and characteristic Frisian farm buildings. Fryslân's northern coastal fringe (Bouwhoek) is preferred for arable farming. The inner marshland districts (Greidhoek) and the low-lying southern parts (Lage Midden, De Hemen) with many lakes and wetlands are only suited to pastoral farming. Trees are mostly lacking. Fryslân is intersected with many canals. Most natural rivers such as the Boorne River have been diverted into the lake district to the south, which is bordered by the drained broadlands (Veenpolders) and the wooded upland villages of Zevenwouden and Stellingwerf (not included here).

The northernmost part of Noord-Holland (de Kop van Noord-Holland) mainly consists of medium quality polder land, bordered by the former barrier islands of Huisduinen and Callantsoog, connected to the mainland in 1610. It is an open landscape, mainly used for mixed farming and horticulture. The polders of Zijpe (1597) and Wieringerwaard (1610) have many characteristic farm-buildings, situated along the main roads. The town of Den Helder originated from a 17th-century naval roadstead that was transformed into a major naval fort by Napoleon. It harbors a naval shipyard since 1822 and serves as the entrance of the Noordhollands Kanaal since 1824. The moraine island of Wieringen has been connected to the mainland in 1925, followed by the embankment of the polder Wieringermeer (1930) and the construction of the Afsluitdijk (1927-32). The island is characterized by a small-scale boscape landscape. The low-lying West-Friesland peninsula (not included here) is a mainly pastoral used fenland district, intersected by fossil river courses (roddons), suited to horticulture. The linear villages include hundreds of characteristic farm buildings. The northernmost parts (De Gouw) and the adjoining

Groetpolder (1846) have been nominated for the UNESCO World Heritage list because of the typical landscape values and the archeological remains of Late-Neolithic settlements and summer camps. The western parts of West-Friesland have a marshland landscape. Around the town of Schagen, we can find many dispersed farmsteads on medieval dwelling mounds. The peninsula is enclosed by a 13th-century dyke (Omringdijk). Its name must not be confused with the German expression 'Westfriesland', which has been used since the 16th century for the province of Fryslân. The western district of Kennemerland is formed by dunes, fossil beach ridges, and tidal marshes.

The island of Texel has a moraine core as well as an extensive polder district. It was united with the barrier island of Eierland in 1630, which was embanked in 1835. The other islands are true barrier islands: Rottumeroog, Schiermonnikoog, Ameland, Terschelling, and Vlieland. Only Schiermonnikoog, Ameland, and Terschelling comprise an embanked salt marsh area. Rottumeroog has been abandoned in 1965 and is destined as bird sanctuary. They all have picturesque towns and villages, due to urban influences. The island of Griend has been abandoned in the 17th century. Rottumerplaat and Engelsmanplaat are just sandbanks with recent dunes, Boschplaat has been united with Terschelling in the 1930s.

The shallow sandbanks of the western Wadden Sea is included are the tentative World Heritage cultural list, because of the many shipwrecks. The hydrological regime in the area was completely changed by the construction of the Afsluitdijk in 1932. As a consequence, the shallow Zuider Zee with its brackish wetlands and picturesque fishing villages has transformed into a monotonous sweet-water reservoir surrounded by polders, artificial wetlands, and recreational harbors. The modern IJsselmeer is deprived of tidal movements.

2.5 Natural history



Fig. 2.6:
Land reclamation,
The Netherlands
Photo: D. Marrewijk

2.5 Natural history

The history of the Wadden Sea Region is distinguished by three closely related features:

1. The highly dynamic natural environment, molded by incessant processes of sedimentation and erosion, and propelled by the periodically rising sea level (present chapter).
2. The intensive and sustained interaction between men and nature (chapter 2.6).
3. The vivid interplay between local culture and foreign incentives, resulting in the articulation of local identities (chapter 2.6).

Natural dynamics were restrained by the underlying geological frame. Geological developments were dominated by moraine plateaus, drumlins and ridges, formed by different stages of glacial extension during the Saale-Riss ice age (180,000-130,000 BP). Several moraine ridges such as the Hohe Lieth extend far into the sea, serving as fixed points for coastal erosion and sedimentation. This is also the case with the islands of Sylt, Föhr, Amrum, Texel, and Wieringen. Eroded moraine banks off Blåvandshuk, Fanø, Amrum, and Texel may have been the remnants of submerged islands. Sylt has an additional Tertiary core (Rote Kliff, Morsumkliff). During the ice ages, the areas between the plateaus were subsequently filled up with fluvio-glacial and fluvial deposits, whereas eolian sands partly covered its surface. Locally, older banks of glacial black till have been used by brick-works and potteries.

Surface relief has determined the size and structure of the distinctive landscape units. Relief is most pronounced around the glacial valley of the Elbe river, with its highest points at more than 100 m. To the north the billowing Pleistocene fringe often reaches a height of 25 to 50 m. To the west differences in height are rapidly decreasing. As a consequence, landscape units are more extensive, culminating in the Groningen and Fryslân coastal plains and the former peat-moors around the Zuider Zee.

Natural dynamics were boosted up by sea-level rise. From the latest Ice Age (about 10,000 BC) to today the level of the North Sea has risen by 100 m. The coastline continually moved south and eastward, until it reached the present Wadden Sea Region at about 6,000 BC. At 5,000 BC the Strait of Dover was flooded, which caused the currents to run parallel to the coast. Sand was heaped up to form sandbanks and barrier islands, sometimes developing into beach barriers that subsequently broke down again. Differences in tidal range determined the outcome. In the German Bight tidal movements are most pronounced (nowadays 3 to 4 m), which prevented the development of barrier islands. On the outer edges of the Wadden Sea tidal range is more restricted (1 to 2 m), which facilitated the formation of uninterrupted beach barriers. Barrier islands dominate the rest of the coastal area. Many details of coastal development are still debated, however, as reconstructed phases of maritime transgression and regression are not

generally accepted. Especially the locally observed effects of the so-called Dunkirk-I (700–100 BC, Midlum layers), Dunkirk-II (200–600 AD, Pewsum layers) and Dunkirk-IIIa transgression (after 800 AD) may have been caused by other, largely regional factors.

As sea-level rose, so did the ground water table. The coastline was driven south- and eastward, a broad belt of marsh and bog spreading before it over the Pleistocene surface to form a basal layer of peat. Between the sandy coast and the inland mires, a vast lagoon of mud flats and shallows – the Wadden Sea – came into existence, gradually filling-up with sediments transported by the sea through tidal inlets. Sand was deposited along the canals, whereas the finer clay particles were taken further inland and deposited under more quiet conditions. Bit-by-bit they constituted an elevated salt marsh fringe behind the lagoon, which protected the inland mires. At many locations layers of peat and marine sediment alternate, due to recurrent periods of rising ground water levels and peat-growth, peat-bank erosion and subsequent maritime incursions.

Wherever extended moraine ridges confronted the rushing waves (as in Dithmarschen and Eiderstedt), these ridges were partly eroded to bars and dune ridges, supplying the sediment for the advanced salt marshes and protecting the back swamps. Wherever the wind got hold of the washed up sea-sand, immense dunes developed. Most of these islands tended to drift south- and eastward. The Jutish marshes consist of a former lagoon, drowned in the last millennium BC and subsequently raised by tectonic movements, preventing the development of back swamps. The sediments in the filled-up glacial valley of the Weser and Jade rivers, on the other hand, tended to set, causing subsequent cycles of inundation, sedimentation, peat-growth, and peat-bank erosion.

Most of the inland mires developed into peat-moor domes, often 10 to 15 km in width and reaching 3 to 6 m above the original surface. Sphagnum-peat growth amounted up to 0.15 to 0.25 m per century. Locally, the upland Oldenburg, Emsland, and Bourtanger Moors may have reached 10 to 12 m. Initially, natural depressions were filled up by reed- and sedge-peat bogs. Subsequently wood-peat began to cover the river back swamps and glacial flood plains, gradually developing into sphagnum-peat moors as soon as the inflow of eutrophous river-water came to a halt. Finally, oligotrophous raised bogs

came into existence, overgrowing higher grounds until the moraine plateaus became isolated from each other. Up to the Early Middle Ages the North-Frisian shallows and the western parts of the Wadden Sea have been covered by extensive peat-moors as well, protected by prolonged beach barriers. The remnants of maritime peat-banks have been reported near the islands of Juist, Borkum, Ameland, Terschelling, and Vlieland.

Peat growth was greatly accelerated by a sudden fall in temperatures and rising precipitation quantities around 800 BC. As consequence, more recent peat-layers are inferior in quality to the initial dark peat-layers. On the other hand, rising temperatures and periods of drought since the 10th century AD prompted the erosion of existing peat-banks and beach barriers. The existing dune barriers were completely transformed, as the lower prehistoric dunes were partly overwhelmed by towering younger dunes, covering the humous fields and former woodlands by shifting sands. The medieval climatic optimum lasted until the 13th century. Due to its after-effects, sea levels began to rise again until they reached a climax in the 16th century. By then storm-surge frequency also reached a peak due to falling temperatures. Severe storm surges took place in 1164, 1219, 1287, 1330s, 1362, 1374, 1421, 1436, 1509, 1511, 1532, 1570, 1634, 1686, 1717, 1825, and 1962. The islands of Büsum, Vlieland, Huisduinen, and Callantsoog shifted landward, Mandø moved to the south. The village of Sønder side and the islands of Großer and Kleiner Wall (Hwæla Major and Minor), Buise, Bant and Ganc disappeared. The Elbe, Weser and Ems river-banks were eroded by streaming water, causing the destruction of villages in the Seestermüher Marsch, Haseldorfer Marsch, Land Hadeln, Land Wursten, Osterstade, Krummhörn and Rheiderland. Several coastal villages in Butjadingen, Harlingerland, Fryslân and West-Friesland were destroyed as well, where their remains can still be found on the shallows or in re-embanked polders. In Nordfriesland 14th- and 17th-century storm surges destroyed large parts of the marshlands lying in the Wadden Sea.

Many mires were eroded and died off during the Late Middle Ages. Dozens of stories about floating islands of peat, sometimes with trees and cattle still on it, have been recorded. As these floating peat-banks disappeared, the coastal marshes became more liable to floods. Nevertheless, the most serious damage was

2.6 Cultural history

done by human efforts to drain and cultivate the mires. The Maadebucht, Harlebucht and Marsdiep inlet probably date from the Early Middle Ages. By the 11th and 12th century the mires of Nordfriesland, Lauwerszee and the western Wadden Sea became exposed to the sea, causing a rapid fall of water-levels in the Zuider Zee and putting the area into tidal range. By the 14th century, the bays of Wiedingharde, Jade and Leybucht had broken in, followed by the Dollard in the 15th century. The fenland island of Nordstrand was destroyed as late as 1634. In each case the silt and organic material set free provided the building elements for new mud flats, salt marshes, islands and polders.

Hence, tidal movements, extreme weather conditions and ceaseless processes of erosion, sedimentation and production of organic material made the Wadden Sea a highly dynamic natural area. Tidal inlets and channels often changed their course, having a far-reaching effect on neighboring islands, salt marshes and mires, thereby determining the possibilities for human survival and intervention.

2.6 Cultural history

2.6.1 The coastal niche

The dynamics of the natural environment had its repercussion on the settlers' cultural heritage. Interacting with nature, men had to adapt themselves to continuously changing circumstances. As a consequence, they created a unique social-ecological niche with four main elements:

1. Abundant natural resources, originating from agriculture on rich alluvial soils, peat-digging, salt-making and fishing in shallow waters.
2. A system of collective arrangements, generated by the need to survive in a potentially hostile environment: artificial dwelling mounds, embankments, drainage schemes, fuel, hay and drinking-water supplies, as well as effective strategies of military defense (flood belts and entrenchments).
3. Accessibility to overseas trade, which enabled its inhabitants to realize their assets and provided cultural incentives at the same time.
4. Geographical insulation and climatic restraints (e.g. malaria), which prevented sudden incursions into coastal wealth and

frustrated long-term military control until the Early Modern Age.

Moreover, coastal civilization had a very distinctive dynamic, characterized by continuous interaction of traditional beliefs and current incentives. Rural traditions, based on experience, were constantly challenged by urban innovations, economic conjunctions and political realities. This resulted in articulate local identities and a more or less insular culture, accustomed to the assimilation of foreign influences as well as to counterbalancing their unwanted effects. Coastal culture was characterized by centrifugal tendencies, in spite of its vicinity to the sinews of international commerce. Hence, cosmopolitanism and holding on to tradition went hand in hand.

During the late 19th and 20th century, the coastal districts took the penalty for taking the lead. They fell victim of a 'leapfrog effect', as they had invested heavily in technologies and ways of life which gradually became outdated. The region's infrastructure was reversed: inland traffic increased, whereas the coasting trade came to a halt. Economic growth fell behind, due to the fact that the demand for agrarian products was inelastic as compared with industrial outputs. As a consequence, many cultural and natural values survived the pressure of modernization. The inland districts, on the other hand, had 'the advantage of backwardness', as the moorland landscape was completely transformed.

2.6.2 Prehistoric Age (before Christ) and Roman Iron Age (0-400 AD)

Men have inhabited the Wadden Sea Region since the late Neolithicum. The marshland amphibian environment with its diversity of fish, shellfish, fowl and wild plants has been exploited since the 5th millennium BC by the sedentary Ellerbek-Ertebølle and Swifterbant cultures. Subsequently, Neolithic, Bronze and Iron Age settlers learned to use the fertile salt marshes and riverine thickets for pasturage, agriculture and fishing.

For long, permanent settlement was largely restricted to the edges of the coastal area. Dozens of sites were located on moraine hillocks and river dunes, where they were subsequently buried under marine or riverine sediments or became overgrown by the mires. In fact, most of these settlements may be considered as outposts of the upland funnel-beaker civilization. Appar-

ently, their inhabitants fled the area as soon as the impact of rising sea levels came to be felt. Near Delfzijl Neolithic settlers built a megalithic chambered tomb about 3350 BC. After 2200, BC the site disappeared under several feet of clay and peat. Settlement remains are known from Emden and Winsum (Groningen), but scattered findings suggest that human activities extended far into the present Wadden Sea. As much as 77 megalithic graves and 1,000 Bronze Age barrows are located on Sylt, Föhr and Amrum alone, whereas the adjoining mudflats and sandbanks provided dozens of flint daggers and sickles. Barrows and megalithic graves are also numerous in the upland districts.

As sea-level rise slowed-down, other tribesmen began to reclaim the coastal plains. The oldest known maritime settlements, dating about 2600 BC, have been found in a former salt marsh area in West-Friesland. Archaeologists

Fig. 2.7:
Burial mound, Hjerpsted,
Denmark
Photo: C. Christiansen



assume that the beach-ridges may have been settled even earlier. The earliest findings are associated with the Vlaardingen civilization (3500–2500 BC), an amphibious counterpart of the upland funnel-beaker settlements. But the overall picture is very incomplete, due to coastal erosion. Apparently, local people have learned to build seaworthy boats at an early date. Even the oldest marshland settlement reveals traces of haddock, caught in open sea. Wherever possible, diets were supplemented by large amounts of shellfish. During the Bronze Age (2100–600 BC) the island of Helgoland, 100 km off the coast,

apparently developed into a center of copper production, flint mining and amber trade. The moraine island of Texel has also been inhabited since the Bronze Age.

About 1350 BC Bronze Age farmers settled down at a former salt marsh estuary near Hoogkarspel (Noord-Holland). As far as we know, they were the first marshland dwellers who held out against rising water levels by building their farmsteads on raised platforms. Another Bronze Age settlement has been found at the Weser River banks near Rodenkirchen. In either case, settlements were abandoned before the beginning of the Iron Age.

The riverbanks of the Ems have been first colonized during the 7th century, the Elbe River banks at the latest during the 4th century BC. Several contemporary burial places have been discovered in the Ballum Marsk. These Bronze and Iron Age settlers adapted to the amphibian environment by draining their fields, expanding their stocks and supplementing their diets with fish and fowl. The riverine woods were cut down in order to obtain building material, fodder and fuel. In some cases, the inhabitants started to raise their farmyards in order to cope with increasing ground-water levels. When forward pushing mires and recurrent sea-breaches submerged their fields, people had to give up their quarters. Most riverbank settlements and several inland districts were abandoned during Pre-Roman times.

It took even greater efforts to establish hamlets in the unprotected salt marshes, as people had to cope with shortages of fuel, timber and drinking water, as well as with the risk of storm surges. The first settlers may have been transhumant pastoralists, who spent the winters on higher grounds. Probably the expansion of inland bogs reduced their means of subsistence and made them look for alternatives in the rapidly expanding marshes. Many upland villages with walled-in field systems ('celtic fields') have been abandoned during the last centuries BC. The salt marshes were largely treeless, dominated by immense reed-lands beyond the reach of the eye. Intensive grazing and mowing, however, created an open landscape in which black-grass communities (*Juncetum gerardi*) were the dominant vegetation.

The Groningen and Fryslân coastal marshes were inhabited permanently since the 6th and 5th century BC. According to recent studies, the first settlers probably came from the east, supplemented by immigrants from the adjoining

upland districts. In Lower Saxony and Noord-Holland, the coastal districts have been colonized since first century BC, the Schleswig-Holstein marshes during the first century AD. By then, a densely populated zone of marshland villages stretched from the Wiedingharde district down to the river estuaries near Amsterdam. Additionally, the North-Frisian islands, the island of Texel and the Jutland coastal fringe came to harbor a large population, in the North-Frisian case probably supplemented by foreign immigrants. Several other islands may have been inhabited as well. Roman naval expeditions conquered a fort on 'Burchana', probably the former fenland island Bant (now Kopersand) near present-day Borkum. But archeological findings are totally erratic.

The ethnic identity of the settlers remains unclear. Roman sources mention the Frisii and the Chauci as well as a series of tribes on Jutland peninsula (e.g. Sabalingi, Sigoulones, Aviones, Ambrones, Saxones). We may expect, however, that only minor cultural differences existed between the marshland dwellers, the island population and the upland coastal tribes.

In each case, the first marshland settlements were established on the surface just above high-tide levels. Subsequently, farmyards were raised. Near Bremerhaven and Harlingen archaeologists discovered that Roman-time settlers sometimes surrounded their infields with quays, measuring three to four feet in height. Only after several generations people started to build collective raised mounds (toft, værft, Warf, Wurt, wierde, terp) from sods and dung on which they situated their farms and infields.

Step-by-step permanent settlers became fully adapted to living in tidal areas, building cattle-farms on mounds, preserving winter-stocks of hay, fuel and drinking water, and tilling the stiff clay-soil during the brief summer season. Various tribes shared virtually the same technology. They cultivated salt-resistant summer-crops such as barley or bere, broad beans, flax, gold of pleasure (*camelina sativa*) and probably kale. Furrows indicate that the mould-board plough may have originated here. The outfields were carefully drained by ditches, radially descending

from the village mound and running towards tidal creeks and gullies. Farms, accompanied by helmed haystacks and artisan pit-houses, were located side by side along the slopes of the mound, in the Late Middle Ages often surrounded by a circular road. Alternatively, along the riverbanks where tide was restricted, farms were situated on a row of house platforms bordering a tidal creek (Ostermoor, Kreis Dithmarschen). The aisled longhouses had roughly the same structure as their Bronze Age predecessors. Cattle was stalled in the side-aisles behind a gutter, the living quarters were located in the adjoining hall. Wells and ponds guaranteed fresh-water supplies, dried cow-dung or peat served as fuel, timber had to be imported.

During the Roman Iron Age (0-400 AD) all coastal tribes had brisk sea-borne contacts with the Roman borderlands from which they borrowed material items (weapons, pottery, quern-



Fig. 2.8:
Castle mound Menaldum,
The Netherlands
Photo: D. Marrewijk

stones, glass, jewelry) as well as religious and political ideas. In return, they offered cattle, hides, textile, bone artisan products and probably also slaves. Many of them served as Roman soldiers, others turned to piracy against the Empire. Ships, however, other than large hollowed tree boats, have never been discovered. A Roman trading post has been excavated at Jemgum-Bentumersiel (Landkreis Leer). The circular forts of Archsumburg on Sylt, Trælbanken in the Højer Marsk, Heidenschanze and Heidenstedt near Langen-Sievern (Landkreis Cuxhaven) and the fort near Borkum mentioned before

show the consequences of nascent political centralization, partly due to increasing interaction with the Roman Empire.

Political turmoil increased during the next centuries. Due to the Germanic tribal expansion Groningen and the adjoining parts of Drenthe and Fryslân came under the influence of the Chauci, leaving only the western districts to the Frisians. The Chauci became subsequently integrated into the Saxon tribal confederation, while the remaining Frisians were dragged into the chaos of the collapsing Roman empire. A host of maritime intruders from Jutland tried to benefit from the unsure situation. Moreover, as sea levels rose, coastal dwellers had to cope with washed-over fields, drowned animals and salted wells. The introduction of malaria (a principal mortality cause in the marshes ever since) may have caused a demographic disaster.

By 300 AD the Fryslân and Noord-Holland coastal marshes were to a large extent abandoned, whereas Groningen and Ostfriesland encountered a profound reduction in population levels. The Schleswig-Holstein and Lower Saxony coastal areas were abandoned somewhat later as the Anglo-Saxons left for Britain, where climate and living conditions were better. Only Jutland saw a more or less continuous development, though several villages were abandoned in the 6th century, probably due to sea level rise.

2.6.3 Early Medieval Time and Viking Age (400–1050 AD)

After a partial break in the 4th to 6th century, coastal population grew to unprecedented levels of density and wealth. Basic technology, however, remained practically the same. As before, the colonists often settled down on the surface before they started to build dwelling mounds. Most villages were located on recently deposited seashore banks. As these obstructed drainage, the original settlement areas often became overgrown by the peat-moors. During the migration period large family farms tended to be replaced by small farms and pit-houses, but soon circumstances improved. By then, most adults may have acquired a certain immunity against the endemic marsh-fevers, which were to rage among children and foreign visitors for many centuries to come.

Resettlement of the western districts took place after 425 AD, mainly by Anglo-Saxon colonists from the East. Apparently, they claimed the old tribal name of the Frisians, which now

covered the whole coastal area down the to mouth of the Scheldt river. Probably the area served as an intermediate for the colonization of Britain. During the 6th and 7th century, Frisian immigrants also repopulated the eastern districts up to the Weser river, including the upland districts, followed by the Bremerhaven area (Wursten, Lehe, Stotel, Vlieland). Here the Frisians may have settled down as military colonists under Frankish rule. Since the 8th century, Frisian colonists also settled down at the edges of the North-Frisian mires, in Eiderstedt, at the islands of Sylt and Amrum and at the fertile lee-side of the other barrier islands (e.g. Terschelling, Ameland). Beyond the Eider river, Frisian immigrants (probably from the Weser area) rapidly outnumbered the Jutish settlers from the North, apparently because of their superior technology, which enabled them to exploit the salt marshes more effectively. Dithmarschen and the Elbe riverbanks were recolonized since the 7th century by Saxon tribes, apparently coming from the upland districts. These villages can often be arranged according to their names: the older ones ending on -wort/warden/wierde, -ingen/ens, -stedt/stede or -thorp/rup/dorp, the younger ones ending on -büttel/büll/bøl, -fleth, -lak, -um/heim, -husen/huizen or -buren/bert/bierum.

Scandinavian bracteates and many other luxury items prove that the whole region was politically and religiously connected with Scandinavia until about 700. Yet, the Frisians and Saxons spoke West-Germanic dialects, closely related to Old English, and quite different from the Scandinavian dialects of the North. Early state formation took place under the charismatic rule of petty kings such as Radbod (d. 719), who resided in Utrecht, but whose political influence reached as far as Helgoland. The jewelry produced at a royal site near Wijnaldum counts among the finest contemporary objects known in Europe. The fame of the Frisian kingdom is reflected in Anglo-Saxon literature.

Shortly after, Frisians and Saxons became formally christianized and incorporated into the Frankish kingdom. The tribal leaders and their families were largely absorbed by the hierarchical structures, developing around the royal court and its ecclesiastical equivalents. Noble estates were granted to remote abbeys and episcopal sees, whereas local chiefs declared their loyalty to foreign magnates. Timber-built baptismal churches were carefully distributed over the various districts in order to support political power

with the suggestion of divine blessing. Though the web of feudal duties was not as inevitable as in the inland districts, by the year 800 the coastal region was fully integrated into the hierarchical configurations of the Carolingian Empire. During the next four centuries the Duke of Saxony, the Archbishop of Hamburg/Bremen, the Bishops of Münster and Utrecht and a whole range of Saxon, Westphalian and Low Country counts dominated the political scene of the Wadden Sea Region. Carolingian power reached as far as the Eider river, where the Danes had erected a defensive wall across the Jutland peninsula. Southwestern Jutland was effectively christianized in the second half of the 10th century under the authority of king Harald Blåtand and his jarls, Ribe and Schleswig becoming the main episcopal sees.

Christianized merchants from the Frisian districts played an important part as middlemen between the Frankish kingdom and the semi-tribal societies of Northern Europe. Their kinsmen established outposts far beyond the borders of the Empire. Trade concentrated on exchanging foreign luxury products, which were vital for the gift economy of local warlords and their retainers. The port towns were newly created under the protection of local magnates and royal representatives. Houses were situated along riverbanks and tidal creeks, where the inhabitants could easily moor their cargo ships and pull them

ashore. These flat-bottomed sailing ships are considered the forerunners of the Hanseatic cog ship (kogge), of which an example from 1380 is exhibited in the Bremerhaven shipping museum.

The most famous of the maritime emporia were the towns of Dorestad (Wijk bij Duurstede near Utrecht) and Hedeby/Haithabu (Schleswig). The former was the gate to the German Rhineland, the latter controlled the shipping route from the Baltic along the Eider and Treene Rivers towards the North Sea. The towns of Ribe and neighboring Dankirke, Hamburg, Bardovick (Landkreis Lüneburg), Stade, Brüggehusen (Bremerhaven–Lehe), Bremen, Jever, Emden, Stavoren and Medemblik had a similar history. Moreover, foreign outposts were established along Europe's main waterways from Scandinavia to Britain (York) and down to the Rhine and Loire valleys. This was not only the case in the towns, but sometimes also in the surrounding countryside. In most cases, Frisian presence is documented by the pottery meagered with grinded musselshells. Frisian grave-goods have been discovered in Darum near Ribe, along the banks of the Elbe river and in Dunum (Landkreis Wittmund). The Frisian guild in Sigtuna (Sweden) existed up to the 11th century. Cities like Cologne, Mainz and Strasbourg had their own Frisian quarters, Frisian small coins (sceattas) were widespread, whereas the North Sea was sometimes called 'Mare fresicum'.



Fig. 2.9:
Farmhouse in the Ballum
marsh, Denmark
Photo: J. Frederiksen



Fig. 2.10:
Misthusum, part of an old
dwelling mound ensemble,
Denmark
Photo: C. Christiansen

Consequently, international commerce brought the Frisians homelands in contact with foreign countries all over Europe. In the Wadden Sea Region a new type of village came into existence: oblong mercantile dwelling mounds, situated along tidal creeks, populated by merchants, skippers and artisans, and protected by a local lord. In many cases these villages developed into centers of political and ecclesiastical power, as was the case with Emden, Farmsum, Appingedam, Winsum, Dokkum, Leeuwarden, Bolsward, Oldeboorn, Stavoren and Medemblik. Others had a more local significance, such as Nesse, Groothusen, Grimersum, Oldersum, Hatzum, Jemgum, Termunten, Garreweer, Westereyden, Holwerd and Berlikum. Sometimes a second village church witnessed the growing self-awareness of the local inhabitants, e.g. Langwarden. To what extent the eastern districts participated in maritime commerce, remains uncertain. The dwelling mounds of Otterndorf, Belum and Hohnswik near Ihlienworth (Landkreis Cuxhaven) are from the same type as the ones mentioned above. On the other hand, Elisenhof (Kreis Nordfriesland), Wöhrden and Wellinghusen (Kreis Dithmarschen) had a radial structure, despite of their contacts with interregional traders. Viking-age merchants from Jutland may have been involved in shipping activities as well.

Since the 9th and 10th centuries, however, Frisian commerce gradually declined, as long-

distance luxury trade gave way to a monetized trade of bulkier consumer goods. Bit-by-bit traditional emporia were replaced by regional market towns. Still, Frisian small coins have been widespread until the 11th and 12th century. By then, however, Saxon merchants and ship owners from the emerging Hanseatic cities had started to take over the Frisian's leading role.

Additionally, Frisian expansion suffered from the dissolution of the Frankish empire. During the 9th century, the Wadden Sea Region came under the influence of christianized Viking warlords such as Harald Klak, who were driven out of Denmark by competing royal lineages. Hidden treasures found on the island of Wieringen witness their activities. Conversely, dissident Frisians settled down beyond the border on Danish territory. As before, the Wadden Sea Region became an intermediary for the conquest of England. Frequently, whole districts were held to ransom, whereas villages were burned and their inhabitants sold as slaves. Probably, however, piracy and trade went hand in hand. Viking age barrows are known from Föhr, Sylt and Amrum as well as from the Jutland coastal area.

A new generation of circular forts served as nuclei of emerging state power. The oldest ones were erected during the wars between the Saxons and their Frankish opponents: Stellerburg, Bökelburg and Kuden (Große Westburg) in Dithmarschen, Kaaksburg and Esesfelt near Itzehoe, Pipinsburg, Hollburg and maybe Judenkirchhof around Cuxhaven as well as Bokelerburg near Rastede (Landkreis Ammerland). Several forts were part of a Carolingian coastal defensive line stretching from Boulogne to Den Burg on the island of Texel. Another 10th-century fort has recently been located at Cuxhaven-Altenwalde. Contemporary structures beyond the imperial border may have been built by Frisian immigrants (Lembecksburg on Föhr, Tinnumburg on Sylt, the former Ratsburg near Rantum). The Woltersberg at Jever-Schortens and three connected moats near Bad Zwischenahn are 11th-century structures, probably established to back the feudal aspirations of the Saxon duke. The Hamburg Nicholas-church marks the location of another ducal fort. Viking attacks ended mid-11th century, as state authority was firmly established in Scandinavia. The political ties between Denmark and its overseas colonies soon broke off.

On the whole, foreign visitors were surprised by the prosperity of the coastal inhabitants. Archaeological findings show a rich and diverse

material culture, witnessing extensive commercial contacts and a considerable degree of specialization. Next to stockbreeding, sheep breeding and some arable farming, people were engaged the production of cloth, salt and hides. Spinning, dying and weaving were female work. Weaving patterns were sometimes quite delicate. Apparently, the woad-died cloths served as currency. Quality and quantity was dropping in the Late Middle Ages, probably due to competition from Flanders. Nordfriesland was a last resort. By the middle of the 16th century, however, local production had come to a halt.

The Frisians were specialists in salt-making, for which they burned silted peat and boiled the ashes. Entire peat-banks have been systematically destroyed in order to obtain the raw material. For each 100 kg of salt 4 cubic meters of peat had to be processed. Additionally, during the relatively warm 12th and 13th century, genuine salt pans, in which salt-water was reduced by evaporation, may have been in use. Early and high medieval salt pits (*daliegaten*) have been discovered at several locations in Ostfriesland, Groningen (e.g. Zoutkamp), Fryslân and Noord-Holland. The former island of Bant (near Borkum) produced salt until the 16th century. Yet, the most productive locations were in Nordfriesland, where several sites were operative until the 18th century. Again, foreign competition was destructive. Lüneburg and Biscayan salt (the latter since the 15th century) were purer and more suited to the preservation of cheese, butter and dried beef than the bitterly tasting local products. Traditional centers of salt-refinery, such as in Harlingen and Alkmaar, switched over to imported salt. The remaining local production was exported to Jutland and Norway. Local salt was also used for the preparation of cowhides.

Most coastal villages were largely agricultural. Farm construction probably remained the same, but wickerwork was temporarily replaced by sod walls, probably due to the scarcity of locally available brushwood. Most dwelling mounds had a fresh-water pond (*fedding*, *fething*, *feit*, *dobbe*), often connected to a natural well. The infields were located on elevated mounds, banks and holms surrounded by ditches and hedgerows (*esing*, *eske*, *marren*, *kampen*, *esscher*, *gast*, *houw*, *valg*, *felling*, *zaadland*). After the harvest, these served the sheep flocks as a winter-refuge. The outfields were parceled out into privately owned irregular square fields (*fenne*, *fen*, *krog*, *block*, *hamm*), leaving only the remote meadows (*wisch*, *miede*, *hemrik*, *zwaag*) undivided. Prob-

bly each peasant had an individual claim to a certain number of wagonloads of hay and specified grazing-rights, depending on his wealth. In this respect, coastal society was not egalitarian at all.

Newly established villages were parceled out in a more or less rectangular pattern instead of the radial forms known since the Iron Age, probably reflecting the rise of private property. By the 9th or 10th century, the newly deposited salt marshes that were suited to arable farming were parceled out in regular blocks (e.g. *Butjadingen*, *Groningen*, *Fryslân*). Planned villages suggest the existence of small-scale royal, noble or ecclesiastical manors. A 10th-century manor near *Hatzum* (*Landkreis Leer*) shows a hall with an adjoining pit-house, where female servants or serfs made cloth. The village of *Baflo* (*Groningen*) originated from a Carolingian manor. In *Dithmarschen* and *Wursten* settlement moved from the inland villages towards a long row of individual farm mounds along the coastline, which were subsequently connected by a dyke. In *Wiedingharde* and northern Ostfriesland individual farm mounds were dispersed all over the area, but in the other districts village mounds remained the rule. Occupation along the Pleistocene fringe was mostly concentrated in hamlets at the border of the marshland zone. Here traditional aisled buildings had been replaced by simple longhouses with exterior wall-posts, which gradually evolved into the high-medieval aisled open-hall type.

The cultural heritage of the prehistoric and early medieval landscape is still omnipresent, particularly in the German coastal districts. In the Netherlands many mounds have been leveled by digging during the 19th and early 20th century, because the humose soil gave a perfect sort of manure. Re-allotment programs since the 1950s have erased much of the original field-systems. Still, many medieval mounds and ancient field-systems are intact, serving as a treasury for archaeologists and landscape-historians from all over the world.

2.6.4 High and Late Medieval Time (1050–1500 AD)

During the 11th and 12th centuries, Europe witnessed a change from outward expansion to internal colonization, due to a growing population and encouraged by the efforts of feudal lords to enlarge their income. Until then, most coastal districts were virtually insulated from the

higher Pleistocene grounds by impassable peat-moors, bogs and lagoons. Thenceforward, huge efforts were made to expand cultivated areas by draining the inland moors and building protective dams against floods and inundations. Moreover, almost 1,000 parishes were founded, reorganizing the population around the priest and the local gentry.

At the end of the Middle Ages, the coastal area had been completely transformed into a cultivated landscape. Entire marsh districts were surrounded by an unbroken earth-wall of more than a man's height, designed to shut seawater and acid bog-water seepage out of the vulnerable fresh water milieu within its confines. Populous villages lay dispersed in a patchwork of fertile arable fields and enclosed pastures, the farms and cottages sheltering around newly built brick churches or dispersed along dykes and river-banks. In the rear, the former peat-moors had given way to a belt of low-lying pastoral farming settlements, boggy meadows and waterlogged wastelands, isolating the maritime zone from its hinterland and functioning as a powerful military defense line.

At the edges of the Wadden Sea powerful cities had risen, sending their freight ships along the North Sea coast and buying the countryside's agricultural surplus. The islands began to take part in the shipping and fishing industry, whereas the villages along the Pleistocene fringe shared in the maritime wealth of the coastal zone as well. The contrast with the inland zones was striking, however, as these were increasingly characterized by endless tracts of disforested heath and desolate peat-moors.

The embankment of the coastal marshes began in the 11th and 12th century. Sometimes neighbors just started with a dyke around their fields or around several villages (Eiderstedt, Butjadingen), alternatively dozens of villages collaborated from the beginning (Nordstrand, Oostergo, De Hemmen). Both ring-shaped quays and linear embankments have been observed. By the 13th century a 1 to 2.5 meter dyke surrounded most districts, with timber-built valve-locks or hollowed trees at its lowest points. Inner dykes such as the Grauwall (Wursten) and the Slachte (Westergo) protected the low-lying inland districts against surface water from the coastal area. Subsequently, rivers became dammed up by a series of parallel dyke-locks (Siele, zijlen). The administration of dykes, locks and polders required completely new forms of administration and control (Köge, Sielachten, zijlvesten, koggen,

waterschappen). Yet, these embankments could not prevent that the fields became inundated by storm surges. The dykes had mild slopes, so that the waves could do limited damage.

At the same time, population growth caused an inward drift in which numerous drawn-out linear villages were founded. Peat-moor colonization started in Zuid-Holland and Utrecht fenlands and in the Frisian districts north of Amsterdam, probably in the 9th or 10th century. But the Frisians districts up to western Ostfriesland and around the Jade and Weser rivers soon followed. By the 11th century, a second wave of Frisian emigrants (probably coming from the districts around the Ems river) began to reclaim the North-Frisian marshes, which were recently made accessible by drought and coastal erosion. They mainly settled in Eiderstedt, Nordstrand and on the edges of the former Risummoor (Bök-inghamde). Other fenland villages were established on the Pleistocene fringe behind the former peat-moor domes (Klixbüll, Schnatebüll, Stedesand, Enge, Bargum, Langenhorn). The Tøndermarsk was settled in the 12th century. Experienced colonists from the Zuid-Holland plains settled down at the peat-moors behind the Elbe and Weser Rivers banks. The oldest colonial settlements were in the so-called Hollerland near the city of Bremen, established in 1113. Local settlers reclaimed the Dithmarschen peat-moors.

The fenlands came to be characterized by a honeycomb pattern of dykes and canals, designed to protect each village territory against the down-streaming water from neighboring districts (Sietwenden) and landward peat-moors (Hinterdeiche). Individual properties (Stave, Hufe, Spal, Bau, heerd, sate) were divided in lengthy parallel strips separated by linear ditches. Wherever peat-land reclamation reached into the upland peat-moors ditches were replaced by hedgerows and sod banks (e.g. Hadelner Sietland, Moorriem, Brookmerland, Westerkwartier, Friese Wouden). Most Frisian villagers had an unrestricted reclamation privilege (right of *Aufstreck* or *opstrek*) that resulted in toothed boundaries between competing village territories. The Hollander colonies, on the other hand, had a more systematic layout with a linear back-frontier, as they were administered by noble entrepreneurs (locators) with limited claims. Frisian settlements usually got names ending on *-wold/woud*, colonists from Holland often used names on *-kop/cope* or *-wetteren*, both employed names on *-brook/broek* or *-wisch*.

These initial reclamation efforts, however, provoked an irreversible range of hydraulic measures, as they corroded the peat surface and made its subsoil set. Every reduction of water levels caused drastic surface subsidence, which made further reductions necessary and increased the risk of inundation. As a rule, farms and villages were relocated several times up to the recently reclaimed peat-moor, reassigning their drenched fields as pastures and meadows. By the end of the Middle Ages, many fenland districts were submerged with rainwater during wintertime. The peasants reverted to cattle farming, supplemented by small-scale agriculture on riverbanks, holms and artificial ridges. This



was the case in the Wilster Marsch, Hadelner Sietland and in the fenland districts along the Weser and Ems River as well as in the low-lying districts of Groningen, Fryslân and Noord-Holland. In the Late Middle Ages, rising seawater levels and rising tides, due to embankments, made the situation even worse. Some fenland areas were completely devastated by the sea after the dykes had been neglected, such as the Jade and Dollard Bay. In Nordfriesland, the legendary town of Rungholt was submersed in 1362. Probably adjacent areas were hit as well: 40 churches are reported to have been destroyed in the 14th and 15th centuries. A stream of Frisian refugees settled down at the Pleistocene fringe around Husum and in the remaining parts of the Risummoor (Kornkoog). The heavily populated district of West-Friesland could only be saved by a 4 to 5 m high sea wall, strengthened with wooden palisades, seagrass (zeewier), twigs, thatch, brick and boulders, greatly reducing the risk of salt-water flooding. Parts of a seagrass dyke have been preserved at the former island of Wieringen.

On the islands and in the upland districts population grew as well during the High Middle Ages. By the end of the Middle Ages, most woodlands were replaced by heath. Villages were relocated at favorable spots next to the marshland area, often situated around a central green (vortoft, forte, brink, theen, tie) and surrounded by oak shrubs. During the Middle Ages, arable farming came to be concentrated in heavily manured infields for the cultivation of winter-

proof rye (alsædjord, dayelsklûn, marker, kampen, gast, es, bouwte), supplemented by temporary outfields for oats and flax (wungelûn, haferland, dries, tresk) and carefully protected by hedgerows, dykes and ditches against cattle roaming on the exhausted commons (ellemode, mente, marke, meenschar). This system was most pronounced in the districts south of the Elbe River as well as on the North-Frisian islands and in the adjoining mainland villages, where peasants completely abandoned the practice of fallowing their infields each third year. In wintertime, the cattle was stalled on heather-sods taken from the commons, which resulted in an increase of available quantities of necessary manure. Buckwheat was introduced in the 15th and 16th centuries.

On the mainland and on several islands (Föhr, Ameland, Terschelling) a restrictive open field system prevailed, in most cases until the 18th or 19th centuries. On the moraine islands of Texel and Wieringen the open fields were enclosed in the 17th and 18th centuries, resulting in a characteristic patchwork of tiny fields embedded by a grid of sod banks (tuunwallen). On the other islands, arable farming was mostly restricted to specific fields in dune valleys, surrounded by a dyke or fence (riem). Unrestricted grazing on the commons reinforced the process of wind-erosion, thereby contributing to the inherent instability of the coastal dunes and inland sand-drifts. Whole villages have been covered by sand or washed away into the sea (e.g. Alt-Rantrum, Ording, Sier, Callinge). Low-lying areas were

Fig. 2.11:
Dyke in the province of
Groningen, The Netherlands
Photo: D. Marrewijk



before the end of the Middle Ages, in the Tøndermarsk as late as 1556. Some areas were only protected by summer-dykes, such as Misthusum in the Ballum Marsk where colonists started to build eight dwelling mounds as late as the 12th century. Apparently, these colonists came from Holland. Instead of building sea-dykes, they left for higher grounds in the 17th and 18th century. The same holds true of the marshland villages established on natural holms near Ribe (Yder Bjerrum, Jernkær) and on dwelling-mounds near Mjolden. Contemporary mounds on Föhr have been deserted

Fig. 2.12:
Wheel (old breach in the
dyke) in The Netherlands
Photo: D. Marrewijk

overgrown by peat, as heathland exploitation caused surface leaching and the formation of impermeable underground layers of bog-ore. Locally, bog-ore was excavated and processed into iron.

The dominant type of upland farm building changed from convex longhouses into aisled open-halls, in which the harvest had to be stored and dried in the loft above the central fireplace. The additional rooms were left unheated. By the 15th century, timber-framed open-halls prevailed from Nordfriesland to Drenthe, leaving only the coastal area to more traditional longhouse buildings. Moreover, the constructive properties of timber-framed buildings were integrated into the traditional longhouses in Jutland and Schleswig-Holstein.

Wherever arable farming was worthwhile systematic salt marsh reclamation took place at an early date. Several recently silted up bends and forelands were embanked since the 13th century, such as in Eiderstedt, Krummhörn (Bucht von Sielmönken), Groningen (Fivelboezem) and Fryslân (Middelzee). These newly reclaimed areas were famous for their fertility. Monasteries and landlords often took a leading role. On the other hand, whenever peasants stuck to traditional cattle-farming embankment was delayed, particularly in those districts where individual farmsteads prevailed. In the Wiedingharde, Hattstedter Marsch, Husumer Südermarsch and Norderland embankment was not concluded

before the marshlands were embanked in the 16th century. Everywhere the upland dwellers were rather reluctant to embank the uninhabited salt marshes and river estuaries, because the floods had a fertilizing effect on pastures and meadows. The Jutland coastal fringe and several barrier islands were provided with dykes as late as the 20th century.

A special case were the Halligen: the exposed salt marsh islands in Nordfriesland and elsewhere, studded with hamlets built on dwelling mounds. Their early history is largely unknown. Probably local settlement originates from salt-making communities, working in the outskirts of the drowned peat-banks. Archaeological remains and references to former churches suggest that the area was quite prosperous. The islands of Oland, Langeneß, Nordmarsch, Gröde, Habel and Hooge have been mentioned in 13th- and 14th-century sources, together with the former islands of Gestenack and Hingsteneß. Norder- and Süderoog must have been settled by then as well. The Halligen Hooge, Südfall, Hamburger Hallig and Nordstrandischmoor were originally part of the embanked island of Nordstrand. The first two have been cut off as early as the 13th or 14th century, the latter contains the remnants of a former raised bog, inundated in 1634. The area's natural environment is very dynamic, however, the present landscape largely dating from the last few centuries. Moreover, the popular idea that Hallig life reflects medieval patterns

is erroneous. The sophisticated system for catching rainwater (schetel) and storing it in a pond (fething) or in cisterns (sooten) may have been quite recent. The house posts were subterraneanly interconnected in order to prevent collapses during a storm surge.

Dozens of small Hallig islands have disappeared, others were included in the embanked polderlands (Galmsbüll, Dagebüll, Fahretoft, Ockholm). Comparable settlements in other parts of the Wadden Sea Region were Jordsand, Bant, Griend and the excavated mound of Torp (near Den Helder). They have all been abandoned in the 16th or 17th centuries. The same holds true for a series of peat-moor islands in the former bays of Jade, Leybucht and Dollard. A special case is the island of Neuwerk, where the city of Hamburg built a fortified tower against pirate attacks around 1300. The tower was erected on an artificial platform and was renewed in the 1370s. The island is embanked in the 1550s and subsequently settled by farmers, who lived on dwelling mounds.

Marshland agriculture suited the amphibious environment. As before, barley, bere, oats and broad beans were the most important arable crops. Peat-moor colonists mainly grew rye. Topsoil desalination, however, had its repercussions on the local economy as it increased the range of available grains and grasses but also gave way to new weeds and plagues. Sheep farming, which had been essential to the Frisian cloth-trade, was restricted by the appearance of liver fluke (carried by dwarf pond snails). Some local cloth and salt production survived, but the local economy came to drift primarily on agricultural exports. Dairy farming grew in importance, particularly in Holland and Fryslân, where new techniques of preserving butter and cheese became available. Huge haystacks with adjustable roofs made it possible to increase the amount of the winter-fodder. The commons were mostly divided among the farms, except for specific plots intended for the poor. Among the farm buildings the traditional longhouse with wicker walls and thatched roofs prevailed. Their durability was greatly enhanced, however, by the use of saddle stones and additional braces instead of dug in posts. Since the 15th century the living quarters were often made of brick, provided with a vaulted dairy cellar, an elevated storage room for valuables (pesel, pisel, upkamer) and sometimes a stately hall with a chimney (saal, binhûs).

The eastern districts, on the other hand, specialized in arable farming. In the Elbe and Weser river districts the longhouses were replaced by timber-framed open-halls in the 14th or 15th centuries. If the longhouse was maintained, as in Ostfriesland, its central floor was widened to increase the loft. Additionally, detached barns, byres, wagon-sheds, granaries and adjustable haystacks were built. Marshland peasants employed a ridge and furrow system, according to which 10-15 m wide ridges were heightened and fertilized with mud from the ditches. In the river marsh districts the ridges often reached a height of 1.5 m. In the arable districts of Fryslân and the adjoining parts of Groningen another system has been observed. The irregular shaped fields were heightened as a whole, resulting in a crested (kruinig) profile.

Political and religious structures changed together with the landscape. By the 11th and 12th century the local elite began to strive for autonomy. Explicit ties with foreign rulers were gradually loosened, if not broken off completely. Only the Holland beach barrier and most of the upland districts were fully integrated into nascent states at an early date. Actual territories were small because of the waterlogged terrain that restricted the effective reach of military control. Moreover, the nascent military techniques that gave armored horsemen an advantage over foot soldiers were rather useless in the marshlands, except for summer drought and extreme winter cold when the roads set hard. The inner dykes were also used to create defendable flood belts, which were sometimes drained again so that the ice did not hold. Several districts had a medieval defense line (Landwehr) with canals, dykes and unsurpassable thickets stretching into the peat-bogs, sometimes used up to the 18th century.

Within these coastal territories participial government had an early start, urged by the requirements of hydraulic management and military defense. They resulted into a range of about forty or fifty peasant republics under the rule of local chiefs and abbots. Officially modeled as urban corporations with counselors and bailiffs these pristine states acted as a rural counterpart to the free Hanseatic cities. In the central area of the Wadden Sea Region most districts had gained full independence by the middle of the 13th century. To a large extent, they benefited from the political vacuum left by the Saxon duke Henri the Lion and the shift of imperial policy towards the Mediterranean. Dithmarschen

became an official member of the Hanseatic confederation, whereas the loosely structured Frisian republics between Zuider Zee and Weser held irregular conferences at the Upstalsboom near Aurich. Just as in their urban counterparts, actual oligarchy went hand in hand with egalitarian feelings, reaching a climax during the 15th century. Local autonomy came to be identified with ancient (Frisian) freedom, supposedly bestowed by kings and emperors.

Local meeting places were found in walled churchyards, in the churches, on the dyke-locks or on special greens, such as Dinghügel (Sylt), Fegetasch (Wiedingharde), Soptswarft (Bökingharde), Ordinger Berg, Burmannswege (Eiderstedt), Auf dem Schinkel (Kehdingen), Warning-sacker (Hadeln), Klénckenhamm (Wursten), Staleke (Osterstade), Rading (Butjadingen), Landeswarfen (Jeverland) or Wonser weerstal (Wûnseradiel). Since the 15th century churches, belfries and vicarages sometimes had a special secretary room where the archives were kept. Butjadingen had a district hall. Often, however, the officials ruled from their own houses.

On the fringes of the coastal area, however, dynastic intervention had to be settled for. The islands of Texel, Vlieland and Wieringen were conquered by Holland in 1184, West-Friesland followed in 1289 after count William II had been murdered by Frisian peasants in 1256. Fryslân had to repel several assaults by the count of Holland and his indigenous allies, namely in 1345 and in the years 1398 to 1401. The upland districts of Drenthe and Westervolde remained formally dependent on the bishops of Utrecht and Münster. The rebellious fenland colonists of Stedingen and Osterstade (Wesermarsch) were completely defeated by an aristocratic crusade in 1234, whereas the Elbe River marsh settlers acknowledged the archbishop of Bremen's formal authority in exchange for autonomy. King Abel of Denmark was killed by Eiderstedt warriors in 1252. Ever since, the loyalty of the Nordfriesland coastal districts (Uthlande) towards the Danish crown was enforced by an alternating mix of military expeditions and tempting privileges. Famous battle-fields on which the coastal republics successfully defended their privileges against feudal lords, were remembered for long: Östringfelde near Schortens (1153), Altenesch (1234), Mildeburg near Oldenswort (1252), Stavoren (1345), Coldewärf near Blexen (1368), Wilde Äcker bei Detern (1427) or the Dusenddüwelswarf near Hemmingstedt (1500),

Wremer Tief (1517) and the churchyard of Mulsum (1524).

In many ways, however, the republican framework relapsed into a more or less stateless society, in which feuds and blood-revenge were the rule. Carefully arranged marriages, ecclesiastical intervention and alliances with foreign powers helped to balance a basically unstable situation. Leading families were knit together by networks of cognate kinship ties. Alternatively, where Frisian or Dutch family law was unknown, as in Dithmarschen, quasi-agnate clans evolved, not unlike their Scottish counterparts. Political instability was most evident in the Frisian districts between the Weser River and the Zuider Zee. Here local chiefs began to build hundreds of brickwork donjons and other types of fortified houses by the 13th century. Particularly in Fryslân they were often located on a moated mound (motte, stinswier), though these mounds are also known from other coastal areas (e.g. Eiderstedt). In the 15th century most villages and towns had several fortified houses where local squires resided (e.g. Langwarden, Bunderhee, Veenwouden). Due to continuous warfare Fryslân fell into anarchy, whereas the eastern territories were more or less pacified by the cities of Hamburg, Bremen and Groningen. By then several regional warlords had started to build real castles, from where they tried to consolidate their territories at the expense of communal government (e.g. Jever, Esens, Greetsiel, Emden). Many free peasants were forced to become tenants, conveying their property to local lords.

Apparently, however, the costs of brickwork and the overwhelming power of the Hanseatic cities prevented the erection of similar buildings in the east of the Weser river. Only the donjons of Neuwerk (1309) and Cuxhaven-Ritzebüttel (circa 1340) are comparable with western examples, though excavations at Schwabstedt and Bederkesa have shown similar buildings. A whole range of strongholds along the Elbe and Weser river and elsewhere was destroyed by the local peasants or the urban militia. Their locations have been remembered since (e.g. Kiek in de Elve, Morgenstern, Friedeburg, Siebetsburg). In general, castle-building was restricted to the strongholds of territorial lords or bishops, such as Riberhus, Møgeltønder, Tønder, Itzehoe, Steinburg, Haseldorf, Stade, Otterndorf, Bremervörde, Oldenburg, Neuenburg and Papenburg. The privately owned Sjaerda castle in Franeker and the castle of Schagen were the exceptions. The count of Holland built five sizable castles in

1287 to subject West-Friesland, of which Radboud castle in Medemblik and the excavated ground plan of Nuwendoord (Eenigenburg) are left.

Another effect of the prevailing political anarchy was the persistence of piracy and wrecking, despite dozens of treaties between the coastal republics and the Hanseatic cities. Pirates did not only find refuge with local warlords, they were often licensed by emerging territorial lords who tried to monopolize the lucrative right of salvage. Since the middle of the 14th century piracy became endemic, leading to a several wars in which the Hanseatic cities tried to pacifying the region. Piracy and wrecking were concentrated on the islands, particularly on Föhr, Sylt and Amrum and the Ostfriesland barrier islands. Famous pirates were the Wogensmänner of Eiderstedt and the noblemen Valdemar Sappy, Hennecke Lembeck, Edo Wiemken and Hero Omken. Most remembered in legends and songs were Klaus Störtebeker and his Likedeelers (equal sharers), who operated at the end of the 14th century from Marienhaf (Landkreis Aurich).

Only the upland villages were more or less feudalized. In Schleswig-Holstein and Jutland they were dominated by royal servants and lesser noblemen who were dependent on the king (or, alternatively, on the duke). The remnants of numerous moated mounds can be found in the low-lying village outskirts. Ecclesiastical landlords were important too: the bishop of Ribe owned about 60% of the district's farms, whereas the bishop of Schleswig, residing at Schwabstedt, held most of the local peasants in servitude. Yet, the most important landowner was the crown. South of the Elbe river, feudalism was more pronounced. The strongholds of leading noblemen dominated the Stader Geest and the Westphalian hinterland, keeping most peasants in a state of bondage. Here too, the timber-framed residences of lesser noblemen were built on small moated mounds.

Christianization, pacification and reclamation efforts were intrinsically connected. Religious zeal, documented by massive Frisian participation to the crusades, acted as an impetus for all kinds of communal endeavor. Parish organizations were fundamental to the political system as a whole, as they were interwoven with numerous local guilds, fraternities and neighborhood districts and knit together on the regional level into draining boards, public courts, deaneries and abbeys. Village-priests and other officials

were recruited from the leading families and nominated by their neighbors and relatives. The widespread elusion of celibacy in the Frisian districts helped to release the inherent tension between ecclesiastical and secular claims. Ecclesiastical jurisdiction was secularized, whereas tithing came to be ignored.

Many parish churches have originally been built near a nobleman's estate. In most cases they served as a nucleus where artisans, merchants and laborers settled down on ecclesiastical grounds. The churchyard was often used as a market. The vicarage was often accompanied by the village fishpond. Since the 14th century many of these villages got a post-mill (Bockwindmühle, standerdmolen), replacing the ancient quernstones. Traditional porridges and cakes were partly replaced by black bread made of barley. These mills were often situated on a special mound. In the coastal districts the milling business usually was free. In the upland districts, on the other hand, it was monopolized by local noblemen or subjected to special permissions. In Jutland, Schleswig-Holstein and on the Stader Geest most upland mills were water mills. Remote villages and islands did not have mills at all. Tide-mills, as in Zeeland, were probably unknown, except maybe for Fedderwarden.

The oldest remaining churches are built with Rhineland tuff, Weser sandstone (Wesermarsch), locally shaped granite blocks (Ostfriesland) or boulders. Tuff churches were especially widespread in the Ribe area, Groningen and Fryslân, but also present in Ostfriesland and the Weser area, witnessing the coastal wealth. Many fragments of sandstone sarcophagi and several baptismal fonts have been preserved.

By the middle of the 12th century locally produced bricks and pantiles became an important building material. Many Romanesque church-buildings can be found in Fryslân and the western parts of Ostfriesland (often with a round apse, sometimes with a noblemen's loge in the western tower), whereas Groningen and the rest of Ostfriesland are dominated by immense Roman-Gothic cruciform churches, often decorated with brick and sandstone ornaments. Ribe had its own cathedral, but the churches of St. Johannis on Föhr, Meldorf, Norden, Marienhaf (with interesting sculpture fragments) and the former basilica of Midwolda (with four towers) had a comparable scale. Several romaneseque and Roman-Gothic can also be found in Dithmarschen, Land Hadeln and Wursten. Apparently brick-making in the western districts was

more advanced as the large-scale reclamation of the peat-moors provided sufficient fuel. Even the important church of Løgumkloster (c. 1200) was built on arches according to western examples. The dark red brick walls, joined with pale shell-lime, have been typical for the Wadden Sea Region until recently.

Quite characteristic for Groningen and Ostfriesland are the fortified detached belfries, designed for military as well as religious and civil purposes. Gothic architecture is well represented in Nordfriesland, the Elbe and Weser River marshes and Noord-Holland as well as in the Frisian cities, often in the form of large aisled halls (e.g. Emden, Groningen, Franeker, Bolsward, Workum). Timber-framed churches are relatively common in the Elbe and Weser River districts. In many churches fine 14th-, 15th- and early 16th-

century fresco's can be seen. Medieval altarpieces, bronze baptismal fonts and other objects of worship are relatively scarce in the western Calvinist districts, where they have been deliberately destroyed at the end of the 16th century.

The coastal area had only a few local saints and places of pilgrimage, for instance the Holy Virgin of Stavoren, the statues of Lambert of Ribe, Catharin of Schönemoor and Stephanus of Östringfelde, the slippers of Pancratius (Nordstrand), the head of Petrus (Burg), the relics of Cosmas and Damianus (Bremen), the shrine of Magnus (Esens), the knee-prints of a praying bishop Rembert (Norden) and the graves of Hippolythus (Blexen) and Dionysius (Bremerhaven-Lehe). Most of them hardly left a trace. Other local saints were Poppo of Schleswig, Hatebrand of Feldwerd, Walfridus and Radfridus of Bedum, Emmanuel de Sescalco (Aduard), Fredericus of Hallum, Siardus of Mariengarde, Dodo of Haske and Adalbert of Egmond. Several churches in Holland and Fryslân had a sacred fresh-water well, dedicated to the Frisian bishops Willibrord or Bonifatius, for instance Dokkum where the latter had been slain in 754. The village of Holwierde (Groningen) still harbors a boulder with the devil's footprint.

The oldest, largely aristocratic monasteries were those in Seem, Stade, Bremen, Rastede, Reepsholt and Egmond, dating from the 10th, 11th and early 12th centuries. Nonetheless, religious houses have only been numerous in the stateless societies between the Weser River and the Zuider Zee. Since the last decades of the 12th century more than two hundred monasteries and nunneries were founded, which played an important part in water management, land reclamation and agriculture. Most of these houses had several granges or model farms, worked by servants and lay brothers. By the end of the Middle Ages the religious houses owned 15-25% of the cultivated area, largely let out to tenants. By then, Noord-Holland and Texel had a dozen religious houses and hospitals as well. Probably the religious houses served the local elite as a refuge for unwelcome heirs (like the crusades did before) and as a political counterbalance against family and village rivalry in the Frisian homelands. Monks and village priests, moreover, provided the literary infrastructure required. The most important monasteries were those in Ihlow, Aduard and Mariengarde.

The religious houses in other parts of the Wadden Sea Region were largely restricted to towns like Ribe, Tønder, Stade, Bremen and Ol-

Fig. 2.13:
Cathedral of Ribe, Denmark
Photo: J. Frederiksen



denburg, whereas Husum, Lunden and Meldorf got their beggar monks. The monastery of Løgumkloster and the nunneries of Itzehoe, Uetersen, Himmelforten, Osterholz, Lilienthal and Hude were reserved to the daughters of the inland aristocracy. Only the nunnery of Langen-Neuenwalde partly served as a refuge for daughters of the coastal rural elite. Few buildings have been left, most of them used as village or town churches (Løgumkloster, Uetersen, Hude, Thesinge, Aduard, Leeuwarden, Bolsward).

Most coastal cities started their development during the 12th or 13th centuries, as the Baltic trade set in. The towns of Ribe, Hamburg, Stade, Bremen, Groningen, Stavoren and Kampen played a leading role as centers of finance, trade and maritime commerce. Soon Lübeck, Hamburg, Bremen and Groningen evolved to major powers, protected by city walls. Part of their success was due to the brewing industry, which profited from the lack of fresh water in the coastal marshes. In the 14th century Hamburg had 250 to 300 breweries, mostly producing for the Dutch and Frisian market. Ribe, Husum and Schleswig were important for the overland trade, as they provided a safe shortcut between the North Sea and the Baltic. Since the 1390s the Stecknitzkanal between the Elbe River and Lübeck provided a more convenient route. By the 15th century Amsterdam, Hoorn and Emden had entered the stage with 10 to 20,000 inhabitants each. The cities of Ribe, Husum, Stade, Leeuwarden and Alkmaar played a secondary role with at least 4 to 5,000 inhabitants. In the coastal hinterland the cities of Flensburg, Schleswig, Lübeck, Münster, Kampen and Utrecht exerted political and commercial influence as well. Several influential merchant families stemmed from the coastal marshes. By then, the most important cities had succeeded in curbing the rural commerce by enforcing a staple-right on the surrounding countryside. Secondary towns such as Itzehoe, Buxtehude, Stade, Oldenburg and Sneek got city walls as well, others had earthen ramparts. The Baltic trade was dependent on bulk transport. Textiles, bay-salt and luxury items were traded against corn and wood. The Hanseatic cog ships were enlarged and supplemented by new ship types such as the British 'hulk' and the Dutch 'mars' ship, often measuring 2 to 300 tons. As ships grew bigger, minor ports declined. Only those cities laying at open streams could really profit from international commerce. Wooden quays were built for the ships to moor. When the harbors silted up, lighters were used to

transfer the cargo ashore or on smaller ships. During the 14th and 15th centuries, however, smaller ship types were developed, better adapted to sailing in shallow waters and mooring near the coast, drawing less than 1.5 m of water. Skippers often sailed in convoys on the Wadden Sea and were organized in special guilds, in which their knowledge was passed from one generation to the next.

The towns and the major islands played an important part in the fishing industry. Already in the 13th century List-auf-Sylt and Neuwerk served as roadsteads for the herring-fisheries around Helgoland. Skippers from Fryslân probably participated in the fisheries around Skåne. As Skåne's herring-shoals suddenly disappeared after 1425, the center of fishing activities shifted to the west. Each summer dozens of ship-crews were active around Helgoland, coming not only from Fanø, Rømø, Sylt, Föhr and Wangerooge but also from a range of coastal towns and villages from Ribe to Enkhuizen. Fishing vessels from the islands of Vlieland, Texel, Huisduinen and Callantsoog were active around the Doggersbank. Mainland fishing activities concentrated in specific villages, such as Sønderby, Büsum, Nesse and the dune villages in Holland (De Zijde).

Apparently, the moderate fishing vessels (pinks, seineships, everts) were used for various purposes, including trade. Part of the year, the fishermen caught cod, haddock, whiting and plaice, which were usually salted, dried in the open air and sold to the urban population. The novel technique of long-line fishery spread after 1500 from Flanders to the Wadden Sea Region and subsequently to Jutland. Zuider Zee herring was often smoked, Doggersbank herring preserved by the novel technique of gutting and curing. The rivers harbored large sturgeons and salmons, whereas the brackish meres, canals and sluices also yielded large quantities of eel, flounder and other fish species. Especially the Zuider Zee was famous for its quantities of fish. On the other hand, the genuine Wadden Sea fisheries were quite modest. The local fishermen were poor, living in hamlets behind the dykes and possessing only tiny boats or sledges. Their catch consisted of speared flounder and ray, clubbed seals, gathered mussels as well as other species captured with the help of reed fences, weirs and baskets (eel, anchovy, smelt, shrimps, etc.). On the beaches, the quest for washed ashore amber was an additional source of income until the 19th century.

In conclusion, the initial marshland landscape was supplemented by embankments and fenland reclamations. The specific cultural heritage of the Middle Ages is primarily expressed in settlement patterns and field-systems, in the remaining tracts of dykes, canals and roads, in specific landscape elements such as mounds and pools, as well as in hundreds of splendid churches and many items of urban architecture.

2.6.5 Early Modern Time (1500–1800 AD)

From the 16th century onward the coastal districts were rapidly integrated into the modern world economy. Rapidly growing cities at the edges of the region required a stream of food-stuffs, people and raw materials. In return, urban culture started to dominate the countryside. Until the 1570s Antwerp was the major city in the region, then Amsterdam took over its leading role. Most fashions and techniques gradually spread from Brabant and Holland through the Zuider Zee area into the eastern districts, known to the Dutch as 'Little East' (Kleine Oost). The islands and coastal ports served as an intermediary. The Hanseatic cities, bound by rigid traditions and guild regulations, acted as a conservative counterpart. In the 18th century Hamburg became an influential stronghold of the Enlightenment, whereas Copenhagen and the metropolis of London became more important as distant centers of civilization as well.

The coastal population probably doubled during the 16th century to about 30 to 50 inhabitants per square kilometer, making the Wadden Sea Region one of the most densely populated areas of Europe. Several districts such as Dithmarschen, Altes Land, West-Friesland and the island of Wieringen had even higher figures. Then population figures stagnated until the middle of the 18th century. In Dithmarschen, Butjadingen and West-Friesland they even dropped. At the beginning of the 19th century the number of inhabitants per square kilometer was diverging from 30 to 50 in the fenlands and grazing marshes to about 40 to 60 in the arable districts and peat-moor settlements. The marshes around the city of Hamburg and the islands of Föhr, Nordstrand and Pellworm harbored the highest population figures. Even by then, most upland districts hardly reached 15 to 30.

Agriculture and maritime trade were greatly intensified, dozens of harbors built, dykes heightened and many forelands embanked. The

islands largely served as a recruiting ground for maritime personnel in the coasting trade and the whaling industry, whereas the upland districts provided the seasonal labor, agricultural products, fuel and timber that were lacking in the marshes and on the islands. The agricultural production suffered from the 17th and early 18th century economic crisis as well as from climatic backlashes (Little Ice Age). The island of Nordstrand (200 square km) was destroyed in 1634, whereas the 1570, 1686 and 1717 storm surges also did widespread damage. During the second half of the 18th century, however, cereal prices began to rise, leading to a considerable wealth among the farming population.

The agrarian exports were made possible by the existence of a growing fleet of flat-bottomed barges. During the 17th and 18th century the Wadden Sea was one of busiest transport routes in Europe, conveying 3 to 5,000 passages a year. Traditionally, international traffic mostly used large ships that could only sail off the islands and down to the river ports, such as caracks, hulks, caravels, galliots, flutes and pinnaces. Coastal shipping, on the other hand, had to rely on small vessels that could sail in shallow waters. Leeboards would often replace the keel. Small easy-handled rigs enabled tacking in narrow channels. Many boyers, tjalks, everts and yawls did not exceed the loading capacity of 20 to 40 tons. Additionally, larger flat-bottomed ships up to 100 tons were developed, such as boyers, boats, smacks, schniggs, hookers, koffs and galliots. These could sail into open sea but were able to land in the newly constructed tidal harbors as well. The spritsail and the gaff-sail spread successfully from the Netherlands to other regions. Each major port had at least one skippers guild, which also provided sea-insurances against wreckage and piracy. Special roadsteads such as Rømø, List-auf-Sylt, Neuhaus (Oste), Bremerhaven-Lehe, Vlieland, Terschelling, Wieringen, Texel and Huisduinen (Nieuwediep) were suited to re-load the products into larger ships or back onto lighters and barges that could sail into the shallow river-mouths and into the Zuider Zee. In case of war they often took in a key position. Hundreds of ships fell victim to storm surges, as they did not reach a harbor in time. The number of shipwrecks is most pronounced in Nordfriesland and Dithmarschen as well as in the western Wadden Sea.

Merchant shipping largely concentrated in the harbors around the Zuider Zee as well as in the main cities. Additionally, the ports of Glückstadt,

Hamburg-Altona, Stade, Bremen, Emden, Groningen and Hoorn participated in colonial trade. Many ships were to be found in the Alte Land, partly used for fruit exports, as well as in the Tønder, Møgeltønder and Højer districts and around Husum, where many local farmers participated in international trade. During the 16th and 17th centuries the islands of Rømø, Sylt, Föhr, Helgoland, Wangerooge, Schiermonnikoog, Terschelling and Vlieland harbored hundred of merchant ships, which may have been used for fishing as well. By the 18th century most of these ships had disappeared (except for Schiermonnikoog), whereas the men enlisted on Dutch vessels. The Hobugt district (Hjerting, Ho, Oksby, Varde), the Elbe and Weser River banks as well as the tidal harbors in Schleswig-Holstein and Ostfriesland did somewhat better. The island of Schiermonnikoog even had more than a hundred tiny vessels. After 1750, however, the major centers of coastal shipping became the peat-colonies in Groningen and Ostfriesland. In general, the skippers and ship-owners were quite mobile. When wars obstructed free trade they often took refuge in neutral ports, sometimes permanently, after 1650 mostly temporarily. Tönning, Glückstadt, Stade, Neuhaus (Oste), Varel, Emden and Papenburg were famous for their hospitality in case of war.

The littoral landscape has been reorganized since the Late Middle Ages for the sake of maritime traffic. Beacons, buoys and beacon-lights had to secure the major trade routes. The cities of Ribe, Hamburg, Bremen, Emden, Kampen and Amsterdam were the first to regulate coastal traffic, forcing all passing ships to pay for the expenses made. The island of Neuwerk got a lighthouse-tower in 1310, followed by Terschelling in 1323. Open fires burned during the shipping season on the islands of Terschelling, Vlieland, Texel and Huisduinen since 1452. By the middle of the 16th century the main channels and sandbanks in the Wadden Sea were marked each spring with a chain of beacons, buoys and pricks. Additional towers were built on Borkum 1576 and on Wangerooge

1597 (by the Count of Oldenburg), whereas the Saint Brendan tower on Terschelling was relocated in 1594. The flattened church-towers of Pellworm, Imsum and Marienhafte may have served as fire-beacons as well. Other church-towers were provided with characteristic spires (e.g. onions) to facilitate maritime navigation. Special groves were planted with the same purpose. As the shipping season was extended into the early spring and late autumn, piloting became more important. Cuxhaven and the islands of Helgoland, Borkum, Terschelling, Vlieland, Texel and Huisduinen (Den Helder) had many specialized pilots, partly organized in guilds.

On the political level the coastal districts lost their independence during the 16th century. They were fully integrated into territorial states and controlled by government officials. Denmark and Northern Germany were largely governed by foreign rulers (Denmark, Sweden, Britain, Prussia, Russia) who considered the remote coastal districts as a strategic investment. Actual government was dominated by the upland aristocracy. The Dutch Republic and the cities of Hamburg and Bremen, on the other hand, were republics where the actual power lay in the hands of the urban elite and their rural allies. In both cases, the rural elite traded for a relatively large measure of autonomy, guaranteed by special institutions and statutes comparable with urban



Fig. 2.14:
Hallig Hooge, Schleswig-
Holstein
Photo: W. Raabe

arrangements. In Fryslân the aristocratic landowners played the major part, in Groningen and Ostfriesland they had to share power with the urban landowning elite. Nevertheless, the other privileged districts were dominated by yeomen-farmers, with the exception of Kehdingen and the Ostemarsch where a substantial number of privileged noblemen resided. More or less feudalized were the edges of the Krempfer Marsch with the adjoining Seestermüher and Haseldorfer Marsch (Itzehoeer Güterdistrikt). On the islands wealthy ship-captains and -owners held dominant positions. (Further details on political territories in chapter 2.7.1)

In the coastal marshes and on the islands, yeoman-farmers, major landowners and ship owners made practically all the decisions. They were dominating parish organizations (sogn, mating, karspel, kerksoking) and neighborhood guilds (bylag, burlag, egge, hove, viertel, rott, theene, kluft, gilde, buurt) as well as polderboards, local courts and citizen soldieries. Often they appointed clergymen and schoolteachers. In the Calvinist districts (the Netherlands and Ostfriesland) they controlled the religious colleges of elders and deacons. In Groningen and Ostfriesland the aristocratic landowners even monopolized the right of jurisdiction. In Schleswig-Holstein the yeomen-farmers formed their own burial and fire-insurance guilds, which set them apart from smallholders and cottagers. Smallholders were dependent on credit and protection offered by the local elite, who monopolized the relations with government officials. Their family power was expressed in grave monuments and memorial tablets in village churches, on sluices and other public buildings as well as on private houses.

The majority of the coastal population valued their supposed liberties and privileges, which were defined in contrast to the feudalized hinterland. Egalitarian feelings were often directed against members of the rural elite that were accused of treason. Political loyalties, however, were often defined in religious terms. Since the Reformation, the eastern districts were largely Lutheran, whereas the western districts converted to Calvinism. Lutherans, particularly in Germany, were far more inclined to cling to traditions than Calvinists, who turned against many expressions of folklore and superstition. The latter, on the other hand, were more tolerant, leaving some room for catholic, Mennonite, Libertarian, Lutheran and Jewish minorities. Yet, both were united in their antipathy against the inter-

national powers of Catholicism, which were associated with feudalism and tyranny. These feelings were sustained by traumatic experiences, such as the Dutch war against Spain, Tilly's occupation of Northern Germany in the 1620s and several military campaigns by France and its allies. Particularly during the 18th century, when pietism gained support in most rural districts, political tensions were often disguised as religious conservatism. The urbanized zones at the edges of the coastal region, on the other hand, became more inclined to modern ideas. (Further details on religion in chapter 2.7.2)

By the 16th century dyke-building had become fundamental for the preservation of the coastal marshes. Dykes were substantially heightened (up to 3.5 to 5 meters) and secured, their width doubled, their volume tripled. The Noord-Holland palisade dykes were heightened up to 6 or 7 meters. Dyke-locks were widened and drainage-schemes improved. This was partly meant as a reaction to higher seawater levels and unstable weather conditions. But modern techniques of dyke-building also enabled more offensive embankment procedures. These implied the erection of palisades before endangered dykes and the construction of dams and groynes with piling and osiery filled with faggots and clods. Breaches were closed with fascines, cofferdams, willow matting and sunken ships. Yet, earthen dykes continued to be valued, they were provided with gradually inclining slopes and carefully sodded with grass. Bare stretches were stitched twice a year with a covering of straw or thatch. Most of these techniques spread eastward from Holland and Zeeland during the 16th century and were improved later on.

After the 1717 storm surge that struck most of the coastal area, massive state intervention accounted for further dyke reinforcements. The introduction of the shipworm (*Terredo navalis*) in the 1730s caused a total destruction of the embankments in Noord-Holland and Fryslân. Existing palisades and cofferdams had to be replaced by earthen dykes with a stone cover. Shiploads of boulders were imported from Drenthe as well as from the Elbe, Weser and Ems districts, for which dozens of megalithic tombs, church ruins and many tombstones were destructed. As boulders ran out, the engineers had to revert to stones from Norway. In the second half of the 18th century stone dykes were also introduced in Northern Germany (Hadeln, Butjadingen), but it was not until the second half of the 19th century that they became the rule.

Here and there the boundary-posts that marked the distinct dyke-pounds have been preserved.

Additionally, simple dyke-locks were replaced by large timber-built floodgate tunnels, often suited to shipping. These have been in use in the western districts since the 15th century (e.g. Greetsiel, Delfzijl, Harlingen), but their design was perfected later on. Most locks had three pairs of gates in order to neutralize the effect of changing tides and storms-surges. Dyke-locks out of masonry, open sluices and chamber locks were relatively scarce until the 18th century. Wealthy towns like Friedrichstadt, Emden, Makkum, Workum, Hindeloopen, Stavoren, Edam and the polder Zijpe were the first ones to have open sluices from brick.

Around the locks a new type of rural settlement came into being: dyke-lock harbors (Sielhåfenorte) planned around an artificial tidal inlet, often provided with a backside water basin to flush the harbor. The oldest examples in Holland date around 1400 (Spaarndam, Delfshaven, Broekerhaven, Kolhorn). The first one in Fryslân was Oude-Bildtzijl from 1505, followed by dozens of tidal harbors in Ostfriesland, Groningen and Noord-Holland (Oudesluis). Each subsequent embankment created a new tidal harbors in front of the older one. Comparable examples in the eastern districts were mostly created 17th century by government initiatives: Rudbøl, Wykauf-Föhr, Pellworm-Tammensiel, Tönning, Friedrichstadt, Glückstadt, Neuhaus (Oste), Cuxhaven and Bremen-Vegesack. The latter was founded 1619 as a new sea-harbor for the city of Bremen, because the Weser River got silted up. The dyke-lock harbors of Land Wursten and the Wesermarsch, including Fedderwardsiel (1821), date from the 19th century. Until then, most of the tidal harbors in the eastern districts were no more than creek banks where flat-bottomed sailing ships could be set ashore.

The lock-canal were made navigable for drawn barges, whereas they came to be interconnected. The first canals connecting partially land-locked towns such as Groningen, Leeuwarden, Franeker, Bolsward and Alkmaar with nearby harbors date from the 15th and early 16th centuries. By the middle of the 17th century a complete web of ship-canal and towing-paths (trekvaarten) with chamber locks (verlaten) and drawbridges at its knots covered the western districts, providing an inland route from Amsterdam across the Zuider Zee to Groningen and western Ostfriesland. These canals mainly served the export of peat and agricultural products to

the urbanized districts in Holland and Fryslân. Scheduled ferry-services facilitated personnel and commodity transport. Minor shipping routes sometimes got a rolling bridge (overtoom), where ships could be drawn across a dyke. In the eastern districts, on the other hand, ship-canal such as the Bootsfahrten in Eiderstedt and the Hooksielier Tief towards Jever remained the exception until the 19th century. Many towns had special guilds for river-, canal- and market-boat-skippers. Nevertheless, the canals and harbors were indispensable, as marshland road-traffic was a nuisance until the 19th century when paved roads were introduced.

The hydrological measures mentioned above caused an important reduction in the frequency of salt-water inundations. Since the middle of the 16th century recurrent dyke-breaches became the exception. As a consequence agriculture could be intensified, the acreage of winter-corn was increased, pastures and meadows were improved and the remaining commons enclosed (Osterstade). Many large farms were relocated from the villages to dispersed house-platforms surrounded by a moat, where they were safe for the seasonal fresh-water inundations that were customary until the 19th century. Smallholders and cottagers often settled down alongside the dykes. Large arable farms were more successful than smaller pastoral ones: by the 18th century farms above 20 to 30 hectares grew bigger, whereas many smallholder families lost their property and became laborers. The effects of scaling up and proletarianization were most pronounced in traditional arable districts where the number of smallholders used to be considerable (Dithmarschen, Hadeln, northern Westergo). Mainly pastoral farming districts already had relatively large farms. Only the pastoral districts of Noord-Holland were dominated by small-scale property and seasonal maritime labor.

Rural property relations were quite diverse: in the eastern districts free-holder property was the rule, except for state domains and feudal enclaves. In Butjadingen, Ostfriesland and Groningen most farmers were long leaseholders who owned their farm-buildings, in Fryslân and the Noord-Holland polders they were mostly tenant farmers. But landowners normally did not interfere with actual farming practices. Arranged marriages and, egalitarian inheritance customs provided each farmer generation with sufficient assets to conduct business as before. Relatives, landlords and merchants supplied them with the



Fig. 2.15:
Farmstead Oosterklief,
The Netherlands
Photo: D. Marrewijk

necessary credit. Things were different, however, on state domains, noblemen's manors and summer residences owned by the urban elite. These were farmed out to qualified tenants or managers, who had a close relation to their landlords. Large model farms such as Groß Bombüll, Arlewattshof and Pynackerhof in Nordfriesland, the Rote Haubarg in Eiderstedt, the domanial granges in Oldenburg and Ostfriesland and the polder-board house of Wieringerwaard served as an example for the surrounding countryside.

Oats, barley and broad beans continued to be the main crops, but they were supplemented with wheat, peas, rye, oilseed rape and sometimes flax, chicory or mustard. Red and white clover were successfully introduced from the Netherlands in the 18th century. Rye for bread-corn was usually imported from the Baltic, Westphalia or the upland districts. In Ostfriesland, Groningen and parts of Fryslân arable farming was extended since the end of the 17th century. Fields were leveled, drainage was improved, whereas novel implements such as Brabant ploughs (not in Fryslân), threshing cylinders and winnowing machines came into use. Flexible rotation schemes and primitive row cultivation were introduced at the same time. The eastern districts, on the other hand, stuck to their traditional ridge and furrow system, heavy carriage-ploughs and fixed rotation schemes. Nevertheless, arable farming was further increased here as well. Around 1800 more than half the coastal marshes were being tilled. Marling with excavated calcareous clay spread rapidly from Ostfriesland to Schleswig-Holstein, allowing an explo-

sive increase in the acreage of valuable market-crops such as oilseed rape and wheat.

Smallholders specialized in cow-milking, market gardening or fruit production. Small-scale horticultural centers were to be found around the cities and near export harbors. The areas around Friedrichstadt, Glückstadt, Bremen, Emden, Groningen, Leeuwarden, Harlingen, Alkmaar and Hoorn produced carrots, parsnips, cabbage, chicory and potatoes. The districts of Altes Land and West-Friesland had many orchards, whereas Altes Land also produced horseradish. Osterstade became well-known for its sweet cabbage. Most of the horticultural knowledge as well as many seeds, roots, bulbs and fruit-

trees were important from Holland. White hawthorn hedgerows, trimmed lime-trees, poplars and elms planted in rows came from Holland as well.

Beef cattle trade reached a zenith in the 17th century. Each spring meager oxen from Jutland and the other upland districts were driven to the coastal marshes, where they were fattened and subsequently sold in the cities. Oxen trails cut through the Jutland peninsula, passing through Ribe, Husum and Itzehoe. Ferries took them across from Wedel to Stade. Part of the oxen went from Bremerhaven-Lehe to Jever, where they were sold at the markets of Aurich and Groningen. Another part of the export to Holland went by ship. Typical fattening districts were Eiderstedt, Dithmarschen, Osterstade, Groningen en West-Friesland. Recurrent waves of cattle-plague, however, made an end to the cattle trade in the 18th century. The cattle-plague's social and economic consequences were profound: large-scale arable farming was increased, whereas smallholders impoverished. The traditional red, gray-patched or stained breeds came to be replaced by fashionable black-patched Holsteiner (Breitenburger or Lowland cattle) and Frisian milk-cows. The Groningen black-and-white-faced (blaarkoppen) and the Frisian and Holsteiner red-patched cattle date from the 19th century. The red cattle from Ballum (Sønderjyllands Amt) and Nordfriesland held out until the 19th century. The black- or gray-patched milk-cows from Jutland (Jydske kvæg), descendants from the original Jutish race, were kept until the 20th century. Both races have now become extinct due to interbreeding with others,

though there are some attempts to reconstruct the Jutish race. In Jutland they were partially replaced by British shorthorns, imported in Eiderstedt in the 19th century.

Horse breeding was intensified by 17th-century military demand. The large Holsteinian, Hanoveran, Oldenburg and Frisian warm-blooded horses had a reputation all over Europe. Here too, black blazed horses came to be valued since the end of the 18th century. The Groningen horse, on the other hand, is an late 19th-century offspring from the Oldenburger and Ostfriesland race, whereas the underbred Jutland and Schleswig horses were developed in the 19th century from existing stocks. The large white marshland sheep were improved by interbreeding with foreign rams since the 16th century. The traditional multipurpose sheep developed into a mutton-sheep since the 1840s. Only the Ostfriesland and Frisian-Zeeland milk-sheep and the Texel mutton-sheep survived as distinct races. Several districts specialized in pig breeding with buttermilk, whey and barley during the 16th and 17th century. The distinct marshland swine, large and square-built with standing ears, was completely replaced by interbreeding with bald Yorkshire pigs in the second half 19th century. Goats were largely unknown (except for the island of Vlieland). Traditional chicken races are the Groningen-Ostfriesland gull, the Frisian hen and the Assendelfter hen. In Fryslân and Holland it was a widespread privilege to keep mute swans, whereas most manors and yeomen farms in Ostfriesland, Groningen and Fryslân had special stone or timber pigeon-houses for the meat. The multi-colored half-tame ducks and pigeons that were numerous until the 1950s have disappeared from the countryside since then. The only local pigeon race that has been left is the Groninger slenk. Danish-minded patriots in Sønderjylland and Schleswig bred a red and white fancy pigeon called the Danebrogsdue after 1864.

Dairy farming was improved in the 16th century by the introduction of Dutch cheese making. Mainly pastoral farming districts such as Eiderstedt, Wilster Marsch, Butjadingen, Jeverland, Rheiderland, parts of Fryslân and West-Friesland concentrated on the production of durable sweet cheese. Well-known export products were kosher cream cheese from the Wilster Marsch, meager clove-cheese from Fryslân and green ewe-cheese from Texel and Griend. The meager round Edamer cheese is a 19th-century product. Ostfriesland, Groningen and Fryslân also produced

lots of salted butter, for which the horse-driven churn was introduced after 1660.

As a rule, the fenland districts specialized in dairy farming and extensive stockbreeding. Arable farming was restricted to a minimum, whereas the redundant population left for the cities. In West-Friesland rural population figures even dropped by about 40%. Seasonal laborers from the upland districts (Hollandgänger, velinks, hannekemaaiers, mieren) took over the hay-harvest. Hay was also exported to the urbanized districts. Large wetland areas such as the Ostemarsch, Hadelner Sietland, the Weser River marsh, the lake district near Emden, the Leda River marsh and the central parts of Fryslân (Lage Midden) became inundated every winter season. Often the farmers opened the sluices deliberately in order to benefit from the fertilizing effect of the muddy waters. Nevertheless, many fenland districts and river marshes were troubled by untimely inundations due to reclamation efforts and deforestation in the upland districts. Some districts, particularly around the city of Bremen, sank into poverty, others became depopulated.

Several amphibious districts such as the Gotteskoog, the wetlands around Bremen and Emden and the Noord-Holland wetlands specialized in breeding geese and ducks. The snow-white marshland goose (preserved as the Emden goose) that stayed close to the farms, was mainly kept for its down. The white-chest ducks from the Waterland district (north of Amsterdam) were kept for their large production of eggs. By selective breeding fancy crested and hookedbill ducks were raised, which were popular around manors and large farms all along the Wadden Sea. Another wetland occupation was reed farming for thatching, which could be very profitable. Several river bank districts specialized in basket making out of willows. The wetland areas were well-known for their fowl and eggs. Geese, swans, cranes, ducks, snipes and golden plovers were hunted with nets or shotguns operated from hidden huts. Small birds were caught with snares. Egg hunting was very rewarding too, particularly on the islands, where thousands of sea-gull eggs could be found. In the 19th century lapwing eggs were even exported.

A typical Dutch innovation were the duck-decoys: artificial ponds surrounded by bushes designed to lure swarms of wild ducks into wicker-work cages, mostly with the help of trained calling ducks and decoy dogs. Duck-decoys originate from Holland, where they have been men-

tioned since the 15th century. From here they have been introduced in Fryslân, where 150 of them could be seen in the 18th century, as well as in Groningen and Ostfriesland. Dutch emigrants introduced the duck-decoy in Stapelholm about 1630. The first decoy on Föhr dated from 1730, followed by a dozen others on the adjoining islands. Most of them have been closed down, the remaining ones are mainly used for bird counting. A special type of dog (*wetterhoun*) was used in the Frisian wetlands for hunting fowl, otters, fitchews, rats and other animals. Hunting in the marshland was largely restricted to hares that were chased with dogs and shotguns. In some districts hunting was only allowed to government officials, in others the freeholders clung to the ancient privilege of free chase. In the upland districts also deer and swines were hunted. Each year falconers from Valkenswaard in Brabant visited several upland districts in order to catch new preying birds.

Arable farming was particularly successful in the newly embanked polderlands. Between 1500 and 1650 more than 140,000 hectares have been reclaimed, largely with the help of urban capital and Dutch know-how. Most of it consisted of former salt marshes and shallows that were subsequently put under crop. The embankment activities shifted eastward and came to a partial standstill after 1640 but were resumed in the 18th century. Up to the 16th century most embankment activities were carried on by local peasants, who enlarged their holdings according to the traditional right of accretion that also applied to the former peat-moor areas. In several districts these rights were conferred upon the maintainers of a dyke-pound (*Hadeln*, *Oostergo*). By the 17th century, however, the territorial lords began to exercise exclusive claims on the forelands. They expropriated the local population and conferred special patents to groups of entrepreneurs, who completed the embankment and recruited the settlers. The work was carried out by contractors and navvies who were specialized in carrying out large earth-works with the help of wheelbarrows on rails. Many of the newly embanked polders got a rational parceling according to Renaissance standards. Large farms were situated along the main road, whereas the former navvies settled down as cottagers along the dykes. Typical mostly 18th-century dyke-bound linear cottage settlements are *Neukirchen-Rosenkranz*, *Dagebüll-Fahretoft-Holländerdeich*, *Vollerwiek-Wester-*

deich, *Barlterneuendeich*, *Kollmar-Deichreihe*, *Krummendeich*, *Balje*, *Belum-Deichreihe*, *Schortens-Roffhausen*, *Hooksiel-Wüppelser Altendeich*, *Ditzumerverlaat*, *Drieborg*, *Kollumerpomp* and *Oude Bildtdijk*.

The first large entrepreneurial project was the embankment of 5,000 hectares of saltings at *Het Bildt* (Fryslân) in 1508, populated by settlers from Holland, another was the *Zijpe Bay* near *Alkmaar* in 1553 and again in 1597, measuring no less than 6,600 hectares. The projects in the eastern districts were smaller, mostly dating from the 17th century, e.g. *Glückstadter Wildnis*, *Cuxhaven-Ritzebützel*, *Wurster Neuland*, *Schweiburg*, *Christian-Albrechtskoog*, *Kroonpolder* (*Dollard*) and the re-embankment of *Nordstrand* by entrepreneurs from Brabant. Several larger projects in Nordfriesland failed. Famous projects of the 18th century were *Landschaftspolder* (1752) and *Kronprinzenkoog* in *Dithmarschen* (1787), where the wealthiest farmers of the whole region were to be found. The latter was largely populated by colonists from Ostfriesland. The newly embanked polderlands were very fertile, suited to barley, wheat and especially oilseed-rape. The latter was sold at high prices to Dutch merchants and transported to the oilmills in the industrial district of the *Zaanstreek* (north of Amsterdam). The flowering rape- and bean-fields fed many bees, thereby stimulating professional bee keeping. Rape-honey is considered to be a delicacy. Part of the beekeepers lived in the coastal villages, others in the upland districts where the bees were transported to as soon as the heather fields came into bloom.

Entrepreneurial activities also lead to the development of extensive peat-moor colonies in the western districts. The raised bogs were drained by canals that subsequently served for carrying off the peat and bringing down urban manure in order to cultivate the remaining moors. Large-scale activities conducted by the city of Groningen, which acted as the largest landowner of the area, served as a model for the other peat-moor districts. Most of the peat workings and subsequent reclamation efforts were conducted by individual farmers, who were obliged by the city government to reclaim their cutover fields. Farming systems and popular culture were comparable to the coastal marshes. The canal settlements were heavily populated, though general wealth was lower than among the coastal population. Many colonists descended from seasonal laborers from the Westphalian

hinterlands, but the bulk of the population came from the neighboring districts.

Special development cases were former fenland lakes that were drained with the help of hundreds of large Dutch windmills with scoop wheels. Foreign investors tried in vain to repeat the success of huge projects in Holland like the Beemster, Schermer and Purmer lakes. The drainage schemes in other districts were rather unsuccessful, except for a few small lakes in Fryslân. The draining of the Gotteskoog and Stapelholm wetlands (Meggerkoog) led to financial disasters, because the maintenance of canals, locks and windmills was neglected.

The use of large octagonal smock mills with a revolving cap (inside cap winders or *binnenkruiers*) was greatly restricted to the wealthiest districts of Noord-Holland, where whole fenland areas lying one or two meters below sea-level became completely dependent on artificial drainage. By the 18th century the more efficient outside cap winder (*Holländermühle*, *bovenkruier*, *muonts*) and the Archimedean screw came into use, which spread into Fryslân, Groningen and Ostfriesland. Originally meant to reclaim the low-lying fenland areas, these drainage mills proved to be so successful that they came into use in the coastal marshes, enabling a substantial increase of the corn-growing acreage.

Initially more successful was the introduction of smaller hollow post drainage mills, suited to drain individual fields and farms (*Wippmühle*, *Kokermühle*, *spinnkop*, *aanbrenger*). They have been invented in the Zuid-Holland fenlands in the 15th century, from where they were exported Fryslân, Groningen and Ostfriesland. In the Wilster Marsch and around Hamburg and Bremen more than a thousand drainage mills were built since the 1570s. Tiny drainage mills with an Archimedean screw (*tjasker*, *Wasserrose*, *Flutter* or *Schrückmühle*) were developed in Fryslân during the 16th century, from where they spread to Ostfriesland and Oldenburg after 1700. In the Wilster Marsch many traditional drainage mills got a screw since the close of the 18th century (*Schneckenmühle*).

In the wake of the dyke-builders and entrepreneurs a new type of farm-building was introduced: the Frisian aisled barn (*Gulfsche-*



une) with a side-passage from where the harvest was piled up in the central bays, while the cattle was stalled in the opposite side-aisle. Its success may be partially explained by the efficient use of timber, which became increasingly scarce. Oak was mostly imported from the Lower Saxon and Westphalian hinterland and transported in rafts coming down the Elbe, Weser and Ems River. During the 17th century it was replaced by Norwegian fir. The walls were normally made of brick.

The first aisled barns were built around 1550 as monastic granges or near gentlemen's manors. Medieval granges in Flanders probably served as a model. Soon they came into use on large farms in Ostfriesland, Groningen and Fryslân. Haystacks became redundant. Normally the barns were attached to the existing brick-built living-quarters, where they replaced the traditional longhouse byre, thereby leading to the so-called head-and-barrel or head-neck-and-barrel (*kop-hals-romp*) type. In Noord-Holland, however, the aisled barn soon developed into a more or less rectangular building with integrated living quarters, the so-called 'cloche'-house (*stolp*). Dutch settlers and engineers were responsible for its transference to other districts. Aisled sheep-sheds (*schapenboet*) became common on the island of Texel. Aisled barns and farmhouses (*Bargscheunen*, *Barghusen*) were introduced in the Wilster Marsch around 1600. Fully developed Dutch 'cloche'-houses (*Haubarge*) were built in Eiderstedt, in the pastoral farming zone of Fryslân (*stelpen*) and on domanial farms in other dis-

Fig. 2.16:
Weighing building in
Leeuwarden, The Netherlands
Photo: D. Marrewijk

tricts. In Ostfriesland and the adjoining districts (Butjadingen, Oldambt) they developed into a large aisled farmhouse (Gulphaus), which replaced the Frisian barns and longhouses. The tiled roof and painted gutters fed the rain cisterns. Cereals were dried and stored on a huge corn-loft above the living quarters, which were made to resemble contemporary urban dwellings. The Ostfriesland type was quite successful: it became the dominant building tradition in the adjoining upland districts, whereas East-Frisian barns supplemented the traditional open-halls in the Weser Marsch. It was also imitated in cottages (often combined into double houses or bummerts). In Fryslân and Noord-Holland, on the other hand, cottages were smaller, consisting of a single brick room with an additional shed.

The Elbe and Weser River districts lying closer to the timber-supplies largely stuck to huge timber-framed open-halls, byres and barns which were often enlarged with deeper side-aisles and additional rooms built out of the house (e.g. the Wilster Marsch Husmanshus). Cottages were of the same open-hall type, often shared by two, three or four families at once. In the northern districts, on the other hand, traditional halls and longhouses were extended with supplementary barns and byres, separated by traverse passages and threshing-floors. Sometimes these were integrated into the farmhouse, as on the North-Frisian islands (Uthlandhaus) and in Dithmarschen (Dwerhus). But usually they developed into L-, Z-, H- or U-shaped assemblies (Geesthardenhaus), culminating into the courted farmyards known from Jutland and the Wiedingharde. Moreover, as brick replaced wickerwork, board and timber-frame walls during the 16th and 17th centuries, the inner posts moved side-ward until they were often left out because of timber scarcity. By the 18th century farms with separate living rooms, transversely built byres and aisled barns were the rule in Jutland, Nordfriesland and parts of Dithmarschen. In the latter case they were ousted in the 19th century by an Ostfriesland type hybrid, imported by settlers from that region.

Other 16th-century innovations were chimneys and heated parlors, built after urban examples. Whereas the western districts stuck to large kitchens with open fires beneath a chimney, probably due to the abundance of peat, the eastern districts (including Butjadingen and Jever) changed over to heated parlors with a tiled stove (stuv, dôns, dornze, Stube). Most of the large

farms in the eastern districts also had a baking shed, whereas the western districts got used to ordering black rye bread from the village bakery. Urban-style wheat bread was only in use in Noord-Holland, Westergo and Eiderstedt. Cupboard-beds with heavy eiderdowns were the rule, except for Holland and Fryslân where blankets were used. During the 17th and 18th century many urban style luxury items found their way to the rural elite, such as illustrated Frisian tiles and wall-case clocks, Dutch linen, Hanseatic cupboards, carved chests, painted ceilings as well as pewter, pottery, majolica and faience. Many farms had an orchard with dozens of different trees surrounded by trimmed maple-trees, as well flower beds with many bulbs and hedges in a baroque style. In the western districts, window-frames, doors and woodwork were often painted in fresh colors, in the eastern districts the front door is often richly decorated. Typical for Jutland and Schleswig-Holstein are the half-hipped roofs and the dormer windows above the doorways.

Aristocratic mansions were numerous in the Elbe River marshes and in the western districts. Around 1600 Kehdingen alone had 100 manor houses, Ostfriesland more than 50, Groningen 120 and Fryslân 200, most of them lying in the coastal marshes. Some of them were real palaces, such as the castle of Breitenburg near Itzehoe. Others such the ruined castle of Trøjborg and the former 17th-century manors of Norden-Lütetsburg and Stedum were quite substantial as well. Typical 16th-century castles, most of them surrounded by a moat, can still be found at Witzwort (Hoyerswort), Meyenburg, Hooksiel (Fischhausen), Dornum, Krummhörn-Groothusen, Hinte, Wedde, Slochteren, Jelsum and Marsum. The remaining 17th- and 18th-century manors have mostly been (re)built in a Renaissance, Baroque or Classicist style, such as the manors of Møgeltønder (Schackenborg), Leck-Lütjehorn, Haseldorf, Sande-Gödens, Leer-Loga, Uithuizen, Leens and Ysbrechtum. Often they are surrounded by a park. The majority of the local aristocracy, however, hardly distinguished itself from the yeoman-farmers. Their numbers were shrinking rapidly and many manors were farmed out in the 18th and 19th centuries or sold to urban investors and yeoman-farmers. Dithmarschen, Land Wursten and Butjadingen did not have any manors or castles.

Most villages and towns showed a substantial growth during the Early Modern Age. The number of people involved in trade and commerce

was increasing more and more. Traditional rural fairs gave way to customary weekly markets: the towns got weigh-houses and specialized market places for items such as horses, cattle, dairy, corn, fish, peat and vegetables. Many villages got a secondary main-street with stone road surface, an elongated green and rows of elms or lime-trees after the Dutch fashion (*buorren, voorstraat, riepe*). This was particularly the case in Fryslân, Noord-Holland and on the islands, but also in several other towns such as Møgeltønder (Slotsgade). Alternatively, they were provided with a harbor around a dead-end canal (*opvaart*). Nevertheless, several older shipping villages such as Sønderho, Borkum and Molkwerum kept their original street labyrinth.

The big houses at the markets and along the main streets harbored merchants, government officials, innkeepers, tradesmen and retired farmers, whereas poor people settled down in the side-alleys. The western districts often had colorful one-story houses made of yellow (or red) brickwork, the eastern districts mostly had partly timber-frame houses with red brickwork and a boarded gable. Tiled roofs were often prescribed after big fires. Amphibious towns such as IJlst, Sloten and Kolhorn harbored fancy gardens along the boards of the canals (*overtuinen*). Emigrant towns such as Friedrichstadt, Glückstadt, Hamburg-Altona, Norden and Emden as well as the main cities in Groningen, Fryslân and Holland were characterized by numerous stately houses in Dutch Renaissance style, often decorated with painted stone tablets indicating the name of the house or the owner's trade. The early modern city-centers of Hamburg, Bremen and Emden have been mostly destroyed in World War II.

Medieval churches were redecorated or enlarged. Many villages got a new parish church, often in a light and spacious Renaissance, Baroque or Classicist style. In the western districts they were stripped from catholic paraphernalia and repainted in plain colors, in the eastern districts they often got splendid altars-pieces by painters educated in the Netherlands, rich wood-carving and a colorful decoration in a peasantesque Baroque style. Many high quality church organs in the coastal districts were built by famous German organ builders such as Arp Schnittger, Huß, Hinz and Freytag. The western districts also harbored many plain hidden churches for religious minorities. Hamburg-Altona, Glückstadt and Amsterdam had substantial communities of Jewish merchants from the

Mediterranean. Yet, most Jews that settled down in the coastal towns since the 17th century were poor immigrants from Eastern Europe, who devoted themselves to unpopular professions such as butchers, sheep-traders and rag-men. Their numbers were only substantial in Friedrichstadt, Hamburg-Altona as well as in the western districts including Ostfriesland. Only a handful of 19th-century synagogues have been preserved.

During the 16th or early 17th century most privileged cities ordered an elegant town hall to be built. Often they also got other official buildings, such as almshouses, orphanages, hospitals, guild-houses and a government castle. The towns of Husum, Oldenburg, Jever, Aurich, Groningen and Leeuwarden had a princely residence, Glückstadt a 17th-century royal palace, which has been demolished in 1708. Dokkum, Harlingen, Enkhuizen and Hoorn harbored the board of admiralty. Smaller market towns such as Heide were often provided with a court- or district-house. The universities of Groningen (1614) and Franeker (1585-1815) were popular among German students, whereas Husum, Meldorf, Hamburg-Altona, Hamburg, Stade, Bremen, Jever and Amsterdam had an academy, most of them founded in the 16th century. Most other coastal towns had a gymnasium.

Urban population growth mainly took place in the 16th century. At the turn of the century Amsterdam, Hamburg, Bremen, Groningen and the newcomers Emden and Enkhuizen were the most important cities of the region with 20,000 inhabitants or more, followed by Hoorn, Alkmaar, Leeuwarden, Harlingen, Stade and Husum. Most cities were even smaller, harboring less than 2,500 inhabitants. Dutch immigrants and refugees settled down in Sande-Neustadtgödens (1544), Emden (1550s), Hamburg, Bremen and Stade (1560s), Tönning (1590s), Hamburg-Altona (1601), Glückstadt (1617) and Friedrichstadt (1621). Yet, in subsequent years urban population growth stagnated until the second half of the 18th century, except for Amsterdam, Hamburg and Hamburg-Altona. Formerly booming towns like Enkhuizen, Emden, Husum and Ribe lost more than half of their population, whereas Hoorn, Alkmaar and Stade were reduced in size as well.

City fortifications were thoroughly reconstructed during the 16th and the beginning of the 17th centuries, first with the help of Italian engineers, then by Dutch experts. Large earthen ramparts, complicated canals and extensive flood belts made it virtually impossible to siege

the cities of Hamburg, Bremen, Emden and Groningen up to the 18th century. Unsurpassable flood belts also surrounded the fortresses of Tönning, Glückstadt, Stade, Oldenburg and Delfzijl, which harbored garrisons. Complete failures were the fortresses of Carlsburg (now Bremerhaven) and Christiansburg near Varel, originally designed in the 1670s as free-trade ports. The Dutch border was defended by an inundation line and series of fortified market towns at the edges of the Bourtanger raised bogs: Nieuweschans, Oudeschans and Bourtange with the outposts Dieler Schanze and Leerort. The Fryslân peat-moors served as a secondary defense line. Additionally, dozens of small fortresses have been built all over the region. Most of them have been leveled in the 18th and 19th centuries. Fortresses at Cuxhaven-Franzenburg, Norderney, Oudeschans and Oudeschild on Texel are still more or less intact, whereas Bourtange has been reconstructed in a large-scale fashion. Remnants of Hetlinger Schanze and Belumer Schanze can be observed as well.

Several industrial methods originated in Holland. During the 17th the Zaanstreek became a center of industrial production with hundreds of powerful smock mills and revolving paltrok sawmills. From here millwright techniques spread to other districts, first and foremost to the port of Harlingen and its surroundings. In the last decades of the 17th century oilmills, hulling mills, sawmills and smock corn-flour-mills were introduced in Fryslân, Groningen, Ostfriesland, Oldenburg and Hamburg-Altona, where they gradually replaced the traditional post-mills. In the 18th century hulling mills came into use in Nordfriesland and several other districts where barley-gruel (prepared from buttermilk) was preferred. Nevertheless, in the eastern districts wind-driven oilmills and sawmills remained the exception until the 19th century. Most surviving mills are smock mills. Only a few post-mills have survived or been reconstructed (Langeneß, Bremerhaven-Speckenbüttel, Dornum).

Medieval brickyards were replaced by modern kilns in the 17th and 18th century. The brickworks on the Oste, Weser and Ems River banks and in central Groningen employed ferruginous marine clay for the production of medium sized red bricks and Frisian pantiles. The city of Harlingen and its surroundings produced millions of small yellow bricks, which were exported in large quantities to Northern Germany and the Baltic, as well as glazed blue pantiles. The scattered works in other districts mostly stuck to red-bak-

ing boulder clay. Only Fryslân and Ostfriesland exported large quantities of brick and pantiles. In the 18th and 19th centuries seasonal brick-makers from Lippe virtually had the monopoly on designing and operating the coastal brick-works. The leveled fields are left as depressions in the landscape, mainly used for pastoral farming. Lime burning originally took place in the open air, but in the 17th century special kilns came into use. Specialized skippers, most of them from the islands (including Wangerooge), dug off the mussel-banks on the mudflats and transported the mussels to the mainland, where they were processed. Not much has been left from the shipbuilding industry. Most cities had shipyards and ropewalks, but many ships were bought second-hand from Holland and Fryslân. By the 18th century, Harlingen and the neighboring towns of Makkum, Workum and Leeuwarden may have been the most important industrial centers in the Wadden Sea Region. They harbored specialized mills, brickworks, tile-works and other branches of industrial production. Specialized faience-works, mainly producing for the wealthy coastal districts, have been operating in Kellinghusen, Bremen-Lesum and Jever.

In general, the western marshland districts had more industry and artisan trade than the eastern ones, particularly bakers, tanners and shoemakers. Several towns and villages (e.g. Leer, Harlingen) had a substantial textile production that gradually disappeared after 1750. Guild regulations were less restricted, in contrast to the districts east of the Weser river, where many professions were not allowed to settle on the countryside. Many coastal dwellers had an aversion for home industry, which was associated with the meager upland districts. New centers of proto-industrial production after 1750 were the Elbe, Weser and Ems River marshes, the Friesische Wehde and the Groninger Veenkoloniën. Most towns bordering the Pleistocene fringe had a substantial brewing industry, due to the fact that the marshlands lacked fresh water. Apart from strong beers from Hamburg, Bremen, Groningen and Delft the local beers from Husum, Friedrichstadt, Bederkesa, Friesische Wehde, Norden, Oldersum and Dokkum also had a certain reputation. Husum's own malting industry collapsed at the end of the 16th century. After 1750 many brewers switched over to distilling brandy flavored with caraway or juniper-berries (aquavit, köm, jenever). Beer became to be replaced by coffee and chicory. Several maritime districts, however, had already switched over to

tea. In Ostfriesland tea drinking became a highly valued ritual, originally connected, as British teetotalism, with religious and social motives.

In contrast with the coastal districts upland developments were modest but undeniable. Only those villages bordering directly on the coastal marshes, such as in Jutland and around Husum, had a full share in the coastal wealth and in international trade. Yet, the upland population grew steadily, particularly since mid-18th century, when potato-cultivation allowed a growing number of cotters to settle down at the edges of the commons. For ten thousands of cotters and smallholders seasonal labor in the coastal marshes and in Holland provided a major opportunity to earn some cash. Especially the squatter settlements and black fens bordering the marshes acted as a labor reserve for the coastal farmers. The squatters used to prepare the peat-moors by slashing and burning, then it was seeded to buckwheat. The method of swidden moor cultivation is first reported 1556 at the edges of the Dollard marshes. It spread to neighboring districts very rapidly. In spring the annoying smoke or 'dry fog' (Haarrauch, veendamp, brouillard sec) sometimes affected the weather at a distance of hundreds of kilometers. Depending on the direction of the wind, its effects were to be felt as far as Vienna, Krakow, Frankfurt, Paris or London.

In many upland districts artisan production such as spinning, weaving, knitting and flax processing served as an additional source of income. The Friesische Wehde produced carved furniture, the district around Tønder harbored thousands of lace workers, whereas dozens of Jutland villages specialized in baking coarse black pots. Several oak groves were cut down and sold to the neighboring marshland districts as well as to foreign buyers, particularly during 16th and 17th-century wartimes. Merchants from Holland were partly responsible for the deforestation of the Stader Geest. Peasants often specialized in breeding cattle and horses that were sold to marshland farmers. Up to the 18th century they profited greatly from the international meager oxen trade.

In general, the upland population was eager to borrow from items of coastal culture. They admired the coastal wealth and the presumed freedom, which they found lacking in their home districts. Nevertheless, agrarian reforms, enclosures, the redemption of feudal dues and the parceling out of former mansions gave an important impetus to rural change after 1750. The benefits were also shared by the upland-fringe market towns (Geestrandorte), such as Bredstedt, Husum, Heide, Itzehoe, Elmshorn, Wedel, Buxtehude, Delmenhorst, Varel, Wittmund, Aurich, Leer and Winschoten. Trade in cattle,



Fig. 2.17:
Moundvillage Midelstum,
The Netherlands
Photo: ROB Amersfoort

horses, timber, flax and home products concentrated on major fairs, at which the coastal and inland population met. Hundreds of upland servants and day laborers gathered there, applying for jobs in the marshes. Famous servant markets were Ribe, Bredstedt, Friedrichstadt and Otterndorf. In the 19th century upland harvesters were often recruited in central towns such as Garding, Wesselburen, Norden, Pewsum, Winschoten and Sneek.

The islands benefited from the flourishing international trade. Especially those islands that served as roadsteads and pilot stations had a share in the coastal wealth. Terschelling and Vlieland were more or less urbanized during the 16th century, whereas Rømø, Wangerooge, Borkum, Texel and Huisduinen also profited from their location at major trade routes. As a consequence, the painstaking agricultural activities were restricted. Wrecking proved an important source of additional income, carefully administered by state officials but often leading to abuses. State-owned rabbit farms were another matter of concern as they often provoked poaching. Nevertheless, the insular prosperity was rather fragile. On several occasions maritime conflicts and storm-surges completely destroyed a local fleet, condemning the survivors to a more primitive way of life. Especially the barrier islands from Wangerooge to Schiermonnikoog suffered from storm surges and coastal erosion. To curb dune blowouts, state officials stimulated the planting of beach grass, a technique borrowed from Holland, where it had been known since the 14th or 15th century.

After 1650 most insular shipping and fishing activities declined, probably due to foreign competition and the availability of more rewarding alternatives. Instead, the men engaged on Dutch or Hanseatic ships. The Hallig population engaged in these activities as well, enabling the inhabitants to continue their insular existence in spite of ongoing coastal erosion. Merchant shipping and whale hunting brought prosperity to the islands, overwhelming them with various items of Dutch culture. Sometimes they even got a paved main street with rows of trees after the Dutch fashion. Retired captains and successful whaling commanders began to dominate the local communities with their money and foreign ideas. Together with the coastal ports around the Zuider Zee the islands and Halligen acted as an intermediary, responsible for spreading Dutch culture into the German and Danish hinterland. After 1750 the islanders reverted to merchant

shipping. Fanø, Juist, Borkum and Schiermonnikoog had their own merchant fleet, but the French occupation largely pushed them out of business.

Reports of stranded whales, mostly sperm whales and blue whales, but also northern right whales and narwhals, start in the 15th century. They stem from the islands as well as from the mainland districts. The whales were mainly slaughtered for train oil. Additionally, seals, dolphins and harbor porpoises were hunted for their oil and flesh until the 20th century. The Dutch started systematic whale hunting from Spitsbergen (Svalbard) in 1619. Later on large ships came into use, transporting the blubber back home for processing it into train oil. Most whaling activities were conducted from Den Helder and Hamburg, though Bremen, Emden and Harlingen also took a share. The whaling crew largely came from the islands. After 1750, whale hunting was primarily conducted by mainland speculators. Even merchants and farmers from coastal villages founded whaling companies with one or two ships. By then the hunters had sail as far as Greenland and Street Davis, because the Eastern Atlantic whale population had been decimated. Other whalers, particularly those from Rømø, shifted to seal hunting. After the middle of the 19th century whale hunting was no longer profitable. Most of the whale jaws and ribs, frequently used as fences, gates and tombstones, have decayed.

During the 16th and 17th centuries the most important open-sea fisheries came to be concentrated in Holland. The large herring boats (buizen) from Enkhuizen on which the herring was processed were so efficient that other fishing villages such as Sønder side were forced out of competition. Additionally, there are reports that the herring shoals began to move away from the eastern North Sea. Attempts to imitate the Dutch success in Friedrichstadt, Tønning, Glückstadt and Emden were doomed to fail. Subsequently, urban demand shifted from dried to smoked and fresh fish. The latter was caught in drift nets and transported in fish-wells to major urban markets such as Amsterdam, Hamburg and London. Faster and stronger ship-types such as the watership came available, which could supply the urban consumers with fish from every corner of the Wadden Sea.

Drift-nets (Kuhlen, kuilen) and boomtrawl-nets (kurre, kor, ra, schrobnet) may have been introduced in the Wadden Sea Region in the late 17th century, together with the longboat called

snekke, schnigg or snik. As a consequence, the number of sea-fisheries was greatly reduced, while many fishermen could not afford the investments required. Only a few places such as Hjerting, Schiermonnikoog and Ameland held out somewhat longer, exporting large quantities of dried flounders and plaice.

Yet, long-line fishery made an unexpected comeback, as many fishermen were not able to upkeep the expenses for longboats and nets. Local fishermen from Helgoland were the first to use boomsail shallows, normally used for whale hunting. Subsequently, most fishing villages reverted to long-line fishery at the turn of the 18th century, forthwith using shallows, yawls and other types of small sailing boats. Many Dutch skippers, on the other hand, did not give up boomtrawl-fishery altogether and combined it with long-line fishery. They switched over to the aak or schokker, which was replaced by the blazer after 1880.

The village of Blankenese near Hamburg became the most important fishing port in the region. Its fishermen held on to draw-nets and subsequently switched over to lighter ships such as everts, cutters and luggers, which were better suited for drawing modern cotton nets. Skippers from Blankenese often transported fish from other harbors as well. Additional fishing harbors were Büsum, Helgoland, Wangerooge (until about 1800), Norderney, Zoutkamp, Schiermonnikoog, Paesens-Moddergat, Wierum, Ameland, Terschelling, Oosterend, Oudeschild, Den Helder and the 19th-century newcomers Finkenwerder, Altenwerder, Fedderwardersiel, Ditzum and Den Oever. The province of Fryslân exported large quantities of eel, which were caught in the surrounding districts and transported to London alive in fast-sailing yachts.

Nevertheless, hundreds of fishermen working with simple yawls and herring boats continued producing for the local market, using traditional tools such as reed fences, weirs and fish-traps. Each district had its own fishing villages near the dyke. Particularly around the Zuiderzee large quantities of white herring (panharing) were caught. Selling shrimps gathered by means of pushed nets, moreover, became an occupation for many impoverished men and women. Oyster fishing was largely farmed out by the state. It started in the 17th century near Sylt and Amrum and spread to the western Wadden Sea, but it disappeared again in the 19th century due to over-exploitation.

We may conclude that the Early Modern Age was essential for the way in which the coastal landscape has been furnished. To be sure, the polderlands, ports, peat-moor settlements, and market towns constituted additional geographic elements. But the most important contributions to the coastal heritage were the specific architectural styles for farms and cottages, the modern technical implements such as windmills and sluices, as well as the introduction of novel agricultural, industrial and fishing methods that have been fundamental for coastal civilization ever since. Finally, there is also an important immaterial heritage, consisting of seasonal folklore, religious perceptions and regional identities. Regional customs at Saint Peter, Eastern, Whitsunday, Martinmass, St. Nicholas' or New-Years Eve, such as bonfires, may-poles, mockeries, masquerades, harvest-homes and beggary with rumbling-pots are characteristic of the Early Modern Age, often referring to the social tensions and communal obligations of the day. Specific sports such as ball playing on courts (kaatsen) or ball-throwing (BoBeln) originate in the 17th, 18th and early 19th centuries, as well as specific dishes, beverages and costumes. In general, they also reflect the impact of a bipolar urban culture, dominated by the distant centers of Amsterdam and Hamburg.

2.6.6 Modern Time (1800-2000 AD)

The 19th-century contribution to the cultural heritage of the Wadden Sea Region was more a matter of quantity than quality. It was the era of industrialization, urbanization, population growth and social upheaval. Cultural patterns that originated in previous centuries prevailed, but their effects were more spectacular and their success more appealing than before. Economic growth was remarkable, whereas the belief in progress was unprecedented. Nonetheless, the major innovations that promoted coastal development were subjected to diminishing returns. Eventually, coastal civilization failed to adapt to the requirements of the modern age.

In many coastal districts the working-class population more than doubled during the 19th century, due to the booming market for agricultural products, but the urban population grew even more. Almost imperceptibly, cities began to outstrip the countryside. Developments were most spectacular in seaport towns and administrative centers, particularly in Germany. Hamburg with its suburbs had grown to 900,000

inhabitants in 1900, Amsterdam had 500,000, Bremen 200,000, Groningen 70,000, Bremerhaven and Wilhelmshaven each 60,000, Oldenburg 45,000, Leeuwarden 32,000, Den Helder 25,000, Emden 22,000 and Alkmaar 18,000 inhabitants. Next came the booming market towns such as Esbjerg, Itzehoe, Elmshorn, Stade, Delmenhorst, Leer, Winschoten, Veendam, and Hoorn. The other coastal towns were expanding as well, though many traditional centers lagged far behind. The previous orientation of the coastal marshes towards Amsterdam completely disappeared, as London and Hamburg became the principle markets for agricultural products. Large parts of the countryside had reached the same population figures, as we know today, approximately 75 to 100 inhabitants per square kilometer. The Dutch coastal provinces were more populated, whereas Jutland and Nordfriesland lagged behind. Most of the islands, on the other hand, fell back into their initial poverty, as maritime traffic began to ignore their roadsteads and labor reserves.

Still, the 19th-century developments were the forerunner of more profound changes in the 20th century. The construction of highways, canals and railroads resulted in a reversal of the coastal infrastructure. Tidal harbors and their surrounding marshes were condemned to a peripheral existence, whereas the inland districts benefited from their location close to the urban centers. Coastal shipping declined after 1870. Coastal agriculture lost its comparative benefits, as it was suffering from falling prices, rising wages and the mounting costs of hydrological management. Substantial numbers of working-class families moved to the cities or emigrated abroad. The sterile upland moors, on the other hand, were greatly improved by the use of modern fertilizers and land-reclamation techniques. They took all the benefits from the possibilities of modern pig-breeding and dairy farming.

As the countryside started to lose inhabitants, the remaining population gathered in towns and major villages, which grew in size and number. Industrial centers and suburbs expanded even more, reducing the surrounding districts to a dormitory area and recreational foreland for the urban economy. This was particularly the case around the major cities. During the 20th century the number of inhabitants of nearby cities doubled to a figure of approximately 5 million, not to mention the more distant urban agglomerations in Holland and North-Rhine-Westphalia, which began to regard the Wadden

Sea Region as their rural foreland as well. At the end of the 20th century, Hamburg had 1.7 mill. inhabitants, Amsterdam 727,000, Bremen 550,000, Groningen 173,000, Oldenburg 154,000 and Bremerhaven 130,000. Other major cities with more than 50,000 inhabitants were Esbjerg, Cuxhaven, Delmenhorst, Wilhelmshaven, Emden, Leeuwarden, Den Helder, Alkmaar and Hoorn. Additionally, the towns of Elmshorn, Stade, Aurich, and Drachten also were strong growers. As regional centers the towns of Varde, Ribe, Husum, Heide, Itzehoe, Uetersen, Wedel, Buxtehude, Langen, Nordenham, Brake, Varel, Wittmund, Norden, Leer, Winschoten, Veendam, Hoogezand-Sappemeer, Delfzijl, Heerenveen and Sneek became more important. As a consequence, the urban population completely outnumbered the people living in rural areas, which can be estimated at about 1.0 to 1.5 million (depending on the demarcations chosen). The coastal marshes and fenlands only count for 7 to 800,000, the islands for another 100,000.

The islands and the neighboring mainland districts took the most important benefits from the urban-based economic development, as they developed into major holiday-resorts for the urban population. High society tourism started in the 19th century on the islands of Norderney, Wangerooge and Föhr (where the royal families resided), followed by Sylt and the other German islands. Important mainland resorts were Dangast, Büsum and Sankt-Peter-Ording. In Denmark and the Netherlands bathing culture started not before the 20th century. In the second half of the 20th century, however, seaside tourism became a mass phenomenon, spilling over to the mainland districts. Several islands experienced a rapid population growth during the 20th century. The islands of Sylt, Sankt-Peter-Ording, Norderney and Borkum as well as the bathing resorts of Wyk-auf-Föhr and Sankt-Peter-Ording became more or less urbanized. In fact, the total island population tripled during the 20th century.

The 19th century constituted the high-days of large-scale modern agriculture. Corn, particularly oats, was exported in large quantities to Britain, Belgium and France, where it fed the horses that pulled the industrial revolution. By the middle of the 19th-century 60 to 80% of the coastal acreage was used for arable farming. The grazing districts were prospering as well, as they profited from the rising export of fattened cattle, horses and dairy products. The typical farms can be described as agrarian capitalist enterpris-

es. The typical farmer was a modern entrepreneur, who refrained from manual labor. Most of the work was undertaken by living-in servants and farm-workers, whose numbers rose considerably. The towns and villages bordering the polderlands and high-farming districts developed into working-class centers, with rows of cottages along their lanes and alleys (e.g. Wesselburen, Marne, Norden, Bunde, Uithuizen). Other working-class families settled on the poor soils of the Pleistocene fringe, where genuine squatter villages emerged, acting as a labor reserve for the marshes. The villages in the Kornkoog district as well as Sankt-Peter-Ording, Sankt-Michaelisdonn, Varel, Moordorf, Muntendam, Zwaagwesteinde, Harkema and Houtgehage became notorious for their obstinate working-class population.

The mounting wealth of the farming population, on the other hand, resulted in a semi-urban way of life. Their splendid farmhouses were built in a neo-classical style, with luxuriously furnished parlors and English gardens with a summerhouse, French roses, and foreign fruit-trees, as well as with separate garage for their gigs and coaches. Cast iron ornaments attested their progressive attitudes. Since the 1860s the most successful farmers started to build urban villas in front of their farms, particularly in liberal strongholds such as Dithmarschen, the Elbe and Wesermarschen, Groningen and Noord-Holland. In Germany, this resulted in a new type of farmhouse: rectangular brick-built buildings with shallow roofs, typical of the so-called foundation age around 1900. In Ostfriesland, Groningen, and Friesland, the traditional type farm-buildings were enlarged, sometimes supplemented by large open barns or huge haystacks.

The agricultural boom was enabled by huge investments in hydrology, infrastructure and machinery. The fields were marled more intensively and drained better by means of deeper ditches, larger canals and bigger sluices. The Hadelner Sietland, for instance, was transformed from a wetland area to a flowering agricultural district thanks to the construction of a canal in 1856. Another canal relieved Butjadingen of perennial drinking-water shortages by diverting fresh-water from the Weser River in 1822. Several lakes and wetland areas that had been drained before were reclaimed again. Until then, it had been the rule that the fenlands and graz-



Fig. 2.18:
Tuunwallen on Texel,
The Netherlands
Photo: D. Marrewijk

ing marshes were inundated each winter, but at the end of the 19th century this had become restricted to extremely rainy periods and specific low-lying areas. Arable fields were drained more effectively as well. Brickwork drainpipes were introduced in the 1850s, enabling extensive leveling operations that enlarged the available acreage. Their introduction on heavier soils was delayed, because the first pipes tended to silt up.

Extensive polder areas such as Anna-Paulownapolder, fairly comparable to their 16th and 17th-century forerunners, were embanked in the 19th century, usually by private firms. Dykes were further heightened and secured, whereas the number of drainage-mills was rising rapidly. The first steam-propelled pumping-engines were introduced in the Netherlands in the 1840s, supplemented by Diesel and electric engines since the 1920s. Traditional drainage-mills were replaced and supplemented by American wind-engines, which led to the establishment of hundreds of additional drainage districts. As a consequence, water-management became increasingly complex, leading sometimes to chaotic situations. This was particularly the case in the low-lying parts of Fryslân, which were burdened by recurrent inundations. In Germany, however, artificial drainage was restricted to specific districts largely below MOD, such as the Wilster Marsch, Wesermarsch, Krummhörn and Rheiderland. Natural drainage prevailed here until the 1950s and 1960s, due to the lower tide and the shorter distance towards the coast. Nevertheless, recurrent inundations had to be reckoned with.

Nowadays, the artificial lowering of the water table during large parts of the year is considered indispensable. Huge sluices and pumping-engines, fed by a web of additional pumps and canals, guarantee a rapid rainwater discharge.

Generally, 19th-century agricultural progress was more profound in the Netherlands and Schleswig-Holstein than in Jutland or Lower Saxony. Particularly the districts of Groningen and Dithmarschen counted to the strongholds of modern arable farming. Fundamental for agricultural progress were iron foundries, of which the first has been built in Rendsburg 1827. In the 1850s, most coastal districts had their own iron foundry, for instance in Højer, Husum, Heide, Itzehoe, Varel, Augustfehn, Norden, Leer, and Martenshoek. Soon the first items of mechanization, such as acrobat rakes, eagle-plows, sowing and threshing machines began to be used. The sandy marshes and polder areas concentrated on arable farming, whereas the older marshes and fenland districts reverted to grazing and dairy farming, exporting their products directly to Britain. The Jutland coastal districts, Eiderstedt and the Wesermarschen developed into major exporters of fattened cattle, transported directly to Britain with the help of steam-ships from Ribe, Tönning, Elsfleth and Brake. Fryslân also exported large quantities of dairy, shipped from the booming port of Harlingen. The internal markets, however, were growing in importance, particularly since the 1870s, when new industrial centers such as Braunschweig, Hannover, Osnabrück, the Ruhr district and Twente emerged.

The 19th-century was also the high-days of coastal shipping. Coastal contacts became more frequent and flexible, smoother, faster and safer. The number of ships in the Wadden Sea Region can be estimated at 3 to 5,000 at least. Especially medium-sized sailing-ships such as koffs, tjalks, schmacks and galliasses were successful, often measuring 125 to 250 tons. Faster sailing ships such as frigates, brigs and schooners were more popular in the western districts and larger ports, whereas the relatively small everts remained dominant in the eastern Wadden Sea. Most ships for coastal traffic came from the Groninger Veenkoloniën, Papenburg, the Elbe and Weser River marshes and the island of Fanø, but the other coastal ports had a modest fleet as well. Newly established seaports such as Den Helder (1811), Bremerhaven-Geestemünde (1828), Wilhelmshaven (1853) and Esbjerg (1874) played a major role as transit harbors,

supplemented by Brake (1790), Nordenham (1857), Brunsbüttelkoog (1895) and the older ports of Stade, Cuxhaven, Vegesack, Emden, Leer, Delfzijl and Harlingen. Bremerhaven became the springboard for hundred thousands of emigrants departing for the United States and Canada. Major waterways with huge sluices, such as the Eiderkanal (1784), Noordzeekanaal (1876) and Nord-Ostsee-Kanal (1895) provided shortcuts between the North Sea and the Baltic. Docks, bridges, cranes, beacons, and lighthouses such as the Alte Liebe in Cuxhaven (1802/03) testify the high-days of coastal shipping.

Railroads, roadways and inland canals, however, outdated coastal traffic. The first railroads merely connected the seaports with their economic hinterlands (Amsterdam 1839, Hamburg 1842, Altona 1844, Glückstadt 1845, Tönning 1854, Harlingen 1863, Den Helder 1865). Subsequently the links with the inland railroad nets were made. The national railroad systems were interconnected in the 1870s, regional offsprings reached almost every coastal district in the 1880s. Additionally, the main roadways connecting the coastal districts to their hinterlands were paved with gravel or stones, providing another alternative to coastal shipping. Local canals such as Fehntjertief (1799), Noordhollands Kanaal (1825) and Hadler Kanal (1853) opened up the coastal hinterland, whereas the Noord-willemsvaart (1861), Bederkesa-Geeste-Kanal (1862), Eemskanaal (1876), Ems-Jade-Kanal (1887), Weser-Ems-Kanal (1893), Dortmund-Ems-Kanal (1899), Küstenkanal (1935), Van Starckenborghkanaal (1938) and Prinses Margrietkanaal (1951) offered a direct connection between different districts as well as an passageway towards the booming inland centers, making coastal shipping largely redundant. Many ship owners reverted to tramping and bulk-transport, but the introduction of iron steam-ships in the 1890s drove most of them out of competition. Only the province of Groningen harbored a substantial number of motor-coasters until the 1960s. Inland shipping flowered around the turn of the century, but it hardly survived the changeover to the mass road-transport in the 1960s. Many 19th-century canals with their monumental sluices, bridges, quays, granaries and warehouses are now outdated and largely deserted.

The upland districts were escaping from their age-old poverty, though the marshland farmers remained skeptical about their modest neighbors for long. Many commons were enclosed during

the 19th century, whereas the number of cotters and smallholder grew. As soon the upland districts were connected to modern roadways and railroads, their rural economy began to boom, increasingly thriving on butter and bacon. The Jutland peninsula recovered after centuries of neglect ('Dark Jutland'), as the Danish government tried to redirect its economy from Hamburg towards Copenhagen.

The Wadden Sea islands, on the other hand, had a difficult time before the modern bathing culture arrived. Heavily populated islands such as Rømø, Föhr and Borkum lost many inhabitants, partly due to emigration. The population of Sylt became dependent on homegrown potatoes. Only Fanø succeeded in restoring its fleet, providing transport facilities for the Jutish west coast and switching over to tramping. Norderney and Helgoland had a substantial fleet of fishing shallops. The island of Wieringen harbored a significant fishing fleet as well.

Additional income came from harvesting sea-grass, which was used for filling mattresses.

Rural change was accelerated in the 1880s. The Great Depression meant a major impetus to agricultural modernization. Railroads and steam-ships made it possible that huge quantities of Russian and American grain reached the European markets, resulting in rapidly falling grain-prices. In order to check wage-costs threshing was fully mechanized in the 1880s, when steam engines were introduced. This caused serious seasonal unemployment and political upheaval, particularly in Dithmarschen, Hadeln, Krummhörn, the Dollard marshes and Het Bildt. Many farm-workers became redundant, they fell back into poverty, moved to the cities or emigrated abroad. The farmers reacted variously. The German government took protective measures on behalf of the grain-producing farmers, thereby linking the fate of the arable farmers to the conservative Prussian landlords. Cattle-farmers, on the other hand, took a more liberal stance, as they were profiting from foreign fodder-imports. In Denmark and the Netherlands most arable farmers remained liberal-minded.

Farmers diversified and reverted back to mixed or pastoral farming: pig-breeding was introduced, dairy-farming could intensify due to

the establishment of local dairy factories that made an end to home-processing. Around 1910 virtually every coastal district had its own butter- and cheese-producing companies. The dairy industry opened up new prospects to smallholders. Other smallholders devoted themselves to



Fig. 2.19:
Fishing harbor on Texel,
The Netherlands
Photo: D. Marrewijk

horticulture or fruit-growing. Their numbers grew considerably since the 1880s. The remaining arable districts partly switched over to market-crops such as flax, sugar beets, potatoes, cabbage, and bulbs. Oilseed rape disappeared due to the completion of tropical oils. Additional processing industries enabled the farmers to keep up arable farming. Groningen got a series of strawboard factories, which made it possible to compensate falling grain-prices by marketing straw. The poor soils at the edges of the marshland districts were planted with new brands of potatoes, suited for the potato-flour mills. Major sugar refineries were built in Dithmarschen, Groningen and Amsterdam. Dithmarschen specialized on cabbage and sauerkraut for the urban market. Cattle farming became often redundant due to the introduction of artificial fertilizers.

The construction of railroads opened up many new possibilities for the fishing industry as well, as the catch could be transported towards the urban centers within hours. Not only large fishing ports such as Esbjerg, Cuxhaven, Bremerhaven and Den Helder took their share. Also dozens of smaller harbors such as Tönning, Friedrichskoog, Neuharlingensiel, Norddeich, Greetsiel, Termunterzijl, and Den Oever began to participate in the fishing trade. Esbjerg concentrated on seine fishery for plaice. Soon it became

the main fishing port of Denmark, harboring many supportive industries as well. The fishing activities in Fryslân declined, as the local fleet was largely destroyed in two storm surges. About one hundred Dutch fishing families settled down in Elsfleth, others in Emden, Vegesack and Geestemünde, where new herring companies were founded.

The introduction of motor cutters after 1900 inaugurated a decisive turn towards commercial shrimp fishing in the Wadden Sea, which became the leading industry in many smaller harbors. Part of these shrimps were dried, the rest was sold to the cities and in the surrounding districts. Since the 1970s competition became fierce. Many smaller cutters were dismissed, particularly in the Denmark and the Netherlands. Huge industrial trawlers from Esbjerg and Urk (partly operating from Lauwersoog and Eemshaven) began hunting the Northern Atlantic for all sorts of fish, which were frozen on board and subsequently processed, largely into fishmeal and fish oil. In the Wadden Sea, mechanical fishing on cockles and other sorts of shellfish was introduced in the 1980s, leading to extensive ecological damage. De damming of the Zuiderzee in 1932 had negative side effects as well, due to the fact that the Zuiderzee served as a childbed for several fish species such as anchovy. A local subspecies of herring, related to local popula-

tions in the Hobugt and the Elbe area, has become extinct.

Agricultural mechanization and scaling up went on in the 20th century, leading to the replacement of foreign workers by family members. Living-in male servants disappeared around World War I, the last farm-workers in the 1970s. Horsepower was replaced by tractors in the 1940s and 1950s. Cattle farming was modernized since the 1950s, herds of 50 to 100 cows were to become the rule. Mixed farming tended to disappear, most smallholders terminated their farms in the 1960s or 1970s. Distant pastures and meadows got into the hands of upland farmers. Changes were most profound, however, in the arable districts, which became completely dependent on modern machinery, as well as fertilizers, herbicides, insecticides and growth suppressors. Traditional crops were replaced by vast acreages of winter wheat, supplemented by barley and oats. Broad beans and flax disappeared, but in several districts farmers concentrated on special crops, among which plant potatoes were the most important newcomers.

The effects on landscape values were dramatic. Re-allotment schemes, infrastructural programs, and hydrological measures, such as the Program Nord (1953), the Ruilverkavelingswet (1954), and the Küstenprogramm (1955), had a profound influence. Ditches were filled up, fields

leveled and improved with subsoil ploughs. The water table was lowered considerably.

The remaining salt marshes were embanked, dykes heightened to unprecedented levels, canals straightened and rivers dammed. In large parts of the Dutch coastal area the original parceling completely disappeared. In the grazing districts the original grass cover was replaced by standardized brands. Still, farming is largely dependent on EU subsidies. Arable farming is hardly competitive due to the tough soils and the high costs of hydraulic management. Moreover, the costs of maintaining the

Fig. 2.20:
Haubarg, Schleswig-Holstein
Photo: W. Raabe



remaining farm buildings, ditches, hedgerows and other traditional landscape elements are relatively high, leading to gradual decay.

On the Halligen farming became marginal. Several Hallig islands have been abandoned, whereas the remaining population is dependent on tourism and employment at land-reclamation projects. The original farm-buildings have partly been replaced by modern buildings, better suited to storm-surges.

In the marshland districts the heritage of earlier working-class deprivation can still be observed, sometimes manifesting itself in a grudge against the farming population. Particularly in those districts where the redundant farm-workers could not be sufficiently absorbed by other sectors, several generations have been faced with unemployment, underschooling, and lack of initiative. Some of these districts tend to become depopulated and burdened by an aging population. In the fenland and upland districts, on the other hand, the effects of recent developments have been more balanced.

Many towns and villages still reflect the 19th and early 20th-century agricultural wealth. Spatial patterns and general views are determined by 19th-century architecture. The more recent extension schemes usually took place outside the former village cores. Red brick and pantiles are prominent, though the more robust buildings in Denmark and Germany are contrasting with the subtlety of Dutch architecture, which is characterized by large sash-windows with white-painted frames. Since the 1870s national and international architectural styles predominate. This is particularly the case with communal buildings, such as town halls, co-operative banks, storehouses and dissident churches. Many traditional market-place inns, former groceries and former artisan workshops have been preserved. Several villages were provided with an elegant estate where retired farmers built their villas. Public housing schemes, on the other hand, resulted in sober housing-blocks, but also in special working-class neighborhoods where houses stood alone amidst substantial gardens for self-supporting.

The most important 19th-century industries were windmills, shipyards, and brickworks. Hundreds of new brickworks were built in the Friesische Wehde (brick-pavements) and in Kehdingen, the latter due to the reconstruction of Hamburg after the 1842 great fire. Traditional kilns were replaced since the turn of the century by round kilns with chimneys, allowing a more permanent

production process. Most of them closed down in the 1960s. Hardly any kilns or drying-sheds have been preserved. Since the 1850s and 1860s, several local works have started using steam engines. Flax, sugar, tobacco, ship's biscuits, rapeseed oil were processed industrially. Dairy, sugar, potato-flour, strawboard, and fish-processing factories often reached a considerable scale after 1900. In the 20th century, rural artisan production largely came to an end. Only the blacksmiths held out somewhat longer. Many local shops survived, providing their owners a meager subsistence, but most of them had to shut down in the 1960s, due to urban competition. In the Netherlands, local groceries disappeared completely, making the villages fully dependent on motorized traffic.

Political developments resulted in the full integration of the coastal population into the modern nation-state during the 19th century. The relations with the central government were at first personal and fragile, but gradually becoming smoother. Coastal autonomy was abolished or exchanged for a more standardized form of municipal self-government. In general, the farming population became liberal minded, perceiving traditional self-government as the forerunner of modern democracy and cherishing local identities as an essential component of national values. Fryslân even saw a revival of the Frisian language, due to the struggle by competing elites for popular support. Yet, the liberal triumph also led to a protest movement in the Netherlands and Ostfriesland, as conservative Calvinist smallholders, artisans, and farm hands left the public church for independent free churches.

The insurrection of Schleswig-Holstein (1848/49), its annexation by Prussia (1864/65), the Prussian annexation of Hanover (1866) and the German-French war of 1870/71 lead to a stronger identification with the nation as a whole and a weakening of cultural ties with neighboring districts. Minority languages tended to disappear. Several 19th-century forts such as Grauerort (Landkreis Stade) and Fort Kijkduin (Den Helder) as well as cazemattes and naval strongholds have remained intact.

During the early 20th century many farmers chose for right-wing protest-movements, particularly in Dithmarschen, the Krummhörn and the Groninger Veenkoloniën. They felt threatened by working-class demands as well as by the growing power of financial and commercial elites. Remarkable were the propagandistic attempts by

2.7 Frontiers and boundaries

the NS-regime to depict the ongoing embankments of the Wadden Sea as a heroic struggle for additional living space for the German people. Polders such as Dieksanderkoog (Adolf-Hilter-Koog) were constructed by unemployed workers and populated by farmers and farmhands loyal to the regime.

In the wake of World War II many bilateral contacts between the three countries temporarily broke off. Nowadays, most coastal districts are governed by labor politicians, particularly in Ostfriesland and the adjoining parts of Groningen.

To a large extent, the Wadden Sea landscape is the product of the 19th- and 20th-civilization. Modern civilization, however, tends to jeopardize its own existence. Human intervention created a unique niche in which cultural richness and natural diversity could thrive. Ongoing developments threaten to reduce these values to a situation in which diversity is rapidly decreasing. The effects of mechanization and large-scale planning constitute a major threat to civilization. Rising sea levels and changing temperatures may even increase the risk of unwarranted actions. Thus, caution and care are the only effective solutions for preserving the cultural landscape in its unique natural settings.

2.7 Frontiers and boundaries

2.7.1 Political territories

2.7.1.1 Denmark

Unambiguous frontiers in the modern sense did not emerge before 19th century. Until 1864, when Prussia incorporated Schleswig-Holstein, the kingdom of Denmark stretched down as far as the Elbe river. The Danish crownlands, however, were restricted to the political districts north of the Kongeå (Vester Horne, Skast and Gørding herred) and several southward enclaves on the mainland (the city of Ribe, Lø herred with Ballum and Møgeltønder Birk) as well as on the islands (Mandø, Rømø Sønderland, List-auf-Sylt, Westerland-Föhr and Amrum). These enclaves were united 1440 under the rule of the bishop of Ribe and incorporated into the Danish state in 1536. During the late 17th century they were pawned to the count of Schackenborg. The other districts south of the Kongeå (including Hviding, Højer and Tønder herred) belonged to the duchy of Schleswig since the 13th century. The only privileged cities in the area were Varde, Ribe and Tønder. The market town of Højer had the jurisdiction over the surrounding countryside (Højer herred).

The duchies of Schleswig and Holstein as well as the royal enclaves were occupied by Prussia, until a plebiscite in 1920 established the present borderline. Only the city of Ribe and its surroundings (Ribe herred) were left to Denmark. Following the plebiscite, the districts north of the river Vidå (Widau) were (re)united with Denmark as well. From 1940 to 1945, Denmark was occupied again by German troops. The harbor of Esbjerg was founded on Danish territory in 1868.

Originally, the whole of Jutland fell under the jurisdiction of the Jyske Lov of 1241. In the duchy of Schleswig (Sønderjylland) it remained operative until 1899. In the royal parts (Nørrejylland) medieval Jutish law gave way to the Danske Lov (Danish Law) in 1683, though the prevailing egalitarian inheritance customs remained intact.

2.7.1.2 Schleswig-Holstein

The duchies of Schleswig and Holstein were united in 1386 and associated to the Danish kingdom in 1460 by means of a personal union. As the king bestowed the duchies upon his younger brothers and their descendants, their

political history took an independent course. They had a distinct royal chancery as well as a diet, largely dominated by the German speaking nobility.

Both duchies, separated by the Eider river, had a very different ethnic background. The duchy of Holstein was part of the German Empire and is considered the ancient homeland of the Saxons. The duchy of Schleswig was originally a part of the kingdom of Denmark. The area has been colonized in the Early Middle Ages by Danish and Frisian immigrants. The latter fell under royal jurisdiction until 1435. Only the small districts of Schwabstedt and Stapelholm (Kreis Nordfriesland) as well as the main cities were populated by Saxon newcomers from the south.

The ethnic divisions were quite pronounced in matters of law and administration. Schleswig's civil law has been dominated by the traditional Jyske Lov of 1241, which was replaced by the 1899 Prussian Bürgerliches Gesetzbuch. In the Holsteinian upland districts traditional Saxon law applied, which restricted inheritance customs by favoring one successor. Similar restrictions were introduced in Schleswig in 1777.

Most coastal districts as well as the cities had their own statutes, privileges, and institutions (including egalitarian laws of succession) that set them apart from the Jutish and Holsteinian hinterland. This applied to the Frisian districts of Wiedingharde, Bökingharde, Sylt, Osterland-Föhr, Nordstrand, Pellworm and Eiderstedt as well as Stapelholm, Norder- and Süderdithmarschen and the riverbank districts of Wilster and Kremper Marsch. Additionally, many newly reclaimed 17th- and 18th-century polder-districts were conferred with special privileges. The privileged cities were Husum, Tönning, Garding, Friedrichstadt, Wilster, Krempe, Glückstadt, Itzehoe and Altona, whereas Lunden and Meldorf lost their privileges in 1559. The upland districts Karrharde, Norder- and Südergoesharde (i.e. (Süd-)Tondern, Bredstedt and Husum) that were colonized by Frisians at the end of the Middle Ages remained under Jutish law.

The political history of Schleswig-Holstein is complicated by several divisions of the royal and ducal estates. In 1544, a separate duchy of Gottorf came into existence that centered around the towns of Tönning, Schleswig, and Tønder. The districts south of the Eider river (including most Frisian territories) were returned to Denmark in 1721, the districts south of the Eider river (including Norderdithmarschen) not before 1773. Dithmarschen has been an independent

republic and a member of the Hanseatic confederation until 1559, when it was conquered and divided between Denmark, Gottorf and the duchy of Haderslev (1544-81). The unique clan system was abolished then. The seigniorship of Pinneberg (with the city of Altona) was part of the Westphalian county of Schaumburg until 1640. Several parts of the seigniorship were passed on to the territorial county of Ranzau until 1726.

2.7.1.3 Lower Saxony, Hamburg and Bremen

The state of Lower Saxony, installed in 1946, has been created from the former kingdom of Hanover, the grand duchy of Oldenburg and two minor states, which, in turn, have been constituted from different territories. Hanover was incorporated by Prussia as an additional province in 1866. The state of Hamburg (Freie und Hansestadt Hamburg) conveyed the city of Cuxhaven (Amt Ritzbüttel) to Prussia in 1937, but it kept the authority over the island of Neuwerk. The city of Bremerhaven, founded 1827, is part of the state of Bremen (Freie und Hansestadt Bremen). The Prussian naval harbor of Wilhelmshaven has been established on Oldenburg territory in 1852.

In Lower Saxony national boundaries tended to be fuzzy. Though the political frontier between Germany and the Netherlands dates from the 16th century, the western border region and the city of Bremen (imperial since 1618) were part and parcel of Dutch civilization until the 19th century. The eastern parts, on the other hand, were dominated by aristocratic government, hanseatic culture, Low Saxon language and Lutheran religion.

The fenland districts behind the Elbe and Weser riverbanks, including the Elbe River marshes in Holstein, have been reclaimed by 12th- and 13th-century immigrants from Holland. Their distinctive cultural heritage has, however, dissolved at an early age. It only survived in matters of common law and administration. Most riverbank districts (Altes Land, Kehdingen, Hadeln, Osterstade) and several villages and towns (Buxtehude, Ostemarsch, Osten, Neuenkirchen) had special privileges and semi-autonomous institutions until the 19th century. Hadeln and Wursten had their own diets. Popular culture was mainly inspired by the Hanseatic cities. Only the district of Stedingen (including Moorriem en Wüstenland) had its autonomy restricted, due to authoritarian Oldenburg rule.

Circumstances were different in the Frisian coastal area, reaching from the mouth of the Weser river into the Netherlands. Here popular culture and civil law contrasted sharply with the feudalized and largely catholic Westphalian hinterland. Dutch influence was profound. As in most other coastal districts, distinctive privileges, customs and institutions survived until the 18th and 19th centuries. Frisian common law (including egalitarian laws of succession) was replaced by the French Code Civil as late as 1811.

The Frisian districts east of the Weser river comprise Wursten and the upland villages of Lehe, Stotel and the district of Vieland (now Bremerhaven), which had more or less the same privileges as the river-bank districts mentioned above. In Oldenburg most Frisian districts have been part of the medieval district of Rüstringen. Among these Butjadingen and Stadland as well as the island of Landwürden kept special statutes and privileges, in contrary to Jader Marsch and the upland district of the Friesische Wehde (Varel). In Jever (covering the medieval districts Östringen and Wangerland) and Harlingerland local autonomy was more or less restricted. The rest of Ostfriesland, however, had a powerful diet, dominated by the semi-autonomous city of Emden. Here we find the geographical districts of Norderland, Brookmerland, Krummhörn, Moormerland, Overledingen, Rheiderland as well as the upland districts around Aurich (including Uplengen).

The political history of Lower Saxony not very impressive. State formation began rather late and was dominated by foreign powers. Before the 19th century the area had only a few privileged cities: Buxtehude, Stade, Otterndorf, Oldenburg, Jever, Aurich, Norden and Emden. The archdiocese of Bremen covered most of the area east of the Weser river. It was governed by Danish princes since 1585, occupied by Sweden in 1645, subsequently transformed into a royal duchy and conveyed to Hanover in 1720. The republic of Land Wursten has been conquered by the archbishop in 1525. The semi-independent Land Hadeln (with its capital Otterndorf) was added to Hanover in 1731, after the ducal family of Sachsen-Lauenburg had become extinct. In fact, the electorate of Hanover may be considered a British colony, as the king resided abroad until 1837, whereas he left actual government to the regional aristocracy.

The county of Oldenburg became part of Denmark in 1667 and was reinstated as a grand duchy in 1774. The seigniory of Jever (acquired

1575) was split off in 1667 and allotted to the Prince of Sachsen-Anhalt. Subsequently it was inherited by the Russian czarina in 1793 and returned to Oldenburg in 1818. The estates of Varel and Kniphausen remained to the last Count of Oldenburg's natural son, the Count of Aldenburg. They passed over to the Dutch patrician family Bentinck and were returned to Oldenburg as late as 1854. The county of Ostfriesland evolved in the 15th century from several smaller territories. It was extended with the seigniory of Esens (Harlingerland) in 1581, promoted to a principality in 1654 and transferred to Prussia in 1744. Administration was complicated by the survival of a handful of semi-independent baronies. The Vienna congress of 1815 granted Ostfriesland to Hanover.

Following the Napoleonic wars, Ostfriesland and Jever became part of the kingdom of Holland in 1807. Subsequently, all coastal territories west of the Elbe River, as well as the city of Hamburg, were briefly incorporated into the French empire in 1810. Nevertheless, Dutch annexation plans after World War II made no sense, as the region was effectively germanized since the 1840s.

2.7.1.4 The Netherlands

The Netherlands came into being in the 16th century, when various provinces were melted together into the Hapsburg-Burgundian state. Its dissociation from the German Empire took place gradually, beginning in 1548, speeding up during the revolt against Spain from 1568 onwards and being completed by the Westphalian peace treaty in 1648. Seven out of the initial seventeen provinces signed the actual declaration of independence in 1579 (Unie van Utrecht), among which Groningen, Fryslân and Holland. In fact, the Dutch Republic was a loose federation of towns and districts under the direction of the province of Holland. Until 1795 actual power was shared with the prince-stadholder and his political allies. After the French military invasion the Batavian Republic became a unified state in 1798 and was converted into the Kingdom of Holland in 1806. The Netherlands was part of the French Empire between 1810 and 1814. From 1940 to 1945 they were occupied by Germany.

Originally, the town of Groningen was an imperial city with intensive links with its Westphalian hinterland. The city and its surrounding Frisian districts (Ommelanden) were incorporated

by the Count of Ostfriesland in 1506, subsequently conquered by the Duke of Gelre and integrated into the Hapsburg Empire in 1536. After backsliding into Spanish rule, Groningen was conquered by Republican troops in 1594. The city had the jurisdiction over the Oldambt district, Veenkoloniën and the seigniorship of Westerwolde until 1798. The city of Groningen and the autonomous districts of Fivelgo, Hunsingo and Westerkwartier constituted the province Stad en Lande. The provincial diet, which was dominated by the local gentry, was presided by the prince-stadholder of Groningen and Fryslân until 1795. The province was temporarily extended into the Département de l'Ems Occidental (1810-14) and subsequently reinstated under the name of Groningen.

The province of Fryslân formally became part of the Hapsburg-Burgundian empire in 1498, but until 1515 actual rule was bestowed upon the Dukes of Sachsen-Meißén. After a period of civil war the province was effectively incorporated into the Hapsburg state in 1524. The rural districts of Oostergo, Westergo and Zevenwouden joined the Dutch Republic, together with eleven privileged cities. Until 1795 actual political power was in the hands of the local gentry under the direction of the prince-stadholder, who resided in Leeuwarden. In 1747 the Frisian stadholder was elected to stadholder of the other provinces as well. The district Westergo had been cast out of the medieval districts of Vijfdelen, Wonseradeel and Wagenbrugge. The island of Ameland was a free imperial barony until 1795. Terschelling was an independent seigniorship until 16th century, when it became a Burgundian loan. The island was incorporated into the province of Holland in 1615. Terschelling and Vlieland belonged to the province of Holland until 1942, when they were returned to Fryslân by the German authorities.

The county of Holland was one of the core areas of Burgundian power, extended by the newly conquered district of West-Friesland in 1289. Only the cities of Alkmaar, Medemblik, Enkhuizen and Hoorn played a minor role in the provincial government, which was dominated by a few large cities such as Amsterdam and Leiden. Several rural districts, such as Texel, Wieringen, Schagen, Barsinghorn, Hoogwoud and Grootebroek had urban privileges as well. The province of Holland was split up and subsequently reunited in the years 1798 to 1814 under the names of department of Texel, Amstelland and Zuiderzee.

It has been divided into Zuid- and Noord-Holland since 1840.

Groningen, Fryslân and Noord-Holland were dominated by Frisian common law, which was replaced by the French Code Civil in 1811. Groningen had official statutes. In Fryslân and Holland common law was heavily influenced by the principles of Roman law.

2.7.2 Language and religion

Coastal culture has been molded by Jutish, Low Saxon, Frisian and Dutch influences. Until the 17th century, Low Saxon served as the lingua franca of the whole Hanseatic realm from Kampen and Deventer to Bergen, Kaliningrad and Tallinn. The dialects of Jutland and Nordfriesland were only used as a vernacular: either Standard Danish or Low Saxon served as the written language. During the 16th and 17th centuries, however, Low Saxon and the other Frisian dialects were reduced to vernacular as well. Low Saxon (Niederdeutsch, Nedersaksisch, Oost-Nederlands) is still widely spoken in Schleswig-Holstein, Lower Saxony and Groningen. Its official role, however, has been taken over by Standard Danish, High German and Dutch. The first two became the languages of Lutheranism, the latter the language of Calvinism and dissent. The reception of urban culture from centers as Copenhagen, Hamburg and Amsterdam has largely been determined by the official language chosen.

The remaining dialects have been strongly influenced by the official languages, causing a decline of mutual understandability across the borders. Yet, most dialects are in retreat, due to mass-media domination, increasing mobility and the massive influx of German refugees from Eastern Europe after 1945. The distinctive island and border dialects are bound to become extinct.

In Schleswig the Southern Jutish dialect was pushed aside since the Late Middle Ages by the more esteemed Low Saxon and High German. A plebiscite established the present borderline in 1920. Since then, the ethnic minorities on both sides of the border have been protected by special statutes. While the Danish minority south of the border ('Sydslesvig') could assert itself, partly because of the highly esteemed school system, the German (Low Saxon) speaking minority in Sønderjyllands Amt ('Nordschleswig') gradually dissolved. The largely German speaking border towns of Tønder and Højer (as well as the ethnic Frisians of the Tønder Marsk) became entirely

Danish (Jutish) speaking. Political activists in both countries even pleaded for shifting the border further southward after World War II. The Southern Jutish dialect (Sønderjysk) is widely used as a vernacular, but south of the border it tends to be replaced by Standard Danish (Rigsdansk, formerly known as Kjöfenhawnsk).

The Frisian-speaking minority in Schleswig-Holstein is shrinking. About 5 to 10,000 people are speaking nine different dialects, some of them mutually incomprehensible. The Frisian dialects on the peninsula of Eiderstedt and the islands of Nordstrand and Pellworm have been replaced by Low Saxon in the 17th and 18th centuries, which is still widely spoken. In all the Low Saxon and Frisian speaking areas (except for List) as well as in several Jutish parishes the official church, school and state language has been High German since the 17th century. Due to intensive maritime contacts, there was also a strong impact of Dutch culture in Nordfriesland.

In Lower Saxony the Frisian language has been superseded by Low Saxon between the 15th and 17th centuries, except for the island of Wangerooge, where it died out around 1900. In the neighboring province of Groningen, it disappeared even earlier. As a last resort, the Westphalian enclave of Saterland (Landkreis Cloppenburg) harbors a rapidly shrinking Frisian speaking community, descending from high medieval fenland colonists from Ostfriesland.

Language and religion were often linked up. Lutheran state churches have dominated Denmark and most of Northern-Germany since the Reformation. They dictated the transition from Low to High German in the 17th century. The influence of pietism and 19th-century revivalism was more obvious in the north. In Holstein and Lower Saxony, on the other hand, orthodox theology and Enlightenment ideas from Hamburg had a stronger impact.

Only the Hanseatic city of Bremen and its rural domains slipped over to Calvinism. Several villages around the city and in the Bremerhaven area are reformed up to this day. As a consequence, the members of the urban elite were accessible for Dutch culture. Parts of the elite wrote Dutch until the 19th century. Religious dissent has been restricted to Dutch colonies in Sande-Neustadtgödens (1544), Altona (1601), Glückstadt (1617) and Friedrichstadt (1621) as well as the island of Nordstrand (1654). Education in the Dutch language was customary here until the middle of the 19th century. The largest group of dissenters were the Mennonites, sup-

plemented by Arminians (Friedrichstadt), Calvinists, Catholics and members of the Old Roman Catholic Church residing under the Chapter of Utrecht (Nordstrand).

The Dutch impact was very profound in the border districts around the city of Emden (Krummhörn, Moormerland, Rheiderland), where Calvinism became the dominant religion. The area harbored some Mennonites and members of other sects as well. Here the official language became Dutch, which was taught in schools from the 17th century until the 1850s. Additionally, the neighboring Lutheran districts were influenced by Dutch culture as well. During the 18th century, growing numbers of Jews and Catholics were allowed to settle down in Ostfriesland, Jever and Oldenburg. Subsequently, 19th-century revivalism resulted in the foundation of minor Baptists and dissident reformed churches (Altreformierten).

In the province of Groningen, the official language was Low Saxon until the 1640s, when Dutch was introduced. The province of Fryslân switched over to High German under the Duke of Saxony in 1498. The Middle Dutch spoken in the county of Holland became the official language in 1515. Though Frisian survived as a written language, it had only a marginal existence until the 19th century. Due to a 19th- and 20th-century revival movement the Frisian language regained its position. It is now spoken by about 400.000 people, taught in schools, used in the media and accredited by the Dutch government as the second official language within the province. The official name of the province has been changed in 1997 from Friesland into Fryslân, and so were many village names.

The population of the larger cities in Fryslân speaks a mixed Dutch-Frisian dialect known as Stadsfries since the 16th century. Additionally, several islands (Ameland, Midland on Terschelling) and newly reclaimed polder districts (Het Bildt, Kollumerland) have switched over to mixed dialects as well.

In Noord-Holland Frisian gave way to Middle Dutch dialects as early as the 13th century, followed by the islands of Texel, Wieringen and Vlieland. In West-Friesland and on Texel the local dialects or regiolects are still very much alive.

Religious diversity is more pronounced in the western districts than in the eastern parts of the Wadden Sea. Substantial catholic and Mennonite enclaves can be found in Groningen and Fryslân, dating from the 16th and 17th centuries. In

2.8 Institutions

West-Friesland whole villages have remained catholic. A true multi-confessional culture developed in the cities and villages around the Zuider Zee and on the islands. Though the official church remained reformed (Nederlands Hervormde Kerk), other groups such as Catholics, Jews, Lutherans, Arminians (remonstranten) and members of different Mennonite sects (doopsgezinden) often incorporated more than half of the population. The provinces of Fryslân and Groningen, on the other hand, harbored many religious conservatives who reverted to 18th-century pietism and 19th-century revivalism, finally organizing themselves into local congregations of the so-called Gereformeerde Kerken, the more dogmatic Gereformeerde Kerken (vrijgemaakt) or in different splinter groups such as the Baptists. The number of Mennonites, Arminians and Lutherans has been rapidly shrinking during the 20th century, whereas most of the Jews have been liquidated during World War II. In the Netherlands secularization has spread rapidly during the 20th century, partly due to the emergence of the socialist labor movement since the 1890s, partly following the disintegration of the liberal wing of the reformed church.

2.8 Institutions and collections

Research on culture, language and history of the Wadden Sea Region is concentrated at specialized institutions, namely the Center for Maritime and Regional History in Esbjerg, the Institute for Grænseregionsforskning in Åbenrå, the Nordfriisk Instituut in Bredstedt, the Ostfriesische Landschaft in Aurich and the Fryske Akademy in Leeuwarden, as well as at the Syddansk Universitet and the universities of Kiel, Oldenburg, Groningen and Amsterdam. Specialized archaeological research is also conducted by the Niedersächsisches Institut für historische Küstenforschung in Wilhelmshaven (founded 1938) and the Forschungs- und Technologiezentrum Westküste in Büsum (1988). The Wilhelmshaven institute is responsible for the publication of a yearly bibliographical survey on the Lower Saxony coastal area (Nachrichten des Marschenrates 1964 ff.). General interest in the coastal heritage is promoted by the Landschaftsverband Stade and the Oldenburgische Landschaft, as well as by a range of regional historical associations with picturesque names. Among them, the Fries Genootschap in Leeuwarden (1819) and the Verein für Hamburgische Geschichte (1839) are the oldest ones.

Regional museums in Husum, Meldorf, Hamburg-Altona, Stade, Bremerhaven, Oldenburg, Jever, Emden, Groningen, Leeuwarden and Hoorn take a professional interest in the coastal cultural heritage. The state open-air museums in Lynby, Kiel, Cloppenburg, Arnhem and Enkhuizen reconstructed several farms and other buildings, including tools and furniture. Material culture is also documented by the Museum für Kunst- und Kulturgeschichte in Schleswig.

Specialized archaeological museums can be found in Ribe (Ribes Vikinger, Den antikvariske Samling), Skærbæk (Hjemsteds Oldtidspark), Heide, Bad Bederkesa, Oldenburg, Ezinge (Wierdenland) and Den Oever (Huis van de Aarde). The regional museums Groningen and Leeuwarden accommodate extensive archaeological collections as well. Professional shipping and fishery museums are located in Esbjerg, Husum, Bremerhaven, Groningen, Sneek, Enkhuizen and Lelystad, with minor collections at Büsum, Wischhafen, Bremen-Vegesack (Schloß Schönebeck), Brake, Rhaderfehn, Moddergat, West-Terschelling, Den Hoorn and Den Helder. The agricultural museum in Meldorf focuses primarily on 20th-century modernization, whereas smaller agricultural collections are exhibited in Jever, Krummhörn-Campen, Leens and Exmorra. Historical farms can be seen at Niebüll, Wyk-auf-Föhr, Husum, Witzwort, Meldorf, Bremerhaven-Speckenbüttel, Bunde, Warten, Stroe on Wieringen, De Waal on Texel, Hoogwoud, Schagen and Beemster. The city of Alkmaar has its own cheese-making museum, Hindeloopen a small museum showing the production of skates. Dyke-building techniques are documented in Husum, Dorum and Petten, recent developments in Lelystad (Nieuw Land Poldermuseum). Working industrial windmills can be found at the open-air museums of Enkhuizen, Arnhem and Zaandam, an oilmill in Roderwolde (near Groningen). Aristocratic culture is documented at manors in Breitenburg, Hagen, Dornum, Krummhörn-Pewsum, Slochteren, Uithuizen, Leens, Veenklooster and Ysbrechtum.

Among the natural museums those in Ribe (Vadehavcentert), Tønning (Multimar), Balje (Natureum Elbemündung), Wilhelmshaven (Wattenmeerhaus) and Texel (Ecomare) are the most important ones. Several artists working in the Wadden Sea Region are commemorated with specialized museum, namely the painters Emil Nolde, Otto Modersohn and Franz Radziwill as well as the writers Theodor Storm, Gustav Frenssen, Klaus Groth, Friedrich Hebbel and Gys-

2.9 References

bert Japicx. The painters working in Worpswede and Fischerhude did a lot of work on the moors and bogs around Bremen. The regional museum in Groningen has a large collection on the painters collective 'De Ploeg'.

Subsequently, there is a host of local museums, covering virtually every island and most of the larger towns. Among these the most interesting are the museums of Rømø (Kommandørgarden), Højer (Mølle- og Marskmuseum), Wykauf-Föhr (Dr. Carl-Häberlin-Friesenmuseum), Sandstedt-Rechtenfleth (Hermann-Allmers-Heim), Fedderwardersiel (Nordseehaus), Wilhelmshaven (Küstenmuseum), Carolinensiel (Sielhafenmuseum), Warffum (Openluchtmuseum Het Hogeland), Harlingen (Hannemahuis), Allingawier (Aldfaers Erfroude) and West-Terschelling ('t Behouden Huys).

The most important historical associations are: Historisk Samfund for Ribe Amt, Historisk Samfund for Sønderjylland, Nordfriesische Verein für Heimatkunde und Heimatliebe, Heimatbund Landschaft Eiderstedt, Verein für Dithmarscher Landeskunde, Heimatverbund für den Kreis Steinburg, Verein für Hamburgische Geschichte, Stader Geschichts- und Heimatverein, Heimatbund der Männer vom Morgenstern, Landesstube des Alten Landes Wursten, Rüstringer Heimatbund, Historische Gesellschaft Bremen, Wittheit zu Bremen, Die Maus (Bremen), Jeverländische Althertums- und Heimatverein, Gesellschaft für bildende Kunst und vaterländische Altertümer zu Emden, Upstalsboom-Gesellschaft (Aurich), Vereniging Stad en Lande (Groningen), Fries Genootschap voor Geschied-, Oudheid- en Taalkunde, Historisch Genootschap 'Oud West-Friesland' and Kring 'Vrienden van de Hondsbosche' (Petten).

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3. Perceptions of the Landscapes

3. Historical and Current Perceptions of the Landscapes in the Wadden Sea Region

by Ludwig Fischer and Jürgen Hasse

3.1 Introduction

Any serious attempt to address the 'landscape heritage' of a region, whether large or small, assumes that a certain value is attributed to what is present there - to the ensemble of the perceivable elements of the 'surroundings'; elements that can, in fact, no longer be clearly distinguished according to whether they are natural or anthropogenic. This attribution of value occurs when, for example, certain elements of a landscape - of a space for living and learning - are considered 'worth protecting' or 'worth preserving'. Such assumptions and judgments are always proposed by individuals or social groups, and, depending on the circumstances, they may be realized politically through a sometimes controversial process of shaping of public opinion. And these assumptions and judgments are always in relation to historically contingent areas of conflict, determined by general economic, social, political and cultural developments. That is to say: On the one hand the perception of a landscape as a living-and-learning space is experienced by individuals primarily as a personal 'relationship' to that landscape; the landscape is decisively anchored in the life experience of the individual, and social groups and factions are brought together by identical or similar life experience, so that often its members achieve what appears to be a natural consensus on the nature, value and meaning of a landscape. On the other hand, the varying interests that arise from the 'life situations' of different social groups often lead to sharp differences over the 'correct' way to perceive a landscape and over the conclusions that are to be drawn from that perception. To some degree, however, it is through that historical process that such controversies contribute to the formation of more general, or rather dominating, conceptions and evaluations of landscape formations. They change on the basis of the often radical challenges that technological developments and their effects, for example, or social change represent for the collective consciousness.

This can be seen in the process, now several decades old, of the ecological valorization of the

Wadden Sea Area. It was substantially triggered by more or less 'catastrophic' damage to the so-called 'natural balance' in the shallow water areas of the southern North Sea; the public was shocked into perceiving the effects of our technologically advanced civilization as negative or even threatening. The effect of such shocks, such crises, is generated or influenced these days essentially through the reporting of events in the mass media. Over the last twenty or thirty years this has been true for the most effective of the 'warning signals from the Wadden Sea'- harmful materials and poisons in the sediments; algal blooms; seal deaths; accidents involving ships carrying chemicals or oil; the pollution of beaches with, for example, oil leaking from oil rigs or ships.

Thus, the population has developed a general awareness - differentiated according to social group and level - of the dangers threatening the natural processes in the Wadden Sea. This affected and still affects the interest that, for example, the users of this coastal landscape who are part of the tourist industry (hosts and guests alike) have in 'intact nature', whether imagined or real. Of course they form only one of the groups concerned with the condition of this border zone between land and sea, and it is important to note that even the image of 'intact nature' in the Wadden Sea Region is understood and valued very differently by the various social groups.

A crisis mentality about the Wadden Sea that was primarily ecologically driven led to convoluted and contentious political processes which resulted in protective measures for the shallow water areas of the southern North Sea between Esbjerg and Den Helder. The most effective but also the most controversial measure taken by Germany was the establishment of national parks on the Wadden Sea coast. Since then, an extensive campaign of educational and training activities aimed not only at tourists has succeeded in fostering in the wider population an awareness of the Wadden Sea as a 'nature space' worthy of protection. Over the course of only a few decades a substantial shift has taken place in public awareness of the Wadden Sea Region; it is now regarded as a sensitive 'near-natural landscape', potentially threatened by the effects of our lifestyle (determined, as it is, by technology and industry), and very much worth protecting. This shift in perception has had the attention and the endorsement of both politicians and media.

It is more or less the consensus that at least large parts of this, the only such extensive landscape in Central Europe apart from the Alps, have been shaped and used by humans for hundreds of years. Even ecologists can agree with the view that large sections of the Wadden Sea Region constitute a cultural landscape - and have done so since before the dykes. However, the idea that its peculiar character and quality as a cultural landscape could also be in certain ways endangered through modern-day processes pertaining to social 'progress' has entered into general public awareness only in recent years. Three developments are primarily to blame for generating the crisis situations in the Wadden Sea cultural landscape: the increased pace of so-called modernisation in agriculture; holiday and day-trip tourism, which has increased by leaps and bounds; and the placement of wind turbines in the coastal zone. All three factors appear to be responsible for massive encroachments on the landscape as it was inherited, from the transformation of the topography and the destruction of old landscape structures, through the profound changes in the cultural heritage of the settlement formations and constructed monuments, to the extensive alteration of the visual reference points and the dominant aesthetic elements of the landscape.

Once again we note a shift in the perception of the Wadden Sea Region. At this time there are still only isolated social groups that view the Wadden Sea coast (though from very different points of view and with strongly differing interests) as a charming, interesting and important cultural landscape, a sensitive 'cultural system' that is increasingly under threat. Most tourists, planners and even the committed naturalists have not yet developed a 'crisis mentality where cultural landscape is concerned'. But the controversies over the erection of wind turbines signal - even for managers and administrators who are primarily concerned with opportunities for economic development - a sensitisation toward what has been referred to as 'the landscape's limited capacity for withstanding aesthetic assault'.

Thus, over the last few decades we have experienced distinct changes in the perception of the Wadden Sea coast. It is not at all the case that these changes - and it is decisive to recognize this - relate only to the perceived landscape image. However much the visually perceptible may determine our idea of landscape, nonetheless in concrete experiences, in the situative

experience of 'environmental spaces' other factors enter in as well: the kind of 'feeling' for the qualities of the coast that someone experiences, diving into the surf off a North Sea island; the 'sensuous pleasure' taken in cycling or hiking through the marshes, the 'understanding' of the quality of the historical buildings experienced by someone wandering through a village, or what the sudden flight of a great gaggle of Brent geese might mean as 'sense event' - all of these experiences, while having a different tone and emphasis for different sensibilities, together determine the perception of the landscape space.

For these reasons it is important, in the context of a discussion of the characteristics and value of the 'landscape heritage', to agree on the bases for the perceptions of the landscape and cultural spaces. The first part of the essay that follows therefore offers a general and strongly theoretical treatment of the fundamental issues concerning the perception of the Wadden Sea coast as landscape. These issues cover everything from basic conceptual assumptions on landscape perception in general and the Wadden Sea coast in particular, to the different perspectives adopted by various social groups that either live in the Wadden Sea Area or make use of the space.

Current perceptions are always formed out of cultural tradition. The way a landscape is perceived is also always the result of the way the course of history expresses itself in culture and mentality. Just as we can recognize clear shifts in perceptions of the Wadden Sea coast in our time, so we can also establish or discern that the same sorts of changes occurred in earlier times. It is clear that, at least in modern times, several radical transformations in the dominant understanding of the Wadden Sea landscape have taken place. It is incumbent on us to regard our own understanding of the characteristics, meaning and value of the Wadden Sea landscape as the outcome of historical processes, by fostering awareness of these processes to the extent possible. The second half of the essay points to this dynamic, in a short outline of the history of the perception of the Wadden Sea Region.

The two sections of the essay together venture into new scholarly territory, and the essay therefore cannot be and should not be understood as more than a sketch which lays out a program for further study and which attempts to make a contribution to the discussion of the problems that attend a valuation of the landscape and cultural heritage of the Wadden Sea Region.

3.2 General perspectives

3.2 General perspectives on the perception of the coastal landscape

The expert opinion about the Wadden Sea Region presented here aims to heighten our awareness of the interconnections that are integral to perception. What is significant here are the situations in which objects and environments manifest themselves both aesthetically and semiotically. These contexts are historical (in the sense both of a history of the times and of a biography). Accordingly, individuals always have both a history of their own as well as a shared history. Cultural landscapes in fact only emerge as the result of the effects of these relationships. Cultural landscape is a lived product of relationships; a fluid transitional stage of nature in its regional manifestations and of a special order of cultural artifacts.

3.2.1 Details on perceptual space as coastal landscape

The definition of the coastal landscape in terms of its topology is problematic. The length of each topographical distance – to the extent that it is to be measured as an actual distance and is not merely intended to be measured as a fictitious straight line – depends on the scale; the larger the scale, the longer the distance measured. On a small-scale map, detailed topographical features tend to be straightened out somewhat, whereas the same feature on a larger-scale map shows up as a greater measured

distance between two points because even small curves in the contour of the coast can be taken into account.

'Coasts' are cultural constructs. They have always referred to some indeterminate space 'between' the land and the sea. In the case of the Wadden Sea Region this definitional problem is aggravated by the fact that, due to regular flooding, the eulittoral zone sometimes appears to be land and sometimes sea. However, this applies not only to the Wadden Sea area in its more narrow definition: due to fluctuations in the mean level of tides (amplified further by storm surges as well as by neap tides and spring tides) it also applies to the sublittoral zone (in the case of extremely low tides) and to the supralittoral zone (in the case of extremely high tides). At least in non-catastrophic cases, the epilittoral can be excluded.¹ Furthermore, in some sense the estuarine areas along the coast extend far inland because coastal phenomena still affect those areas. This peculiarity applies as far upriver as the effects of the tides can be observed (as far as dike-building extends inland). In the Dutch regions this covers extremely large areas which have been reduced on the ocean side only in the last 100 years by means of enormous hydraulic engineering works.

It may have been for these and other reasons that Friedrich Ratzel (1882) defined coastlines as seams. According to Ratzel, coastlines consist of sea and land:

„The greater the sea's share in the land, the stronger the effect this 'sea into the coast' has on the coastal inhabitants „², since „what one might call the 'mental-spiritual sea climate' of a sea that often reaches far inland, can sometimes be more difficult to grasp than the last traces of the physical sea climate.“³

For Ratzel 'human collaboration'⁴ is a social mirror of the general danger of living near and with the North Sea. Despite the use of modern technology this danger persists; this is particularly evident in the ongoing erosion resulting from the surf pounding the western coastlines of the North Sea islands. The 'topographical fragility' of the entire coastline culminates in the consciousness of the inhabitants of the islands. The fact of living under the constant threat of the loss of

Fig. 3.1:
Halligland with unprotected salt marshes and eroded cliffs.
Photo: T. Möller, appr. 1905 – archive of the curator of the Land Schleswig-Holstein



home and property is an open wound in the coastal inhabitants' sense of place.

For the purpose of defining the limits of the perceptual space we are calling 'coastal landscape', the following conclusion has been drawn: The coastal landscape of the Wadden Sea is considered – as is customary in the literature – to extend from Den Helder in the Netherlands to Esbjerg in Denmark. No exact measure can be given for the stretch between the sea and the mainland (extending north-south in the Netherlands, and in Denmark east-west). According to Ratzel, this is where we find the life-world space of the cultural landscape of the Wadden Sea coast, which may extend up to 20 km inland, but which cannot be clearly delineated.

This coastal belt, which remains rather more vague than precisely measurable, is heterogeneous in its micrological structure, due to formal differences in the legislative frameworks [of the respective countries]. Differences come into play as a result of living conditions that have evolved (among other things, these include differences in the patterns of cultural interpretation between the three affected countries). As the scale is enlarged, the differences in the smaller regional scale mentioned earlier become more evident. At the level of the regions, some sections of the coastline have formed into so-called 'landscapes' or 'counties'⁵ in a cultural-historical process (see especially Part B). We will not be able to deal with this type of differentiation in much detail; instead, we will only be able to follow a rather rough trail of evident differences in perception. Even with regard to the latter, in keeping with the purpose of this expert opinion, as stated earlier, only basic aspects can be dealt with.

3.2.2 General determinations concerning the perception of landscape and living space

What is generally referred to as 'nature' landscape is 'gathered' from the 'materials of nature' (the solid-material and the fleeting-phenomenological) and composed into a landscape. In the act of manifesting itself, nature becomes intrusive. This moment of subjective perception is significant when viewing the extensive tidal flats, which are protected under nature conservation measures as a 'natural' landscape⁶ and which therefore also influence thought concerning landscape categories.⁷

The process of perceiving a landscape cannot be segmented. Perception invariably produces

the character of a landscape in its totality.⁸ Individual aspects blend into a whole and given emotional value. Landscape thus becomes a mental and physical impression. Living conditions in their totality act on our sensibilities and our attentiveness to our surroundings. In the impression of a landscape the material conditions (mudflats, groynes, salicornia, etc.) and the fleeting modes through which these 'things' are perceived (wind, air temperature and humidity, light, etc.) fuse into a simultaneous-perceptive 'image'.

The evaluative act of perceiving takes place through the 'window' of the emotions, which themselves are in an indissoluble relationship with cognitive acts. In the act of experiencing landscape and nature, this results in a certain degree of speechlessness of expression. The linguistic capacity of Western intellectual cultures does not provide an adequate and generally accessible conceptual system with which to formulate comprehensible statements about subjective impressions, that is, about sensations. In the debate concerning (cultural) landscapes worthy of protection, including the structures and elements of such landscapes, it is therefore imperative that this tendency of the language to lag behind what is expressed be taken into consideration.

Association, memory and construction are fused in the (evaluative) perception of landscapes. This problem is accentuated in the modern media, which is socially highly differentiated, yet, in today's Western societies, more or less ubiquitous.⁹ Because memory is always bound up in the history of an individual's biography, memory is diffused and meanders into multiple areas of a society's knowledge store, for biography is always socialized. Since the work of remembering also provides the raw materials of and for societal construction, an 'exact' prognosis, aimed at determining certain perceptual patterns or preferences, remains an impossible undertaking. The project of determining structures and elements worth protecting in the cultural landscape along the Wadden Sea coast thus remains fraught with problems relating to the lack of clear definitions.

The experience of space and of landscapes is the expression of certain life practices. They are also always based on a certain relationship to nature (through work). For this reason human labor assumes special importance in the formation of preconditions for the perception of nature and landscape.¹⁰ Every experience is con-

textual, and is influenced from two directions: from that of the subject, and from that of the appearance of an environment. Baier writes:

„When one has finally entered the space, one does not 'see' it so much as withstand it. [...] A space does not depend primarily on its materials, but on the degree of being-in or the degree of vitality pertaining to the situation as a whole.“¹¹

Landscape in this sense is a space that comes into being only as a result of the presence of participating observers.¹² Which is to say, it is not present 'before' the subject. In investigating perception the issue of practical life in its local aspects is of paramount importance. This life practice is also the background of what is capable of being remembered. These variables come together in the concept of the 'situation'. Impressions impinge on us from live situations, which in themselves are vague entities. All perceptual acts are interwoven with the perceiving person in a highly delicate fashion that is also differentiated in terms of feelings. That is to say, perceptual acts are interwoven with a situation that is virtually overflowing with subjective significance. According to Hermann Schmitz, a situation exhibits three characteristic features:

- a. significance (of the facts of the matter, programs and problems),
- b. the internal diffuseness or chaotic manifoldness of significance and
- c. the coherence of a situation in its totality as a result of this significance.¹³

In the investigation of the perception of coastal landscapes the significance of situations becomes pivotal. Situations reside in the facts pertaining to the subject as well as in the facts pertaining to the object. On the side of the subject these contingent facts are based on the actual circumstances within which an individual perceives and experiences the Wadden Sea (e.g. whether during leisure time or in the pursuit of a trade, whether from a distance of 5 or 100 km). On the side of the object, the observer is confronted with the material circumstances of the perceptual act (e.g. through a particular rule governing access, which may apply to a nature reserve or a national park, and which thus facilitates or prevents a perceptual perspective).

A situation is characterized by manifoldness. In the situation of actual experience it is the subjective facts of the matter (those which, because they have affected only one person can be given expression only by that individual) which are of importance in the creation of significance. And yet, these facts can never be ful-

ly translated into the realm of communication-minded language. However, in public situations, those instances of signification which conform to the conventions of 'normal' speech enter into the language as concepts, and in this way 'format' a common language. In differentiating between impression and expression, it must be considered that it is especially the residues of what is unspeakable and what is unspoken (concerning biography and region) which remain virulent in the process of spatial socialization. Thus the unspeakable and the unspoken also affect individual pathways of perception.

The thematization of the perception of landscape in terms of situations provides one indisputable benefit for the assessment of issues relating to the protection of structures and elements of the cultural landscape of the Wadden Sea coast: the concept of situation allows the manifold and overlapping significative contexts which evolve in regional life practices to become the focus of attention. Next we shall consider general issues of perspective.

All human activity is shaped by perceptual perspectives. In the course of daily activity these perspectives are not only substantiated, they are also continually modified, expanded and refined. The types of perspective that are significant here do not derive solely from the fact-bound point of view from which something is observed. Nor do they derive solely from the personal situation, which lends a particular vitality to the overall situation we call the 'subject' – 'landscape environment'. The question of perspective is not limited to the perceiving subject. Perspectives are also based on modes of appearance, that is to say, on the way in which something presents itself, the conditions under which something is apprehended by the senses (conf. also Point 4). An impression can never be reduced to a small number of perspectives, let alone to a single perspective. In most cases impressions are so complex that the most diverse perspectives overlap in them. The following four examples outline perspectives that are of importance in the perception of the coastal landscape.

The perspective of the senses

Human beings have five senses: eyes for seeing, ears for hearing, a tongue for tasting, a nose for smelling, and the skin which provides a sense of touch. All the senses are integral to perception, and they play their part in the creation of 'chaotic-manifold' impressions. However, because of the intellectual culture that has shaped Western

society, these perceptual paths are not given equal acknowledgement.

The division of perception into sense-organ-specific currents and into families of sense data is overcome in phenomenology. A concept of perception whose objects are situations as chaotic-manifold entities is favored instead. The perspective of perception is therefore not restricted to the limited capacity of one sense or of individual senses. Instead, what is seen, heard, and so forth, is apprehended – in its quality as impression – as being integral to the act of perception, as a moment in a situation of vital experiencing in which the subject, with all his or her existential conditions, is present in the world.

The ideological perspective in the perception of nature and landscape

Every act of perception requires a thinker. Perception always undergoes a process of ideological filtering. By that we do not mean ideology in the more narrow sense of world views. The perception of landscape in particular is culturally impregnated. Georg Simmel regards landscape as a 'mental construct', one that is lifted from nature in the act of perception. „[...] through the human gaze, which divides, and then arranges that which has been divided into separate categories, nature is transformed into the respective individualized entity: 'landscape.'"¹⁴ Seen from this vantage point, landscape as a cultural product is a modern phenomenon. It has given rise to the capacity to perceive a thing in such a way „that the part of a whole becomes an independent whole."¹⁵

Original vs. technologically mediated encounters

Every experience of landscape is also the result of a perspective in the sense that it is an immediate bodily coexistence in a situationally vital nature. This also applies if the object being perceived is not part of the realm of nature in the more narrow sense, for example, an artifact in a cultural landscape (a windmill, or a section of a sea dyke). Therefore, in considering the conditions under which something is perceived what is relevant also is the issue of the degree of mediation between the subject and the object of study (the role of the mass media!).

A distinction is to be made between original sensory encounters and 'technical' encounters which are transmitted through the media. Today we are increasingly faced with representations

of reality that are transmitted through the mass media, and which are themselves experienced as reality. Nevertheless, technologically mediated experience is different from the vital experiencing of real events. Encounters in the real world often result in entirely new experiences because they do not necessarily correspond to the images and mental constructs related through the media. Only in the original encounter, in the encounter which takes place through the senses and through one's own skin, is the body's capacity for perception the only medium to the world. The surrounding space which is experienced then shows itself to be 'corporeal circumreality'.¹⁶

In this circumreality one is spatially oriented according to elementary orientational dimensions. In this way we tap into impressions that can be described as being the other of mediated information. The body's orientational space is structured in various ways. In every case it unfolds from within the confines of the body, as from the absolute experiential locus, and spreads out into the world. This is not one of the customary three-dimensional measures of a mathematical spatial concept. Rather it is the expression of pre-dimensional, surface-less (!) space. It is fundamental to every experience, yet is not taken into account by modern theories of space. Perception via print- or video-based media is broken up into separate stimuli and objects, whereas perception 'on location' benefits from this quality of aesthetic interwovenness that is present in actually existing full-sensory living space. This formal difference asserts its presence primarily in the realm of meanings which influence both actions and attitudes, as well as intuitive dispositions.

The perspective of distance

In the act of encountering, perspectives of distance are always at work. In this event the distinction between nearness (e.g. of beach and salt spray) and farness (of an apparently calm sea) is categorical. The impressions are structurally different, and therefore they each convey their own mental image (in the mind) of the sea. This relationship of difference applies to all objects and areas of experience, and it is therefore also significant in relation to the cultural artifacts of the coastal region.

Distance determines not only how precisely we perceive something, at a mundane level, it also determines how we are involved in an environment atmospherically and how it affects us, emotionally. In discourse concerning nature con-

ervation, the issue of distances is of fundamental anthropological significance when, in nature preserves and national parks, distances are enforced by means of restrictive regulations, and emotional sensitivities are thereby also affected. For the protection of structures and elements in cultural landscapes, too, the meaning of the relationship between nearness and farness is significant for the establishment of emotional relationships with what is encountered. For here, too, the atmosphere in which something manifests itself, in which it can develop an aura, and hence exert a specific effect on the approaching subject, is important.

The gaze into the distance sets up a bodily orientation that differs from measurable distances. What is measurable corresponds to the breadth of the space. When we say 'breadth' we generally mean the three-dimensional depth in space which is characterized by reversible orientations. Dimensional depth sets the absolute locus of bodily existence in relation to the spatial environment.¹⁷ Dimensional depth, however, can only be experienced as pre-dimensional width. And in bodily communication pre-dimensional width is found in non-reversible orientations. Nearness and farness are not precise distances in the dimensional sense of the spatial; rather, they provide indications as to farness and nearness in the sense of bodily communication. This is not a question of knowledge regarding an exact distance, but of an orientatedness in 'corporeal circumreality'.

3.2.3 Socio-cultural differences in the modes of perception – diversity of perspectives

The perceptual perspectives described above need to be supplemented at the purely pragmatic level of factual references. The following outlining of regionally significant socio-cultural differences must therefore be read as a concretization, which establishes no additional categories reaching beyond the remarks made under Point 2. They tend rather to unfold at right angles to those categories. References are established to particular regionally relevant groups. These groups are then also linked to specific realms of objects within the inventory of the cultural landscape, thus bringing into relief any connections to the issue of protection for cultural monuments.

The following groups can be identified, all of which play a decisive role in shaping the com-

munication of perceptual patterns in the Wadden Sea coastal region:

1. Farmers
2. Fishermen
3. Individuals working in the secondary or tertiary sectors (whose place of residence and place of work are identical or in the immediate vicinity, or at least within the same region)
4. Commuters working in the secondary or tertiary sector
5. Tourists

Re 1, Farmers

The group comprising farmers and individuals employed in agriculture can be roughly divided into those for whom farming is the main source of income and those for whom it represents a subsidiary income. Furthermore, in this coastal region, which was shaped by tidal flooding in medieval times and by land reclamation between the 16th and the 20th centuries, an economic differential is evident between large-scale farm operations ('polder barons') and farmers cultivating smaller areas.

Generally speaking, all agricultural activity is characterized by its relationship to the land (large-scale animal husbandry can be discounted here, especially since it is virtually non-existent in the area right along the coast). From an agricultural perspective the sea does not play a central role in the coastal region. That is true for the cultural artifacts related to the sea, as well. That is not to say, however, that the influence of the sea is of no relevance for the perceptual and evaluative categories in agriculture. To the contrary, there are a number of influences, especially natural ones which, in the cultural refraction affect daily activities even today, and which therefore make themselves felt in agriculturally influenced perceptual dispositions of the coastal region.

Among them is agriculture's unavoidable dependence on nature, which also finds expression in aspects of every-day life: (a) in the tides, (b) the storms, and (c) in the (always threatened) area immediately behind the sea dikes. While the tidal cycle has only an indirect influence on a cow's calving, it makes itself felt very strongly in the form of an awareness of nature as an integral part of daily life. Storms, however, and in particular hurricanes, represent a real danger with which (or despite which) the locals have to live. The attendant dangers do imperil house and home after all. The relationship to the natural environment of the sea is reflected in a work-

oriented mental and emotional attitude. This is particularly true for farmers whose farm houses are located directly behind a sea dike (the same applies to some degree to the land and farm buildings located behind the sea dikes in the tidal areas of the lower reaches of the great rivers).

Due to the spatial relations between the arable land lying below the mean sea level (former low-lying marshland, large expanses below mean sea level in the Netherlands) and the higher polders closer to the sea, the natural drainage regime has been changed. Without suitable land management technologies to achieve proper drainage, land use would not be feasible at all. Where conflicts arise with nature conservation interests, this historically deeply rooted pro-cultivation attitude toward nature comes to the fore, and applies an agriculturally defined pattern of interpretation and signification – important in cultural-landscape terms – to the relationship between humans and nature on the coast.¹⁸

Government-sponsored energy production from wind power represents a modern means of exploiting the coast's natural potential.¹⁹ Although the number of farmers deriving economic benefits is relatively small, this form of use is of some significance. The large-scale technological artifacts are visible from great distances, which means they collide with the perceptual preferences of others. In justifying and arguing for the use of wind power the beneficiaries draw their arguments from the discourse surrounding climate protection, thus communicating an exclusively ecological pattern of perception.

Generally speaking, the coast-related perceptual patterns in the realm of agriculture are 'functionalized' as a result of the complex (socio-economic) situation prevailing in agriculture incl. the areas of animal husbandry and plant cultivation. The economically restrictive standards imposed by the EU sharpen conflicting positions on the human relationship to nature, which in turn promotes the formation of sometimes contradictory perceptual preferences.

Level of structures and elements in the cultural landscape:

To this day cultural landscape structures and elements remain, which not only provide an understanding of the history of agriculture, but which also shed light on the divisions in the agriculture-oriented modes of perception,

shaped as they are by the imperatives of labor and production with and within the natural environment. This applies to the remains of old lines of inland dikes, dating back to the 17th and 18th centuries, old sluice works, sluice harbors dating from the 18th century and drainage mills, mainly from the 19th century. This 'cultural landscape inventory' is under heavy pressure due to modernization. The remains of dikes make it difficult to cultivate fields efficiently with modern agricultural equipment. Sluice harbor locations (to the extent that they actually remain more or less within the historical settlement structure and retain their functionality as sluices) run counter to the objectives of modern communal policies aimed at fostering the development of existing settlements. The upkeep of old drainage mills is a major burden due to the high cost of restoration and maintenance.

Appropriate protective measures would appear advisable not only for the reasons mentioned thus far, but also because these artifacts (listed here by way of example) represent a layer in the genesis of a cultural landscape that is important for the understanding of an integrated regional developmental history. An understanding of such a history cannot rely on the mere presence of 'the things'. A successful policy of cultural heritage preservation requires practical measures accompanied by educational programs. This task must not be underestimated, because all the historical artifacts in a cultural landscape are exposed to commercial pressures that reduce objects to visual clichés and hence to mere sensations. The protection of structures and elements of the cultural landscape presents the need for a forward-looking cultural policy that engages an applied critique of images and their use.²⁰

Re 2, Fishermen

Even though the entire primary sector no longer plays an important role in terms of the economy and the labor market, it still presents itself in an important context when it comes to discussing the issue of the perception of the cultural landscape of the Wadden Sea coastline. It is true that the coastal fishing sector represents a niche economy of minimal importance which can in no way compete with the (comparatively) large scale of the agricultural sector. However, coastal fishing, by using the few remaining technological relics which have been preserved in spite of the pressure of modernization, does have a part to play in the creation and the passing on of

coast-related patterns of perception. This applies even to such nostalgically charming relics as pot fishing, which is still done using mudflat sleds, for subsidiary income. This (historical) Wadden Sea fishing practice in particular, of which mere vestiges survive as more of a social rather than an economic entity, is a typical example of the role played by fishing in the creation of the perceptions of the coast even today. This is the cliché mentioned above, of a certain form of fishing (in fact long gone) which transfigures a practice that rarely makes an appearance in the modern Wadden Sea coast picture any more, by linking it to history like a linguistic cliché. Much the same can be said for scoop-net fishing in the lower reaches of rivers, which is still practiced with traditional methods and using small boats, wherever the straightening and deepening of river channels has not wiped out the estuaries completely.

Prawn fishing differs somewhat in that, as a result of modernization measures, it uses mostly state-of-the-art technologies. For this reason it no longer fits seamlessly into the transfigured image of the Wadden Sea coast. In popular perception this disjuncture has been papered over for the time being, while the modern fishing fleet remains in a visibly functional relationship with the old port facilities (especially the sluice harbors). This means that the boats must remain in view, and continue to be moored in the old ports. The disjuncture is also tolerable because the general appearance and the (visible) technical equipment of modern fishing vessels is reminiscent of the traditional work processes on crabbing boats and can thus be integrated with the image of the 'cutter'.²¹

Level of structures and elements in the cultural landscape:

Apart from the sluice harbors mentioned earlier, a few other artifacts are in a functional relationship with fishing. Their preservation both safeguards and facilitates the possibility for reconstructing a coast-related economy and way of working with nature, which might otherwise fall victim to primarily touristic, 'event-based' (culture-industry) kitsch. The danger of idealization and nostalgia-mongering is greater in the case of coastal fishing than it is for some of the major forms of agricultural practice that have also fallen into disuse. On the western and eastern Frisian Islands the development of these vestiges of the original fisheries for the tourist industry is in full swing, in the form of image marketing.

The sluice harbor settlements, which have (led by Greetsiel) been prettified for mass tourism, derive a major part of their income from these distorted images. What was said above in relation to agriculture, regarding the need for a cultural policy that critiques images and their use, applies to the fishing sector with even greater urgency.

Preserving fishing-related artifacts and historic structural elements can ensure that work routines involving nature remain comprehensible to public perception. It would have the effect of countering the current unquestioning acceptance of abstract (industrial) practices in the processing of fish and prawns. Not the least effect of the resulting perception of contradictions is that it would provoke a critical questioning of current environmental issues (production of foodstuffs). Given this context of cultural use, what would seem to be most worth preserving, apart from sluice harbor facilities, are lighthouses and, within settlements originally defined by fishing, any drying kilns (provided they still exist).

Re 3, Individuals working in the secondary or tertiary sectors

Due to modern professional and work circumstances, those who work neither in agricultural nor in the fishing industry no longer have any practical connection with the structures of the cultural landscape, or with the artifacts visible within that landscape. For this reason they probably contribute in their own way to the transfiguration of perceivable. But in contrast to people from outside the region or to tourists, these individuals have a life history (and not infrequently a family history as well) which is linked to the development of the region, and which needs to be understood as integral to that process. This creates its own perceptual dynamic of meaning generation, which needs to be taken into account in the preservation and especially in the presentation of cultural monuments worthy of conservation.

Level of structures and elements in the cultural landscape:

Aside from the structures and elements mentioned earlier, entire forms of settlement, or preserved parts of settlements in specific locations are now up for consideration - areas whose permanence as historical settlements should be protected against modern development (at least examples of such, for each region). Especially



Fig. 3.2:
Eroded cliff and Wadden
area near Westerhever
Photo: L. Fischer

worthy of mention here are terps settlements or agricultural operations located within settlements.

Re 4, Commuters working in the secondary or tertiary sector

The comments under Point 3 are also pertinent to out-commuters, but they deserve greater emphasis in this context, since out-commuters are somewhat more removed from the developments in their 'own' regions. For out-commuters the regional living space possesses a different experiential quality than for 'pure' inhabitants. Earlier remarks regarding the 'being-in' within lived space are now revisited in the concrete life experience of the out-commuter, and they are expressed as a difference in quality compared with the life practice of farmers and fisher people, as well as with that of individuals pursuing modern professions while living and working in the region. This difference generates patterns of perception and signification which are divergent (in terms of life practice), through which and by means of which structures and objects in the cultural landscape are 'understood' and explained. This is why these social differences in perception deserve to be taken into consideration when the topic is the preservation of objects.

Re 5, Tourists

As a social group tourists' specific perspective plays a major role (in spite of the heterogeneity of the group). Characteristic of their particular mode of perception is the focus on leisure and recreation. What was stated earlier with regard

to the distance-difference relations in connection with the perceptual modes of inhabitants now presents itself in a structurally different light. This is because for tourists the region is neither living space nor working space. It is not perceived and experienced selectively according to recreational needs. From this perspective the region is seen or 're'-cognized through the templates of culturally circulating clichés.

Much of the tourist perspective mirrors media-generated productions, aimed at the tourist economy. This perceptual attitude is decisive when it comes to assessing tourists' perceptual attitude relative to the preservation of artifacts in a cultural landscape. The objective differentiation is considerable, corresponding to existing social differences. The cultural tourism of middle-class intellectuals generates its own set of perceptual preferences. On the other hand there is mass tourism, which is concentrated in the so-called sight-seeing centers. And then there is event-based tourism which operates on a massive scale, and which mainly consists of consumer events that largely bypass the inventory of the cultural landscape (an example here would be the coach tours organized as part of specialist events, like the so-called 'East Frisia Graduation').

The vacation on the West, East and North Frisian Islands²² (despite all the differences in the international comparison) is characterized by a diversity of expectations, demands and perceptual dispositions, which apart from the socio-economic and cultural differences between travellers is further differentiated in terms of the geographical origins of these holidaymakers. The

few existing studies merely graze this area, if they address it at all.

What is not only 'seen' but perceived, and how it is perceived through all the available senses is a matter of perceptual attitude: The consumption- and event-oriented approach to cultural landscape, which uses it as a local resource, differs categorically from the contemplative approach which allows the same environment to act on the perceiver in such a way that he or she is open to the atmospheric manifestation of architectural elements.

Decisions about the preservation of cultural landscape inventories as well as work on educational programs should be seen as integral elements of a complex process. The touristic perception of the coastal region is as multi-faceted as are the different ways tourism is practiced. These uses undergo constant change and ongoing differentiation. Tourism, as a powerful economic market, tends to take a neutral view on restoration, and then, only if it can be integrated into economic concepts. Conceptually, successful preservation programs can achieve more than the politically neutral interests of the tourism industry. On their basis the structures/inventories of a cultural landscape become subject to a cultural appropriation that is open to profound differences within the framework of a perceptual culture that is self- and object-related.

3.2.4 Significance of 'elemental nature' and 'cultural nature' for the appearance and perception of the landscape in the coastal region

The landscape in the coastal region is bound to nature in two ways. As a cultural landscape it is nature appropriated. When it appears with all its cultural artifacts, changing according to the situation, nature is experienced in a way that is specific to the space. A distinction can thus be made between an 'elemental' and a 'cultural' nature.

On the coast land and water touch each other. Due to their differing capacities for storing heat energy, large expanses of land and water create a special set of climatic circumstances. Minor differences, especially in day-time and night-time temperatures, result not only in more or less continuous winds but also in greater humidity in the coastal region. This in turn leads to a specific type of cloud formation which is characterized by rapid changes and which clearly distinguishes itself from cloud formation in, for example, peri-Alpine regions. The air is 'fresh' and carries the scent of the Wadden Sea. And finally, because the landscape is wide open (especially in contrast to urban landscapes, but also in contrast to peri-Alpine landscapes) the sun can be seen as it travels across the sky, casting shadows on the land. Depending on the sea-



Fig. 3.3:
Painting of Hallig Oland,
Schleswig-Holstein

3.3 History of the perceptions

son low-lying areas in the flat grasslands are often covered by broad sheets of fog.

Landscape always appears in atmospheres. Their constitutive power is not just the weather, however. Often it is the 'semi-permanent objects' that are responsible for the changing nature of the phenomenon. These are noises, scents, temperatures, wind, light and shadows, and so on. It is these very phenomenal events, these intangible aspects of the character of things, belonging to the cultural landscape as they do, which, in spite of their fleeting nature, help to constitute the peculiarity of a landscape's atmosphere. Schmitz calls these features, which cannot lay claim to object qualities, 'half-objects'.

„They differ from objects in two ways: in that they vanish and then reappear without there being any point in asking where they were in the meantime, and in that their effects can be felt and are affecting, although they are not the cause behind the influence they exert as much as they are the effect in themselves.“²³

In a way they act like the ground in the figure-ground relationship image. Thus they connect with the changing seasons and provide an almost limitless variety of 'phenomenal landscapes'.

For the question of the protection of certain existing spaces in the landscape, the result of all this is that those spaces where the cultural landscape manifests itself in a particular way deserve special protection. This approach lends significance not only to the artifacts in the cultural landscape which are worthy of preservation, but also to the openness of the landscape space as an 'surfaceless space'²⁴ – for the experience of the quality of vastness, a significance that for this very reason is given little weight in official nature conservation policy.

3.2.5 The Wadden Sea coast as 'living space' and as 'experiential space': internal and external perspective

The diversity of phenomenal events along the Wadden Sea coast encounters different sets of filters for internal and the external perception respectively. Where the cultural landscape, with its characteristic phenomenal multiplicity, has formed a spatial reference point for identification (in the sense of homeland), the experience of the landscape takes on a peculiar moderation, in terms of the emotional experience, which is specifically homeland-related. The perceptual

conditions are categorically different for 'outsiders to the region' (tourists are especially relevant here) than they are for the 'natives'. This is of course due to the difference in the relationship between the experience of the landscape and the socialization (into the landscape) for each of these groups. This difference is bound to lead to divergent evaluations and levels of appreciation. It can nevertheless be assumed that the characteristic of a landscape's appearance receives the attention of 'natives' and 'strangers' alike. This applies at least to more salient phenomenal events of the cultural landscape.

3.3 Outline of a history of the perception of the Wadden Sea Region

3.3.1 Early phase (until ca. 1600)

The Wadden Sea landscape, as it presents itself to us today in its most interesting elements, is a relatively young landscape from the point of view of the history and the morphology of the earth. This more or less flat transition zone between the open sea and the 'naturally' rising mainland, seems featureless at first glance, but is in fact quite varied. Its aspect, which is still undergoing slight changes even today, was only formed over the last two thousand years. And in the last thousand years humans have decisively intervened in the natural processes of landscape transformation through the practical use of the marshes, primarily by mining peat, building dikes, reinforcing riverbanks, foreshore development, etc. Human activity has been at least as influential as natural factors in forming the Wadden Sea area we know today, witness the consequences of increasingly intense storm surges and the permanent shifting of sands, silt banks and channel systems.

When we look into the past to reconstruct the history of the perception of the Wadden Sea Region, only the very latest history of this extremely altered coastal zone is available to us; for sources from which one might deduce or even infer manners of perceiving the Wadden Sea Region are (with few exceptions) no earlier than the 16th century.

It is therefore almost impossible to ascertain the way the Wadden Sea coast, lying between the open sea and the higher mainland, was perceived in the first centuries of permanent human settlement which interfered with the natural conditions of the area. Even the few isolated

clues that have been handed down, however, necessitate several distinctions right from the start, which define varying 'views' of the Wadden Sea Region.

The perception of a landscape is necessarily always determined by the relationship to the observed or experienced feature which is determined by the viewer's situation and life practice. Thus it must be stated that, from the very earliest useful records, there exists a fundamental difference between the view 'from the outside' and the view 'from the inside'. More concretely: over many centuries, for the few travelers who thought that the southern coast of the North Sea was worth visiting and describing, the essence of this landscape was very different from what it was for those who settled and used it and relied on it for their existence. A third important group of observers are those who, over several centuries, although they themselves lived outside the space in question, nonetheless had a direct material or strategic interest in it (the rulers and other foreign landowners and, later, various 'speculators').

The 'Natural History' of Pliny the Elder (23-79 AD) offers an almost unique early record of the perception of the Wadden Sea Region. It was written when the marshy areas of West and East Friesland (and perhaps by then even those of the western coast of Schleswig-Holstein) had been settled, but not with any sort of permanency or with any protection, however small, in the form of dike-like structures to secure the land from the sea.

Gaius Plinius the Second had seen the edge of the West and East Friesian coastline with his own eyes, and described what he considered to be the most significant elements of the place. The famous citation is: „There twice in each period of a day and a night the ocean with its vast tide sweeps in a flood over a measureless expanse, covering up Nature's age-long controversy and the region disputed as belonging whether to the land or to the sea. There a miserable race occupies elevated patches of ground or platforms built up by hand above the level of the highest tide experienced, living in huts erected on the sites so chosen, and resembling sailors in ships when the water covers the surrounding land, but shipwrecked people when the tide has retired“.²⁵

Two things would seem to be important for the history of the perception of the region. In the first place, the 'eternal battle of nature' which Pliny sees in the turn of the tide is an image for

a characteristic disturbance in the dominant mental concept of 'coast'. When 'one does not know whether this region belongs to the mainland or to the sea' the standard image of coast has blurred: the concept of a reliable line of demarcation between what is firm and what is liquid is partially deprived of meaning. Therefore, in the second place, in the mental processing of what is observed, one must look for a substitute construction, as it were (the concept of coast drifts into a concept of seafaring: the inhabitants are compared to 'seafarers' or 'shipwrecked people' because the accepted mental construct of coast does not include people not living on terra firma). In the image for the world of the Wadden Sea Region the concept of coast retreats, in a manner of speaking, toward the higher mainland with its clear line of demarcation, and the 'coast image' is replaced by the representational model 'ship on the sea', including that of a stranded ship, thrown up on the coast.

The shift in the mental concept of coast contained in Pliny's remarks on the Wadden Sea Region is not usually noted, any more than is the second shift contained in the text. For what Pliny attempts to grasp, in the image of the 'seafarer' or the 'shipwrecked person', is in fact not the fore mentioned daily blurring of the coastline which occurs at the turn of the tides, but rather his perception of spring tides and storm surges, which sometimes inundate the otherwise 'dry' land. The fact that he confuses the normal turn of the tides with the occasional excessively high floods which inundate the unprotected marsh and moorlands of the edge of the coast is indication enough; based on his concept of coast he is not actually able to distinguish between the regularly flooded portions of the Wadden area and the flat areas of the coastal lands which are only occasionally 'occupied' by the sea.

Pliny's metaphors model a pattern for the perception of the Wadden Sea Region which informed even more recent scholarly concepts like, for example, that of the geographer Hartmut Valentin in the 1950s, who proclaimed the „new coastal morphology“, a pattern on which popular characterizations of landscape draw, even today. For Valentin (often cited as representative of a characteristic concept of the coast) „the coast [is generally] the three-dimensional battleground between mainland, sea and the sky“...²⁶ As with Pliny, the central metaphor in determining the 'frontier', which is taken to



Fig. 3.4:
Eiderstedt marsh landscape
with single farms
Photo: L. Fischer

be the task of coastal morphology, is the 'battle' between the various 'forces' of nature involved.

But a coastal region which has been especially affected by what may have been very drastic 'shifts in the frontier zone of mainland, sea and sky' (shifts which are experienced over a very short period of time, in some cases within a lifetime) is a landscape which must be seen as validating the battle metaphor. This is all the more valid when the 'shifts' are strongly influenced by the intervention of humans in the 'battle of natural forces'. This is why – as will be shown – it was so easy to ideologically style the existence of those who dwelt on the coast of the Wadden Sea, especially the Frisians, as a never-ending 'battle with the sea'.²⁷ Until this day the Wadden Sea has therefore remained the coastal zone in which society manifested its 'victory over nature' by having to 'wrench' dike-ready land from the sea time and again.

For the cultural history of a perception of the Wadden Sea Region we should consider two more aspects of Pliny's text: For one thing, Pliny gives the impression of a traveler who, as a member of the urban, educated elite of his time, feels alienated by the Wadden Sea coast, and who makes a point of distancing himself, almost with contempt, from the lifestyle of the inhabitants of this region as it presented itself in his time. Structurally, in observers of a comparable social standing, this perceptual model persisted for many centuries: to most of the elite who were setting the tone at any given time – arriving as they did from the cultural centers of their

respective countries, and taking in this landscape in the course of their travels – the Wadden Sea coast appeared to be a 'strange', dangerous transition zone between sea and land; and they saw the lifestyle of the inhabitants of the unprotected marshlands as 'primitive', and in fact quite wretched. Traces of this attitude and way of perceiving the area can be seen in 'folkloristic' 19th-century travelogues concerning the last remains of such unprotected coastal regions – the ones in the North Frisian Halligen islands.²⁸

Furthermore, of the Wadden Sea coastal area, Pliny describes only the marshes which were not protected by dikes at the time. This is probably because this area was interesting to him precisely because of its peculiar, alien character, while the islands, with their Geest cores, the sand bars and Geest ridges presumably corresponded rather more closely to standard notions of coast.

Now, the concentration of the perception of the Wadden Sea Region on the marshland areas is a further structural characteristic which makes itself felt, over the course of history, in viewers from quite different social and cultural spheres. Based on a few indicators in early sources one may conclude that, from the high Middle Ages onward, increasingly effective dike building around an ever greater area of marshland effected a decisive shift in 'attention': the areas which were gradually relatively well-secured, even against medium storm tides, could be used for what was soon a more intensified

agriculture with much greater success than could the open salt marshes or those areas which were at first shielded only by low summer dikes for fair-weather seasons.²⁹ As long as the dikes did not offer lasting protection against the direct influx of the sea, the perception of the area reflected an uncertainty as to whether the marshland 'belonged to the mainland or to the sea'. That is to say, the 'mental provocation' of a dominating image of the coast fixed the impression – at least among travelers and visitors from other places. With the progressive transformation of more marshland areas to 'secured' land which could be intensively used these coastal zones appeared remarkable from a different point of view: because of the extraordinary fertility of the lands now under cultivation.

The Danish chronicler Saxo Grammaticus, in his 'Gesta Danorum' in the early 13th century, supplies evidence as it were from the period of transition: already anticipating the successful building of dikes he points to the risk for the low-lying estates, noting that, if dikes were to break during a heavy storm tide, vast areas would be flooded. Therefore „nature made it almost impossible to decide“ whether one should reckon that the area belonged to the sea or to the land, „because it is sometimes navigable, and at other times it is suitable for ploughing“.³⁰ The formulations from Pliny's 'Natural History' are unmistakably at work, here, but the perceived characteristics of this coastal zone have changed, because the relatively effective securing of the land by means of dikes has already permitted the successful cultivation of grain.

The record shows that over the next two to three hundred years perceptions of the essential character of the marshlands – which drew almost all the attention in the Wadden Sea Region – shifted somewhat. The marshlands were now 'history-laden' (the events which took place there, whether wars, storm floods, dike-building activities, church or state matters could become part of written history and, more specifically, 'economically viable'.³¹ The returns which were obtained from these marshlands were soon so extraordinary, even compared with the fertile regions of the higher mainland, that they became the predominant characteristic of the region.

3.3.2 The Wadden Sea coast as 'area to be exploited and occupied' (ca.1600 – 1800)

The marshes as epitome of successful mastery over nature

Through the building of successful dikes and the development of drainage techniques as well as a more intensive agricultural exploitation, the Dutch coastal areas led this development. Dutch experts, immigrants, and later investors then enabled a similar process to take place in the German Wadden Sea Regions, especially the west coast of Schleswig-Holstein.³²

As early as the 17th century Europeans saw the exemplary cultivation of Holland's marshes as the epitome of the effective use of secured, fertile land. One of the predominant patterns of perception took its lesson from this success, and dominated the 'image' of the Wadden Sea Region for more than two hundred years.

The admiration which travelers expressed over the 'victory' of the Dutch over the sea – against whose violence the land was protected by dikes – was equal to their astonishment over the efficiency of the agricultural use of the area. Well into the 19th century, descriptions of the Dutch coastal lands typically represented the meticulous cultivation of the marshes as providing a model for human ingenuity and farmers' industry.³³

During his student years in Holland (1723–1725) the Swiss doctor, botanist and writer Albrecht von Haller, on a canal trip between Amsterdam and Leiden, noted the following, which can stand in for a broadly established view:

„The land itself is extremely pleasant. On both sides of its straight channels there are either broad fields occupied by well-fed cattle, or beautiful villages one next to the other, magnificent gardens, pleasing outworks. In this land no tree is out of line and no patch of earth, however small, goes unused. The cities are big, most of them fairly well fortified, laced with waterways, built in long, straight, clean streets. The inhabitants are many, busy, and wealthy. There is no more comely place to travel.“³⁴

The landscape was perceived to be a visible, readable sign of a profitable 'conquest' of nature: as limits were impressively set to the sea, so from the earth the greatest return was won, which expresses itself in the 'order' of the landscape image. In this way, too, the concept 'beautiful' applies unmistakably to a marshland whose

form gave evidence of its having been managed for human use.

The fact that this characterization of the coastal marshes was generally accepted as early as the beginning of the 17th century is shown in a citation (once again to be taken as an example) from Peter Saxen's description of the countryside around Eiderstedt: „A land which is level, low, in some places sandy, but everywhere fertile, well-populated, with good soil, pasture, grain and stock, a beautiful country...“³⁵ In the section 'On productivity' Sax, citing older supporting witnesses, emphasized that there were „everywhere beautiful meadows, scented with the sweet smell of flowers“, and „no rocks, no wasteland, no monstrous mountains' spoil the usefulness of the flatlands.“³⁶ Sax completed his image by indicating that there were „many orchards containing vines and many fruit trees on which there were apples, pears, cherries and plums.“³⁷ The 'beauty' of the landscape was determined solely by its potential for use by humanity. This perspective was common until well into the 19th century, when the marshes were perceived to be akin to 'Paradise'.³⁸

This view of the marshes as the most remarkable part of the Wadden Sea Region, lent authority by descriptions and travel literature, was developed and popularized by members of a cultural elite who perceived this landscape mostly as 'foreigners'. It is possible to conclude from the writings of an author like Peter Sax, who was an expert on the local geography and culture, that in this case a perception 'from inside' was complemented by the external characterization. The marshes were his home, and though he based his writings on 'foreign authorities'³⁹, even worked in exemplary fashion on a catalogue of the deficiencies of coastal marshes⁴⁰, he evidently managed to combine the perspectives of the foreign observer with those of the local residents. His description of the land details the enormous pains which were required to reclaim and cultivate the coastal marshes, and the high productivity of the land appears as a 'reward' for those efforts. In order to justify the high expense of dike-building, draining, and farming operations – sometimes ruinous in terms of finances and organization (every tiny patch of soil had to be intensively used). This central stance with respect to living space was the classic attitude of the marshland farmers, at least until the end of traditional cultivation



Fig. 3.5:
„...nach der Schnur“ Wöl-
bächer and Gruppen (drai-
nage channels) in the
Eiderstedter Marsh
Photo: L. Fischer

methods. It was an attitude which was contained in the traditional formulation: 'Every tree costs a few square meters of useful land'. The result of such a conception of 'worked landscape' was that the wealth of the marshland farmers was expressed not least in the luxury of being able to plant large stands of trees and gardens, even entire parks around their farms.⁴¹

The dominant image of the coastal marsh landscape, determined as it was by the use of the land, was in a sense translated into practice through large, speculative dike-building and settlement-founding operations, especially during the 17th and 18th centuries. Members of the feudal nobility, courtiers, provincial governments, patricians and businessmen, but also regional interest groups, invested in dike-building projects, and sometimes they recruited 'colonists' using the very admiring descriptions of the marshland areas which had been formulated in descriptions and travelogues.⁴²

Because of the land reclamation through dike-building projects – some of them planned, some pushed through by individual interest – people's attention, or at least that of the interested parties, directed itself strategically toward the Wadden area and salt marshes, as well as toward the tidal channels which possibly might need damming, lying directly before the existing dikes. In the history of the Wadden Sea Region such a perception of the foreshore and the tideway had already long been established, since the time when dike-building no longer served only for the protection of older, open marshlands which needed to be protected, but also for 'pushing back' the influx of the sea. Beginning in Holland

in the 16th century, however, dike building increasingly became an 'offensive' strategy to expand the area covered by productive marshland, and this was driven primarily by economic calculation.

The dike-building activities resulted in the integration of reclaimed areas, to the extent that they were permanent, in the secured agricultural marshland regions. That is to say, the strategic attentiveness directed toward parts of the Wadden region was in a certain way only a temporary and limited one. It was essentially limited to the circle of those who were directly and indirectly interested (the administrators and political and juridical supervisory authorities). Even though, in the 18th century, publications about dike-building operations presented the relevant points of view to a limited public⁴³, this particular 'perspective' on the Wadden Sea Region did not enter into the dominant pattern of perception.

However, generalizing broadly, one can say that between the 16th and the end of the 18th century, the Wadden Sea Region was seen primarily as a space for occupation and effective exploitation of natural resources. The secured marshes were seen as the epitome of the brilliant success of that 'task'. In this way the Wadden Sea coast became the most outstanding and marvelous evidence of the modern distinction between a 'beautiful nature' which could only be a shaped, cultivated, conquered one, and a revolting, ugly and worthless one which comprised all the remains of uncultivated nature: 'wasteland, desert, wilderness'.⁴⁴

The coastal space as 'metaphysical battleground'

When the coast marshes were celebrated as the most convincing model for human 'victory over nature', thought was also given to the risk associated with these measures – dike building, draining, settling, exploitation of the land. 'Victory' was considered to be in permanent jeopardy. Some travelers expressed their astonishment that the inhabitants could sleep soundly, and they found it unsettling that the cultivated and settled earth might lie below sea level in some places.⁴⁵ Admiration and latent fear were not infrequently combined, and in this blend we can see a foreshadowing of the aesthetics of the sublime⁴⁶, which, toward the end of the 18th century, prepared the way for a reinterpretation of the coastal landscape.

The locals were always conscious of the threat to the successful nature-conquering operations which they had carried out in the coastal marshes. The geographical descriptions of the landscape and historical works by resident or well-informed authors always underlined both: the incomparable 'magnificence' of the marshes, defined as they were by their use, and the threat to their security. It is for this reason that all relevant works contain records, and sometimes detailed descriptions of the severe storm surges, above all of the catastrophic 'centennial tides' which resulted in enormous destruction and property loss.⁴⁷

Pliny's old metaphor about the 'battle of nature' in the Wadden Sea Region, describing the literal back and forth of the 'battle' between land and sea, had long since been applied to the relationship between humans and the sea: the Wadden Sea Region, and in particular the border of the secured marshland, represented the arena for a continuous fight, in which the inhabitants, aiming to secure their existence, 'wrestled' with the unpredictable forces of nature. Over the course of the 18th century this fight came to be represented in more and more bellicose images. Dike building and land-securing were often described as strategic operations against an 'enemy'.⁴⁸

This rationalist interpretation of the relationship to nature on the Wadden Sea coast superseded another long-dominant one, which was based on a theological understanding of the world. The latter interpretation saw the cultivation of the coastland – and therefore also the aggressive protection measures taken against the sea – as [the fulfillment of] a divine task, at least indirectly, following the biblical maxim that man shall 'have dominion' over the Earth. The success of the measures for conquering nature depended therefore on the degree to which the work and the lifestyle 'was pleasing to God'. Accordingly, storm surges were regarded for centuries as 'God's punishment' for the inhabitants' failings.⁴⁹

In Germany this understanding of the confrontation between humans and the sea on the Wadden Sea coast was valid well into the 18th century. In Reformation Holland it was possible to give this kind of orthodox interpretation a rationalist tinge within a theological framework much earlier.⁵⁰ We will leave open the question of whether this early reinterpretation in the spirit of the enlightenment was connected, for a seafaring nation like Holland, to the role played

by its very much older metaphoric reference: the 'battle' of seafarers with the sea.^{51 52}

The fact that the Wadden Sea coast was increasingly seen as a battleground, as a war between human activity and the forces of nature, gradually dissolved the theological interpretative framework. But the 'battle' remained as it were a metaphysical one: the concrete measures taken against the sea represented a test of humankind itself relative to one of the most elemental forces of nature. In terms of the history of attitudes this was a way of laying the groundwork for the development that followed in the 19th century, when the coastal inhabitants – embodied in the 'generalized Frisians' – were styled as the heroes of the struggle against nature.

In the long dominant perception of the Wadden Sea Region – centered on the grand human work of marshland cultivation – an essential component shifted during the age of Enlightenment: by virtue of the fact that the awareness of the dangerous influence of the sea was represented by a secularized battle metaphor, the image of the coastal zone was for the first time completely saturated with the dialectic of the modern image of nature. In the image of the continuously repeated event which characterized the Wadden Sea coast, the program of 'beautiful nature' as one of a nature that was conquered and made compliant, comes to its full expression. For the 'magnificence' of the observable, livable landscape is defined as the result – always needing renewed proof – of a 'war against nature'.

3.3.3 Reinterpretation and divergences (ca. 1700 – 1900)

The intellectual re-evaluation of the coastal region

Even as early as the end of the 17th century, however, the sometimes enthusiastic praise of the Wadden Sea coast marshes was disputed. It was not the premise of the laudatory description which was disputed the impressive success of the securing [of the area], and the extraordinary, engineering and economic success of its use. Instead, a completely different manner of perceiving resulted in an highly divergent, and in fact contrary assessment of it. It was a view which was formulated by traveling members of Europe's cultural elites, who were primarily looking for whatever aesthetic thrill might be had from their experience of the regions they visited. In England and France it was mostly the members of the nobility – materially fairly secure, but politically largely without purpose; German travelers were also often the representatives of an educated middle-class. They were familiar with the recognized artworks of their time, as well as with the traditional ones, and looked at landscapes in large measure according to the compositional givens of visual art.⁵³

Such a perspective represented the state of fundamental remoteness in terms of their life practice from the observed, as enlightened 'purposelessness' of observation and, with increasing decisiveness, defined aesthetic perception as a function of the visual sense.⁵⁴ It could only lead to a harsh, even annihilating judgment concerning the qualities – as landscape – of the coastal



Fig. 3.6:
"Breathtaking sky" sheep in
the Eiderstedt foreland
Photo: Archive Ernst Payns,
Nordfriisk Instituut

marshes: monotonous, boring, unattractive, uniform, even 'ugly'.⁵⁵ The aesthetic denigration of the marsh landscape is still with us; one sees it in the often defensive claim that it has a 'unique charm'.⁵⁶

At the end of the 18th century the inferiority of the coastal marshes, aesthetically speaking, had already become so encapsulated in formulas which were in currency among the cultural elites, that even people who had never seen the place condemned it. Nothing more was needed than a reference to what everyone knew to be true:

„Who would not rather spend time in the inspired disorder of a natural landscape than in the spiritless regularity of a French garden? Who would not prefer to wonder at the marvelous battle between fruitfulness and destruction in Sicily's meadows, to feast his eye on Scotland's wild cataracts and misty mountains, Ossian's grand nature, than to marvel in dead-level Holland at the dour victory of patience over the most defiant of all the elements? No-one will deny that better care is taken of the physical man in Batavia's meadows than under the treacherous crater of Vesuvius, and that understanding, which wants to grasp and categorize, finds far more satisfaction in a tidy market garden than in a wild natural landscape. But man needs more than to live and to feel comfortable, and also has a destiny beyond that of understanding the things which appear around him.“⁵⁷

Friedrich Schiller's negative assessment of the aesthetic qualities of the marshlands to some degree reversed the enthusiastic praise which dominated under the nature-subjugating point of view: the most quintessential example of the rationalistically led practice of the appropriation of nature, the Dutch coastal marshland, supplied the clearest illustration of the aesthetic inferiority of such a landscape; and the intellectual elite explained its aesthetic inferiority as a deviation from the general destiny of humanity.

This denigration of the much admired marshes from the point of view of aesthetics was so common that the travelogues of the 19th century dripped with scorn for the aesthetic shortcomings of the landscape.⁵⁸ During the same historical phase, from the conclusion of the 18th century onward, however, a counter movement for aesthetic perception of the coast was formed. Somewhat later, this 'new aesthetic' of the image of the coast came to include the flat area of the Wadden Sea Region.

Conceptually this aesthetic was founded on a reappraisal of uncultivated, of savage and frightening nature, the very nature which had previously been considered repugnant, empty, and terrifying. To expose oneself to the experience of such a 'vast', potentially unconquerable nature was to trigger, in what was at first an extremely small cultural elite, very special, highly valued sensations: a stimulating blend of fear and desire, and finally a dissolution of a triggered fear through the awareness of being safe and of being sure of one's identity. As concerns the perception of the coast, this aesthetic of the sublime⁵⁹ related initially to the experience of the uncontrollable forces of the ocean on the one hand, and of its 'infinity' on the other.

In the visual arts the attempt was made to represent the experience of the sublime with respect to the limitless sea through changes in the classical composition of a painting. Once again the avant-garde was formed by the Dutch who, as early as the 17th century, strove for an 'opening up' of the image in their seascapes and coastal landscapes by emphasizing unbounded horizontals, and by lowering the line of the horizon, so that an 'overwhelming sky' filled the greater part of the painting. Such methods were radicalized in the German Romantic period especially, in order to allow limitlessness to become imaginable on the limited surface of the painting.⁶⁰ Because the compositional methods of such representations of the sea were now applied to the flat region of the Wadden Sea coast, even this landscape, which had been written off as so empty and boring, gained a place in the aesthetics of the sublime: the very unending breadth of this coastal region, the vastness of the vault of the sky and the 'radicality' of a space devoid of all lovely diversity, was increasingly understood as a challenging and enriching quality. From the end of the 19th century the achievements of a positive aesthetics of the Wadden Sea Region were first represented by an artistic avantgarde not least in 'artists' colonies' like Dangast or in meeting places like Sylt in their paintings. After a few short decades this aesthetic had become stereotypical for the common perception of the region. Today the images which support coastal tourism feed on these models of a 'special charm' in the perception of the Wadden Sea Region.⁶¹



Fig. 3.7:
Open salt marsh landscape
on the Hallig Habel
Photo: T. Möller, appr.
1905 – archive of the
curator of the State of
Schleswig-Holstein

Glorification in the coastal space

The positive aesthetic interpretation of the Wadden Sea coast has long been a favorite quotable set piece of the popular schemata of perception. But since the time when it was brought into play by what was then a tiny cultural elite, it has remained part of a 'view from the outside'. It is tied up with an attitude based on a remoteness from day-to-day dealings with the natural qualities of the Wadden Sea Region – whether the remoteness is that of tourists or of those who may have come to the region to escape from the cities, or whether it derives from the appropriation of the 'aesthetic view' through education and an intellectual focus. The aesthetic appreciation of the broad, flat coastal zone – the characteristics of the offshore islands are different in important nuances⁶² – still belongs to a mental appropriation on the part of 'outsiders'. But what was at first only an observational, contemplative interaction with the Wadden Sea Region has long since led also to practical, and in the end politically highly divisive results: the buying up of retreats and holiday houses by more or less wealthy outsiders transforms the aesthetic judgment effectively into an 'occupation' of the area. In some areas this influx has made the locals a minority. What came about in earlier centuries out of economic calculation – the appropriation of the potentially profitable coastal lands – today corresponds to the transformation of whole sections of the coast (rather than the tourist centers) into rest and recreation spaces

for more or less short-term visitors. This has given rise to a novel kind of competition in the ways of perceiving, and in the articulation of needs in the very regions of the Wadden Sea coast which are 'structurally weak', a competition which has practical consequences – for example, protests against certain agricultural practices.⁶³

Still, from the middle of the 19th century, that glorification mentioned several times became more and more significant for the locals' way of perceiving themselves and hence for the perception of their living space. In the wake of the Enlightenment's trends criticizing civilization, a popular agrarian romanticism generally celebrated the transfigured idyll of a 'poor, simple life' in a disappearing, premodern peasant lifestyle. The agrarian-romantic and culturally-critical 'discovery' of a deprived but supposedly authentic existence, particularly in the sparsest areas – heath land, moorland, inhospitable islands – led to a moral elevation of the inhabitants.⁶⁴ To what were mostly educated middle-class observers, the farmers' daily struggle appeared to be a constant opportunity for purification, for the promotion of 'inner values' and for proving one's worth.

These were the circumstances under which the old metaphor of the coastal dwellers' 'battle' with the sea was further developed. The object of a generous disregard for regional-ethnic differences 'the Frisian' was made to represent the embodiment of a type of humanity which had developed an almost soldier-like toughness in its

constant struggle with the forces of the sea. According to this perception Frisians represented the earthbound, almost elemental form of that 'victorious type' which was in fact secretly in keeping with the civilizing process under critique – the subjugation of nature.⁶⁵

It was not long before the characterization of the coastal dwellers – usually in the generic label 'Frisian' – as defiant resistance fighters in the existential struggle with the sea became extraordinarily popular. This myth-building was advanced by regional writers from the mid-19th century onward in Germany and, in the first third of the 20th century, it attained its broadest acceptance with a great number of sophisticated entertainment novels.⁶⁶ The Nazis made use of this by claiming an ideological connection between their land reclamation measures along the North Sea coast and the heroic history of the coastal dwellers.⁶⁷

Even the historical 'narrative' of the heroic battle of the Frisians against the sea was at its core an educated-urban-bourgeois reinterpretation of actual history. This interpretation gave the coastal dwellers a role which had not developed out of their own understanding of themselves. But precisely because this scenario presented itself as a 'true' understanding of witnessed history, it offered the people on the Wadden Sea coast a projection space in which the value of their identity was enhanced. In this way, the characterization of the marshland inhabitants, defined as Frisians, as the heroes of land reclamation and land-securing, continued to hold true, in a milder and 'adjusted' form in the consciousness of the people. For example when, recently, protesters against environmental protection measures – especially in connection with the proclamation of the national parks – used the slogan: 'God created the sea, the Frisian the coast', a self image was clearly adopted which was in fact 'imported' into the region.

At least in Germany, the use of the old metaphor – according to which the Wadden Sea Region must be regarded as a 'battleground' for the subjugation of natural forces – in the texts of picture books on the region, in tourism advertising and even in the inhabitants' self-schematization, has a more than subliminal meaning. For example, it explains why, for the widest circle of coastal people and beyond, the ecologically motivated idea of removing pre- and post-dike structures (which are problematic in terms of their effect on the water dynamics) is perceived as an attack on the fundamental principles of wisdom and self-image.

Split perception: different zones of the Wadden Sea space

The so-called bridge period, the political, social and cultural transformation phase in the history of central Europe between 1770 and 1820, brought yet another important change beyond the above-mentioned shifts and reinterpretations in the history of the perception of the Wadden Sea Region: attention was directed toward areas which had hitherto hardly come into view. This was especially true of the seaside of the islands off the coast, which is to say, for the stretches of sand and dune facing the open North Sea.

By the end of the 18th century, when the practice of bathing in the sea had become a well-established form of recreation for 'fine society' in southern England, in France, and along the Channel coastline in Belgium and Holland, and when medical practice, based on various health concepts, had begun promoting spending time by the seashore as a cure for body and soul⁶⁸, even the western, eastern and northern Frisian islands were included in the boom in seaside resort development. Norderney was the first of the German North Sea islands in 1797, followed by Wangerooge in 1804, and Spiekeroog in 1809; Wyk, on Föhr, opened in 1819.⁶⁹ The upper classes' enjoyment of bathing and cure-taking brought a new perspective to the islands on the edge of the Wadden Sea in line with the interest of well-heeled, educated travelers, in 'folk life'. The spare and generally wretched existence of the island dwellers (the 'golden age' having passed when the islanders served on foreign ships, and some of them made their fortunes as captains), the more than modest existence of the fishermen and smallholders on the Geest and heather flatlands became the picturesque background, in fact the backdrop for the guests' more or less luxurious sojourns.⁷⁰

With the early tourism which developed around the practice of bathing in the sea off the islands of the Wadden Sea Region a pattern for the perception developed which still has a strong effect on the mass-tourism attitudes of today: the space where the holiday makers spend their time, especially during traditional beach vacations, is experienced extremely selectively. The interest is focused – if one ignores the 'framing' imposed by the touristy infrastructure, the range of services and entertainment on offer – almost exclusively on the narrow strip right on the edge of the sea. This explains why today's dramatically overdeveloped structures and space impres-

sions in the tourist centers even on the North Sea coast, but more especially on the majority of the islands, have hardly had an effect on the holiday makers' 'anticipation' of this experiential space.

Because seaside tourism from the end of the 18th century focused attention on new centers in the Wadden Sea Region, it also caused a screening-out of vast areas: the inclination was to pay very little attention to the 'back side' of the islands, and even less attention was paid to the Wadden Sea itself and to the mainland marshes. They were mere 'thoroughfares'.

That began to change in the 1920s, here and there, through, amongst other things, the interest of artists in the flatlands near the coast, and in the heath land or mudflat areas on the islands. The representatives of this movement were first Emil Nolde, then the bridge painters in Dangast, Max Beckmann and Wenzel Hablik on Sylt island, as well as the graphic artists Alexander Eckener and Ingwer Paulsen in North Frisia.

This change of focus was not widespread until the 1960s. At that time the expanding tourist traffic started to include the mainland marshes, at first for individual tourists; then, from the late 70s onward, an expanding mass tourism which took in, for example, the East Frisian sluice harbors. In the course of all this a perception of the Wadden Sea area developed that followed the previously mentioned aestheticisation of the flat coastal landscape and the occasional enthusiastic descriptions of the 'peculiar charm' of the marshes.⁷¹ In this way the 'zoning' of the Wadden Sea Region was defined by the touristy perceptual schema, in that at least a few groups of tourists added the experience of the coastal marsh to that of the sea-related 'recreational strip' by the seaside. This space connected, and connects, the experience of a peculiar agrarian landscape with a decisive focus on the sea.

3.3.4 Competing syntheses in coastal perceptions (ca. 1900 – 2000)

The developments that have been described can support the view that, in the 20th century, tendencies appear which shifted centuries-old, highly differentiating selective perceptions of the Wadden Sea Region to a rather more complete experience. In this manner, the view of the region, which the fine arts (including photography)⁷² opened up after 1900, includes the seaside of the Wadden Sea islands as well as the Wadden hinterlands like the mainland marshes. This

view has been so widely popularized today that it has been possible to give the entire space the tag of 'Nolde's landscape' in innumerable picture books and photographic volumes. Thus it succeeds in gaining the effect of a 'beautiful', aesthetically pleasing image even from apparently uninteresting sections like the silt banks in the mudflats or the monotone agricultural areas.

A perception that attempts to unify the different zones within the Wadden Sea Region could be labeled an attempt at 'synthetisation'. An 'aesthetic-contemplative synthetisation' would therefore be the one transmitted via fine arts and photography, and later film and television. Later, from the 80s onward, a new 'touristy synthetisation' followed. It sketched out the coastal area, according to the stated objectives of a 'gentle tourism', as self-sufficient and self-contained life-world. The perception of a developed, regional unity of culture and social life is thereby supposed to supplement the – in a narrower sense – spatial overall impression.⁷³ However, the fact that, even in the Wadden Sea Region, so-called conformist tourism has remained a largely convenient postulate makes the truth of this synthetisation somewhat dubious.

Highly significant for the current, more general perception schemata giving access to the Wadden Sea Region, is 'ecological synthetisation', which in

Fig. 3.8:
Old marshes in
Westerhever/Eiderstedt
Photo: L. Fischer



3.4 Conclusion

the last few decades has facilitated the understanding of the region as an interconnected 'near-natural cultural landscape' with a very sensitive and complex ecological system, worthy of protection. It is true that the regulatory protective measures officially include the area outside of the sea dikes, which, for its part, excludes economic enclaves like the islands, shipping lanes, fishery areas in differing degrees; but the ecological point of view obliges one to see the Wadden Sea Region as an entity which in fact includes the marsh zones near the coast. The conflicts with the different users of the individual areas are preprogrammed. In the public perception, however, this 'ecological synthetisation' has assumed an important role within a short space of time. This can be ascertained through questionnaires answered by tourists and through the media coverage of events like the 'Pallas' disaster.⁷⁴

The massive confrontations in the coastal regions over the validity, legitimacy and breadth of the ecological synthetisation (which was once again brought in 'from outside') thus supply incontrovertible proof that, in spite of the avowedly holistic view – the Wadden Sea Region as a unit of natural processes that work together as a system and cannot be separated –, even this 'unification' is split up: it defines the area as coherent natural space, but until now it has not been possible to incorporate the dimensions of the equally well-differentiated cultural and experiential relationship.

Thus, in the 20th century, successfully established new ways of perceiving the Wadden Sea Region certainly contain tendencies which open up an integrating view of this cultural landscape. But at the same time, each of these synthetisations establishes a partial viewpoint, and these are in competition with each other. They unfold out of the differing interests and needs of the various social groups which, for their part, tend to come together to form coalitions of sometimes only short duration (tourists, for example). The new synthetisations suggested above, as meaning-and-perception schemata brought in from outside to the coastal area, have placed heavy cultural, political and economic pressure on the Wadden Sea zone. Against this pressure the traditional pattern of experience in the regions, themselves not at all homogeneous and conflict free, can scarcely hold firm, because their life-world foundations are being continuously eroded, the base in traditional areas of endeavor – agriculture, fisheries, coastal shipping, land reclamation and protection – is disap-

pearing. Cultural and political self-determination is diminished both politically and at the policy-making level. The earlier, relatively close cohesion of the population disintegrates.

It remains to be seen whether, using novel approaches, such as the 'integrated coastal management', it will be possible to develop truly integrated views of the Wadden Sea Region, views which can absorb the 'historical heritage' of the often overlapping, dynamic patterns of perception.

3.4 Conclusion

The outline for a short overview of the history of perception of the Wadden Sea Region is obliged to simplify and highlight ideas. To many of the historical phases, themes and lines of development that were touched on, scholarly discussion can already offer sophisticated and detailed contributions. However, there is still much to be determined from the various sources.

The most important insights from this short overview are as follows:

1. The perception of the Wadden Sea landscape has been and still is particularly heavily affected by the tension between a 'view from the outside' and a 'view from the inside'. In Central Europe the only landscape of which comparable statements can be made is that of the Alps. This difference, if it is not given enough consideration, leads almost necessarily to heated conflicts between different interest groups. This reveals itself too in the newer approaches to 'synthetisations' (that of the ecological, the touristy, the political-planning, and even the aesthetic-contemplative approach).
2. Over the course of history it should be recognized that the Wadden Sea Region has been seen in recent times primarily as a space for the 'battle between humans and nature'. The 'mastery over the forces of nature' seemed to be the most significant quality in this space. For this reason the marshes themselves were given a lot of attention, even though they were long perceived exclusively from the point of view of their utility. This attitude continues to hold form, even now that the economic and structural conditions for it are disappearing.
3. The dangers for the Wadden Sea Region tend to be seen differently now from the way they were seen centuries ago: no longer are the risks from natural factors (storm surges, and so on) regarded as the most threatening;

those are now the disturbances caused by human activity (environmental pollution, overexploitation, climate change, etc.). This shifts the perception of the Wadden Sea Region to one of 'at-risk area', a perception which has by no means been accepted by all.

4. It is increasingly difficult to establish the 'value' of the Wadden Sea Region based on the direct use of its natural resources. Hence, the latest of the 'alternative uses' (wind power) has generated new conflicts. The appeal to so-called indirect uses of the Wadden Sea Region (recreation and relaxation; preservation of its natural potential; spatial and structural balancing functions) represents an enormous challenge for the local population. The struggles to establish the right criteria for determining the value of this landscape can only be adequately understood with reference to its historical development.
5. The aesthetic 'appeal' of the Wadden Sea Region must still be defended against the dominant notions of the 'beauty and variety' of a natural and cultural space. Negative judgments like 'monotonous and boring' continue to form a substrate for this view. The 'influence of the sea' is also aesthetically decisive for a positive perception of this space. That the Wadden Sea coast, even as a coastal formation, appears strange in many ways, is a contributing factor. This idea still represents a 'mental provocation' which has not been completely resolved, for example from the ecological point of view.

It is mostly the national and regional differences which were sacrificed to the global view, which necessarily abbreviates and simplifies. It is not only the different national cultural contexts in the Netherlands, Germany and Denmark which have led to sometimes considerable deviations from the lines sketched out in this text; in addition, within the Dutch and German Wadden Sea spaces, regional differences have developed which are not included in the 'mainstream' studied here. The historically developed national and regional differences in perception cannot be resolved through a political integration either, nor should they be.

It has been a question of tracing historical process with a few strokes. For we must become aware of the historicity and historical contingency of our ways of perceiving the Wadden Sea Region. And, above all, we must explore and work out the patterns - still effec-

tive, often disguised - that determine our experiences in this coastal space.

In all phases of the relatively short available history of the perception of the Wadden Sea Region there have been partial, conflicting, overlapping attitudes. There has always been a hierarchy of perceptions, as well. Which is the dominant one under what circumstances?

That should be considered, too, when special attention is focused - and not by accident once again 'from outside', and bound up with forms of the political and administrative regulatory processes - on the cultural and landscape heritage of the Wadden Sea Region.

Notes

- 1 See also Sindowski, K.-H. (19): Das ostfriesische Küstengebiet, Sammlung geologischer Führer, vol. 57. Berlin Stuttgart 1973 and Buchwald, K. (1990): Nordsee. Ein Lebensraum ohne Zukunft?, Göttingen, pp. 32ff.
- 2 Ratzel, F. (1882): Anthropogeographie. 1. Teil: Grundzüge der Anwendung der Erkunde auf die Geschichte, Leipzig 1899, p. 289.
- 3 Ibd., p. 303.
- 4 See ibd., p. 311.
- 5 For the East Frisian coastal area see van Lengen, H.: Bauernfreiheit und Häuptlingsherrlichkeit im Mittelalter. In: Behre, K.-E. / van Lengen, H. (ed. 1995): Ostfriesland. Geschichte und Gestalt einer Kulturlandschaft. Aurich, pp. 113-134.
- 6 Compare areas of the national parks in the Wadden Sea area of the Netherlands, Germany and Denmark.
- 7 On cultural konstruktion of landscape see also Wenzel, J.(1991): Über die geregelte Handhabung von Bildern. In: Garten + Landschaft, vol. 3, pp. 19- 24.
- 8 See already Simmel, G.: Philosophie der Landschaft. In: Ders: Brücke und Tür. Essays des Philosophen zur Geschichte, Religion, Kunst und Gesellschaft. Ed. by Landmann, M. Stuttgart 1957, pp. 141-152.
- 9 Reck, H.U. (1994): Geschwindigkeit, Destruktion, Assoziation. In: Kunstforum International, vol. 128, pp. 84-105.
- 10 See Fischer, L.(1998), a.aO.
- 11 Baier, F. X. (2000): Der Raum. Kunstwissenschaftliche Bibliothek, issue 2, Köln, pp. 90f.
- 12 Ibd., p. 91.
- 13 See Schmitz, H. (1999): Der Spielraum der Gegenwart. Bonn, p. 47.
- 14 Simmel, G. (1913): Philosophie der Landschaft. In: M. Landmann (ed.): Georg Simmel. Brücke und Tür. Stuttgart 1957 (pp. 141-152), p. 142.
- 15 Ibd., p. 143.
- 16 See. Dürckheim 1932, ibd., p. 395.
- 17 See Schmitz 1967, p. 400.
- 18 See Natur- und Kulturlandschaftswandel - Perspektiven im Rheiderland; in: Grenzenlos, Die Identität der Landschaft in der Ems-Dollart-Region, Groningen 1993, pp. 46-54.
- 19 See also Hasse, J. (1999): Bildstörung. Windenergie und Landschaftsästhetik, Wahrnehmungsgeographische Studien zur Regionalentwicklung, vol. 18, Oldenburg.
- 20 See also in part. Pörksen, U. (1997): Weltmarkt der Bilder. Eine Philosophie der Visiotype, Stuttgart.
- 21 Concerning coastal fisheries see example German/Dutch border area Dollard, Stratingh G.A. / Venema, C. A. (1855): De Dollard. Groningen 1979 as well as Kirchhoff, J. (2000): Fischfang auf dem Wattengrund, Weener.
- 22 Concerning history of tourism on the East Frisian islands see Hasbargen, L. (1964): Die Ostfriesischen Inseln. Zur Wirtschaftsgeographie eines Fremdenverkehrsgebietes. Göttingen, Hannover.
- 23 Schmitz, Hermann 1994: Neue Grundlagen der Erkenntnistheorie. Bonn, p. 80.
- 24 Concerning conception of the openness of landscape space see in particular Hermann Schmitz (1967): System der Philosophie. Vol. III, 1st part. Der leibliche Raum. Bonn 1988, p. 393.
- 25 German translation in Friedrich Müller: Das Wasserwesen an der schleswig-holsteinischen Nordseeküste. First part: Die Halligen. Vol. 1, Berlin 1917, p.140.
- 26 Hartmut Valentin: Die Küsten der Erde. Beiträge zur allgemeinen und regionalen Küstenmorphologie. Gotha 1952, pp.14f.
- 27 See as an example the study by Harro Segeberg: Der Friese als 'Schimmelreiter'? - Zur Heroisierung der Marschenbewohner in Literatur und Film. In: Ludwig Fischer (ed.): Kulturlandschaft Nordseemarschen. Bredstedt/Westerhever 1997, pp.233-251.
- 28 More detailed Ludwig Fischer: Das Feste und das Flüssige. Zur Ideologie und Wahrnehmungsgeschichte des Wattenmeers und der Halligen. In: Bernd Busch/Larissa Förster (red.): Wasser. Bonn 2000, pp.624-652, esp.pp.639ff. (Kunst- und Ausstellungshalle der Bundesrepublik Deutschland. Schriftenreihe Forum vol.9)
- 29 For an overview on the history of diking see Thomas Steensen (ed.): Deichbau und Sturmfluten in den Frieslanden. Bredstedt 1992. Concerning Schleswig-Holstein: Hans Joachim Kühn: Die Anfänge des Deichbaus in Schleswig-Holstein. Heide 1992.
- 30 Cit. efter Peter Sax: Werke zur Geschichte Nordfrieslands und Dithmarschens. Bd. 1. St.Peter-Ording 1986, p. 144.
- 31 Compare the short description of the North Frisian islands by Peter Sax: Werke zur Geschichte Nordfrieslands und Dithmarschens vol.3. St.Peter-Ording 1984, pp.39ff.
- 32 There is, for example, the influence of the Dutch farmhouse-type Gulf-house upon the building in the German coastal marshes (see f ex Ludwig Fischer: Haubarge - Eine Bauernhausform hat abgewirtschaftet? Bredstedt 1982).
- 33 More detailed Ludwig Fischer: Die Ästhetisierung der Nordseemarschen als 'Landschaft'. In: L.F. (ed.): Kulturlandschaft Nordseemarschen. Bredstedt/Westerhever 1997, pp.201-232; esp. pp.208ff.
- 34 Ludwig Hirzel (ed.): Albrecht Hallers Tagebücher seiner Reisen nach Deutschland, Holland und England 1723-1727. Leipzig 1883, p.27.
- 35 Peter Sax [note 6], p.48.
- 36 Ibd., p.141.
- 37 Ibd.
- 38 Fischer, Ästhetisierung [note 8], pp.218f
- 39 Cf. Dieter Lohmeier: Peter Sax und seine Quellen. In: Peter Sax [note 6], S.XV-XLV.
- 40 Ibd., pp.143ff.
- 41 See Fischer, Ästhetisierung [note 8], pp.218ff.
- 42 An outstanding example is the interest of Dutch investors in rebuilding parts of the island of Strand, which was destroyed in 1634. See Fritz Karff: Nordstrand. Geschichte einer nordfriesischen Insel. Hamburg 1978, pp.221ff.
- 43 F.ex. Johann Nicolaus Tetens: Reisen in die Marschländer an der Nordsee zur Beobachtung des Deichbaus in Briefen. vol.1, Leipzig 1788.

- 44 See Rainer Beck: Die Abschaffung der 'Wildnis'. Landschaftsästhetik, bäuerliche Wirtschaft und Ökologie zu Beginn der Moderne. In: Werner Konold (ed.): Naturlandschaft - Kulturlandschaft. Die Veränderung der Landschaften nach der Nutzbarmachung durch den Menschen. Landsberg 1996, pp.27-44, esp.pp.28f.
- 45 Documented in Alain Corbin: Meereslust. Das Abendland und die Entdeckung der Küste 1750-1840. Berlin 1990, pp.53f.
- 46 This following Corbin, *ibid.*, p.54.
- 47 For the storm surges of 1634 see Boy Hinrichs a.o.: Flutkatastrophe 1634. Natur - Geschichte - Dichtung. Neumünster 1985. For the surges of 1717 Manfred Jakobowski-Tiessen: Sturmflut 1717. Die Bewältigung einer Naturkatastrophe in der Frühen Neuzeit. München 1992.
- 48 As an example Tetens, Reisen [note 19], p.109.
- 49 That can be seen in the legendary stories about the destruction of Rungholt 1362 (see Hans-Herbert Hennigsen: Rungholt. Der Weg in die Katastrophe. vol.1. Husum 1998; vol.2. Husum 2000) and the comments on the catastrophe at Nordstrand (see Karf, Nordstrand [note 18], pp.193ff). Explanation of the theological background in Hinrichs a.o. and Jakobowski-Tiessen [note 23].
- 50 Such differences discussed by Otto S.Knotterus: Die Angst vor dem Meer. Der Wandel kultureller Muster an der niederländischen und deutschen Nordseeküste (1500-1800). In: Fischer, Kulturlandschaft [note 9], pp.145-174.
- 51 As an overview Jean Delumeau: Angst im Abendland. Zur Geschichte kollektiver Ängste im Europa des 14. bis 18. Jahrhunderts. Reinbek 1985.
- 52 In this case, Corbins explanation ([note 21], pp.54f.), going back to Dutch marine painting of the 16th century, seems not to be convincing.
- 53 Corbins study [note 21] depends almost exclusively on the witnesses from this travelling cultural elite, so painting becomes of great importance.
- 54 The concept of 'landscape' has since the Renaissance been developed as a visual composition within a frame. See Fischer, Ästhetisierung [note 9], pp.204f (with bibliographical notes).
- 55 More detailed Fischer, *ibid.*, pp.207f, 211ff. See even Corbin [note 21], pp.55f.
- 56 See Fischer, Ästhetisierung, [note 9], pp.216f.
- 57 Friedrich Schiller: Über das Erhabene. Stuttgart 1970, p.93.
- 58 Documents in Steffi Schmidt: Die Niederlande und die Niederländer im Urteil deutscher Reisenden. Eine Untersuchung deutscher Reisebeschreibungen von der Mitte des 17. bis zur Mitte des 19. Jahrhunderts. Siegburg 1963, pp.22ff.
- 59 For a short explanation of the aesthetics of the sublime concerning the coastal area see Fischer, Ästhetisierung [note 9], pp.213ff.
- 60 Cf. Oskar Bätschmann: Entfernung der Natur. Landschaftsmalerei 1750-1920. Köln 1989, and Albrecht Koschorke: Die Geschichte des Horizonts. Grenze und Grenzüberschreitung in literarischen Landschaftsbildern. Frankfurt/M. 1990.
- 61 See Fischer, Ästhetisierung [note 9], p.217.
- 62 An outline is given by Ludwig Fischer: 'Noldes Landschaft'? Wandel der Wahrnehmung. In: Thomas Steensen (ed.): Das große Nordfriesland-Buch. Hamburg 2000, pp.20-37, esp.pp. 28ff.
- 63 Very interesting remarks in Jürgen Hasse: Wahrnehmung und Bewertung der Marschenlandschaft in der Konkurrenz unterschiedlicher Interessen. In: Fischer, Kulturlandschaft [note 9], pp.175-188.
- 64 See Henning Eichberg: Stimmung über der Heide - Vom romantischen Blick zur Kolonisierung des Raumes. In: Götz Großklaus/Ernst Oldemeyer (ed.): Natur als Gegenwelt. Beiträge zur Kulturgeschichte der Natur. Karlsruhe 1983, pp.197-234.
- 65 More detailed, reading the film on Theodor Storms 'Schimmelreiter', Harro Segeberg: Der Friese als 'Schimmelreiter'? Zur Heroisierung der Marschenbewohner in Literatur und Film. In: Fischer, Kulturlandschaft [note 9], pp.233-251.
- 66 Confirming Nazi ideology, there were novels like Ferdinand Zacchi: Volk an der See. Ein Nordseebuch von Trutz und Treue. München 1934, or Waldermar Augustiny: Die große Flut Hamburg 1943.
- 67 As an example, a document like Der Hermann Göring-Koog. Denkschrift anlässlich der Einweihung Ende Oktober 1935 (s.l.s.t.), p.18.
- 68 Details in Corbin, Meereslust [note 21], pp.83ff.
- 69 A popular overview is Jutta Kürzt: Badeleben an Nord- und Ostsee. Kleine Kulturgeschichte der Sommerfrische. Heide 1994.
- 70 One of the most famous texts is Heinrich Heine's 'Nord-seebilder' of sojourns on Norderney 1825/26.
- 71 See Fischer, Ästhetisierung [note 9], pp.218ff.
- 72 Almut Klingbeil: Die Bilder wechseln. Meeresbilder in Fotobüchern der 20er bis 40er Jahre. Hamburg 2000 (Diss. 1998).
- 73 There is a countless number of studies on concepts of 'gentle tourism'. To be mentioned here, concerning coastal areas: Jürgen Hasse/Frauke Schumacher: Sanfter Tourismus. Über ein konstruktives Verhältnis von Tourismus, Freizeit und Umweltschutz. Bunderhee 1990. Jochen Lamp/Hans Fricke (red.): Sanfter Tourismus - eine Chance für die Küste. Stuttgart 1989 (WWF-Tagungsbericht 3).
- 74 See Wolfgang Settekorn: Konstruktion und Vermittlung von Ereignissen in der deutschen Presse: zum Fall PALLAS. Hamburg 2001 (ms copy)

4. Description of Sub-regions

4. The Wadden Sea Region: Description and Characterization of Sub-regions

4.1 Introduction

The Lancewad project has dealt with the cultural heritage along the Wadden Sea as a whole. However, there were big differences in the characteristics within the Wadden Sea Region; in some regions the Wadden Sea specific traits are abundant and can be seen all over the landscape whereas in other areas you have to look carefully to recognize the Wadden Sea specific elements.

In order to describe not only the similarities but also the differences of the Wadden Sea Region and to carry out typical characteristics of certain areas, the whole Wadden Sea Region has been divided, besides the division into the regions Denmark, Schleswig-Holstein, Lower Saxony and The Netherlands, into a number of sub-regions. Details of the historic landscape development and cultural identity could only be given on the smaller scale of local regions.

In this chapter the sub-regions are described one after another, starting at the northernmost point of the Wadden Sea Region and proceeding south to den Helder. The descriptions take their starting point in the modern landscape and look backward in time in order to describe how more recent changes overlay older structures. The emphasis is on those objects and structures that can still be recognized in the landscape.

The descriptions leads up to a short evaluation with the aim of pinpointing the essence of the individual sub-region. This assessment has been done on the basis of the four categories archaeology, historical buildings and monuments, historical geography and perception of landscapes. The defined criteria for the importance of these categories in the sub-regions were conservation status, context between the elements, density and representativeness.

4.2 The Danish Wadden Sea Region

by Mette Guldborg and Adam Schacke

4.2.1 Introduction

The Danish region involved in the Lancewad Project includes the coastal parishes and the parishes with marshlands which do not adjoin the coast. Where these parishes stretch a long way inland, only the village areas containing marshlands have been included. Thus the region covers both the marshlands and the adjoining geest areas. The region is divided into three sub-regions: 1. Vardeådal, Sneummarsken and Ribemarsken, 2. Rejsbymarsken, Ballummarsken and Tøndermarsken, and 3. The Danish Wadden Sea islands.

Compared to the rest of the Wadden Sea region, the Danish section is a relatively recent landscape, where embankments were made late. Within a relatively short expanse, virtually the whole spectrum of marshland development is represented.

- The newly created marshland on Skallingen.
- The unembanked marshlands by the mouth of the Varde Å river and at Novrup south of Esbjerg
- The marshlands with no building at Sneum and Ribe, which were embanked recently.
- The marshland north of Ballum which were built on early and embanked late.
- The marshland at Tønder, which was both built on and embanked early.



Fig. 4.1:
The Danish Wadden Sea
Region

4.2.2 Vardeådal, Sneummarsken and Ribemarsken

By far most of the Wadden Sea coast in this sub-region has historically belonged to the Kingdom of Denmark. As a rule of thumb, the Kongeå river demarcated the Kingdom of Denmark from the Duchy of Schleswig, while the City of Ribe and its hinterlands south of the river formed a royal enclave.

Landscape

The lighthouse at Blåvandshuk marks the northern boundary of the Wadden Sea. From here, the reef Horns Rev extends for more than 40 kilometers to the west under the sea. It has caused innumerable shipwrecks, which accounts for the Dutch name for the reef Duyvels Horn ("The Devil's Horn"). The area around Blåvandshuk is characterized by the numerous dunes, which in most of the area are barren, whereas the eastern section towards the bay Ho Bugt supports characteristic conifer plantations, which were established from the latter half of the 1800s on. The dunes, which rise high above the sea, form a stark contrast to the marshland areas, which in general are very narrow in this region, and where some stretches are still unprotected by dykes. The dykes in the sub-region date, in the main, from the period 1914–1929, which means that the older inhabitants of the area can still remember a significant change in the landscape.

The marshlands in the County of Ribe - Vardeådal, Sneummarsken and Ribe marsken - constitute the northern section of the Wadden Sea coast and show a transition from the most recent paludification at the east of Skallingen in the north, to the older, undeveloped marshland by Ribe in the south. On the protected tongue of land called Skallingen exist areas of untouched marshland used almost exclusively for pasture and for recreational purposes. Further north, there is the marshland around the Varde Å river. This is the only place in the Wadden Sea where a larger watercourse debouches directly into the sea without any regulation from sluices or dykes, and so provides an impression of how the other watercourses used to debouch unimpeded into the sea.

To the south, Esbjerg Bakkeø (old moraine) stretches right out to the Wadden Sea. This is largely characterized by the cultivation of heath land, which started in the mid-1800s. The old moraine, with its numerous fields and plantations thus represents a relatively recent cultural

landscape. The only place where a significant section of heath land from before this nineteenth century cultivation is still preserved is north of Sjølborg.

Unlike the river Varde Å, the rivers Sneum Å, Kongeå and Ribe Å, south of Esbjerg Bakkeø, were all altered during the 1900s. This was partly through straightening the watercourses themselves, for better drainage, and partly through the introduction of sea dykes with sluices. Only on Ribe Å was a lock built to allow passage to the city by boat. This area represents a young, undeveloped and recently embanked marshland.

The southern end of the Ribe dyke clearly demarcates the previous border between Denmark and Germany, 1864–1920. An agreement was not reached on building a common dyke, and so the flanking section of dyke at Vester Vedsted was created as a termination of the Danish embankment. Only after the Reunion in 1920 was the King Christian X Dyke built to link Vester Vedsted with the bar Astrup Banke.

Settlement

Characteristically, the settlements in the sub-region are situated on the edge of the geest. The narrow marshlands meant that the population could settle here and use both the rich grazing of the marshlands and the acreage on the geest. There are very few places where there are settlements in the marshlands from before the embankment, and even these are on natural geest outcrops and not on artificial mounds, none of which exist in the region. In its most typical arrangement the settlement forms a long row of farms right on the edge of the geest. They often still have a well-preserved system of fields in the marshlands, divided by ditches. In the past these fields were mainly used for hay production and grazing, but today grain-growing is common in the embanked areas. The location of settlements still makes it very easy to see the difference between the previous pastures in the marshland and the cultivated geest.

The combination of cattle farming on the marshlands and cereal production on the geest can be traced right back to the centuries before Christ. Even then, people chose to live on the geest alongside the marshlands, and so many of the still extant villages can trace their history back to the Iron Age. However, up to the eleventh century, villages were often relocated, and so the villages are not necessarily in exactly the same place as originally, but are within the same area of resources. Most villages took their

existing positions during the Middle Ages, and previous settlements are often to be found on the nearest upland. One example of such a village is Novrup, east of Esbjerg, situated near one of the few remaining unembanked marshland areas. On the outskirts of the village the remains of settlements have been unearthed from both the Iron Age and Viking Age. There have also been rich Iron Age finds in the area around the village of Billum at the mouth of the Varde Å in Ho Bugt, as well as at Tjæreborg south of Esbjerg and at Vester Vedsted outside Ribe. Here especially Dankirke has proved rich in finds, stretching from 200 B.C. to 750 A.D., indicating trading contacts with Frisian and Anglo-Saxon areas.

On the inner part of the old moraine land settlements have historically been hamlets or individual farms. It is quite clear that the occurrence of marshlands made it possible to establish larger villages, while the lack of pasture only allowed smaller settlements. However, it does seem that the old moraine land was densely inhabited in prehistoric times. Traces of numerous prehistoric settlements and not least the burial mounds testify to this. In the Marbæk Plantation there are two protected Iron Age dwellings where remains of the houses and paving still can be seen. In the plantation there is also a large protected field system, called celtic fields, from the same time. In a small heathland area north of Hjerting there is a group of no fewer than 15 protected burial mounds, out of a total of 18 which have been discovered. The group is unique in that they are in very good condition and very close together. In Esbjerg a range of historic dwellings has been excavated, which show the whole development of settlements from the Stone Age to the Middle Ages.

As in many other parts of the country the land reform movement at the end of the eighteenth century has left its mark. One example is the sale of the agricultural estate of Krogsgård in 1792, where the demesne was divided up into smallholdings on Krogsgård Mark. This is an early example of division into smallholding, and the structure is still well-preserved. The current division by ditches into individual pastures of the marshland itself can frequently be traced right back to the enclosures around 1800. This is true, for example, for Vilslev, which was enclosed as early as 1762.

There are, and were, few private manors in the area around Ribe. The power of the secular and especially the ecclesiastical institutions of the city made it very hard for the nobility to settle in

the area. Thus the manor of Lustrupholm, close to the city, belonged to the Bishop of Ribe in the Middle Ages. A similar situation existed around Varde, with the power of the royal castle.

In other parts of the region there was almost one manor per parish. Most, however, were small and over the years the main buildings disappeared, meaning that very little is left today. This is true of, for example, the manors of Sneumgård, Krogsgård and Visselbjerg, where it cannot immediately be seen that around 1700 these were the core of medium sized estates. On the other hand, at Hesselmed you can still see what the main building of a small West Jutland manor looked like in the 1700s. Also the village of Høgsbro, southernmost in the region - although there is not a great deal to see - gives the impression that the manor house Høgsbrogård, located a little to the north of the village, used to have a special status. This was once a stately home, mentioned as early as the 1400s, but later became an ordinary copyhold farm.

Style of building

While the older agrarian buildings in the rest of Denmark are timber-framed, the dominant style in the Danish part of the Wadden Sea region is brick-built. This was the result both of a shortage of wood and the influence from the south. The brick-built farms reached the Ribe area in the middle of the 1700s. In fact there are virtually no agrarian buildings in the region still surviving from before this time. In addition, the huge changes in agricultural methods from 1700 until the present day mean that very few of the old, brick-built houses from the 1700s have been preserved, although there are exceptions, such as the many fine farms in the village of St. Darum.

Fig. 4.2:
Farm in the village of Ho in the northern part of the Wadden Sea region. The farm dates from around 1800 and consists of farmhouse, stable and barn. In connection there is a „pensioner's house" from 1870.
Photo: S. Søndergaard



Traditionally West Jutland farmhouses had four wings, one of which was the living quarters, and the others were used for keeping animals and storage. A distinctive feature of these four-winged farms on the west coast, as opposed to the rest of Denmark, is that the courtyard was a *mandgård*, used only by people and not by animals. Thus the dungheap was outside the farm, not in the courtyard. It was also typical that the farms were "inside out", with the main facade facing south, as in the western parts of northern Schleswig. This means that entry into the buildings was from the outward side of the farm, rather than from within the courtyard as with farms in the rest of Denmark. In the Ribe area, the influence of Frisian and Schleswig farm architecture (called *Jütisches Haus* in Schleswig) is also evident. In this style, the animal stalls and living quarters are in the same wing, separated by a transverse hall.

The farms were typically built of red brick, with thatched roofs ridged with turf, while the gables were hipped. It was also typical to have a hatch over the doors for loading hay and grain, called an *arkengaf*. In this region these were semicircular.

When agriculture boomed after 1840, new buildings tended to be designed in late classical style, while in the decades around 1900, new materials were used, such as machine-cut stone, cement and concrete, zinc, lead, slate and roofing felt. It was in part in reaction to this that a movement called *Bedre Byggeskik* ("Better Architecture") started. The

idea was to improve the aesthetics of agrarian buildings by recreating an ideal "Danish" style. Examples of this style can be seen several places in the sub-region.

Most of the churches in the sub-region were originally built in Romanesque style in the twelfth and thirteenth centuries, and many have been subsequently extended. Many are built from tuff from the Rhine area, and typically they are whitewashed and roofed with lead. In Southwest Jutland alone in the twelfth and thirteenth centuries more than fifty tuff churches were built. An outstanding example is Hviding church. The oldest section dates back to the 1100s and is Rhine tuff on a stone foundation. The church, which is situated high amongst the small villages in the west of the parish, is in many ways an excellent example of the tuff churches in the Ribe area. It was built as a church for the aristocracy and originally had two west towers, which collapsed in the 1500s. In the same area

buildings from the Viking Age and the Middle Ages have been found, and there is a suggestion that this was an alternative trading place to Ribe with an embarkment place.

Cities

The two old urban settlements in the region are Ribe and Varde, both located on eponymous rivers. Then there is the more recent and dominant town of Esbjerg, which was formed at the end of the 1800s. The location of all three must be seen in close relation to the opportunity to navigate the North Sea via the deeps which run through the Wadden Sea, notably Grådyb, Knudedyb, Juvredyb and Listerdyb.

Ribe is the oldest city, not just in the region, but also in the whole of Denmark. It started as a market place on the northern side of the river Ribe Å at the beginning of the 700s, but later was moved to the southern side, where the cathedral and castle mound were built in the 1100s. Throughout the Middle Ages, Ribe was the predominant port for the region, and until the quay was built in the late Middle Ages it primarily consisted of a row of anchorages behind the islands of Fanø, Mandø and Rømø. Exports from Ribe included horses, bullocks, fish, salt, grain, butter and salted meat. Among the goods imported via Ribe were cloth and luxury goods from Flanders, Frisian salt and the tuff from the Rhine region used to build the churches. Ribe was also an ecclesiastical center and the seat for the powerful bishop. There were also several monasteries. The impressive twelfth-century cathedral and the well-preserved abbey of St. Catharina dating back to the middle of the 1200s are evidence of the ecclesiastical importance of the town. Royal power was strongly represented by the castle of Riberhus. This was built in the high Middle Ages, but was abandoned around 1660 and later demolished. Today only the castle mound with a few traces of the castle remains.

Up to the 1600s Ribe was one of the most important cities in the country with thriving maritime and commercial traffic. Then the city experienced a sharp decline which did not get any better at the delineation of the border in 1864, under which the city lost a great deal of its southern hinterlands. This economic stagnation, as well as the fortunate absence of fires after the great fire of 1580, is the reason why Ribe still has a very well-preserved town center with a wealth of old timber-framed houses, several dating back to the 1500s. Some buildings are even

older. To mention some: St. Catharina Abbey and cloisters from c. 1400; the Grammar School, where the original core is Puggård which dates from the 1500s; the old Town Hall from the 1520s, Tårnborg from the 1540s, two timber-framed houses which originally belonged to Quedens Gård from the 1580s, Weis' Stue and the modest buildings for ordinary citizens from around 1600. The old Cathedral School from the 1720s is one of the few notable buildings from the lean years of the eighteenth century. Although the architecture is dominated by Renaissance style houses from around 1600, Classicism began to make an impression from around the end of the 1700s, in part through new constructions, but also in the extension of older houses, with facades of brick. The best examples are: The front building of Quedens Gård from 1789, the Prefect's House from around 1800, the current Bishop's Palace from 1801, the old customs house and Pastor Bang's Foundation from the 1830s. A private home from 1864, now housing Ribe Art Gallery, is the best example of historicism in the city.

The main road in Ribe runs along a dam which was built across Ribe Å in the mid-1200s to collect water for the no longer extant mill Kongens Mølle and as a thoroughfare. Other mills were built in the 1500s, of which Midtmøllen and Ydermøllen are still centrally located in the city.

Age, history, the almost unaltered network of medieval streets - which still reveal the original structure of gabled houses - the mill ponds and well-preserved buildings make Ribe absolutely unique and an essential part of the history of the Wadden Sea region.

Varde originally started as settlement by the ford over the river Varde Å in the 12th century. In the Middle Ages there was a bustling maritime trade here, especially for the export of cattle, fish and agricultural produce. The town was also a royal administrative center, and for this reason a castle was built west of the town. Around 1300 it was moved to the rampart, which still exist, south of the town. The oldest known municipal charter is, however, from 1442. At that time Varde was not a particularly large town, rather like a large village. The numerous thatched roofs may well have been a factor in the fires that raged through the town, such as those of 1779 and 1821. As a result of these fires there are few buildings dating from before 1821. There are some, however, notably the medieval church of St. Jacobi, the Kampmann House from the 1780s and the Silasen House from the 1790s.



Fig. 4.3: This house in Grønnegade in the city of Ribe dates back from around 1530. It is a good example of the timber-framed houses from the 1500s. The façade was brick-built in 1848, which is also a typical feature in the development of the timber-framed townhouses. Photo: S. Søndergaard

Other historic buildings include the School of St. Jacobi from the 1850s, the Customs House from the 1860s, the Town Hall from the 1870s, and Jugendhuset from the 1880s.

A problem that Varde shared with Ribe was that large ships could not sail right up to the quays, and so there was a row of embarkment places where the goods would be put aboard smaller vessels which could navigate all the way to the town docks. While there were no buildings of any consequence at the embarkment places in Ribe, such as Hviding Nakke, Rømø and List, the biggest embarkment place at Varde - Hjerting - developed into a town of its own as it in the 1700s became the biggest port in the Danish part of the Wadden Sea. Today, Hjerting has become suburb of Esbjerg. It still contains several well-preserved houses and the pattern of streets and the town structure reflect the importance of the shipping traffic. However, there is no real harbor construction here, as the cargoes were loaded and unloaded at low tide when the vessels lay on the flats. In addition, Janderup should be mentioned. This was a smaller embarkment place on the river Varde Å, and today displays a fine entity of buildings, a church and the river.

Esbjerg grew as a result of the construction of a state harbor between 1869 and 1878, with a railway link to the rest of Denmark. Today the town is an important center for fishing, shipping and the offshore industry. The harbor was princi-

Fig. 4.4:
The city of Esbjerg grew as a result of the construction of a state harbour between 1869 and 1878. Today the city is an important centre for fishing, shipping and the offshore industry. In the centre of the picture lies the triangular basin of the harbour from 1874 and in the background rises the water tower from 1897.

Photo: Fiskeri- og Søfartsmuseet



pally intended for trading with Great Britain, as Denmark had lost its ports in the Duchy of Schleswig after the 1864 war with Prussia. Subsequently the harbor at Esbjerg prospered because of the growth in Danish livestock production, principally because of the establishment of dairy co-operatives and the increase in international trade.

Soon, the fishermen from the nearby coastal area moved in and created the basis for a fishing port. Extensive seine fishery for plaice developed, and attracted several service companies, workshops and engineering companies to support the fishing fleet. As the establishment of the harbor created greater growth than anticipated, in 1870 a town plan was drawn up which included a checkerboard pattern of streets which remains outstanding in newer Danish town planning. The town contains a number of notable buildings of a style characteristic of the time around 1900. Many of them are protected. Examples are the Water Tower, the Customs House and the Old Court House, from the 1890s, the station from 1904, the Mission House from 1906, the Post Office from 1908 and several residential buildings from around 1900.

Other activities

The coastal area is principally agrarian, except for the town of Esbjerg, where the suburbs and allotments stretch right up to the recreational area of Marbæk, with its plantations and heathlands. The coastal stretches are at several places characterized by bunkers built during Second World War. The bunkers were part of the German

coastal defense for which Esbjerg was one of the pivotal nodes in Denmark.

In the past the salt marshes in particular were used to graze bullocks, which were then either taken south or shipped from Ribe to end up in Dutch markets. This trade brought a great deal of wealth to the region. In the seventeenth and eighteenth centuries, however, there was a general economic decline in the region which hit the largest city, Ribe, particularly hard. Once been the center of cattle trading, it suffered during the recessions which started in the mid-1600s.

Before this time, fishery had also been of great importance to the region. The heydays were from the 1200s to around 1600, when it fell off drastically. Sønderside at the old coastline between Ho and Oksby, was one of the biggest fishing villages in South-west Jutland, along with Nordby and Sønderho on Fanø. In the season it had up to 1000 inhabitants. In 1581, 60 boats from Sønderside were involved in fishery, and the place acted as an embarkment place for Varde. The great storm flood of 1634 destroyed the village, and even today its exact location is not known. The place name of Havnegrøften, which means "harbor trench", testifies to the existence of Sønderside, and it is presumed that this marks the old coastline.

4.2.3 Rejsbymarsken, Ballummarsken and Tøndermarsken

Historically this region was part of the Duchy of Schleswig, with the exception of the royal enclaves which have always been Danish. The Duchy used to belong to the Danish King, but after the war in 1864, the King had to cede the area to the victorious Prussians. The new border followed the river Kongeå, but at the eastern and western extremities adjustment was made for the royal enclaves, which meant that the area around Ribe came under the Kingdom of Denmark. With very few exceptions, this is the current boundary between the Counties of Ribe and Sønderjylland. Thus the region was under Prussian administration from 1864 until the delimitation of the border in 1920, when it voted in a referendum to become Danish. It is important to keep the shifting border in mind when looking at the history of the region.

Landscape

In contrast to the region to the north, the marshlands here are wider and settlement took place on man made mounds in the marsh. Several watercourses transect the three marshlands of the sub-region, Rejsbymarsken, Ballummarsken and Tøndermarsken. At the northernmost point Rejsby Å meanders towards the dyke, while Brøns Å further to the south has been mainly straightened. This is also true of the two largest watercourses in the sub-region, Brede Å and Vidå. Unlike Brøns Å and Brede Å, Vidå was originally not straightened for drainage purposes, but to make it easier to sail to Tønder. One demonstration of this is that the lock at Højer was built in 1861 to allow passage. All the other watercourses mentioned flow into the Wadden Sea through ordinary sluices, all of which were constructed in the period 1915–25. As part of the drainage of Tøndermarsken in the 1920s, a dyke was built along the river Vidå which, at the same time, was straightened in many places.

The most remarkable area is the marshland of Tøndermarsk, which is now partially protected. Here some of the oldest dykes on Danish soil can be found. The landscape is characteristically flat, with channels that served both as boundaries, which previously had to be crossed with poles, and for transport, carrying the flat-bottomed marsh boats. The polders at Tønder, Møgeltønder and Højer were all embanked with the construction of the Højer-Rudbøl-Lægan-Grelsbøl (now in Germany) dyke in 1556. The effect of this was

that the old harbour town of Tønder was cut off from the sea, although sailing was still possible on the river Vidå.

In subsequent centuries new embankments were built regularly, moving the coast and the course of Vidå further and further west. Gammel Frederikskog was embanked in 1692, Rudbøl Kog in 1715, Ny Frederikskog in 1861 and finally Margrethe Kog in 1981. Although all the polders are part of the same development, each reflects the various periods of exploitation of the embanked land. Behind the first embankment from 1556, the field structure is typical of the medieval irregular division of the land. This is largely due to the old ditches which determined the division of the fields. The polders of 1662, 1715 and 1861, in contrast, typically show very regular divisions of pastures after embankment. Division into pastures made it easier to share the land between the parties involved. The polders were embanked through a charter, which was a contract for embankment tendered by the king. The group who won the tender could invest money in building dykes and in return be granted a piece of land in the new polder which they could rent out. This meant that the owners and the users of the marshlands were separated and that the areas were kept for pasture. The pattern of ownership can still be seen today from the gates, which often carry the name of the owner of the land.

The most recent polder, from 1981, shows a still different form of exploitation of the land. The main purpose of the polder changed from being a way of bringing more land into use to being a way of protecting the inward lying land, and also for nature conservation. The usage of these areas through grazing of larger parcels of land as well as the creation of a reservoir for inland water - which also benefits several species of bird - results in a landscape quite different to that of the polders behind. In addition in the southern part of the polder a saltwater lake has been created to preserve marine conditions.

The whole area of Tøndermarsken is characterized by the drainage work that took place between 1925 and 1928. The landscape was altered considerably by the creation of an embankment along the Vidå river and the introduction of pumping stations, while at the same time the old windmills previously used for drainage disappeared. Most recently, a unique conservation project on the outermost polders of Tøndermarsken attempts to manage the devel-



Fig. 4.5:
One of the many preserved
burial mounds near Hjerpsted north of the town of Højer.
Photo: Carl Christiansen

opment in such a way that many of the older characteristics, such as grazing, are preserved.

Equally characteristic of the sub-region is the extensive bogland east of the old moraine land of Hjerpsted. The inhabitants of Ballum, Koldby, Hjerpsted and Sønder Sejerslev dug peat here, as this was an important fuel in a landscape without woodland. A large section of the bog, Skast Mose, was drained beyond recognition in the 1960s, whilst Kogsbøl Mose, to the south, has kept many of its properties as a place for peat excavation.

In the early decades of the twentieth century the northern coasts of the region were also embanked, except the stretch from Emmerlev in the south to Koldby in the north, where the geest extends right out to the coast. The polder Møgeltønder Kog has two of the three known wheels in the Danish part of the Wadden Sea region. A wheel is a deep waterhole behind a dyke created when the dyke is breached in a storm flood.

Settlement

Just as in the more northerly region of the Wadden Sea, this sub-region is characterized by many settlements on the edge of the geest. The region shows a pattern of a transition from the entirely undeveloped and late embanked Rejsbymarsk, through the early built on and - with the exception of a low summer dyke - late embanked Ballummarsk to the Tøndermarsk, which was built on and embanked early. Hjerpsted Bakkeø (old moraine) lies between the two latter marshlands. Here there is evidence of habitation from

the Stone Age to the early Middle Ages. The southern part of the old moraine is particularly densely covered with burial mounds, bearing witness to prehistoric habitation. A number of villages from the Old Iron Age have been excavated at Hjemsted, on the edge of Ballummarsken. The finds are on display in a museum on-site.

During the Middle Ages the inhabitants moved from the geest to the marshlands. On Ballummarsken, in the first instance, building took place on small moraine outcrops such as Mjolden, Lunde and Forballum. The later construction shows a change to using man-made mounds, which artificially elevated natural hummocks. Furthest out in Ballummarsken, the village of Misthusum also shows evidence of early habitation. Misthusum is the most northerly settlement on man-made mounds in the entire Wadden Sea region. Here in the Middle Ages eight mounds were created, each with its own farm, as well as a summer dyke to protect against the less severe storm floods of that season. However, these were nowhere near strong enough to withstand the big winter storm floods, and the village was inundated several times. In the eighteenth century, people started to move onto the geest, and in 1814 the last family left Misthusum. All that remains now are the ruins of the summer dyke and the eight mounds, on most of which are the remains of the freshwater reservoir essential to survival.

The Tøndermarsk is the northern part of a large connected marshland extending deep into Germany. This part of the Danish section is mostly reminiscent of the German and Dutch parts. The marshland was so big that as early as the Middle Ages people lived on dwelling mounds on it. This is especially true in the part called Ved Åen, where ten farms are located on mounds above the levees set up along the old course of Vidå through the Møgeltønder polder. The farm at Vester Anflod, the westernmost in this group, perhaps bears witness to the old village of Andaflyth, which was destroyed in a storm flood in the Middle Ages. In comparison to the rest of the Wadden Sea region, though, the mounds are both small and recent, for the most part only large enough to support a single farm. In the Danish part it is quite exceptional to have these 40 or so mounds within a relatively limited area. Many of the mounds are no longer inhabited, but remain as proof of mankind's eagerness to exploit the fertile soil.

To increase the "Germanness" in the principally Danish-minded area, the Prussian government began to buy up larger farms in 1896. The farms were often expanded through purchases. These state-owned farms were leased on very favourable terms to German farmers, who, in return, were expected to take political and cultural initiatives to increase the Germanness of the region. Most of these state-owned farms are to the east, and there are only a few in the Wadden Sea region. One such is Røj at Møgeltønder, which was bought by the Prussian state in 1903, and where the recent main buildings date from 1916. Later the farm was bought by the oldest and biggest estate in the sub-region, Schackenborg.

As well as the royal castle in Tønder, there used to be several private manors in the region. This is particularly true for the area around Højer and Tønder. In the parish of Emmerlev there were no fewer than three manors, which were all situated on the eastern side of the old moraine land at Hjerpsted down to Sejersbækken. The most notable manors in the sub-region, though, were Trøjborg and Schackenborg. The history of Trøjborg can be traced back to the 1300s, but all that remains today are the picturesque ruins of the Renaissance building, which was demolished in the 1850s. The farm buildings from the 1700s and the rampart have been preserved, and give a good impression of the construction of the manor in the seventeenth and eighteenth centuries. By contrast, the main building at Schackenborg is very well preserved, but it lost its farm buildings as early as the 1700s. The castle was known as "Møgeltønderhus" back in the thirteenth century, when it belonged to the bishopric of Ribe. In the fifteenth century, the estate was annexed as a Danish enclave in the Duchy of Schleswig and, with the rest of the episcopal estate it went to the crown during the Reformation. The royal general Hans Schack was given the estate in 1661 by the Danish king as a reward for long and loyal service. In the 1660s he commissioned the current main building. The previous outer wall is still a part of the south wing. The current appearance of the main building, with its hipped roof and the rococo ornamentation on the side wings is the result of work in the 1700s. Schackenborg is currently considered one of the most authentic examples of a manor from the seventeenth and eighteenth centuries, and the street Slotsgaden, which leads from the castle down towards Møgeltønder is quite unique with an extraordinary number of

typical and well-preserved houses from the eighteenth and nineteenth centuries. These were built by the owners of Schackenborg both to strengthen commerce and crafts in the town and as living quarters for the estate workers.

Style of building

Brick-built farm houses became usual in the region around 1700, and no entire timber-framed farm building from before that time still stands. In the region, as further to the north, there are four-winged farms which are "inside out". However, The Frisian style, where the stalls and the living quarters are in the same wing but divided by a crossways hall, is found here much more than it is further to the north. The layout of this type of farm is very variable. There are four-winged farms built around a small courtyard, which, as in South-West Jutland, were for peo-



ple only, but the many farms have two parallel wings connected by shorter wings. Although the agrarian buildings in the sub-region were influenced by contacts with Frisia the characteristic types of farm such as Haubarg or Saxon house (Fachhallenhaus) are not traditionally found in the area.

The farms are built of dark red brick and have hipped thatched roofs. Above the main entrance is the characteristic gable with a hatch - the arkengaf - which in this area and further south takes the form of a gabled attic. Often the non insulated houses are tiled inside.

In some of the houses on Tøndermarsken dating from the 1700s, behind the outer brick wall, roof-bearing posts have been preserved. This could be interpreted as a desire to keep the old-

Fig. 4.6:
The protected farm Hjemstedgård dates back to around 1800, but was rebuilt 1850. The farm is a good example of the Danish West Schleswig building style.
Photo: John Frederiksen

er type of construction in areas threatened by storm floods, which would remain standing and offer a means of rescue should the water volume push down the walls.

In the latter half of the 1800s, agrarian architecture, also in this sub-region, was distinguished by the use of new materials and the reaction to this at the start of the 1900s through the movements *Baupflege* and *Bedre Byggeskik*. As the people of *Bedre Byggeskik* sought the traditions of "the Danish house" they looked towards the West Schleswig style and found that the style of building in *Møgeltønder* was an exemplary model.

The churches in the region are almost exclusively Romanesque from the twelfth and thirteenth centuries. This includes *Brøns* church, one the largest Romanesque village churches in Denmark and also the best preserved tuff church in the County of *Sønderjylland*. *Emmerlev* church is also large, and on the edge of the geest, but is in a solitary location next to an inn between the larger villages of the parish, *Sejerslev*, with the old manor of *Kærgård*, and *Emmerlev*. The tall spire on the tower has served as a landmark for sailors.

The churches of the region are generally bigger than those immediately to the east and are typical expressions of the wealth which the parishes along the marshlands enjoyed in the Middle Ages.

Cities

The region has only one city *Tønder*, which has many old, well-preserved buildings and streets. The town is first mentioned around 1130, and is situated on the edge of the geest by the largest marshlands in Denmark. It presumably started as an anchorage and embarkment place at the bottom of *Vidå*, which was accessible even to larger ships. At that time the village of *Møgeltønder* ("Great *Tønder*") was the real *Tønder*. *Tønder* was awarded a charter in 1243, but the castle of *Tønderhus* had already been built some years before. The extensive work on embankments and land reclamation in the middle of the 1500s cut off access to the sea, and so *Tønder* lost its importance as a port. Nonetheless it continued to be an important trading centre, especially for grain and cattle, which brought wealth to the city. Later, trading in lace became very important for the economy of the city, meaning that *Tønder* continued to be a significant trading centre right up to the beginning of the 1800s.

The previous town layout, with its narrow gables and the resulting structure and buildings still dominates the town. There are still timber-framed buildings in the town, but many of the facades are clad or in bare brick. Bay windows and portals set in two gated doors are typical. While there are few remains of the old castle, *Tønder* has preserved several of the stone houses from the sixteenth and seventeenth centuries. The oldest, apart from the church, is the large grey gabled house on the market square from the mid-1500s. The partially rebuilt mill *Slotsmølle* is from the 1590s, the grammar school from around 1610, the Town Hall from the 1640s, the large apothecary from the 1660s, *Drøhshes House* from the start of the 1670s, the hospital from the 1720s, the Prefect's House from the 1760s and *Digegrevens House* from 1777. In addition there are a number of less distinctive, but nonetheless well-preserved buildings from the eighteenth and nineteenth centuries which all contribute to the special character of the town.

When *Tønder's* access to the sea became difficult, due to the construction of the dykes, *Højer* became the cargo harbor for *Tønder*. In 1736 *Højer* was granted a royal charter for commerce and craftwork thus becoming a so-called *flække* (market town), a type of town particular to the Duchies of Schleswig and Holstein. There were larger villages which had been given certain rights to conduct business and craft trades. In *Højer*, however, most people lived from seafaring, agriculture, oyster fishing and cattle trading. From the end of the 1700s the town was afflicted with stagnation due to a drop in the market for bullocks as well as the war with England from 1807-14 and the subsequent crisis. Several attempts were made to revive trade, with little success. Still today many well preserved and protected buildings testify to the town's status as a market town. These include the high medieval church, the vicarage from the 1700s, the merchant's house and *Kier's House* from the 1760s and the mill from the 1850s.

Other activities

Much of the economic activity in this region has been the same as that in the northern marshland areas, that is agriculture, cattle trading, fishing and seafaring. Today, agriculture, especially rearing cattle and sheep, dominates the landscape. The extensive stone stable at *Solvig* manor, which dates from 1585, is an expression of the huge importance of the cattle trade in the past. In all probability it was used to house the

numerous bullocks over the winter, before the spring when the livestock would be sold to a trader.

Access to the sea, and thus seafaring, became much more difficult with the embankments. When the first dyke was constructed, a sluice was built at Lægan, but this was soon moved to Rudbøl when the polder Guds Kog was embanked in 1566. Seafaring was still important for Tønder, and in 1611 a canal was dug through to the town to allow passage for smaller vessels. Larger ships put to and were unloaded off Emmerlev. The sluice was moved again, to Nørremølle with the 1715 embankment and finally in 1861 to Højer, which had long operated as a harbour. The Vidå sluice in the 1981 projecting dyke does not allow passage and thus signals the very end of seafaring for the Tønder region.

A peculiar industry in the region was the production of lace. The lace industry started slowly in the 1500s, and reached its peak at the end of the eighteenth century. The big farmers and the merchants of Tønder employed several thousand women and children in the rural areas around Tønder who produced laces in their own homes.

4.2.4 The Danish Wadden Sea islands

The Danish Wadden Sea islands are the most northerly in the chain along the Wadden Sea. From the north, they are Langli, Fanø, Mandø and Rømø. Jordsand, which used to be the most southerly in the Danish Wadden Sea and was the only hallig in the region, vanished into the sea at the end of the 1990s. The most northerly island, Langli, has been uninhabited since the start of the twentieth century, when it was abandoned after several storm floods ravaged the scarce fertile land. The Danish State bought the island in 1982, and has established a field station there.

At low tide it is possible to walk or drive over the seabed to Mandø and Langli, and it is possible to drive to Rømø across a dam. There are ferry links from Esbjerg to Nordby on Fanø.

Thus there are three inhabited islands in the Danish part of the Wadden Sea, and habitation can be traced back to the thirteenth century. Frisian influence is especially visible in the style of building, but the Frisian language is not spoken on any of the Danish islands.

The churches on the three islands are generally more recent than in the other sub-regions. On Fanø, Nordby church dates from 1786 and Sønderho church from 1782. Mandø church was

built or renovated in 1727, and the porch dates from 1792. However, Rømø church was originally a late medieval brick-built church, which was considerably extended in the seventeenth and eighteenth centuries.

On all the islands, the women took care of the farms when the men went to sea. The islands have always had better links to the mainland to the east and the world to the north, south and west than to each other, and the development of each island has to be seen in the context of its links.

The islands have five of the 75 rescue stations set up in Denmark after the formation of the Danish Rescue Service in 1852. The stations, identified by their green doors with two Danish flags, were manned by volunteers. Four of them are protected.

Fanø

Fanø is today primarily a tourist economy. Seaside and hotel tourism started to develop at the end of the nineteenth century on the northern section of the west coast of Fanø. There are still some well-preserved summer cottages from this time. In the period 1957-1961 there was a considerable expansion of the holiday home areas. The west and north coast of Fanø also has a lot of bunkers built during the Second World War.

The attractive skipper towns of Nordby and Sønderho show signs of the development in the eighteenth and nineteenth centuries when the island was the home for an unusually large fleet of ships which undertook long voyages. With the flourishing of seafaring, the towns developed a special, densely populated maritime character with a typical architectural style, narrow lanes and slipways, as well as institutions linked to

Fig. 4.7 : Timber-framed house from Nordby on the island of Fanø. It dates from the eighteenth century and represents the time before brick-building became dominant. Photo: S. Søndergaard



shipping. Sønderho is the better preserved, whereas Nordby is the livelier because of the ferry link. Both towns are typical skipper towns, of which there are only a few in Denmark. These towns were not given municipal charters, but nonetheless have an unmistakable town feel. Traditionally, Sønderho looked to Ribe, while Nordby looked to Varde and Hjerting; a situation which shows that contact over the sea was often more important than that over land.

The houses on Fanø were single blocks, with the animal stalls at one end and the living quarters at the other, divided by a transverse hall with a hatch over the door. The roof was thatched, but unlike on the mainland, the gables were entirely boarded. Frisian and Dutch influence can be seen not just in the colors of the woodwork and the painted lintels over the doors and windows, but also the interiors, for which wall tiles were imported in huge quantities during the first period of the growth of shipping from Fanø at the end of the eighteenth century.

The war with England (1807–14) put an end to the good times for seafaring at first, but from the 1840s it recovered and by the end of the nineteenth century the fleet at Fanø was one of the biggest in Denmark. Then the shipping collapsed in the face of competition from steamers. By 1905 the fleet was down to half its previous size, and the last of Fanø's large ships was sold in 1919. Once Fanø's role as a sailing community was played out, only a small amount of local traffic remained. One of the vessels used was the traditional Wadden Sea ewer, which was used to transport goods in the region from the new large harbor at Esbjerg. Although the seafaring era is history, there is still sailing instruction on Fanø and many sailors live on the island.

Before the rise in shipping in the eighteenth century, the main livelihood on Fanø was from agriculture and fishery. Sønderho and Nordby were two of the biggest fishing hamlets in the sixteenth and seventeenth centuries, and the rural settlements were to the south of the current site of Nordby. While no traces remain of the fishery, the structure of the agriculture can still be seen in the landscape around Nordby. Examples are the pastures north of Nordby and the roads to them, the old fields on the outskirts of Nordby, and the fields, salt meadows and heath south of Nordby where the original villages were situated. The only duck decoys in the Danish section of the Wadden Sea can be seen on the east of Fanø. Four have been preserved and two restored. These traps were constructed

in the 1860s and were used to catch ducks, until they were banned in 1931.

Mandø

Mandø is the only island in the Danish Wadden Sea protected by a dyke, which extends around the whole island except for the dunes on the west coast. The buildings are concentrated in a small town, which is protected against the sea to the west by dunes. In the town there are a small white-washed church which was built or renovated in 1727, a windmill constructed in 1830 and altered in 1860 to supersede a post-mill, the inn in the previous community center and the rescue station built in 1912 after a shipwreck in 1911 in which several people perished. There is also a museum set up as a nineteenth-century captain's home.

The only way to reach the island is over the seabed at low tide. The point of arrival is Gammel Mandø ("Old Mandø"), which was the site of the town and the church until the inhabitants were driven out by the storm floods. When the island is first mentioned, in the thirteenth century, the town was in the northern part of the present island, but around the mid-1500s it was moved to its current location in the lee of the dunes. The nearby land was cultivated, and was protected by a summer dyke made of seaweed around 1830, called the Toftegård Dyke. The first proper sea dyke was built in 1887 and protected a larger acreage against flooding. This dyke incorporates a støpe - a passage through the dyke which can be closed up with planks and sandbags in the event of a storm flood. The dyke has been breached several times by storm floods, for example in 1911 and 1923, which created a wheel at the eastern section. Because of the vulnerability of the dyke, and to protect the land beyond the old dyke, from 1935 to 1937 the current dyke, the ring dyke, was constructed. It was this dyke that united the two parts of Mandø and made them one island.

Rømø

Rømø has no particular towns. Instead there is a long row of small villages along the east coast. Here they lie in the lee of the dunes which stretch from north to south. The island has a complicated history of ownership, at times having been divided between Germany (the northern part) and Denmark (the southern part), at times entirely German, and today entirely Danish.

Tourism is very important for Rømø today, and this was boosted by the construction of the

causeway out to the island in 1948. As early as 1899 the Reverend Mr. Jacobsen from Skærbæk did a lot to attract tourists by building a trackway between the bathing spots at Lakolk and Kongsmark, on which the carriages were pulled by horses. From Kongsmark ferry connections were established to the mainland. There was an attempt to encourage "mass-tourism" and several of the summer cottages built with this in view still stand at Lakolk. In 1964 a fishing harbor was built at Havneby to generate commercial opportunities on Rømø. Today it is the center for the most extensive shrimp fishing in Denmark, and is a transit harbor for German and Dutch shrimp vessels. It is also important as a ferry berth for the route to List on the island of Sild.

At the end of the nineteenth century, Rømø was a depressed agricultural society with a resulting depopulation, but before that time the sea had been very important. Until the end of the sixteenth century, Rømø combined fishery and agriculture. Subsequently, trading in partnership with merchants from Ribe developed as a new commercial sector, and from around 1630 seafaring, combined with oyster fishing in the winter, dominated the commercial scene.

The Swedish occupation of Rømø in 1644 marked the end of the zenith in Rømø's own shipping commerce, and the inhabitants supported themselves through a combination of agriculture and small scale fishing, oyster fishing, sea trade and voyages to Greenland. A large number of the male population worked with whaling from Hamburg and the Dutch ports, and many became captains aboard whalers. At the peak, in 1770, there were 30 whaler captains from Rømø. This period is reflected on the island by fences made of the jawbones of whales and the monuments to the captains in the cemetery. This prosperity also resulted in a number of "Captain's Houses", one of which is now owned by the National Museum. In fact this one is not typical of the captains' houses, but it exhibits a lot of Frisian qualities, including the ornamented stones in the brick lintels and the abundance of wall tiles in the kitchen and living rooms.



Fig. 4.8: Captain's monument in the cemetery on the island of Rømø. It reflects the period where many inhabitants of the island participated in whaling from Hamburg and the Dutch ports. Some became captains and monuments were erected of their deeds. Photo: John Frederiksen

4.2.5 Characterization of sub-regions

Vardeådal, Sneumarsken and Ribemarsken

Traces of the settlement of prehistoric time have been found on the geest bordering the marsh areas. The landscape today is characterized by the many preserved burial mounds, such as those north of Hjerting. In the city of Ribe archaeological excavations have revealed traces of market activities as early as the beginning of the 8th century.

The most important building of the sub-region is the cathedral in Ribe from the 12th century, and its value is heightened by the context with the rest of the very well preserved town by Ribe Å and the marsh areas. Most of the parish churches dates back to the 12th and 13th centuries. Typically they are whitewashed and roofed with lead - often containing tuff stone.

The marshlands of this sub-region show a transition from the most recent paludification at the east of Skallingen in the north, to the older, undeveloped, marshland by Ribe in the south. The Varde Å river to the north debouches directly into the sea without regulation from sluices or dykes. South of this the old moraine land stretches right out to the Wadden Sea. Charac-

teristic for the sub-region is that nowhere is the marshland so wide that it has been necessary to settle in the marsh. Consequently the old settlement is found on the geest. Here many villages can trace their history back to the Iron Age. The major sea dykes are all from the 20th century and some of the marsh areas have never been embanked.

Many villages still lie along the edge of the geest. The town of Ribe is beautifully situated on the rim of the Ribe marsh. Traces of the old borders between the kingdom and the duchess of Schleswig can still be found in the landscape

Rejsbymarsken, Ballummarsken and Tøndermarsken

In this region too, all the finds from prehistoric times are on geest. The visible remains are the burial mounds, and especially the southern part of the old moraine is densely covered with them.

The old town of Tønder and the large village of Møgeltønder have many beautiful old houses. Both here and in the countryside good examples of the influence from the Frisian areas can be found. The castle of Schackenborg has a very well preserved main building mainly from the 18th century. The churches of the sub-region are mainly from the 12th and 13th centuries.

Settlement on the edge of the geest is typical, but as the marsh areas in this sub-region are wider than in the northern sub-region settlement also took place on man-made mounds in the marsh. Though dwelling mounds are typical of the Wadden Sea Region as a whole, there are relatively few in Denmark and very characteristic of this particular sub-region. Also the polders are unique in a Danish context. In the Tønder Marsh the oldest dykes on Danish soil can be found around the polders Tønder, Møgeltønder and Højer, constructed in 1556. The most recent polder is from 1981.

The typical landscape here is the wide marsh areas. The landscape in the Marsh is flat, with channels that were used for boundaries, drainage and transportation. Visually there are still great differences between the irregular ditches of the old polders from 1556 and the regular patterns of the younger ones.

The Danish Wadden Sea islands

On the Danish Wadden Sea Islands there are very few finds from prehistoric times and the early history of the islands is not very well known. The settlement of the three inhabited islands can be traced back to the 13th century.

Only the church on Rømø dates back to the Middle Ages. On Fanø and Mandø the churches are all from the 18th century and they are thus recent in comparison to the churches on the mainland. Especially Fanø and Rømø have a lot of well preserved farms and skippers' houses from the 18th and 19th centuries showing beautiful examples of Frisian building style. The islands bear witness of seafaring of past centuries, of which the skipper towns of Fanø are very good examples. On Rømø whale bones can be found used as fences as a reminder of the heydays of whaling and at the cemetery there are monuments to the captains.

The two biggest islands have a small rim of marshland to the east while a large part of the rest is dunes. Two of the Danish Wadden Sea islands can best be reached by walking over the seabed at low tide.

On the west coast of Fanø and Rømø there are wide sandy beaches which attracted the tourist industry at the end of the 19th century.

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Fig. 4.9:
The lighthouse Blaavand Fyr at Blaavands Huk marks the northern boarder of the Wadden Sea. It was founded in 1888 and got its present appearance in 1920. It lies in a area characterised by numerous dunes, which form a stark contrast to the marshland areas.
Photo: Svend Tougaard



Fig. 4.10:
Varde Å is the only larger watercourse in the Danish Wadden Sea area that debouches directly into the sea without any regulations from sluices or dykes, and so provides an impression of how the other watercourses used to debouch unimpeded into the sea. In the background Ho Bugt and in the foreground the village of Tarp right on the edge of the geest overlooking the marshlands.
Photo: Svend Tougaard



Fig. 4.11:
The Romanesque church in the village of Vilslev lies on the edge of the geest close to the watercourse Kongeåen, which used to mark the border between the kingdom of Denmark and the duchy of Schleswig. The church is seen from the hamlet of Vilslev Spang, which grew up around a custom house and an inn.
Photo: Mette Guldborg

Fig. 4.12:

Ribe is the oldest city in Denmark and used to be the predominant port for the region. It is very well preserved with a wealth of old timber-framed houses, several dating back to the 1500s. It also contains the cathedral from the 12th century, which is the most important single building of the region.

Photo: John Frederiksen



Fig. 4.13:

The rescue station near Blaavands Huk was built in 1851 and used until 1975.

Today it is a museum.

Photo: Varde Museum



Fig. 4.14:

Jugendhuset in the city of Varde is a remarkable house in Jugend style. Originally it was a typical townhouse built in 1887

and it only got its present appearance after a rebuilding in 1901. It is now protected and a part of the Museum of Varde.

Photo: Varde Museum



Fig. 4.15:

The bunker at the Tirpitz-position near Blaavands Huk was built during World War II as a part of the German coastal defence. It was never finished and today it serves as a museum, telling the story of the defence wall along the Danish west coast.

Photo: Varde Museum

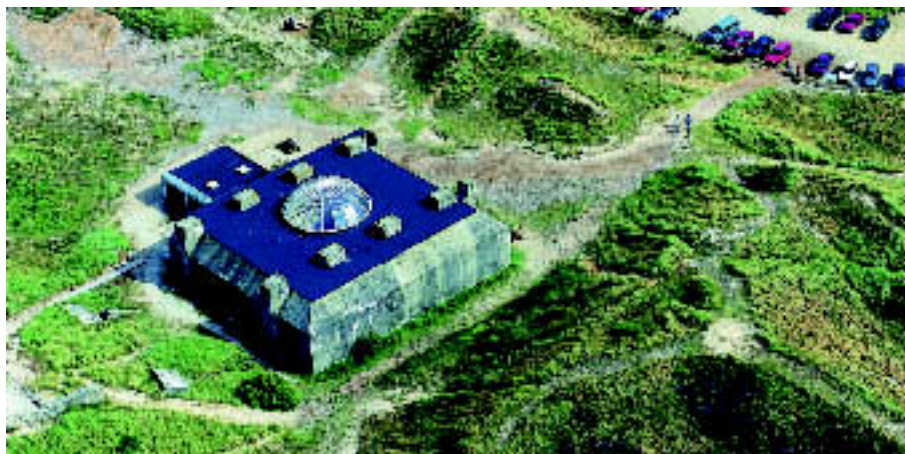




Fig. 4.16:
The villages of Vesterende and Østerende Ballum lies as a string of farms on the edge of the geest overlooking the Ballum Marsh. This is a good example of the many villages on the edge of the geest. The sea dyke was built in 1919 and stretches from the vil-lages to Astrup Banke 10 kilometres further north.
Photo: John Frederiksen



Fig. 4.17:
The two pumping mills in Ballum Enge illustrate how mills were used to provide fresh water for the animals in the marsh. The mills are reconstructions built on their original place.
Photo: Carl Christiansen



Fig. 4.18:
Slotsgade in the town of Møgeltønder is a unique row of houses erected by the count of Schackenborg. The first houses were built in the end of the seven-teenth century for the employees on the manor and the local craftsmen.
Photo: John Frederiksen



Fig. 4.19:
The protected farm Sødram lies on a dwelling mound in the polder Møgelønder Kog. It dates back to the seventeenth century and was rebuild in eighteenth century.
Photo: Carl Christiansen



Fig. 4.20:
The church in the village of Brøns is the largest village church in Denmark and at the same time one of the best preserved church made of tufa. The size bears witness of the great wealth that was to be found in the parishes along the marshlands. The church also contains exceptional fresco paintings from the beginning of the sixteenth century.
Photo: Carl Christiansen



Fig. 4.21:
The street Uldgade in the city of Tønder is a example of the many well preserved buildings in the city. Tønder started as a embarkment place, but due to the embankments the city now lies 10 kilometres from the sea.
Photo: Carl Christiansen



Fig. 4.22:
The lock at Højer was built in 1861 and allowed ships' passage to the harbours inside the new dyke.
Photo: Carl Christiansen



Fig. 4.23:
The only way to reach the island of Mandø is by the seabed at low tide. The picture shows Mandø Ebbevej, the tidal road to Mandø.
Photo: John Frederiksen



Fig. 4.24:
The island of Mandø is first mentioned in the thirteenth century. In the mid-1500s the town of Mandø was moved to its current location. The small white-washed church was built or renovated in 1727.
Photo: John Frederiksen



Fig. 4.25:
This rescue station on the island of Rømø was built in 1886 and is one of the five stations on the Danish Wadden Sea islands. In the background lies the medieval church.
Photo: Carl Christiansen



Fig. 4.26: The well preserved skipper town of Sønderho is situated on the southern end of the island of Fanø. The special architectural style and narrow lanes is due to the flourishing of seafaring in the eighteenth and nineteenth century. Photo: Svend Tougaard



Fig. 4.27: This house from Sønderho on the island of Fanø is a typical example of a brick-built house from around 1800. Photo Steffen Søndergaard



Fig. 4.28: The whaling also resulted in a number of "Captain's Houses" on the island of Rømø. The picture shows Kommandørgården from the mid-1700s, now owned by the National Museum. Because of its size and ground-plan, it is not a typical captains' house. However, it exhibits a lot of Frisian qualities, including the ornamented stones in the brick lintels and the abundance of wall tiles in the kitchen and living rooms. Photo: John Frederiksen

4.3 Schleswig-Holstein

4.3 The Schleswig-Holstein Wadden Sea Region

by Ellen Bauer, Ludwig Fischer, Hans Joachim Kühn, Matthias Maluck & Dirk Meier

4.3.1 Landscape and cultural heritage

4.3.1.1 Introduction

The North Sea coast in Schleswig-Holstein has preserved a unique landscape and cultural-historical heritage down to the present day. Scarcely any other region in Europe has seen the transformation of its land so profoundly affect its history. Entire swathes of settled marshlands were inundated in the 14th century and the sea constantly reshaped the coastline up to early modern times. The North Sea coastal area of Schleswig-Holstein comprises many regions: Dithmarschen, Eiderstedt, the North Frisian Wadden Sea with its islands and „Halligen“, and the North Frisian mainland marsh. Each of these regions has preserved a rich and varied cultural-historical heritage.

In Dithmarschen the old sea marsh and its village mounds with their churches, marketplaces and harbors have provided focal points for village life since the 12th century. These village mounds date back as much as 2000 years. Mounds like the ones of Wesselburen and Wöhrden with their characteristic churches are visible attractions on the open marsh landscape. In the Middle Ages these villages took part in North Sea trade as part of a maritime cultural landscape. To the east of the sea marsh and its village mounds long rows of settlements ranging across the formerly moor-like flatland marsh were settled by clans and formed into cooperative societies which maintained independence until around 1559. The early marsh to the west of the mediaeval dyke was enlarged by the construction of dykes dating from the 17th century. Straight lines of dykes characterize the landscape here.

There is more frequent variation of landscape in the north of Eiderstedt than is found in Dithmarschen. The visible remains of mediaeval ring dykes with large and small mounds lying scattered about, some with old Haubargen (square, multi-storey buildings) are suggestive of how this area once formed an island-like sea marsh traversed by tidal gullies. The middle section of the peninsula is occupied by elongated rows of settlements consisting of indi-

vidual farmstead mounds. Old village mounds, which were the center of maritime trade, lie along the Eider river.

As was the case in Eiderstedt, Frisians migrated to the north Frisian Utlande in the 8th century and again in the High Middle Ages, bringing their own culture with them – though there are no historical records providing knowledge of the immigration. The North Frisian Wadden Sea with its islands and the Halligen make for a unique landscape whose natural and cultural histories are closely and fatefully bound to one another. The numerous traces of culture found at the mudflats, mounds, wells, fields and paths are the cultural legacy of a drama played out here in the 14th and 17th centuries, when large sections of inhabited land were covered by sea water. The Halligen, unique along the entire North Sea coast, cropped up as small marsh islands over the mediaeval countryside. It is primarily the dwelling mounds which provide protection from the North Sea to the present day. Life at the sea has best been preserved here and, although influenced by new construction and coastal protection measures, has passed on a unique architectural heritage and architectural treasures.



Fig. 4.29:
Old cisterns constructed from dried bricks of peat or clay, Wadden Sea north of Pellworm
Photo: L. Hermansen

The island of Sylt – heavily impacted by tourism – still features significant monuments. Stone Age megalith graves, Early Middle Age ring walls and burial grounds preserve the cultural-historical heritage just as much as the numerous dwelling mounds and the farmhouses built upon them. Archaeological finds and cultural treasures show the far-flung maritime routes of the North Sea coastal area, which in the early modern era profited to a considerable degree from

trade with the Netherlands and whaling. Fabulous wealth appears in the Lilienchron poem, which describes the sunken „Rungholt“. Myths and literature are essential elements of the cultural heritage, which in the following is organized based on regional groupings of landscape and historical settlement monuments and buildings along Schleswig-Holstein's North Sea coast. A treatment of the Wadden Sea follows. Road construction, the infrastructure for tourism, the construction of wind parks and the industrialisation of the economy has transformed the cultural landscape to a high degree and made it into an agricultural-industrial landscape. In the places where the cultural landscape has been preserved over the centuries, this may also be a consequence of the remoteness of some coastal regions.

4.3.1.2 Nordfriesland

General remarks on topology and landscape history

Across the entire Wadden Sea region along the western and southern coast of the North Sea, no other section of coast features the level of variety as does the North Frisian coast between the Danish border to the north and Heverstrom, the sea channel near Eiderstedt, to the south. Three zones, clearly staggered one behind the other, can be observed today: Viewed from the west, the large geest islands of Sylt and Amrum and outer sand banks of Japsand, Norderoogsand and Süderoogsand lie along a virtually straight north-south line with their sandy beaches facing towards the sea. The island of Föhr, set off to the back, appears to be divided in two: a southern section, similar in composition to Sylt and Amrum, and a northern section bearing resemblance to the marsh islands in the actual mud flats. These 'green islands' enjoy the protective line of the outer sand banks. Their appearance is clearly differentiated: the two large, marsh islands of Pellworm and Nordstrand with dykes – the latter in the meantime having turned into a peninsula due to dyke construction – and the many small, Hallig islands („Halligen“) which are fully exposed to the sea. The third zone is the mainland marsh, where a line of outer dykes runs in a relatively straight line between the Hindenburg Dam in the north and Nordstrand in the south, only interrupted by the small „outpost“ of Hamburger Hallig.

This impression of a clear structural arrangement, though varied and in the mud flats area

finely delineated, is the result of a long historical process, which – when considered from a contemporary perspective – only brought about results of significance over the past five to seven centuries. Human activity played at least as important a role as did natural factors in this most recent development.

The clear staggering of the zones mentioned above makes it easy to overlook the fact that the entire area, i.e. islands, mud flats and mainland marshes, was a unified whole from its earliest formation. Its separation into distinct zones today can be attributed to two counteractive processes: Firstly, a partitioning, which ran its course for thousands of years, sometimes in dramatic thrusts caused by influences from the sea and secondly, a „unification“ brought about by land reclamation and protection of this newly-gained land.

The two counteracting processes had varying consequences on these three zones of the north Frisian Wadden Sea area: Expressed in simplified terms, the effects of nature have in recent times „counterbalanced each other“ as regards the geest islands and the outer sand banks. The core of these remains of glacial moraines and alluvial sand appear to have remained fairly constant for thousands of years. However, the massive breaks on the beaches and cliff edges of Sylt show that this does not apply universally to the past few centuries. The constant easterly retreat of the undersea edge just off the shore of the mud flat substratum and the slow migration of the visible outer sand banks towards the mainland make it sufficiently clear that we cannot really refer to this as stability per se. Nonetheless, the dune-covered geest cores of the large islands represent the oldest signs of the geology and the history of human settlement in the north Frisian Wadden Sea landscape.

The loss of arable and habitable land in the area of the mud flats with embedded dyked marsh islands and the Hallig islands (nestled in the space between the protected side of the geest islands or outer sand banks and the mainland coast) has clearly prevailed in the course of the past thousand years. The marsh islands and Hallig islands as they appear today are merely vestiges and far smaller deposits of an area of land divided by large and small watercourses yet, for the most part, as a whole was still very much intact as one geographical unit during the first millennium A.D. These areas, embedded like a flat, elongated bowl within a kind of depression between the – not completely closed – barriers

of the present-day outer sand banks and geest islands to the west and the geest edge of the present-day mainland to the east, for the most part consisted of expansive moors until the Early Middle Ages. The marsh of the Early and High Middle Ages was created through sand and silt deposits caused by repeated flooding arising from more and more frequent incursions by the sea. Due to a combination of severe, catastrophic tidal flooding and continuous erosion, these ancient marshes have for the most part become mud flats or, on the islands and Hallig islands, have been covered as newer marshes formed.

The opposite applies to the third zone, the mainland marshes, as this zone owes its existence to eight hundred years of unending efforts to repel the effects of the sea. The mainland marshes were also a part of the divided and increasingly jagged moor and salt meadow areas between the outer sand banks and the mainland geest. Here, large open areas of grassy flatlands were also gradually destroyed by incursions by the sea, creating an immense number of Hallig islands, peninsulas, spits and foreshores. These areas of arable grassland were gradually secured by dykes, joined to one another, drained, the streams and tidal gullies between them dammed, and areas of solid, silt-deposited mud flats merging to become an extension of the mainland. The North Frisian mainland marsh thus consists of a mosaic of large and small areas of differing age which forms – if you will – a man-made portion of landscape, and a sharp eye can quite easily read the moving story of this unified area of settlement by observing the features of the landscape.

The differing features of the three present-day zones – the geest islands and outer sand banks, mud flats with marsh islands and Hallig islands and mainland marshes – call for treatment in separate sections. The story of how these areas relinquished their unified appearance, the process of division, destruction and being partially joined together by man, also constitutes a part of the region's cultural and landscape heritage.

The Geest islands

The three large geest islands of Sylt, Amrum and Föhr are composed of three main elements, each of which can be easily distinguished: stretches of sand and dunes on the sea side (on Sylt and Amrum these areas sometimes form points resembling spits of land), sandy upland soil much of which was originally covered with heath and small, sometimes larger low-lying areas of

marshland facing the mud flats. The extent of these marshland areas on Amrum is quite small and limited to the silt-covered land on the far sides of the „hook-shaped“ spits protruding into the mud flats in the northern and southern parts of the island. On Sylt, somewhat larger marshland areas have survived in the middle of the island under the protection of the tongue-shaped sand core stretching to the east. For this reason, marshland villages can be found on Sylt. Nonetheless, marshes are actually more characteristic of the scenery on Föhr. An old marsh protected by dykes covers well over half the island and was, until only very recently, virtually uninhabited and cultivated by people from the villages lying on the geest edge.

On Amrum, the sand on the sea side takes on enormous dimensions. However, only a relatively narrow strip lying before the dunes actually belongs to the moraine core of the island. It was only within the last 150 years that most of the sand making up the area known as the „Kniepsand“ was first deposited by the wind and sea into areas resembling spits and then integrated into the island's main body of sand. On Föhr, the sand core is limited to a very narrow, crumbling strip which is constantly worn away by the sea, revealing erratic blocks left over from the Ice Age. And finally, on Sylt, there are raised portions of moraine sand forming cliffs which are constantly being worn away by the sea. As a result of severe tidal floods, the geest core has been weakened to such an extent that the entire island is in danger of being cut in two. By creating extensive offshore sand washes and reinforcing the banks it is hoped to protect what still remains.

As can be seen, the three islands are quite different from one another not only in terms of their geographical form, but also in their „composition“ and the resulting visual effect. Recent changes brought about by man with regard to vegetation, cultivation and, above all, construction have only served to accentuate these differences.

On Amrum, for example, a wooded area adjoins an exceptionally wide belt of dunes. This stretch of forest was planted after 1880 on areas of heath as a result of a forestation program initiated by the Prussian government and, since then, has had a considerable effect on the appearance of the entire island. The „desolate“ appearance of the island which was to be seen well over one hundred years ago has changed considerably since that time. The former large

expanses of heath beyond the dunes, the meagre cultivation of the sandy soil in the east, and the villages (except for the village of Norddorf assailed by the dunes) covering on the eastern edge of the geest core have long since parted. Cultivation of the land, which has long allowed a relatively high yield to be extracted from the geest soil by means of artificial fertilization, has only played a minor part in these changes. On Amrum, several stages of land reform and land allocation have slowly led to „modernization“ of the property and cultivation structure characterized by the division of inherited land into smaller lots.

Forestation efforts on Sylt and Föhr have not played as important a role. In essence, the very narrow shape of Sylt exhibits the same structure as can be found on the island of Amrum, i.e. a moraine core with sections of steep cliffs facing the sea and chains of dunes covering the surface, lightly rolling sandy soil with regions used for cultivation and areas of heath which were originally quite large, and a small adjoining area of marshland. Despite these similarities, these elements are much more sensitive to human intervention due to the lack of space on the island. On Föhr, the development of dunes is quite limited. The specific composition of the island gives an idea of what the structure of settlement in the Wadden Sea area may have initially looked like after the development of sprawling marshland areas. Settlements were concentrated on the geest, especially on the edges of the geest bordering the marsh. The low meadowland, which was in constant danger of being flooded, was cultivated from homesteads located on higher ground.

The Föhr marsh was more than likely a part of the large expanse of continuous salt meadowland which, well into the High Middle Ages, stretched from the geest cores and sand embankments on the sea side all the way to the edge of the mainland geest. According to reports dating back to the 12th and 13th centuries, it was still possible to get from Eiderstedt to Föhr and Sylt without „getting your feet wet“.

Up until the late 19th century, the organization and structure of the landscape on the geest islands was only to a very small extent influenced by human intervention and building efforts which included, for example, dyke construction around the Föhr and Sylt marshes. The historical development of settlements was also to a great extent dependent on the forces of nature well into the 19th century. The relocation

of ports on Amrum and frequent moving of entire villages on Sylt and Amrum to escape the sand of encroaching dune formations attest to this fact.

Today, the geest islands are feeling the serious effects of the growing tourist industry. On Amrum the health resort Wittdün, located on the southern tip of the island, was literally stamped out of the earth in a remarkably short time at the end of the 19th century. Villages on Amrum have been careful to preserve their historical stock of buildings, above all the brick houses with thatched roofs from the „golden era“ during which many men made their fortunes as sailors in the service of others. Nonetheless, in recent decades „renovation efforts“ designed to attract tourists, further construction to fill the remaining gaps and now areas of new development which have been greatly expanded, especially near Nebel, have all completely transformed the appearance and character of these villages.

On Sylt, the characteristic scenery of the area has been affected considerably by the construction of buildings on large portions of the heath and in dune areas due to the development of tourism since the beginning of the 20th century, and in particular, since the sixties. Massive construction projects affecting the infrastructure, for example a train station, airport, streets, parking lots, camp grounds and, especially in the dune areas, a network of paths which in places are quite closely meshed, have all led to a complete transformation of Sylt, leaving the island with the appearance of a well-equipped resort area.

Except for the northern part of the island, the dune belt and the proportionally small areas of land cultivation, the increase in the amount of construction has, for the most part, done nothing but reduce the former open spaces to mere empty gaps between buildings. Natural elements of the landscape dominate only in the north, in the area between Kampen and List and in the List nature reserve, and in the south near Hörnum. The village of Keitum, located on the side of the sand core which begins to give way to the tidal flats, has been able to preserve the essential elements of an old Sylt village. Nonetheless, the village has been „refurbished“ to such an extent that the historical constructions no longer seem authentic.

On Amrum, it is still possible to recognize the historical settlement structure typical of all the geest islands, i.e. the relatively widely-spaced villages arranged in clusters or in a linear pattern

on areas of the geest as well as a few individual buildings, especially on the side facing the mud flats. On Sylt, however, this historical settlement structure today only exists in well-protected areas such as Keitum, Archsum, Morsum and, in part, Munkmarsch.

Among the many villages on Föhr, most resemble the geest villages of Sylt and Amrum with respect to their historical settlement structure. Nonetheless, the settlements located directly on the edge of the geest bordering the marsh are laid out following a pattern best exemplified by Wrixum. Between the main arterial road running along the edge of the geest and a second parallel road leading through the main body of the geest, narrow plots of land are arranged parallel to each other. These conditions all favoured the development of the Frisian longhouse, a type of building characteristic of these villages which takes on a hook-formed shape („a five“) through the addition of annexes needed for farming.

The original structure of some of the villages on Föhr, such as Oevenum, Midlum, Toftum, Klintum and Oldsum, has been well preserved to the present day. Nieblum, which was strongly influenced by the „Frisian houses“ of well-to-do captains and sailors of the 18th century, was already protected at the beginning of the 20th century as a result of preservation efforts. Only in the last three decades have the effects of the development of tourism become evident.

This development has transformed the main village of Wyk, which was initially characterized by the most important port on the island, into a small town which has recently become quite modern in its appearance. Nonetheless, the older parts of Wyk still preserve much of the characteristic appearance of a 19th century seaside resort. Established in 1819, Wyk is one of the oldest beach resorts in Germany. The development of tourism, especially in the last fifty years, has not only drastically transformed the village of Utersum in the east of the island and parts of Nieblum, but the villages of Boldixum and Wrixum adjoining Wyk as well. The policy of land allocation in the sixties was also an important factor leading to these changes.

Relocation of numerous farms from the cramped villages into the Föhr marsh has allowed for more efficient and improved cultivation of the land. However, in doing so, this relocation has not only radically changed the appearance of the island marsh, which up to this point had been occupied by only a few individual farmsteads, but also necessitated measures in

the villages themselves to account for changes in building use, often leading to the replacement of historical structures. Despite administrative efforts to control development, in numerous villages these market forces have brought about an ever increasing disintegration of their tightly-knit, impressive character still present in the years after the war.

In all probability, the Föhr marsh was not protected sufficiently by dykes until the 15th/16th century. This fact would explain the presence of a drainage and road system which more closely resembles grid-like construction carried out in the modern era than the irregular outlines of the land from the Early and High Middle Ages.

Evidence of previous settlement and land cultivation on the geest islands can still be seen by careful observation. The geest cores, in particular those located on Amrum and Sylt, possess numerous more or less well-preserved stone tombs, burial mounds and burial and urn areas dating from the Stone Age up to the Bronze Age. In addition, it is possible to find burial areas and traces of settlement dating back to the Viking Age. In some cases, historical landmarks characterize much of the scenery. An example of this can be seen in the circular ramparts of Tinnumburg on Sylt or those of Lembecksburg on Föhr (the circular ramparts, which can also be found in other places along the west coast, are defence constructions dating back to the Early Middle Ages). Other landmarks are so well-preserved or have been restored to such an extent that they now belong to the group of „cultural landmarks“ intended to attract tourists to the area. On Sylt and Amrum, the remains of settlements from various periods in history, from the Early Stone Age up to the Early Middle Ages, lie hidden under the dunes and are occasionally revealed by the blowing winds. Based on numerous archaeological findings, it has been possible to establish with a measure of certainty that the geest islands have been continuously occupied for thousands of years. Moreover, it is safe to assume that there were high levels of trade and migration, especially into the southern Scandinavian area but also on distant shores, and that farming played an important role in addition to seafaring and fishing. However, in contrast to the amount of evidence preserved in the older marshes, it seems that traces of settlements and cultivation dating back to the High Middle Ages and early modern era have not survived to the present day.

The „Hallig“ islands

The marsh islands in the North Frisian Wadden Sea with no defense against the sea are remnants of a type of landscape which has been a distinctive feature over the centuries along this coastline. The impression they still faintly make today was already being referred to by ancient chronicles of the West and East Frisian regions.

The process of an ongoing erosion of the land which was sped up by repetitive storm surges over the past 700 to 800 years can be testified to both by cartographical records and archaeological finds. Traces of settlements located on the mud flats and which intermittently surface due to the tide-induced shifting of sedimentation demonstrate to an astounding degree that today's Hallig islands are for the most part the remnants of more recent deposits above older marsh soil. Archaeological research and evidence gathered at excavations have proven that the once marshy land between the Hallig islands – which today has become tidal mud flats – had undergone intensive use starting in the 10th/11th centuries. In various parts of the mud flats, signs have been discovered indicating the construction of dykes, drainage systems, single-dwelling and village mounds with their water supply facilities as well as the traces of paths and roads. These traces have been found in layers dating from different periods – the Early Middle Ages when the first settlements were established up to relicts of the modern era's cultural landscape, in particular those from the ravages of the storm surge of 1634.

Various forms of agricultural cultivation have been proven – including wide-scale farming, systematic peat mining and in particular, the production of salt. The three characteristic forms of settlement on the marsh have been established to be: Scattered single-dwelling mounds and mound villages of a circular or elongated shape, linear settlements along dykes and pathways, accumulations of smaller and larger mound dwellings as „communities“. The structural significance of churches, frequently placed atop high mounds, can also be established for the cultural landscapes of the past at some sites. Making the church accessible from the outlying marsh and the many tidal gullies and water courses dividing it was a prime factor in the organization of daily life. There is documentary evidence that the ongoing „sub-division“ of land areas resulted in the demolition or removal of churches to other locations or the redefinition of communal or parish boundaries.

The Hallig islands that remain are of a relatively uniform appearance today despite their varying evolution and geomorphologic characteristics: Scattered dwelling mounds and pastures which scarcely remain above water at high tide and are used only for grazing – if at all. The image passed down from antique history of houses appearing to float as though they were „ships at sea“ becomes even more eye-catching during periods of tidal flooding when the entire island surface is covered with water.

Important characteristics of the conventional evolution of the Hallig islands have been obliterated or covered over by dyking efforts to stave off the sea. Since the late 19th century, most of the shoreline has been secured by a layer of rocks or by paved surfaces, thereby forever removing the typical island border on which swollen layers of deposits from tidal flooding were exposed to view. The larger Hallig islands have had low-level „summer dykes“ erected on them as a defense against frequent tidal flooding and most dwelling mounds are fortified by ring dykes or berms. This partly conceals the building structures which has a considerable effect on the visual impact of the islands. These measures were instituted after the 1962 flood-tide, a milestone event which clearly marks the end of the „old Halligen culture“ as it had been known up to that time. Most historical dwellings on the Hallig islands were either completely remodeled or replaced, lending the historical traits of buildings that now stand on the islands clear signs of the most recent architectural styles.

In its overall effect, however, the Hallig islands represent a singular monument to one type of landscape within the panoply of the Wadden Sea which otherwise have long since disappeared. The increasing impact of tourism combined with the almost complete neglect of native agricultural farming does not bode well for the future of the Hallig islands and to which conservancy programmes provide no alternative. Efforts to preserve and extend the life of the existing island habit therefore appear to be inevitable and are becoming more firmly established through such organizations as the Hallig Foundation.

The marsh islands

The two large dyked marsh islands of Pellworm and Nordstrand encompass fragments of the former island Strand, which once covered an area of more than 20,000 hectares. This island was

almost totally inundated in the frightful flood tide of 1634. More than two-thirds of the population drowned and most houses and churches were destroyed or so severely damaged that they had to be abandoned.

The exceptionally fertile and rich island of Strand had already been substantially reduced in size by the earlier expansion of the marshland. Above all the inundation of 1362 (the so-called „Manndränke“) had turned large parts of the Rungholt region in the south into mud flats. The history of dyke building on Strand and then Pellworm and Nordstrand is one of the most eventful and revealing stories of using, securing, losing and regaining profitable marshland in the Wadden Sea region. On Pellworm and Nordstrand, nowadays secure, the processes involved can still be reconstructed from historical features of the landscape.

The Pellworm parish (Harde) was one of the three administrative districts of the island Strand. In 1634 it lost its entire land area, with the exception of parts of the western dyked areas. By 1687 large polders had been reclaimed through the building of dykes. In the following centuries further dyke building led to a step-by-step increase in the size of the island.

As a result of these historical developments Pellworm now makes an overall impression of being a unitary marshland environment with many internal dykes. However, the characteristics of the individual polders are visibly different. The oldest areas lie in the west, where the most distinctive feature of land is the irregular structure of the old marshes. The newer polders show the effects of planned land reclamation and division, culminating in the northern Buphververkoog polder, which was enclosed by a dyke in 1938/39 and shows the typical characteristics of the formalistic dyke-construction policy of the Nazi period.

In the older sections of Pellworm the structure of settlement is characterized by the contrast of large, widely separated single-farmstead mounds and linear patterns of building along the inner dykes or on their crests. There are no centers of inhabitation worth mentioning. In the east, adjoining the old harbor – which in the meantime has been partly replaced by an offshore ferry harbor that is linked to it by a mole – a small centre of settlement organized around tourism with communal institutions and areas of new building development, has developed in Tammensiel and Ostersiel. The modernization of farming activities has, on Pellworm as every-

where, in part significantly altered the appearance of built-up areas as well as a number of stretches of land.

Due to the formation of the Beltringharder Koog through the building of dykes, Nordstrand has in the meantime become a peninsula. The land areas of the new polder, almost without exception as a result of environmental protection regulations, display a landscape that is unusual in the Wadden Sea area and is otherwise only found in the Hauke-Haien-Koog near Bongsiel: extensive areas of water on the inside of the dyke, extended reed beds and apparently „wild“, only sparsely grazed meadow land.

Even more than Pellworm, Nordstrand's pre-flood features reveal the impact of the planned reddyking that was carried out in the 17th and 18th centuries. A bird's eye view of the old polder, which survived the floods of 1634, still reveals the form of an island. However, the entire eastern side of the island is marked by straight-line dyke courses, streets, and water drainage systems. As a result, only in the eastern polders the older patterns of settlement are still to be found – characterized by a few individual mound settlements and the more frequent rows of settlements along the inner dykes. The catastrophic effects of the floods of 1634 can still be seen from the remaining buildings: The church of Odenbüll was the only one to survive the catastrophe, and a number of major buildings from the 17th and early 18th centuries provide evidence of the step-by-step rebuilding of dykes and resettlement, which was strongly influenced by the Dutch.

Mainland marshes

The North Frisian mainland marshes between the Danish border in the north and the geest spit of Hattstedt-Schobüll-Husum, which projects to the mud flats in the south, can be divided – in simplified terms – into two sections: the wide area north of Langenhorn and Bordelum, which from the air displays a very irregular structure with a number of different elements, and the narrower southern part, which is characterized by a strip of long narrow polders arranged parallel to the coast, and only with the Hattstedt Marsh in the south ends with irregular forms again.

In the northern part, deep bights mean that the geest edge is a long way from the coast in some places, so that the marshes along the courses of the Wiedau/Süderau and the Soholm meadowlands penetrate more than 20 or 15 km

respectively inland, whereas they are only 12 km wide in the vicinity of Uphusum and only about 5 km near Langenhorn. The very active history of the securing of individual stretches of land through dykes, their linking up and the increase in the land area through systematic secondary dyking is still clearly visible until today through the characteristics of the individual sections of the North Frisian mainland marshes.

Wiedingharde (Wieding parish)

The old administrative district of Wiedingharde (previously Horsbüllharde) has in wide areas retained the appearance of an „amphibian landscape“ (Theodor Möller) the longest: until the extensive drainage projects of the 1920s, wide areas regularly lay under water during the „wet periods“. The farmsteads in the entire eastern section of the parish – the over 10,000 hectare large Gotteskoog polder between Neukirchen and Uphusum or Aventoft and Niebüll – were not only referred to as „Halligen“ (Großhallig, Vogelhallig, Hattersbüllhallig and so on), but de facto they really were inland islands. Despite the fact that the links of these islands to the open sea had already been cut off in the 16th century by the building of dykes, they were so low-lying that it was impossible to make the land that had been reclaimed completely secure in an exacting process of dyke-building involving heavy losses. The large Bundesgaard or Gotteskoog Lake even had Hallig islands in their middle which had an island character all year round.

While in the east a marsh landscape stretched along the geest edge until into the 20th century that was similar to the marsh regions throughout North Frisia during the Early Middle Ages, the western part of the parish consisted of a marshy island, the old Wiedinghard Koog, which was finally dyked from all sides in 1465. This island, the old Horsbüll parish, itself constituted the remains of larger marsh areas of which – above all in the northwest – whole parishes had been lost up until 1400. The oblong shape of the island running in a north-south direction is easily recognizable on maps, and the course of the old enclosing sea dyke on which a road now runs – except in the western part – marks off quite distinctly the difference between the old marsh of the island, with its relatively early dykes, and the areas in the Gotteskoog polder that were enclosed much later.

The dyked island of Horsbüllharde arose out of island or Hallig mounds in the marshes: The large mound villages of Emmelsbüll, Horsbüll and

Klanxbüll, as well as the scarcely smaller settlements of for instance Toftum, Großbombüll, Nordhörn, Hesbüll and many others, are built on former Hallig mounds. In some cases it can be shown that the first settlement occurred during Roman times (Toftum, Horsbüll). The former Horsbüllharde thus belongs to the small number of ancient marsh settlements that still remain in North Frisia; its modern form – with a few mound villages, a large number of smaller and larger individual farmsteads and a network of internal dykes – dates from the High Middle Ages or the early modern era.

In the northern part of the Gotteskoog polder the landscape is similar. However, the courses of the network of earlier sea dykes that in some places form a very fine mesh show how difficult it was to dam the various channels, which ran between a large number of marsh islands and connected the mud flats and the salt marsh area of the present-day Gotteskoog polder with the open sea. As a result, a few of the farmsteads on the old island mounds in this region show traces of harbor construction.

All in all, however, the present-day character of the Gotteskoog polder is determined by the extensive drainage and development measures of the 1920s and 1930s. Large, straight sluices and equally straight roads divide the surface area. The farm settlements dating from the Nazi period that are systematically placed along the connecting roads dominate broad stretches of the polder, which in its eastern and southern sections seems less developed in comparison with the northern „Halligland“ (marsh island region), and displays the monotonous uniformity of the planned, modernized agricultural industry. The afforested areas which – as in the case of Aventoft and Kahlebüll Lake – were planted on land not suitable for agriculture, make a particularly alienating impression.

The cultivation of the Gotteskoog polder continued until the 1960s. In the course of the „Programme North“ the drainage and dyke-building measures (among others the Gotteskoogdeich between Emmelsbüll and Niebüll) were pushed ahead, land improvement measures intensified and above all the remaining inland lake areas drastically reduced. In the 1980s, measures aimed at returning the land to its natural state reversed the land reclamation process, so that today large swamp areas and expanses of water, above all the Gotteskoog Lake, are once again the elements that shape the character of the landscape.

However, the Wiedingharde has also experienced striking changes in the west in the direction of the Wadden Sea. The very narrow fore dykes of the new Wiedingharder Koog still belong to the laborious security measures of the western rim of the old parish. However, the Friedrich-Wilhelm-Lübke-Koog, which was enclosed in dykes in 1954, displays the square pattern of a „modern“ land reclamation measure – it was the last large-scale measure of this kind in North Frisia. The polder, with its completely „unnatural“ geographical structure, gives the impression of being shut in between the old and the new sea dykes. Since 1982 the most striking contrast to this is the adjoining Rickelsbüller Koog north of the Hindenburg Dam, which is exclusively maintained as a conservation area with large expanses of water between the dykes.

In recent decades, modernization measures of various kinds have also strongly influenced parts of the Wiedingharde. These range from new housing developments that have significantly altered the landscape, above all in Klanxbüll, Rodenäs and Neukirchen, to new buildings that do not harmonize with historical structures any more. The frequently intrusive modernisations of old buildings, not confined to those used for agricultural purposes, have a similar effect, and have in some places truly altered the form of, for instance, the traditional linear settlements along the old lines of dykes. The clustered groups of wind-powered electricity generators also produce a completely altered landscape. The chains of middle-sized machines in the Lübke-Koog almost give the impression of a single industrial plant, while significant parts of the old landscape also offer a completely altered picture as a result of the new, dominant technological scene, as for instance in the Toftum-Südwesthörn area.

Bökingharde (Böking parish)

The land areas of the Bökingharde, south of the Gotteskoogdeich, are also in great part the result of the linking of old Hallig mounds through dyke construction and the reclamation of further stretches of land that had been destroyed by the sea in the Middle Ages. However, the Bökingharde possesses a „stable core“ of a special kind: South of Niebüll the almost circular Kornkoog is a cultivated high moor from the Early Middle Ages on a flat geest island which during the Late Middle Ages was temporarily surrounded by incursions of the North Sea and had to be protected by the building of dykes. Until farming began the island was known as Risummoor and

the line of villages on its edge almost forms a closed circle. This remarkable landscape monument is cut through by a railway line and a highway, and as a result of the development of Niebüll into a small city has experienced such a striking imbalance that the impression of a unitary island is now hardly recognizable any more.

Of the many island mounds around Risummoor and the mainland geest after the disastrous floods of the Late Middle Ages – remnants of the broad moorland and marsh areas between the seaward barriers and the geest edge – three larger ones have been integrated into the mainland marshes since the 15th century: Galmsbüll, Dagebüll and Fahretoft. The old polders of Dagebüll and Fahretoft still today clearly display their origins as Hallig islands, with mounds on which small houses stand packed close together in some places. On other mounds larger individual farmsteads have taken the place of small-scale building. A significant number of other old island mounds such as Bollhaus, Schweinehallig, Trollebüll or Süderweygaard, which into the 1970s had changed little, are located in the polders which underwent dyking on a continual basis.

To these prominent elements of the former Hallig island structure of extensive areas must be added the characteristic pattern of linear settlements on the former sea dykes, which in the course of reclaiming the land became internal dykes. Most striking is the „Holländerdeich“ running through Fahretoft, which was constructed during the extensive damming of the Bottschlott Channel. Extensively modernized cottages and small longhouses now stretch for kilometres on it. The building structure on the neighbouring Gotteskoogdeich in the north, on the Mitteldeich or the Kaiserkoogsdeich is less homogeneous.

The third defining component of the landscape in the Bökingharde – and occupying the largest area – are the large polders which have been built since 1465 in order to reclaim land which had been occupied by the sea. To the east, beginning with the Klixbüller Koog and the Große Kohldammer Koog, which converted the Risummoor to dry land again, numerous dykes were built, at times in rapid succession. These were the most successful land reclamation measures of the late 17th and early 18th centuries. The land areas of the old and the new Christian-Albrechts-Koog as well as the Kleiseerkoog, which became arable as a result, belonged to the most fertile marshlands of all. The geography of these polders is determined by the systematic land development (roads, paths, drainage sys-

tems) and the substantial individual farms on the flat mounds, most of which originally occupied three or four sides of a square and almost had the character of the estates of a ruling class. Today, many of them have lost their original function and some are partly in ruins or have been reduced in size through demolition of buildings. However, the wooded mounds still divide up the farmed areas lying around them that are otherwise as flat as a board and in some places have been consolidated into gigantic industrialized landscapes. The impression made by these polders forms a stark contrast to that made by the old „Halligland“.

With the Marienkoog the series of dyke enclosures was completed in 1798 and a fairly straight line of dykes established between the old Horsbüllharde and Dagebüll or Fahretoft, until the ideologically driven land reclamation policy of the National Socialists led to construction of two new polders closer to the sea (Neu-Galmsbüller Koog and Osewoldter Koog). The characteristic pattern of their development and settlement structure, as well as the sentimentally patriotic architecture of the buildings, distinguish these clearly from the older polders.

Due to new housing developments and construction of industrial areas, erection of large public buildings and the build-up of the necessary infrastructure, especially transport, the central town of the parish, Niebüll, which had been thoroughly „restored“ and modernized in an urban style in the 1980s, has largely lost its links to the historical character of the surrounding landscape. Remains of old buildings still worthy of mention are only to be found in Deezbüll, which had been incorporated into the parish and until after the Second World War retained the character of an intact „Frisian village“.

The ferry harbour Dagebüll and Niebüll, connected through a railway line, form an „axis“ of modern touristic infrastructure. Dagebüll Harbour has in the meantime developed into a more and more completely planned service centre for the ferry traffic to the islands and the Hallig islands. The extended building activity and connection to the transport network, together with the loss of characteristic old buildings, now completely hide the fact that it is situated on the seaward tip of an old Hallig island. This is only made evident by the dwelling mounds lying further inland and away from the built-up roads.

Inland of Fahretoft and Ockholm the Hauke-Hayen-Koog was enclosed in 1959 to further straighten the dyke line. This polder is only part-

ly used for agriculture and contains a major inner-dyke biotope in its large rainwater reservoir. For centuries drainage via the large „Bongsieler Kanal“ was the most important regulator of water levels for the entire parish. The point where this canal terminates and flows into a wide tidal gully can be counted among the most „picturesque“ tableaux of the North Frisian coast. Today the new sea dyke, with a road on the inner side and a pumping station at Schlüttsiel – at the same time serving as the harbor for ship traffic to the Hallig islands – offers a remarkable contrast to the wide, „natural“ expanses of water and reed beds of the rainwater reservoirs.

Karrharde, Norderharde and Südergoesharde

The three old parishes of Karrharde, Norderharde and Südergoesharde show a less varied structure of their marsh regions than the Wiedingharde or the Bökingharde. They mostly consist of geest – in particular the Goeshardes have only a relatively narrow belt of long polders on the geest edge. In the northern section in the lowland meadows of Soholm, the marshy areas push quite far into the interior. Ockholm stands as the western „outpost“ of an old Hallig island in the dyked areas. However, from the Ockholmer Koog southwards to the Hattstedt polders the marshes show a comparatively uniform structure: In the Late Middle Ages the geest edge was also the coast of the Wadden Sea almost everywhere, but from the 15th century the coastline was moved westward step by step through the enclosure of the foreshore within dykes – which in this area was also settled and farmed land. In the Bredstedt Bight long narrow polders running in an almost north-south line were built in the 18th century. These were the indirect result of a failed attempt in the 17th century to enclose the Bredstedt Marsh within a single dyke. The stages of the gradual enclosure by dykes were completed with the Sönke-Nissen-Koog (1923-25). Its strikingly „modern“ structure not only differs from the admittedly systematic but nonetheless small-scale system of land division in the older polders, but in addition displays the land reclamation efforts of the National-Socialist period through its use of the main road as a central axis and the row of individual properties stretched along it. The buildings in the Sönke-Nissen-Koog represent what was really the only attempt to impose a uniform, at the time contemporary, architectural style on an entire housing development in

the marshes. The exceptionally fertile polders along the Bredstedt Geest have only a few large farmsteads – in the older polders many of the historically significant buildings have disappeared or been drastically altered. Due to the very sparse population, the systematic nature of the land development and in some parts the very large fields, the polders of the Hattstedt Bight present the picture of gigantic, well-nigh monotonous agricultural areas between the lines of the dykes.

Today the impression has changed radically due to the rows of wind farms running parallel to the dyke line. They represent a sudden „surge of modernization“ that is in stark contrast to the traditional characteristics of the marsh landscape's visual picture – the absolute domination of horizontal lines and the radical „openness“ of what seem to be endless open spaces. This is a particular challenge in the case of the polders of the Bredstedt Bight, because the unusual height of parts of the geest edge (north of Bredstedt, where the Stollberg is 44 m high) offers a unique view over the marshes as far as the Wadden Sea.

Along the geest edge the marsh is practically uninhabited. The village of Langenhorn, which stretches kilometres along the road, shows most clearly the cultivation of narrow strips of land stretching from the geest edge. We can assume that a similar basic structure prevailed from the earliest phases of use of the open marsh and salt meadow areas and, as a result, it is not surprising that the geests of the three parishes have yielded numerous archaeological finds from prehistoric and early times.

A peculiarity of the Nordergoesharde are the two Hallig islands of Nordstrandischmoor and Hamburger Hallig which are linked to the mainland by connecting dams. Both are remains of the island Strand which was destroyed in 1634. Other Hallig islands in this region have either disappeared or been integrated into the mainland through the building of dykes.

Hattstedt Marsh, located south of the Bredstedt Bight, also features the remains of old Hallig island settlements in the closely divided polders in the west. But in the east it is also characterized by broad unsettled areas that are cultivated by farming communities on the geest. Since 1987 the newly enclosed Beltringharder Koog stretches along the sea dyke of the Hattstedt Marsh and turns Nordstrand into a peninsula. It is mainly a natural preserve, with large rainwater reservoirs serving as biotopes.

Near Hattstedt the geest projects into the mud flats in the form of a moraine spit. This means that, after the dunes of St. Peter-Ording have been secured through dykes, parts of Schobüll represent the only remaining dyke-free section of the North Sea coast. As a result of afforestation programmes in the once-dominant heath areas, the forest has here advanced right up to the coastal areas. Its unique location has entailed building measures on a large scale in Schobüll, which completely hides the characteristics of the old town. By now, the buildings of Schobüll constitute an almost closed line to the suburbs of Husum. The old marsh village of Hockensbüll and the Porren Koog before it already belong to the outskirts of the city. Schobüll also shows evidence of prehistoric and early settlement. During the dredging of Husum Harbour – as is emphasized again and again – the remains of a rib from the hull of the oldest boat ever known (about 8000 B.C.) were found.

Settlement of the Wadden Sea region by man is thus of enormous historical significance. But it is the North Frisian section of the Wadden Sea region which shows through its unique structure and contemporary landscape conditions how the extraordinarily changing, in part extremely localized, very varied interaction between „natural factors“ and human activities has created a cultural and geographic system in which disparate elements have grown together and the resulting combinations contain complex patterns of destruction and separation.

4.3.1.3 The Wadden Sea of Nordfriesland

When flying over the Wadden Sea area of North Frisia at low tide, traces of earlier land cultivation, farming and settlements can be seen on the eroded banks of tidal gullies lining the mudflats or in areas where the mudflat substratum has been worn away by the flow of water. The remains of ditches used for drainage and soil improvement are the most common traces which appear. However, it is also possible to find the remains of roads and dykes, mound bases, wells and cisterns constructed from dried bricks of peat or clay, pits and stakes used for various purposes as well as areas used for the mining of peat for fuel and salt.

Walking out onto the mudflats, it is possible to date some of these structures, known locally as „Kulturspuren“ (traces left by cultural development), with the help of archaeological evidence. In this way, it is possible to reconstruct the

course of earlier land development and settlement and to outline the general contours of the development of land cultivation in space and time. Archaeological and geographical research has shed light on the complicated interplay between human manipulation of the environment, a rising sea level, and the increasing frequency and severity of tidal flooding. At the same time, interdisciplinary cooperation has shown that the morphological development of this coastal landscape cannot be fully understood without knowledge of the composition of the geological subsoil and, in particular, the consistency and strength of the Holocene sediments.

Fig. 4.30:
Old cisterns in the Wadden
Sea of Nordfriesland
Photo: L. Hermannsen



According to the information currently available, the history of settlement in the coastal marshland seems to have taken the following course:

Numerous individual findings from the Early Stone Age and Early Bronze Age suggest that around 4000 years ago the area of today's islands and Halligen had already become a place of intense traffic and was probably even settled at that time. However, the land was never occupied for extended periods due to the increasing water levels which made settlement of the area difficult and prolonged stays undesirable.

It was only after the geest islands had been recolonized by Frisian settlers that settlement of selected marshland areas also began in the 8th century A.D. The regions of choice included the area around Pellworm-Hooge, the Föhrer marsh as well as today's northern mainland marsh located between Horsbüll and Emmelsbüll. Favorable environmental conditions initially allowed settlement on flat ground. It was only in the High Middle Ages that construction of

dwelling mounds and dykes became necessary due to the increasing influence of the sea. These protective measures also enabled lower-lying areas to be settled and led to the expansion of settlement and cultivation of the coastal marshland in the Late Middle Ages.

Beginning in the 14th century, things began to change dramatically, in particular due to a severe tidal storm, known as the „grote Mandränke“, which occurred in 1362. Severe tidal flooding in the Late Middle Ages and in the early modern era engulfed the entire Rungholt area as well as a large portion of the settled and cultivated marshland. In this way, the settled and cultivated area was re-transformed into the very mudflats from which it had arisen.

Numerous findings and artifacts as well as a wealth of historical sources recording the history of this amphibious environment and its settlement have been preserved to this day. Nonetheless, nothing in this area can survive unchanged. Erosion and sedimentation processes bring about continual change which, at the same time, both aids and hinders the documentation effort. In general, experience gathered in recent decades has shown that destruction of these cultural signs, or „Kulturspuren“, in the Wadden Sea Area continues to advance and that there is indeed reason to make immediate use of these cultural signs for research into the history of the land and its settlement before they disappear forever.

4.3.1.4 Eiderstedt

The Eiderstedt peninsula, approximately 30 kilometers long and 15 kilometers wide, borders the North Frisian Wadden Sea to the north and the estuary of the Eider river with the adjoining Dithmarschen coastal area to the south. To the east, the peninsula's marshes extend to the edge of the geest near Husum. An elongated sand embankment, broken by the incursion of the Süderhever tidal gully, extends across the west of the peninsula. The churches of Garding and Tating, visible from a long distance, are located here.

Tall ridges of sand also extend northwest of Tating at Tholedorf. Another sand embankment runs in a north-south direction in the area of Witzwort. This embankment originally extended further to the north, but was carried away as a result of tidal storm flooding in the Late Middle Ages. These different sand embankments, existing no earlier than 3100 years before now and frequented since the Stone Age (Harck 1980,

Austen 1992) facilitated the draining of the marshes. High embankments formed (Meier 2001) along the Eider, which at that time had a smaller estuary and followed a more winding course as it flowed into the North Sea. Since 500 B.C. moors have developed in the area north of the Tating-Garding sand embankment as a consequence of insufficient natural drainage. After the advancing sea had to an increasing degree broken down the system of sand spits and geest formations, which acted as barriers, in the south-west area of the present-day North Frisian Wadden Sea, the moor areas in the north of Eiderstedt were inundated and covered with sediment (Meier et al, 1989). At the turn of the 1st century A.D. low marshes formed, dissecting the numerous systems of tidal gullies into little islands. The advance of the Süderhever to the north, by no means a catastrophic event, breached the elongated sand embankment between Garding and Tating, allowing the Fallstief channel to encroach from the west to form a connection to the Hever. This is how the structure of the peninsula landscape as we know it today came into being, comprising three „Harden“ (administrative districts) since the Middle Ages: Eiderstedt itself on the east of the peninsula along with Tönning, the islands of Utholm and Westerhever to the west including the village of Tating and the island-like Everschop, dissected by numerous tidal gullies, with its suburb Garding.

The natural development of Eiderstedt influenced the history of its settlement and to a high degree the formation of the present-day cultural landscape. The peninsula can be divided into three regions, each with its own characteristic pattern of settlement of great individual significance.

- The area of the high sea marshes along the Eider estuary with its high village mounds and the remains of old Celtic block fields.
- Central Eiderstedt with long rows of low farmstead mounds as typical U-shaped marsh settlements with elongated row (expansion) corridors.
- Island-like west and north Eiderstedt, dissected by old tidal gullies and the incursions of the sea, with its irregularly spaced large and single-farmstead mounds and small-scale dyking in the form of ring dykes.

Along the Eider estuary groups of farming settlers came across high shore embankments, whose salt meadows presented the economic potential for agricultural use (Behre 1976, 60 ff.).

By the beginning of the 2nd century the first communities of farming settlers in Tofting built their long houses on flat platforms of sod at an old bend of the Eider on an embankment 1.45 meters above sea level. A series of probes and small surface digs carried out by A. Bantelmann (1955) point to the formation of a village mound with a diameter of approximately 200 meters from the integration of individual dwellings, which were relatively constant in their location and gradually rising on debris. This site was abandoned at the beginning of the 5th century. The alternating build-up of layers of debris and alluvial deposits reveal Tofting to be an example of the ancient type of slowly rising village mound of the 1st century. The economy of the settlement was based on subsistence cattle raising on the salt meadows. The utensils and tools for daily living were made domestically, yet finds of Roman terra sigillata indicate interregional trading contacts. Today, the large village mound, visible from afar, lies deserted, partly covered by a stand of trees. Because it was preserved under favorable conditions, Tofting is a cultural-historical monument of early marsh settlement. Around the village mound block-shaped corridors recall the old lands, traversed by tidal gullies. The old bow-shaped course of the Eider is still distinguishable as a depression to the east of the mound. As was the case with Tofting, the village mounds in Pernör and Tönning were constructed in similar fashion and became regional centers (Meier 1996). Other large village mounds in the area of the Eider estuary, such as Elisenhof (Bantelmann, 1975), Welt (Meier, 1997) and Olversum came into existence in the Early Middle Ages. The founding of these mounds is tied to the Frisian immigration in the 8th century. The early mediaeval section of the Welt village mound is still discernible as a large mound. The present-day village and church lie on the neighboring mound, erected in the Late Middle Ages.

At Elisenhof excavations of the marsh settlement from the time of the Vikings (Bantelmann, 1975) provide the best example of an early mediaeval settlement with several farms relying on cattle raising. Elisenhof is a village mound near Tönning that is no longer easily recognizable as such and was eventually partly covered by new building construction in the 1960s. Several long houses from the 8th to the 10th century were located on the slopes of an embankment, near a side channel of the Eider. The surrounding area was dominated by salt meadows, of which today only small remains have survived along the

North Sea coast. Other settlements, drainage fields and treasure finds from Roman times and the Early Middle Ages lay on the sand embankments at St. Peter-Ording, Brösum, Tating and Garding (Meier 2001).

In the 1st century A.D. central Eiderstedt was characterized by drainage problems in the flatlands, when low-lying areas were turning into moors. Only inland water induced the inhabitants to marginally raise their low-lying settlements which, because of the unfavorable land, were only inhabited for short periods of time (Bokelmann, 1988; Meier, 2001). Whether the development of these small settlements is related to the enlargement of the farms on the village mounds is a matter of conjecture. The swampy flatlands were completely avoided in the Early Middle Ages. While settlement in the 1st century remained dependent on local environmental conditions and were non-disruptive to the natural surroundings, the opportunities for settlement and cultivation changed completely from the Late Middle Ages. New methods of farming, knowledge acquired in the Netherlands about the drainage and cultivation of large moor areas and a burgeoning population combined with the immigration of other groups of settlers provided the impetus needed to settle the moor area (Meier 2001).

In the Middle Ages an extensive dyke, only parts of which are preserved, enclosed the central section of the Eiderstedt peninsula. This dyke construction enabled the drying-out of the swampy marsh by regulating the drainage of inland water.

This extensive dyke construction encompassing parts of the two „Harden“ of Eiderstedt and Everschop is comparable to the Westfriisje Omringdijk, completed in northern Holland in the year 1320. A „Harde“ is an administrative district consisting of several villages or farmsteads in Schleswig-Holstein. The construction of this dyke took place under the influence of the counts of Holland. The reason for its construction and frequent reconstruction is not only to be seen in its function as protection against tidal floods, but can also be attributed to its regulating the drainage of inland water. This also applies to Eiderstedt, although to a lesser degree. Even today the scenery of the region around Oldenswort, Witzwort and Ülvesbüll is distinguished by farmsteads extending in long rows on small mounds (made of clay to protect from inland water, less often made of peat). These farmstead mounds are found in the marsh and characteris-

tically protected by an encompassing dyke and the adjoining regular striped fields framed by drainage ditches. Smaller dams („Sietwenden“, moor dykes) mark off the different areas of drainage. The remains of old „Wölbäcker“ (marks on abandoned farmland) parallel to the channel ditches attest to the remains of an old method of field-grass rotation agriculture. Elevated Wölbäcker (as protection from ground moisture) have today become meadowlands. The moor disappeared entirely as a consequence of its drainage.

In the Middle Ages the island of Utholm stretched across what is now the southwest of Eiderstedt. Both the island and Westerhever (Haefrae) formed a single „Harde“. Reports in the record of royal land holdings of Waldemar II for the year 1231 documenting the existence of the island „Holm“ (Aakjaer 1926-1949) suggest that it was only after this time that the island was connected to the Eiderstedt peninsula by means of a dyke construction through the tidal gully system of the Süderhever. In the west, the natural dunes, which today are covered predominantly with pine trees, created a natural protection zone near St. Peter-Ording. The church villages of Tating, Ording and St. Peter, which date back to the 12th century, are situated on sand embankments or sands which served as a starting point for the expansion of cultivation and settlement into the marsh. Tating has been able to preserve much of its original appearance while St. Peter and Ording have suffered under the influence of tourism to the area.

The settlement patterns in the marshes of the former island are characterized by occasional large mounds supporting several farmsteads, such as Ehst and Medehop, as well as several single-farmstead mounds dotting the area. Block fields reveal traces of the island's old cultivation fields, now traversed by tidal gullies. The remains of the island's mediaeval dykes have only been preserved in the east. The Süderhever, which separated Utholm from Eiderstedt, was enclosed by a dyke in the 12th/13th century (Prange 1986; Meier 2001). In the marshland regions of the Süderhever, small dykes were initially built on the seaward side before several dykes were then constructed in perpendicular fashion to dam what was only a small tidal gully in the Middle Ages. This is still made evident by the remains of dykes and traces of fields in the area. Numerous breaches in the dyke (with pools formed behind the dyke) testify to the tidal flooding which

threatened the marshes well into the early modern era.

The power of the sea to transform the landscape becomes particularly evident when examining the northern part of the Eiderstedt peninsula. After the North Sea had partially dismantled the barriers provided by the geest cores in the northwest and the sand embankments in the south, new clay was deposited in northern Eiderstedt throughout the large areas of marshland. At the turn of the 1st millennium A.D., areas of marshland resembling islands and crisscrossed by numerous tidal gullies began to form. Cultivation and settlement of these areas first started in the 11th/12th century (Meier et al. 1989; 1996; 2001). During the first phase of colonization, clay was used to create large mounds which were quickly enlarged to support several farmsteads. These large mounds are characteristic of today's landscape, such as Sieversbüll and Stufhusen in Eiderstedt, Osterhever or Helmfleth and Hundorf near Poppenbüll, and closely resemble in their construction the mounds located on the Halligen of North Frisia. The building of dykes in a small area of the farmland characterized by block fields allowed the construction of individual single-farmstead mounds scattered across the newly gained land. Analysis of botanical remains taken from excavations on the Hundorf mound provides evidence supporting the fact that construction of higher mounds had become a necessity. This, in itself, suggests the influence of large amounts of salt water in the High Middle Ages. Today, older channels which have partly reappeared naturally in the area (Fallstief, Kraueltief) still reveal the former cultural landscape that was divided into small individual polders in the middle of which occasional church mounds (Poppenbüll, Osterhever, Westerhever) were thrown up. Evidence of previous construction of dykes with flat sides facing both the sea and land has been found in several excavations (Meier et al. 1989; 1992; 1996; 2001). The families and communities living on the large mounds and organized into parishes seem to have begun work to enclose their farmlands with dykes largely on their own initiative. With its well-preserved settlement structure, farmland design and dykes as well as a tidal-gully system that can still be easily discerned, northwestern Eiderstedt represents one of the best-preserved examples of a cultural landscape containing mediaeval monument and landscape ensembles. The most striking is represented by St. Johanniskoog (polder) whose northwestern and western

dykes ran along the banks of the wide Fallstief channel for which dykes were built around 1456. The ring-shaped dyke protected the farmland of several large and single-farmstead mounds which were partially integrated into the course of the dyke and connected by roads („Löhnen“) to other large mounds. On some of the large mounds, such as Helmfleth, old livestock watering holes have been preserved. The church of Poppenbüll, recorded in documents dating back to the 12th century, is situated on a high mound located roughly in the middle of the polder. Stretching to the north and east of St. Johanniskoog, additional small polders (Osterhever, Mimhusenkoog) can be found whose mediaeval dykes have also been well-preserved. There are also large and single-farmstead mounds on some of these polders.

Improvements in dyke construction beginning in the 15th century allowed larger channels (Fallstief, Nordereider) to be dammed. The courses of these channels, such as the Fallstief in the northwest of the peninsula or the old Nordereider in the east, can still be detected today by observing the arrangement of the farmland. In contrast to the dykes from the Middle Ages, dykes constructed by the ducal dyke master builders since the beginning of the early modern era were no longer built with consideration given to the natural surroundings. Instead, the dykes cross the marshland in long, straight lines. Within these polders, such as Alt-Augustenkoog, which was enclosed by dykes in 1611, well-ordered rows of farmland extend from one end to the next. The farmsteads are situated in rows on the flat earth or on relatively low mounds. Beginning in the 16th century, dykes were constructed for increasingly larger bights (polders in the area of the Oldensworter Bight) and incursions of the sea (Nordereider). At the same time however, areas of cultivated land, such as Lundenbergharde, were continually re-transformed into mudflats due to severe tidal flooding. As a result of subsequent dyke construction on the sea side, dykes built in the Middle Ages partially lost their original protective function. The many extensive settlements constructed on these dykes attest to this fact.

The early modern era also brought improvements in transportation, which is shown by the creation of a boat connection from the sluice harbor of Kating to Garding. Maritime trade with distant lands was carried out from the port in Tönning which today has preserved much of its historical structure. In contrast, the embank-

Fig. 4.31:
Estuary of the river Eider
with village mounds



ments of the former walled city and the ducal castle had already been demolished in the early modern era.

Today's cultural heritage of the Eiderstedt peninsula still gives a sense of the historical dimensions of the landscape. Traces of settlements with village mounds up to 2000 years old located along the Eider, small ring dyke systems in the north of the peninsula or the extended U-shaped marshland settlements with farmland arranged in well-ordered rows still characterize the scenery of the area.

Thus, Eiderstedt is a region of exceptional diversity, character and beauty which has succeeded in preserving its cultural heritage to the present day. Some exceptions, however, can be seen in the regions around St. Peter and Ording which have been heavily developed for tourism. In places where the cultural landscape has been best preserved, a thousand-year seclusion has effectively thwarted any lasting change. The development of Westerhever attests to this fact. The island, which until well into the 15th century was protected by a ring dyke, was connected by dykes to the mainland after a dam was constructed on the Fallstief channel. Today's landscape with its old, block farmlands, watering holes and winding shapes of former tidal gullies used as drainage ditches is still characterized, just as it was 1000 years ago, by the large mounds (Stufhusen, Sieversbüll) and single-farmstead mounds dotting the area. Nonetheless, the houses and farms are now hidden by trees to break the force of the wind, giving the impression of being in a rolling landscape of a park superimposed upon a horizon line created by the course of the sea dyke (Fischer 1994, 21). Around 1850, the marsh in Westerhever still resembled the landscape of the Halligen with its farmsteads lying unprotected upon the mounds. Despite the losses of historical structures and the newly planted trees, the preservation of the scattered settlements can be attributed primarily to the fact that Westerhever was considered to be the epitome of seclusion well into the 60s. An indication of this is that until 1960, many homes still had no connection to the water and power supply. This state of affairs began to change as people from the city began purchasing farmhouses and tourism was developed. In the course of a good hundred years, Westerhever has lost three-quarters of its inhabitants. In the last thirty years alone, the population has lost another half of its inhabitants (Fischer 1994). Almost all of the smaller farmsteads have

disappeared, several larger farms have been forced to abandon production and independent craftsmen are no longer to be found in Westerhever. In addition, there is no longer a school, village store, post office, poorhouse or forge. The community reaps little if any profit from the increasing number of tourists who come on day-trips, especially to Westerhever Sand west of the island. Despite the many historical facets of Eiderstedt's cultural landscape which have been preserved, the area is nonetheless exposed to the forces of change.

4.3.1.5 Dithmarschen

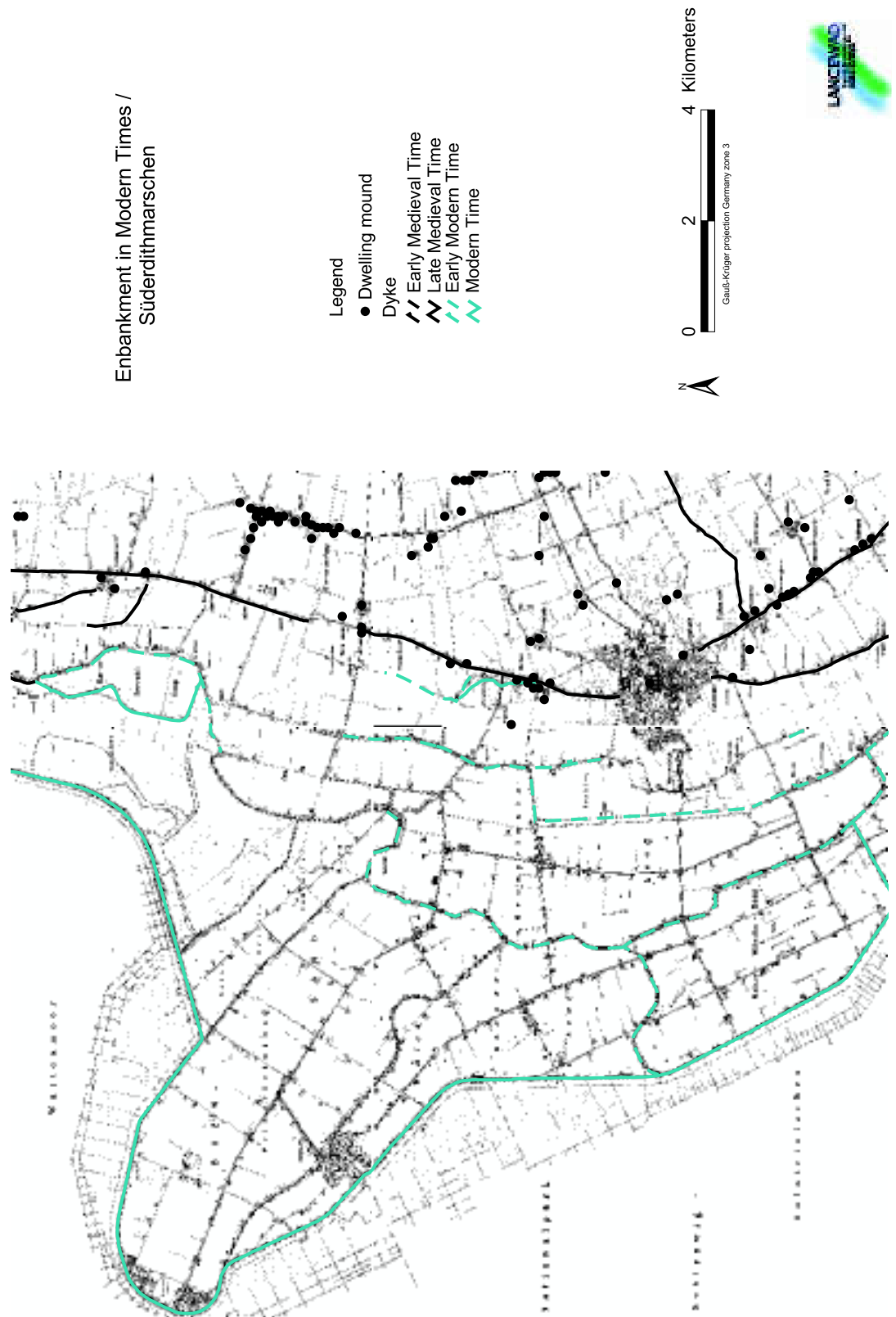
The Dithmarschen coastal area, with its sea marshes facing the Wadden Sea in the west, stretches from the estuary of the Eider river in the north to the estuary of the Elbe river in the south. The Meldorf Bight separates the Dithmarscher Nordermarsch from the Südermarsch. In the east are wooded old moraines dating from the Saale Ice Age, with boggy lowlands between them that reach as far as marshes stretching to the west and linking up with the Wadden Sea (Meier 2000). Since the Middle Ages Dithmarschen has been part of the three northern Elbe districts of Saxony and was recorded by Adam of Bremen about 1075 as „Thiadmaresgaho“. In the 9th century the area was protected by the circular ramparts of the Stellerburg in the north and the Bökelnburg near Burg in the south. Both sets of ramparts are still clearly visible today and are outstanding cultural monuments. By contrast, the semicircular wall of Kuden, southwest of the geest rim near Burg, is already severely worn away.

Unlike North Frisia, as a result of the landscape's pattern of development, the cultural heritage of the Dithmarschen coastal area lies inside the present-day sea-dyke. The contemporary cultural landscape of the Dithmarschen marshes, as it has been shaped by humans, can be divided into three sections:

- The old sea marsh which was enclosed in dykes in the High Middle Ages, with its substantial village mounds
- The low-lying Sietland, which was made arable in the Middle Ages, with its elongated linear settlements
- The new sea marsh with its modern dyke constructions

The North Sea reached the edge of the Dithmarschen old moraines for the first time 6500 years ago as a result of the post-Ice Age rise in

Fig. 4.32:
Embankments in Süderdithmarschen



the sea level, and penetrated deep inland in the form of a bight. With the slowing of the rise in the sea level about 4500 years ago, a line of demarcation between land and sea formed as sand and gravel were carried down from the interior of the geest and deposited to form sandy spits running from north to south, on which dunes built up. Places like St Michaelisdonn or Lunden are situated on these spits. To the east, the low-lying areas that had been cut off turned into bogs, to the west the oldest sea marshes formed about 2500 years ago and quickly extended westward (Hoffmann et al 1997; Meier 2000).

After the sea marshes had probably been used as pastureland by the inhabitants of the settlements on the edge of the geest since the pre-Roman Ice Age, the first colonization of the old marsh occurred early in the 1st century A.D. The Dithmarschen coastal region thus belongs to the oldest settled sea marshes in Schleswig-Holstein. The surviving mound settlements from this time in Norderdithmarschen stretch out in a long north-south line. Further west, a second line of settlements came into existence starting in the middle of the 2nd century. Even today, building activity still follows this linear pattern of settlement.

Higher marsh areas around Tiebensee, about 2 km west of the geest rim near Heide, allowed conventionally shaped farmsteads at ground level to be built which had to be raised up on mounds in the 2nd century (Hoffman et al 1997; Meier 2001). As excavations in Haferwisch show, low mounds built up of clay were formed here on low reclaimed sea marshes. Increasing water-logging and the beginning conversion of the marshes lying some distance from the coast into bogs may have been one of the reasons for abandoning settlement. By the 3rd century signs of a depopulation of the Nordermarsch are increasingly evident. Only in the vicinity of the meandering course of the Eider river do village mounds appear to have been built for settlement over a longer period of time, as the villages of Hemmerwurth and Flehderwurt suggest.

Further settlements from the period of the Roman Empire were located in the South Dithmarschen sea marsh near the coast. Despite this, here settlements also existed on the banks of tidal gullies, as the example of Eddelak shows. Extensive excavations have revealed that marsh settlements of the Roman Empire have survived as the foundations of village mounds from the Middle Ages. In Süderbusenwurth for instance, a

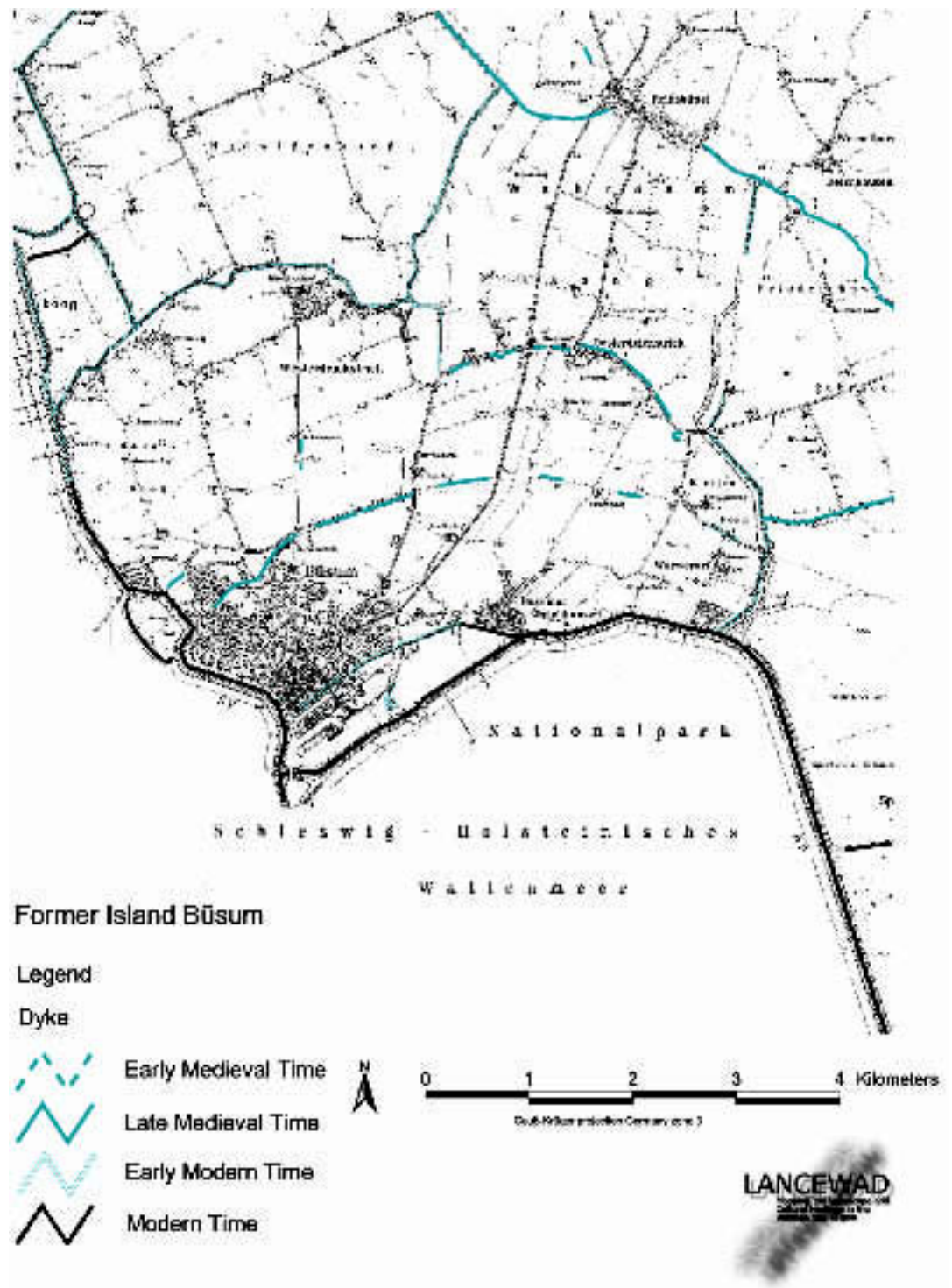
settlement with several agricultural operations came into existence along a tidal gully. Because the sea marsh was only just above sea level, these had to be built on mounds. In the 2nd century the settlement area was raised substantially with clay. By 300 A.D. the mound was abandoned, apparently because the low-lying land became excessively briny as a result of frequent flooding.

A resettlement of the Dithmarschen sea marshes – carried out by groups of Saxon farming settlers – began in the middle of the 7th century. In the following years village mounds were established which today, due to their well-preserved history spanning over a millennium, belong to the outstanding cultural monuments of the Dithmarschen coastal region and constitute principal features of the landscape.

In Norderdithmarschen the sea marsh extended further to the west. High salt meadows along the tidal gullies were first used for settlement. This is evidenced by excavations in Wellinghusen, one of the most impressive Early Middle Age village mounds in the Schleswig-Holstein coastal region. The low, rounded subsections of this village mound, which fell into disuse in the Late Middle Ages, makes it possible to imagine how a substantial village mound came into existence over many generations, evolving from the linking-up of individual farmstead mounds. The well-preserved layers from the 7th to 11th centuries have a thickness of up to 4 m. From the middle or the end of the 7th century a ground-level settlement of several agricultural operations came into existence alongside a tidal gully. From the early 9th century this was raised to form farmstead mounds linked to a larger village mound that was continually raised until the 14th century (Hoffman et al 1997; Meier 2000; Meier 2001).

In the 10th century settlement became intensive, as the example of the village mound of Hasenbüttel north of Wellinghusen shows. Around 1100 A.D. a long chain of village mounds stretched from the Eider in the north to the Elbe in the south. These are notable points of interest in the sea marsh still today, above all the villages with churches, even though a growing number of wind farms begin to spoil the beauty of the landscape. The establishment of churches in the marsh is documented since the 12th or 13th century. These were built in the middle of the village mounds, as the ones in Marne, Wöhrden and Wesselburen show. Wesselburen and Wöhrden still display parts of their characteristic

Fig. 4.33:
Former island Büsum



medieval layout even today, with a church in the center, a market, plots of land radiating out, and a surrounding ring road.

In addition to this type of circular village mound with a church in the center that is common in the North Sea area, square mound villages with a chessboard structure also remain from the 11th and 12th centuries, as the examples of Schülps, Büsum and Büsumer Deichhausen show. Modern building patterns and the infrastructure of tourism – as in Büsum – have largely defaced or destroyed the original appearance of many village mounds.

A third kind of mound from the High Middle Ages can be seen in the long narrow mounds Norddeich and Reinsbüttel, which are reminiscent of early mediaeval mounds of a similar kind in northern Holland and Lower Saxony. As in the case of the mound village Wöhrden, these had small harbors through which maritime trade took place.

Cooperatives operating in the mound villages and organized into parishes began to enclose the sea marshes within dykes in the 11th/12th centuries. Around 1100 a long sea-dyke parallel to the coast was completed to protect the Nordermarsch and the Südermarsch. Unfortunately, only remnants of this first sea-dyke still exist today, for instance near Schülps in Norderdithmarschen and Busenwuth in Süderdithmarschen, and its exact course can only be estimated by the shape of the fields.

To the west of this dyke the island of Büsum projected far into the present-day Meldorf Bight. Its seaward marsh areas have again been reflooded by the Wadden Sea since the 14th century, as a result of catastrophic tidal flooding. In the second inundation in 1634, 168 people were drowned in Büsum and 102 houses were destroyed. Near the church lies the old harbor, originally purely a freight harbor until, in 1881, the fishing industry that is now so typical for the location began with the first fishing cutters.

In the east of the old island, dykes from the Middle Ages with numerous pools formed behind the dyke make it possible to trace the stages of the process of connection with the mainland by means of dykes (Prange 1986; Meier 2000). Right up to the early years of the modern era the flood tides flowed in to the height of the church. The building of dykes had far-reaching consequences for the marshes: The sea marshes were protected from the direct influence of the sea and regulation of the internal draining of water permitted extensive settlement of the boggy

Sietland marshes („Wische“). Here the characteristic clan farming settlements that are so typical of Dithmarschen developed (Jarrenwisch, Tödi-enwisch, Wennemanswisch, Barlt). The broadening of landholdings carried out by these cooperatives and legally-constituted societies in the Sietland moved outwards from the village mounds of the sea marsh, and was completed by about 1400, as the building of churches in the Sietland shows (Neuenkirchen, Barlt). Since water was drained off, the bog-land disappeared and the cultural landscape which now dominates the inner area of the old marsh, with its long linear settlements and their adjoining strip-like fields extending ever further into the wasteland, emerged from the natural landscape. Remnants of the old Sietland bogs are only to be found in a protected habitat area called „Weißes Moor“ in Norderdithmarschen.

To the west of the mediaeval dyke line, which has only been partially preserved, areas of land were reclaimed by the construction of polders (so-called „Köge“). Their higher sea dykes permitted establishment of farmsteads at ground level. For instance, large areas of Süderdithmarschen marsh were enclosed by dykes to form the Kronprinzenkoog in the 17th century and the Friedrichskoog in the 19th. Here, as in the Wesselburener Koog, two watering places involving cattle troughs surrounded by a circular dyke have survived, built on the land stretching out in front of the dykes in the same manner since the early modern era. After the Friedrichskoog had been enclosed within dykes, in 1854 a harbour was built in front of the drainage lock, with an 80 m long plank wharf for cargo-carrying sailing ships and fishing cutters. As a result of the connection to the railway system in 1884 the importance of the cargo trade diminished, whereas that of the fishing industry increased. In 1934 the harbour was secured against tidal floods through construction of the dyke enclosing the Dieksanderkoog with its large sea lock. The Dieksanderkoog, with its row of farmhouses along a long connecting road, offers the perfect example of a typical dyke enclosure of the 1930s.

The previously agrarian landscape in the vicinity of Brunsbüttel has had to give way to modern industry. Completion in 1895 of the North Sea-Baltic Sea canal with its sea-locks meant a strong upsurge for the little town, whose population rose from 709 to 5500 in 1939 and has reached 13000 today. Brunsbüttel owes its economic significance to its position on the North Sea-Baltic Sea canal, whose old sea locks form

part of our maritime cultural heritage. In 1950 the DEA petroleum company moved to Brunsbüttel and in 1978 Bayer followed.

The building of modern roads, the touristic infrastructure (Büsum), industry (Hemmingstedt, Brunsbüttel) and the erection of numerous wind parks have converted parts of the Dithmarschen coastal region into an agricultural-industrial and technological landscape. Despite this, areas of substantial cultural significance have survived. The most outstanding monuments are the large village mounds, which have preserved a history of settlement going as far back as a thousand years with finds of exceptional quality. As archaeological finds show, by the Early Middle Ages, the population of the village mounds was already participating in the maritime trade between the Franks and the Frisians, which originated in the trade center of Dorestad near Utrecht, covered the North Sea coastal region and extended past Dithmarschen and North Frisia as far as Ribe. In the 14th century, mound villages such as Wöhrden had trade contracts with the cities of the Hanseatic League.

The Sietland landscape is characterized by long chains of linear marsh settlements that even today make it possible to recognize the orderly agricultural development of the Middle Ages. The building of dykes and the draining of the land was organized by cooperatives, which functioned as hereditary power centers and preserved the independence of the region against foreign noble rule in numerous conflicts (Hemmingstedt 1500). Even today the local population feels strong bonds to its history. Dithmarschen's cultural heritage is thus held in high regard as a part of the cultural heritage of the North Sea Region.

4.3.1.6 The quality of the cultural landscape in the Schleswig-Holstein Wadden Sea Region

For the first time, the LANCEWAD project delivered an overview of the cultural heritage of the west coast of Schleswig-Holstein in digitized form. With this report it is only possible to offer some thoughts on the evaluation of this cultural heritage. A more detailed evaluation requires further studies. The cultural heritage can be characterized under four headings („archaeology," „historical buildings and monuments," „cultural geographical values," and „landscape images"), using three criteria of quality: „conservation status," „integrity of a system and context of the elements," and „representativeness". It is through its individual characteristics that the cultural heritage of a landscape can be recognized. Goal-directed evaluations of landscapes such as J. Geissler's (1999) study of Norderdithmarschen are essential for making sound decisions to protect the environment.

North Frisia (Nordfriesland)

North Frisia is a landscape of extraordinary variety. In the Wadden region, with its periodically dry phases, the traces left by cultural development (churches, dwelling mounds, wells, farmland, dykes, ditches, archaeological finds) contribute to a unique, representative heritage of vanished portions of the Utlande cultural landscape. However, these sources of historical knowledge of the landscape and its settlement cannot be preserved permanently, for they are threatened above all by erosion. Numerous dwelling mounds are preserved both on the marshes of the mainland as well as on the islands of Nordstrand, Pellworm and Föhr. This is also true of the Halligen islands which are unique within the entire North Sea region. Burial grounds and circular-walled castles on the islands of Sylt and Föhr are also important archaeological sources.

Variety is also a special characteristic of the North Frisian islands. The irregular distribution of dwelling mounds with their surrounding block-like fields on Pellworm are reminiscent of the old sea-marshes with their network of tidal gullies, while in Nordstrand the long chains of farmstead mounds take on a form that is typical for the formerly extended boggy areas of the interior of North Frisia. On both islands the variety and historical importance of the landscape are as well preserved in the shape of the fields, the dykes

and the distribution of settlements as in parts of the North Frisian mainland marshes (Wiedingharde).

The many areas of land reclaimed through polders bear witness in an impressive way to the struggle of human beings against the sea. Some of these are of great individual significance (Sönke-Nissen-Koog). The structural remains, especially the buildings, are of great variety and particularly worth documenting. The heritage of city buildings is preserved in North Frisia in places like Husum, Tönning and Friedrichstadt to a degree not otherwise seen in any region of the North Sea coast of Schleswig-Holstein.

It is true that the impression of North Frisia as a wide, open land has persisted until today, but wind parks are disturbing the landscape in some regions.

Eiderstedt

Eiderstedt presents a marsh landscape of high individual significance. In the northern part of the peninsula the marsh landscape, which has been settled since the High Middle Ages and boasts great historical interest (St. Johannis-Koog, Westerhever, Osterhever), is characterized by ring-dykes, block-like fields, irregularly distributed multiple and single-farm mounds and old systems of tidal gullies. Sites of archaeological interest (mounds, dykes), cultural and geographical elements (the shape of fields, tidal gullies) are extremely well preserved here and make it possible to recognize the mediaeval cultural landscape. The different small polders make it possible to follow the history of dyke-construction in the region. It is true that the localized planting of windbreaking trees has changed the landscape from an open marsh region to a park-like area, but despite this the marsh region is one of the most impressive of the Schleswig-Holstein North Sea coast. The mediaeval structure of long linear settlements with elongated fields projecting from them remains intact until today in the central part of the peninsula (Oldenswort, Üvesbüll, Witzwort) and represents the pattern of land development during the High Middle Ages. The area around the estuary of the Eider river, with its mound villages dating back as far as 2000 years and the historical city ensemble of Tönning is also of great significance. Apart from a few exceptions, the structural heritage in Eiderstedt is well preserved. Particularly characteristic is the farmhouse form known as the „Haubarg“.

Dithmarschen

Although Dithmarschen belongs to the regions of the Schleswig-Holstein North Sea coast in which the conversion of rural areas to an agricultural-industrial landscape has clearly left its mark, the cultural heritage has essentially been preserved. Especially impressive are the large mound villages in the Dithmarschen coastal region, with its 2000 year-old extremely well-preserved layers of settlement. Like the Early Middle Ages circular walls on the edge of the geest, they number among the most important archaeological monuments of Schleswig-Holstein. Together with the surviving system of tidal gullies, the Early Middle Ages mound villages between Wesselburen and Wöhrden in the Dithmarscher Nordermarsch show very well the structure of the old sea marsh. Unfortunately, the structural remains on the village mounds as well as in the remaining landscape have suffered badly. The dykes from the Middle Ages, like the sluice channels, an important documentation of the cultural landscape wrought by human hand, have in part been destroyed in Dithmarschen but can still be recognized along the original dyke line they once traced. Breaks in the dykes with surviving pools formed behind the dyke, as on the old island of Büsum, add to the historical significance of the dykes from both a cultural and environmental point of view.

Thus, the mound farmsteads on the inner side of the old marsh from the High to Late Middle Ages can be regarded as having high structural significance. Their distribution as long north-south rows of mounds, coupled with the straight sluice channels running in an east-west direction, show the conversion of the boggy low-lying marshes into agriculturally useful environments. The polders in Süderdithmarschen are characteristic for land reclamation policies instituted in the early modern era.

Dithmarschen is, however, one of the coastal regions where there is a high incidence of aesthetic conflict between nature, cultural traditions and modern technology. Because of the broad vistas offered by the landscape, the large number and the high concentration of wind parks have decisively altered the aesthetics of the coastal region displacing the once-dominant village mounds and their churches as the principal features of the landscape.

4.3.2 Cultural heritage of agrarian buildings

4.3.2.1 Introduction

The regions of North Frisia with the Eiderstedt peninsula and Dithmarschen along the western coast of Schleswig-Holstein feature a coastal margin of mud flats stretching from the Danish border near Wiedau all the way to the estuary of the Elbe river and are divided by an ancient natural boundary, the Eider river. The Eider follows a winding course through the geest ridges of the old moraine into its wide estuary. Despite this the area also displays geological features common to the region as a whole, with a shared history of settlement that fascinatingly unfolded in different ways within each region. It is thus probably helpful to start by providing a broad overview of the entire region's forms of settlement and house construction.

Since recorded history, this marshland landscape and the adjoining geest ridges have been utilized as a farming region. This has not changed to the present day. The focus will therefore be on considering the current state of farm dwellings as they represent living history and cultural legacy.

The settlers came into the area along the rivers and tidal gullies and began farming the land and raising livestock on the pasture meadows as early as the 1st century A.D. Their homes served as animal stables and living and cooking areas for the family. Evidence can still be dated to around 800 to 1000 A.D. of this type of low, narrow, hip-roof thatched house supported by an interior frame structure. The building was divided into three sections with the living area lying at right angles and the stables extending along its longitudinal axis.

The longest partly excavated longhouse was found at the marsh settlement of Elisenhof on the Eiderstedt peninsula. Capable of accommodating 30 „large animals“, it dates from the Early Middle Ages and measures 32 m in length.

The buildings are constructed in close proximity for mutual protection. In Archsum on the island of Sylt, a row of parallel houses on an east-west axis still exists to this day. Beneath this are four documented layers of settlement. Wind protection and the mound's proportions have always defined the features of the site. The low Uthlande longhouse native to the islands and marsh foreshore in North Frisia, which was built up to the second half of the 18th century,

is similar to the type found here, while the North German bay hall house, the house commonly found in the Dithmarschen geest and the southern geest of North Frisia, also springs from this style of building.

Around 800 A.D. the settlers inhabiting the Uthlande were Frisians. More Frisian immigrants came to the area in the 11th/12th centuries. Traces of Viking settlement indicate an early influence exerted on the region by the Scandinavians (Danes). In the 16th and 17th centuries colonists came from the Netherlands (Eiderstedt/Nordstrand/Friedrichstadt) and in the 18th century East Frisian colonists also came to help build dykes and settle the Kronprinzenkoog in Dithmarschen. With them came an influx of building styles – „Haubarg“ (square, multi-storey building), the „Barg“ barn and the East Frisian gulf longhouse. By building their typical North German bay hall houses on new settlements in Dithmarschen's geest, the North Elbian Saxons, whose settlement of the Schleswig-Holstein interior is documented, were pivotal in the development of the farmhouses there as well as in the Dithmarschen marshlands. In Dithmarschen, the structure of these Saxon houses came to be blended with the later gulf house of the Frisians.

The cultural heritage of agrarian building in the regions described in this publication cannot be portrayed without considering the trilateral influences stemming from West and East Frisia, the Netherlands and the stretch of land between Denmark, North Frisia and Dithmarschen.

4.3.2.2 Nordfriesland – the mainland including the geest, marsh and Hallig islands

The district and its settlement structure Churches and parishes

The district of North Frisia with the islands and Hallig islands off the coast was established as a newly formed political unit in 1970 by combining the former districts of Südtondern, Husum and the Eiderstedt peninsula. Common economical and cultural forms evolved under the provincial authority of the Dukes of Gottorf from 1544 – 1720 and also under the Danish crown from 1720 until the region became a part of the Prussian province of Schleswig-Holstein in 1864. The region is made up of the Wadden Sea tidal wetland on the North Sea coast, the marsh landscape consisting of 171 polders which resulted from dyke building and drainage systems built

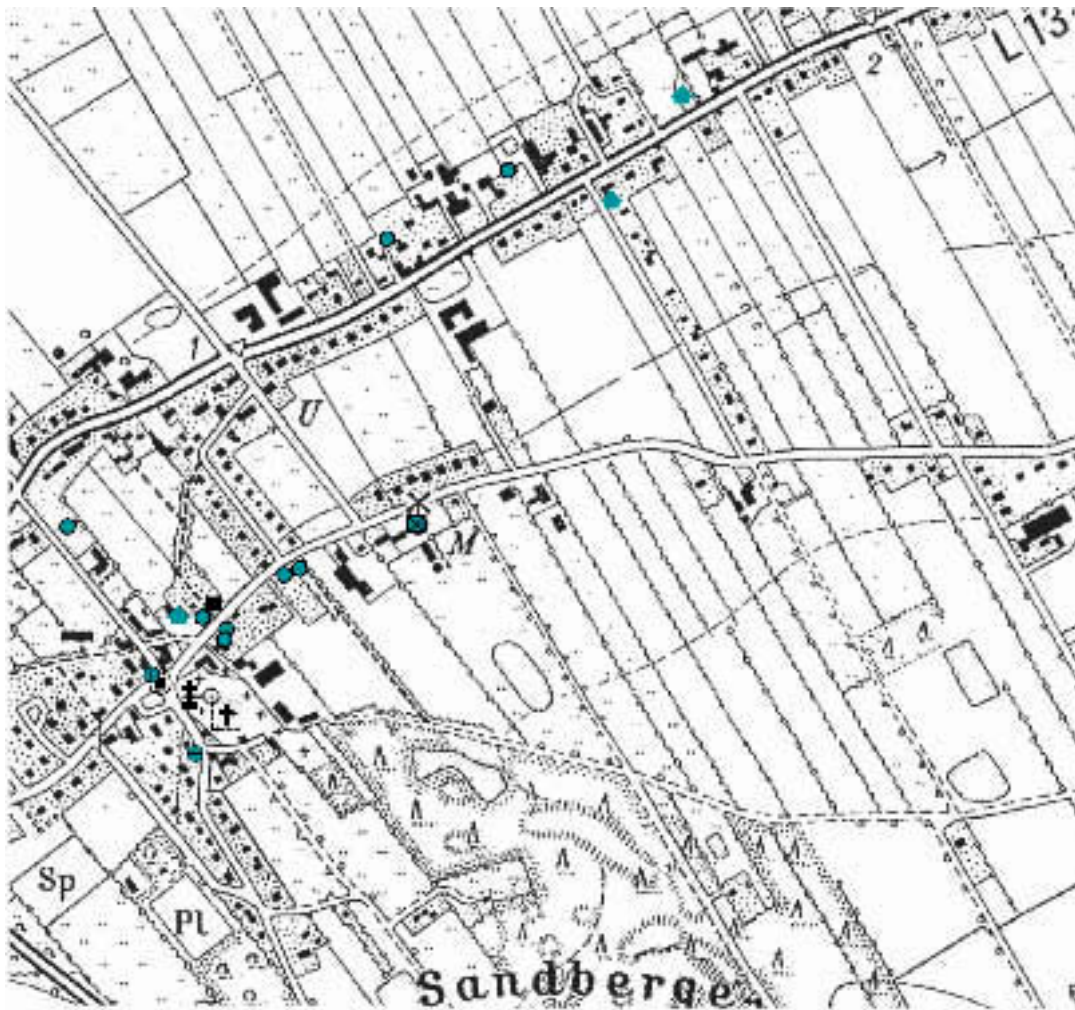


Fig. 4.34:
Road village Langenhorn

Marshland
Road Village Langenhorn /
Nordfriesland

Legend

-  Industrial mill
-  Craft and industry
-  Communal and other buildings
-  Agrarian buildings
-  Church
-  Burial place
-  Place of trade
-  Village



0 100 200 300 400 Meters
Staatliche Geographische Anstalt Berlin-Preussischer Kulturbesitz



from the 12th century until the present day, and finally the geest ridge running from north to south. The district's subdivision into so-called „Harden“ (administrative districts) took place in the 12th century when the area was ruled by the Danes. The chronicler Saxo Grammaticus called the region „Frisia minor“. Several farming villages made up a parish and several parishes a Harde. These divisions and terms continue to be used today. Wiedingharde, Bökingharde and Karrharde are still administrative districts.

The first parish churches were established in the 12th and 13th centuries. The architectural value of these structures is considerable because the scale of building efforts and traditions of those times are preserved from a period from which no secular buildings still exist. Valuable interior fittings, especially Romanesque baptismal fonts, Gothic altars and pulpits dating from the 16th and 17th centuries have been preserved.

The large island churches – for example the „Frisian Cathedral“ of St. Johannes in Nieblum on Föhr – served as a guide to sailing vessels near the shore and also demonstrated the affluence of the Frisians in the Middle Ages. This was acquired through trade in cattle and salt and through their role in the Golden Age of Dutch whale and seal hunting in the 17th and 18th centuries.

The small Hallig hall churches exude the charm of modest simplicity. Churches of this type can now also be seen in the middle of the polders (after dyking enclosed them – e.g. Ockholm, Westerhever and Osterhever). These churches often have a separate low wooden belfry pedestal (Hallig Oland, Hooge and Langeneß) or belfry (among others, Katharinenheerd, Koldenbüttel, Bordelum and Bargum). In keeping with Frisian architectural style, many churches have an entrance on the north and south side. A small lime-tree shaded village church from the 12th century located in the geest village of Olderup (Südergoesharde) is also noteworthy here. Its floor and ground plan are in the tradition of early Carolingian hall churches from the period of early Christianisation in this region and are probably similar to those found in England and Ireland. The nave and square chancel are separated by a triumphal arch with entryways along the north and south walls. There is also a wooden belfry erected at a later date.

The geest bordering the marsh was the preferred location of settlement from the very beginning – and was also favored as the site for

churches. The convenience of living on the geest verge meant farming and animal husbandry could be carried out profitably on the plots of marshland as well as the upland geest – both only a short distance away.

Langenhorn in Nordergoesharde is a fine example of a linear village with plots of land lining the village street. On both sides of the road longhouses, farmsteads and narrow plots of land face each other symmetrically, their borders set off by ditches. The island villages of Midlum, Oldsum, Oevenum and Wrixum on Föhr also demonstrate the same principle, which is still preserved today. However, as was once the case in Niebüll, there are two paths permitting access from either side, with smaller paths leading off to the geest, the farm sites and the marsh. The upper path to the geest remained dry, even at high tide.

Beginning in the 16th century, the dukes began to exert more control over the foreshore. Following the example set at Nordstrand, where re-dyking of the island was completed after the tidal surge of 1634, the duke imposed an agreement on the new settlers from the Netherlands which led to the erection of many new dykes. Individual farmsteads are the rule on the mounds. Former Hallig islands which now form part of the mainland, such as Waygaard, Fedderswarft and Dagebüll, but also Stuffhusen on Eiderstedt, have retained their distinctive Hallig architectural style to the present day. As a means of protection from the prevailing winds, longhouses all face to the west, standing in single file along one axis, lending the villages along the edge of the geest a unique appearance. With each succeeding year, detached homes encroach on the centuries-old layout of the villages with no overall plan guiding their construction. Klockries (Bökingharde) and Büttjebüll (Nordergoesharde) – serving as representative examples from a much larger number of communities – have a well-preserved village structure with many farmsteads still intact, although they will eventually need to be listed on the national register. The restoration of these village buildings (windows, doors, roofing) is worth considering. The „Anton Andersen“ house in Klockries – where restoration has been carried out on the basis of historical findings from the 18th and 19th centuries – is an impressive example of such a preserved building (Fig. 4.46).

Husum is the seat of local government. Osterkamp square, today the site of the local government, was once the large regional stock-

yard and served as the stock mustering site for fattened cattle in the autumn or lean cattle in the spring for the entire region as well as for the Jütland peninsula after Danish approval of exports in 1783. From here and from the Hallig islands and geest, lean cattle were brought to market in cattle drives of 1000 lasting ten days. In the summer the cattle grazed on the rich meadows of the surrounding marshlands.

Trading companies in Husum dealt in grain with the Netherlands via Amsterdam and the Rhineland, as well as carrying on trade in cattle, cheese and butter from 1847 to 1888 through shipments to England via the Tönning harbor. The large warehouse of 1783, located at the Tönning harbor, serves as a reminder of the Eider Canal which was an early passage connecting the North Sea with the Baltic Sea. The existing port facilities – today there are grain silos at the outer harbor in Husum – are signs of the large farm owners' affluence and self-esteem, whereas the larger part of the population were fighting to survive in penury.

Bourgeois and ducal buildings

The oldest market towns of Husum, Friedrichstadt, Tönning and Garding were granted civic rights in the late 16th century and the beginning of the 17th century under the duchy of the Gottorfs (Tönning 1599, Garding 1599, Husum 1603 and Friedrichstadt 1621). The cityscapes bear common cultural traits derived from Danish, Dutch and finally German influence, and demonstrate the steady growth of residential areas with bourgeois homes over a number of different periods. The oldest buildings still extant date back to the founding of the city. Upon receiving civic rights, in Garding, for example, a „Rektorschule“ (demolished in 1985) and a courthouse were built, the latter a long structure with windows on the gable side built using large „cloister“ brick with a Gothic frieze gracing the eaves beneath its high saddleback roof. It is largely preserved. The building structures, brickwork and roof structure and even the wall ties often date back to earlier times than would be assumed by looking at the façade. The interior of Husum's city hall, built in 1601, was restored to reveal the completely preserved hall with heavy oak beams and frescos, while the façade was covered over with brick in the 1970s in accordance with evidence of the prevailing style dating from the Baroque age and Classicism. It should be mentioned here that Husum commissioned the construction of a prize-winning city

hall during the 20th century (1986) at the slipway of Husum's shipyard. The exemplary variety of the city's historic layout is part of the local architectural heritage.

Among the oldest bourgeois homes are those built by Husum's mercantile class with their trademark Hanseatic style characterized by a two-storey hall, counting room, living area in the upper floor and attic below the high saddleback roof. Only a few of this type have been preserved in Husum whereas there are many extant in Friedrichstadt. Classicism frequently brought changes to the appearance and design of buildings built during the Baroque period. Thus many bourgeois homes – especially homes erected during Late Classicism – can be found within these cities, whereas only a few Baroque façades such as the home of Theodor Storm's parents in Husum still exist. Violent intrusions that defaced the cityscape took place during the Gründerzeit both here and elsewhere. The addition of more city streets and changes to the old city center carried out during this construction boom are symptomatic for the appearance of cities in this area.

In Tönning stepped gable buildings were concealed by non-descript façades. These buildings are older than the buildings of the Classical era from the harbor area which were built after the great Husum fire. In all communities, the smallest buildings with windows either facing out from beneath the gable or the side are a reminder of the life led by the poorest members of the population – the fishermen and laborers. A single window and low door directly below the eaves speak for the meagre needs of these people. There are buildings of this type on the west side of Husum and its „Osterende“, as there are in Garding und Tönning as well.

The ducal buildings in Husum are the best preserved thanks to financial support from the national registry of landmark sites. Outstanding structures bear witness to bygone periods while also underscoring the chasm of power dividing the bourgeoisie and the duke. These include the castle outside Husum, completed in 1577 – 1583 in Dutch Renaissance style with red brick alternating with light-colored sandstone, the white-washed gatehouse from 1612 and the cavalry house in the castle park where the monument to Theodor Storm also stands.

The landscape heritage of agrarian buildings

The Uthlande longhouse/Angular buildings and four-sided farmsteads/The Geestharden

house/The „Haubarg“ (square, multi-storey building)/The North German bay hall house

A representative order of rural buildings in North Frisia can most easily be conceived of if the two basic types of building found here are presented: In the Uthlande, a coastal marsh area, Hallig islands and islands settled by Frisians, one finds the Uthlande house (Fig. 4.45). The so-called Geestharden house is found in the villages throughout the geest and along its edges (Fig. 4.47).

Both types of house and their extension to form large farmsteads are one of the most distinctive features of the landscape, and bear the unmistakable stamp of North Frisia: Red bricks, white windows, doorways and gates, thatch-covered hipped-roofs. However, the deterioration of building substance, the abandoning of farmsteads, structural changes foreign to the original architectural style remain dangers these structures are exposed to.

The prototypical Uthlande house is a small, narrow bay house with a joist-supported inner frame structure separated into a stable and living area – in the event that a major storm and flooding were to take the walls and roofing off the building the wooden frame structure would remain as a final haven to protect the inhabitants of the house. One bay marks the distance between two rafters. It resembles the rectangular longhouse of the Iron Age and Early Middle Ages found in archaeological excavations. The stables ran the length of the building with the stable door in the narrow gable entry with a dung heap directly before it.

The living and stable areas were always separated by a narrow vestibule with entryways on the north and south side, with the building as a whole placed on an east-west axis to provide protection against the wind. The fact that the buildings face the same direction – a characteristic most frequently seen on the islands and the Hallig islands – is typical, with all buildings in close proximity to one another. The living area is subdivided into four rooms by cross-shaped wall partitions, at the intersection of which the fireplace and chimney are to be found. The Uthlande house was most commonly occupied by small farmers grazing livestock and by sailors, especially the inhabitants of the Hallig islands on the seaward side of the dykes. Consequently, there was no space for crops and threshing, only a low space for storage in the stables. Hay was wrapped in linen cloth and transported into the house through a small hatch in the attic's half-

hip roof. Hay was also stored outdoors in four-post sheds with an adjustable roof or in haystacks.

Additional siding with rafters slightly extended the width of the house, while early use of sod walls, mud-wall with hurdle-work and wooden walls (both within and without) gave way to walls of masonry, and wooden siding in the gable was succeeded by brickwork. On the Hallig of Langeneß – standing side by side on the Ketels dwelling mound – the homes „Haus Tadsen“ dating from 1741 and „Haus Sönnichsen“ now house a museum and are examples of an Uthlande house with a joist-supported inner frame structure. „Haus Olesen“ of 1617 at the open-air museum in Wyk on Föhr is another example of this type of house.

The later style dispenses with the inner frame structure and can be found at many places in the area as a small farmstead, a cottage or an artisan's or fisherman's house. Additions made to this type of house – depending on the kind of farming being done – were completed by adding a barn or stable with a hayloft supported by a similar inner frame structure, but with the half-timbering at a higher point.

The earliest known example was the Axen house in Lindholm, erected in the first half of the 17th century. (Braun/Strehl, 1989) It had a barn annex running parallel to the original building, with an entry at right angles. This house is privately owned and has been completely restored and is excellently maintained (Fig. 4.45).

Because the Uthlande house cannot be extended in length, barn annexes form one or more angles (Fig. 4.46). Researchers studying this kind of architecture refer here to farmsteads which are shaped like a „7“ or are „5-shaped“ until the next level, a three-sided farmstead, or even four-sided farmstead in the most fertile polders (Fig. 4.48). These proud farmsteads still exist in both polders at Christian-Albrechts-Kögen, in the Kleiseer Koog, in the old Wiedingharder Koog and also on the marsh island of Pellworm. On the islands of Sylt, Föhr and Amrum, the angular design dominates with some farming carried on by the wives of sea-faring men. These buildings still exist today, but have been converted into bungalows for holiday-makers. Finally, there are two authentic farmsteads with their original farming implements in Utersum and Midlum which will probably meet the same fate.

The Geestharden house is a long, wide bay house with superimposed tie-beam construction, also running along an east-west axis, with the

building space, living area, threshing floor, stable, second threshing floor and square main hall all supported by four posts. The living area thus resembles the Uthlande house in its basic form in that it also has four rooms.

This type of house can easily be extended, and thus there are smaller Geestharden houses with low eaves as well as Geestharden houses boasting a considerable length built over various periods until the end of the 19th century. Belying its name, the Geestharden house was also built in the marsh, with extended angular annexes (Fig. 4.47).

Dutch domestic culture, complete with tiled walls in the living areas which retained and gave off heat from the two-legged cast iron „Bilegger“ stove, and with alcove beds and closet space along the walls, all form a part of the Uthlande and Geestharden house tradition that is well worth preserving today as a facet of our European cultural heritage. Ship captains on the islands and Hallig islands enhanced their standard of living by bringing various objects back with them from Holland.

Dutch immigrants who came to Eiderstedt starting in the 16th/17th century instituted their own tradition for building farmsteads which will be presented in a separate section. This was the tradition of the „Haubarg“ (Fig. 4.52).

In addition to the farmhouses already mentioned, there is also the Anglo-Saxon North German bay house, spread over a small area limited to the southern part of Südergoesharde, on the geest north of the Eider and Treene. The Ostfelder farmhouse dating from the 16th century (separate parlor room extensions in 1673) was relocated to Husum in 1899 and converted to an open-air museum. Exceptional examples of this type of house are found in Seeth in the district of Stapelholm. These oak-timbered frame structures date from the late 16th century.

At this time, the inhabitants raised livestock and tilled the land, both to meet their own needs and for sale. Grain was processed into milled flour, groats and coarsely ground barley, rapeseed pressed to gain oil. Of these post mills, there is only one specimen preserved at the Molfsee open-air museum. In the 18th and 19th centuries, windmills of the Dutch style gained favor over the post mills because the latter were so labor-intensive, requiring the entire mill to be rotated on a crosstree to face the wind. The rotating cap of the new smock mills from Holland – built on ground level, with an additional gallery or a mound of earth pitched to allow

access to the blade – represent a considerable gain in efficiency. This design was further extended when the so-called tail pole – used to position the mill to face into the eye of the wind – was replaced by the fantail in 1750. There were many mills within the region. During the 17th century, much to their distress, millers and farmers were forced to give up control of their mills by a royal edict issued in 1720. Government control of mills was not abolished until 1852. The demise of windmills began in 1925 as large mills which ran on electricity were constructed. The last „Dutch-style“ mills were still in operation until 1950/1960. Conversion to other purposes has led to the preservation of 13 mills in North Frisia. The oldest date from 1771 and are found in Joldlund and in Nebel on Amrum. The last one is still operational as a mill, and also serves as a heritage museum. Most restored mills date from the 19th century. On Pellworm the mill „Gott mit uns“ (God be with us) was also a navigational aid. Of 40 mills on Eiderstedt, „Emanuel“ and „Catharina“ underwent restoration and were converted to other purposes.

Farm buildings – contemporary trends

The valuable inventory of surviving farmstead dwellings and ancillary buildings from agrarian life in North Frisia is constantly being adversely affected by two post-war developments. It has become possible to separate ownership of the farmstead and of buildings. Large tracts of land are required in order to be able to achieve economies of scale for a farming operation. Many farmers are leasing their land and placing the farmstead property on the real estate market.

The most beautiful and best-preserved four-sided farmstead in the verdant „Neuen Christian-Albrecht-Koog“, the Nahn farmstead, greets visitors with a sign advertising the „Beauty und Wellness Hotel“ housed within it (Fig. 4.48).

After leasing additional land or purchasing a larger share of milk quotas, farmsteads require more buildings. From time to time, new ancillary buildings are added by the leaseholders – forming a hive of sheds and outsize buildings around the original single-family house, in some cases crowded in at the foot of a dyke. Building and zoning legislation passed in 1998 allows less orderly principles for construction. This has led to rampant building methods which give the property a jumbled appearance. As early as the mid-seventies, the tourist industry made overnight lodgings and a second domicile in the

country away from the traditional seaside resorts more popular, and has also meant that farm dwellings have become the property of new owners. A large proportion of the houses forming the local heritage were thus preserved, yet conversion of the property to other uses has resulted in varying levels of preservation quality.

The property development in the Sönke-Nissen-Koog – just outside Bredstedt in the district of Nordergoesharde – is a rare and noteworthy example within the landscape of „modern“ farm buildings. In 1926 four large farmsteads were built here by the architect H. Stav. These are living proof of how the creative use of new materials allows building design to blend into the landscape (sheet metal painted green and white, white plasterwork, glass). Those familiar with these farmsteads appreciate how the flickering of the sun's rays on the light green roof blends with the azure sky in the distance. The building and landscape meld to become one, a basic law of architecture still valid here.

The considerable heritage represented by the houses in North Frisia require the use of fundamental planning principles for their preservation and redesign.

4.3.2.3 Eiderstedt – the peninsula of the North Frisian district

The district and its settlement structure Churches and parishes

Still called the „Dreilande“ (three lands) to this day, Eiderstedt consists of the three isle-like administrative districts (so-called „Harden“) of Utholm, Everschop and Eiderstedt. These districts are separated by tidal gullies and incursions of the sea and were transformed into a peninsula through dyke-building and drainage measures starting in the 12th century and continuing all the way to land reclamation efforts of our day. Eiderstedt was a separate district until the administrative reform of 1970.

The large island „Strand“, of which only the marsh islands Nordstrand and Pellworm remained after the flood tides of 1354 and 1634, once stood close to the shore of Eiderstedt, only separated in the north by the Heverstrom sea channel. These islands and the peninsula share the common trait of having an unusually fertile layer of marsh topsoil, which on Eiderstedt is especially rich. This soil formed the basis of the Eiderstedt farmers' affluence.

The Garding chronicler Volckmarus Carolus wrote in 1795: „The soil is the source of two-fold riches.“

The sand embankment running across Eiderstedt from west to east, referred to by the locals as their „geest“ holds not only finds from the Stone and Bronze Ages, but also the oldest evidence of settlement – dating back to the 1st century A.D. In the Middle Ages too, the soil's intrinsic quality and high elevation offered the safest conditions of survival by making it possible to build houses on a site which would not be flooded.

Thus, settlements were established here in the Middle Ages, which also saw church structures completed in the 12th and 13th centuries, leading to the establishment of the parishes St. Peter-Ording, Tating, Garding and Katharinenheerd.

The „Chronicon Eiderostadense vulgare von 1547“ – a chronicle which also contains historical records from 1103 to 1482 – reports that wooden chapels were erected in „Tatinghen“ (Tating) in 1103 and „op dem Kleve Garsande“ (Garding) in 1109. Shortly thereafter both were destroyed by fire and replaced by stone churches. Garding anno 1117: „Chapels are constructed from the chapels“ – one should note the „water-ravaged land“ and the difficulty of navigating the paths and roads. The sites are named „Poppenbüll, Tetenbüll, Osterhever, Katrinherde, Welte and Vurewyck“ (Vollerwiek).

The 18 churches still existing bear witness to these early beginnings. They stand alone as the most valuable remnants of mediaeval architecture in this region, despite alterations to their structure carried out mostly in the 19th century. The „Eiderstedt pulpit“ from the 16th century belongs to the post-Reformation church treasures from the golden period of church culture.

Eiderstedt is home to a large number of individual dwelling mounds which can be recognized as mound villages and former Hallig mounds. It can be stated here that these sites represent the most desirable locations for dwellings and farmsteads from earliest habitation to the present day, in particular for the imposing large kind of farmhouse native to Eiderstedt – the „Haubarg“. Some dwelling mounds have fallen into disuse after fires or been abandoned after the farmstead was demolished. They are normally included as pasturage. The large „Schockenbüll“ dwelling mound, located in the Marschkoog of Tetenbüll on the formerly navigable tidal gully, serves as one example. A wide area of reeds has evolved along a waterway here, for centuries

providing the building material for thatched houses.

With Poppenbüll's oldest polders, Osterhever and Westerhever – with their traditional church, parsonage, school and pub forming the community's center – many Hallig dwelling mounds have been retained from that portion of the foreshore once encircled by ring dykes. „Sieversbüll“ (Westerhever) has two Haubarg buildings where once three stood and „Stuffhusen“ boasts a single Haubarg and other structures closely tied to Hallig building tradition.

An old village mound of surprising height and mass named „Op'n Dörp“ is located in the village of Osterhever. In 1837 J. von Schröder noted: „Houses on top of the mound are still called 'the village'“.

The village mounds of the polders which were eventually surrounded by ring-dykes are flatter. An example of this is the Sieversflether Koog (1610) with its „Rich Man's Row“ – originally a series of six Haubarge, five of which still stand – their approach following a long, uniformly laid out path running across the middle of the polder. Settlement structures follow along similar lines in the Altaugustenkoog (1611) and the Neuaugustenkoog (1699). Here the Haubarg buildings also stand in single file on the flat farmstead land with a square-shaped system of ditches surrounding the entire compound. Water runoff and the ground water of the ditches pass through the natural filter of the reeds and sedge growth, providing a fresh water supply to the people and their livestock. Examples of this circular system of ditches surrounding the sod farmstead mounds are known that date from the period of settlement after Christianisation.

At strategically important, well-fortified compounds such as the one in Hoyerswort (constructed by Caspar Hoyer from 1591 to 1594) and in Wolfenbüll (Marschkoog Tetenbüll) the farmstead mounds are encircled by a system of ditches with intermediate pastureland, called „Blök“ or „Bleeke“. These were also fitted with a drawbridge for security. Impenetrable briar hedges protected the mound with additional protection afforded by a large stand of ash, willow and elm trees.

The Hoyerswort castle is the former residence of the lease-holders and the only patrician building in the landscape. It is well-preserved thanks to being listed on the national registry of historical monuments (Fig. 4.49). A local family runs a farm and tends the compound, including

a renovated farming Haubarg building, while applying traditional methods.

The population density in the 17th and 18th centuries, the period when Haubarg buildings were built, was higher than it is today.

The Haubarg buildings

The Dreilande „Utholm“, „Everschop“ and „Eiderstedt“ were granted common land rights in Lower German in 1572 and a common seal in 1613. This was the period in which the three districts merged due to the completion of the dykeworks and drainage measures.

At the wish of the duke and because of the financial interest of the Dutch in earning money by applying their technical expertise in dyke building and drainage construction in beyond their own borders, Dutch dyke builders came to Eiderstedt as early as the 16th century, followed by investors and farmers.

The special feature of housebuilding in North Frisia – the famous Eiderstedt Haubarg – originated here. As expert builders the Dutch brought with them to the area their mighty house design, as well as the Dutch windmill with rotating cap, modern methods in dairy farming („Holländereien“), and among other things techniques for cultivating rape, which continues to be rotated with wheat to this day.

In 1619 at the confluence of the Eider and Treene, an uninhabitable wetland, the Dutch founded Friedrichstadt. As a privilege granted by Duke Frederick, seven different churches provided a place of worship for people being persecuted for their faith. Friedrichstadt has stepped gable houses from the 17th century and is very well-preserved. With its Dutch ambience, it is also a magnet for tourists. In 1625 the duke and Dutch counterparts predominantly from Catholic Brabant as well as other contractual parties entered into an agreement to build new dykes around Nordstrand and settle it. The imposed agreement by the duke also guaranteed privileges to the parties involved. The Dutch settlers and their lease-holders thus gained ownership of large areas of land. Unlike the situation in Eiderstedt, a map dating from 1725 only provides evidence of one Haubarg structure.

Due to constant renovation of farm buildings on Nordstrand, there are only a few remaining specimens of the imposing longhouses with entryways on the side, which may also be the predecessors of Eiderstedt's stock of Haubarg buildings.

During the same period, in Holland polders were being reclaimed from the grasps of the sea. The Beemster in the north of Holland was thus reclaimed by means of dykes and Dutch pumping mills around 1612 – 1620. The bountiful harvests which were reaped led to that area being called Holland's pleasure-garden in 1640. The singular impression made by the many „Stelp“ farmsteads is well-known. These farmsteads were built on the newly reclaimed polders using a building style derived from the Frisian gulf house. „Stelp“ and „Haubarg“ building styles are very similar in their design and construction and are related to the gulf houses with their large square central room – the „gulf“ or „barg“.

The novel and modernizing effect of these two types of buildings can be attributed to the spaciousness of the interior, which required less wood to construct a substantial amount of storage space. This stood in stark contrast to gulf longhouses and their more narrowly spaced joists. The Haubarg is a typical marshland house, serving as stables for dairy cattle feeding on coarse fodder while also being suitable for farming harvest-rich crops (Figs. 4.50 – 4.52).

The gaps between the half-timbering (horizontal wooden frames) are maximized, thus producing an impressive square space between only four posts.

The living area (Vörhus) and combined stable-barn (Achterhus) with the threshing floor and stables for cattle and horses running along the building's length constitute the parts of the multi-purpose dwelling. Six-post and eight-post variations of this design add a correspondingly larger number of spacious central storage rooms. The old method of using wall ties allow the posts to be spaced farther apart cross-wise and stabilizes its construction – an important feature for withstanding the strong winds of the coastal region. The large hip-roofed thatching rests on crossbeams and rafters of a four-post square frame. Lacking a nearby source, wood needed as a building material had to be imported from Pomerania and Norway while oak was initially taken from the geest. By 1588 the use of bricks for house construction was already required by ducal decree. Shell lime was supplied by ship from the Netherlands; on Eiderstedt two lime-kilns have been documented from the 19th century as well as a large number of brickworks. Today, no brickworks exist on the peninsula any more.

The Haubarg followed its own course of development. „Dutch immigrants built the first known

Barghaus on Eiderstedt as early as 1605. In Freesenkoog (near Friedrichstadt) the first Haubarg buildings were probably built in 1611“ (Knottnerus, 1997, pp. 94 – 99).

The entry recorded by Peter Sax in 1636 only makes one reference to a structure of this kind. Describing the villages of Kaltenhörn and Büttel (Koldenbüttel), he notes that: „.... the pond, of Johan Philip of Hertingeshusen's Hewberg on....“. The construction of Haubarg buildings was common around 1650. There are some Haubarg buildings which have integrated the previous Frisian longhouse at the home site in full or remnants of it. Among other things, this led to various ground plans and exterior forms. The Red Haubarg was erected as a ducal building and is the highest and largest of this type. The Haubarg was first built in 1659 using „red roof tiles“ – a costly measure rather than using conventional thatching, the hall in the upper floor was also an indulgence, displacing a room where normally grain would have been stored. In 1759 the present building was erected in the wake of a fire. The building was restored completely in 1983/84 with support from the state registry of historical monuments and is home to an agricultural museum and restaurant (Fig. 4.51). The Mattheißen Haubarg in Brösüm near St.Peter-Ording, the Kühl'sche Haubarg near Katharinenheerd and the Tetenbüll „Staatshof“ (all fine specimens) have preserved façades and noteworthy details dating back to the 18th century (Fig. 4.50). Only one example of inner furnishings has been preserved from the period. These furnishings can be viewed in the Rotelau Haubarg, which was relocated to a Copenhagen open-air museum in 1959. The Poppenbüll Holmhof (1870) has original elements such as a multi-gabled Haubarg barn featuring side entryways with a passageway connecting it to separate living quarters.

There are numerous examples of well-preserved cottages of day laborers, which are built in the Haubarg style. These small half-timbered houses, which are also related to the Uthlande house in their extended form as small farmsteads, no longer make use of an inner joist-supported structure, but instead have roof beams set on solid masonry with wallboard. There is only one known example of a house using an inner joist-supported frame on Eiderstedt – it was a smokehouse located in Poppenbüll, which burned down in 1990 after being condemned before that. Studies have shown that the smokehouse's frame came from the Helmfleth Hallig dwelling

mound, the last remains of an Uthlande house on Eiderstedt, testifying to the peninsula's place within the North Frisian architectural landscape.

„Haubarg“ buildings in danger

The existence of Haubarg buildings has been threatened from the middle of the 19th century to the present day. A large number have been torn down over the years: of the 400 Haubarg buildings recorded in 1795 (chronicler Volckmarus Carolus), only 370 were counted in 1860, in 1930 only 160 were still standing and today approximately 70 such structures still exist, some of which have only retained their inner frame and outer building structure. These heavy losses point to the transformation of agricultural methods which began in the middle of the 19th century.

The change from dairying and raising grain crops to grazing oxen for lucrative export trade with England from 1846 to about 1890 meant that there was no longer a need to utilize the space provided by Haubarg buildings. Around 1900, statistics on land use show that 14 % of the land was being farmed and 86 % covered by greenspace in Eiderstedt, whereas in 1800 the proportions were 40 % for farming and 60 % for greenspace (Hammerich, 1984).

A new type of farmstead evolved during the period of Prussian rule starting in 1870. Its separate living quarters and farm buildings have a flat sloping board roof and hayloft wrapped in tin sheeting. This style of building continued to be constructed until 1960. However, unlike in Dithmarschen, the Haubarg has continued to dominate the landscape in Eiderstedt.

Today, the farm buildings with loosebox stables being constructed for fattening bulls, for housing dairying lines or for stowing straw and implements reveal the contemporary needs of farmers. Planned alterations to the original building structure of the Haubarg buildings are considered uneconomical and the cost of constantly maintaining and insuring the thatched roofs is also seen as a burden. A Haubarg has approximately 1000 sqm of thatching worth EUR 100,000. There are Haubarg buildings being fully utilized which are completely covered with metal siding, thus pointing to the maintenance costs for manual labor as the prime cause of the Haubarg's demise today. The simplest solution chosen by farmers is building new multi-purpose buildings for a fixed price, sometimes while doing the construction themselves. In this way, year for year, Haubarg buildings are being sold to

people from outside the area who are not in the business of farming. Conversion of these buildings to other uses involves thorough restoration and their preservation. Unfortunately, there are also a large number of alterations made to these buildings which are inappropriate to the building design. These are carried out to accommodate larger numbers of holiday visitors. This reduces the Haubarg to the level of a „trademark“.

These buildings can still be experienced, much to the pleasure of their owners and the delight of tourists. Speaking only of the Eiderstedt peninsula – Haubarg buildings and the landscape so tellingly graced by these buildings are unique and irreplaceable treasures of our cultural heritage.

4.3.2.4 Dithmarschen – North and South Dithmarschen

The district and its settlement structure

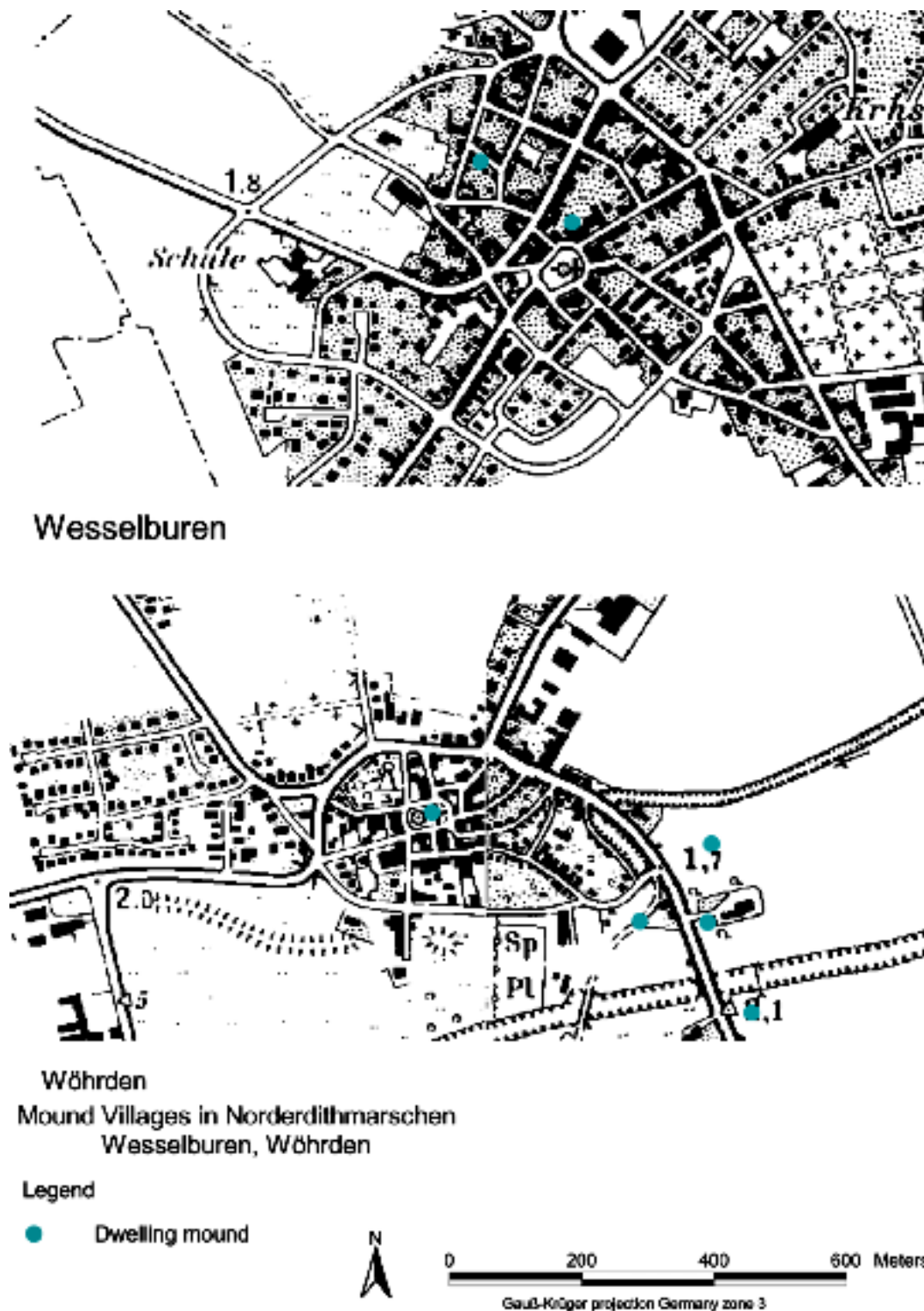
Churches and parishes

The district of Dithmarschen known to us today – bounded by the Eider in the north and the Elbe in the south – is made up of Norddithmarschen with its seat of local government in Heide and Süddithmarschen with its seat of local government in Meldorf. Meldorf was founded in the Middle Ages as the district's main city on a spit of geest, well above the surrounding countryside.

The old moraine geest ridge and spits of land partially covered by dunes („Donn“), such as near Michaelisdonn, and partial formation of a cliff face („Kleve“), like the one at the approach to the village of Kleve near Hennstedt, provided desirable settlement locations while reminding the observer of the earlier North Sea surf which 6,500 years ago broke on the shore far inland from today's coast. The „first-generation“ parishes of Meldorf, Tellingstedt, Weddingstedt, Süderhastedt are located here.

After the annexation of Saxon territories during the reign of Charlemagne and the ensuing missionary effort, Meldorf was the first and thus oldest church built in Dithmarschen (before 826). Today, the church is the most important large Gothic monument (1250 - 1300) of the region, though it has a neo-Gothic spire which was added later. The Carolingian-Saxon ramparts and castle fortresses still exist in both Stelle (Norddithmarschen) and Burg (Süddithmarschen) on the upland geest edge, affording a broad view of the marsh. The churches atop village mounds in the marsh have developed into circular settlements whose distinguishing fea-

Fig. 4.35:
Mound villages
Wesselburen and Wörden



tures are a ring road surrounding the churchyard with streets radiating outwards. Wöhrden and Wesselburen are well-preserved examples demonstrating this pattern.

The church at Wesselburen still holds remains of the round Romanesque fieldstone tower from the 12th century. The church and provincial government (seat of the parish vestry) from 1737 are a further indication of the power and wealth of local farmers. The parishes of the 12th and 13th centuries remain centers of power to this day for the farming population both among geest and marsh farmers. Preserved Romanesque churches in Dithmarschen are long hall churches of fieldstone (Lunden, Hennstedt) with belfries partly made of wood (Hemme, Lunden). The villages are largely preserved in their original layout and, due to their agrarian structures, have been spared sprawl or aimless development except for new residential subdivisions. The alteration of many historic buildings, especially their demolition during the post-war economic boom have taken their toll on the cityscapes. There are only scattered examples of the earliest half-timbered frame construction, e.g. the „Material Storehouse“ in Wöhrden in the Hafestraße dating from 1519, as well as the former Meldorf vicarage in Papenstraße dating from 1601.

The rows of dwellings found in the earliest settlements stretching along a north-south axis on the old marsh and the later development of single-farmstead settlements on the low-lying areas clearly mark the structure of modern-day marshland villages. Farmsteads line up side by side with tree-covered ditch systems along their flanks. The typical farmstead houses which arose over various periods are found here. Large-estate farmers have farmsteads dating primarily from the final decades of the 19th century up until the beginning of the following century. An upsurge in the farming economy of the 19th century allowed the construction of new buildings. Thus, in Tiebensee, Wennemannswisch, and Jarrenwisch and at other points in the region farmstead compounds nearly take on the dimensions of a farming estate.

The polders situated off the old marsh and its village mounds and single-farmstead settlements from between 1600 – 1970 form a system subject to various regulative forces. The house design and the division of farming land are determined by the settlers and the architectural period. On the geest ridges villages developed without following a set structural pattern. The

field edges follow the irregular course of the reclaimed plots of land which were cultivated cooperatively until the reapportionment of land into larger plots during the 18th century. This was the primary factor behind the development of clustered villages. Villages near towns expanded and developed into more densely populated residential communities with a large number of new detached homes in all manner of styles and positions in the town. The once harmonious appearance of villages with uniform hip-roofed structures within the landscape of residential buildings is now history.

Marsh plot settlements with a row of farmsteads set off from each other are weathering these changes more auspiciously. This settlement structure is being disturbed at many places through the subdivision of building property to accommodate single-family homes. Moreover, new commercial buildings are being built, including windowless sheds to replace former farmstead sites on mounds which now have nobody living there. The tourist industry also makes use of some existing buildings. However, the sites which are operating as farmsteads with large immaculate front yards easily predominate the scene. These farmers have chosen to live with the changes required of buildings used in modern agriculture. The cultivation of cabbage and vegetables requires large stacks of crates to stand nearby in the open or in nearby buildings along with tractors and front-end loaders.

The landscape heritage of agrarian buildings

The North German bay hall house/The „Dwer“ house/The „Barg“ barn /The East Frisian gulf house

Presenting the history of agrarian building development in Dithmarschen is difficult. First, there are no inventories using modern investigation methodology, and additionally most architectural historians will emphasize the problem:

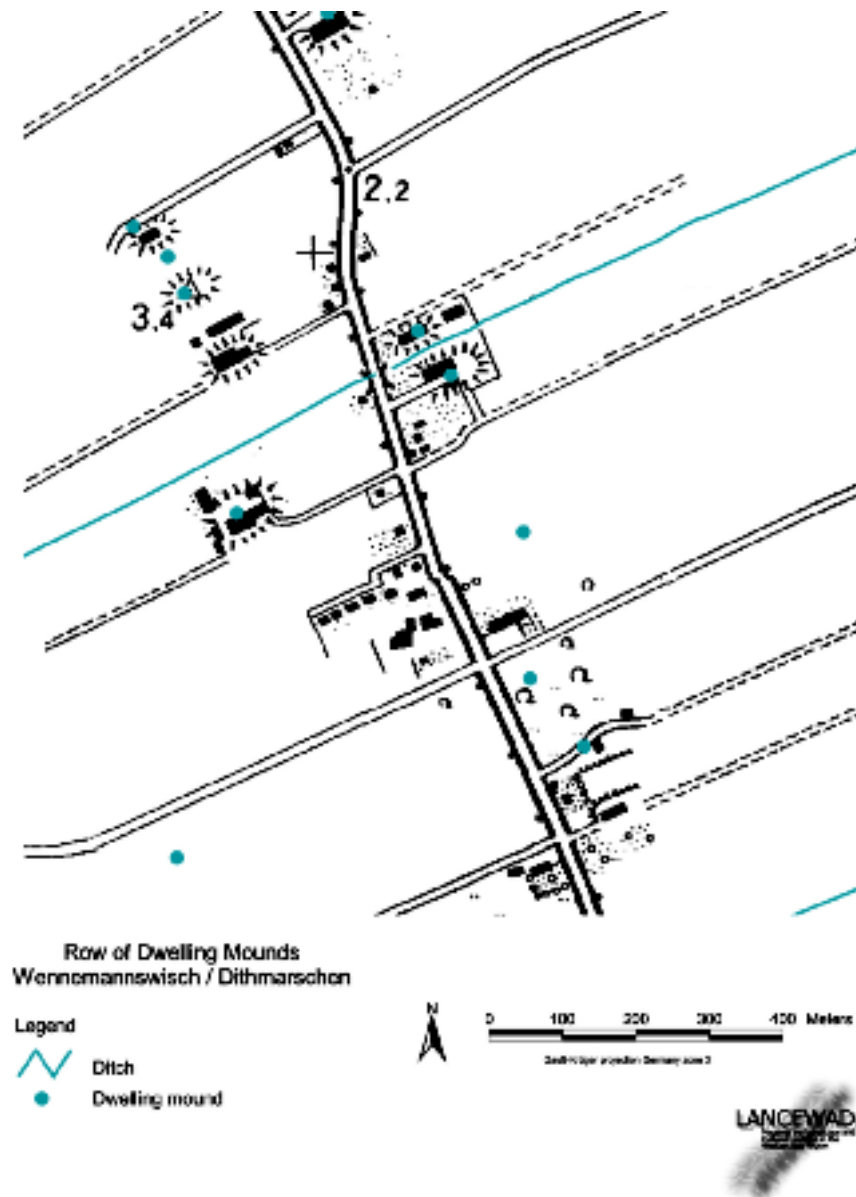
„The development of the farmhouse is more elaborate here than it has been in Elbmarschen“ (Lehmann, 1927, p. 63).

„The houses themselves are difficult to sort out...“ (Wolf, 1940, p. 151).

„The Dithmarschen geest was once an area of houses in the Lower Saxon style. These have all disappeared“ (Lehmann, 1927, p. 82).

As is the case with urban buildings, the oldest type of structure in Dithmarschen uses half-timber frame construction. In 1907 a North German bay hall house dating from 1700 was successfully preserved in Osterrade. It was relocated to

Fig. 4.36:
Row of dwelling mounds,
Dithmarschen



Meldorf to serve as the centerpiece of an open-air museum and now provides visitors with an impression of how people lived in this „Dutch-style“ building (Fig. 4.53).

As the geest agriculture became more economically stable in the 19th century, the larger house design called the „Dwer“ house became more common on this less fertile soil. The „Dwer“ house („Dwer“ is a Low German term meaning „cross-wise“), which researchers of this architecture have dated back to 1600 takes on the building structure of the Saxon bay house, but the distinguishing feature of this Dithmarschen house is an entryway to the living quarters, work areas and stables or barn away from the gable front.

As of 1800, the work area of the „Dwer“ house took on the Frisian gulf house design, most likely to enlarge the storage space and improve the use of the building. That is why there are two kinds of farmstead. As is the case in the Wisternmarsch, the Saxon design is combined with the Frisian gulf frame construction. It cannot necessarily be seen if a building uses gulf house design without looking inside.

That is one difficulty posed when completing an inventory. There is an apparently well-preserved building located on the national highway in Epenwörden, with remnants of Frisian roof framework, that will probably be torn down due to its proximity to the road (Fig. 4.54).

In order to improve the appearance of the home, some houses are having a vestibule added to the living area in the front gable. At the same time, farmsteads of Saxon design have had a side gable added on the eaves side as an entryway to a large transverse vestibule, such as the at the Löwenhof farm in Süddithmarschen.

The „Dwer“ house came to be typical for Dithmarschen farmhouses of varying dimension and variation as described above, yet many impressive farmsteads have fallen victim to new development.

„Around 1850 agricultural life underwent significant transformation as yet unequalled in recorded history – through so-called industrialisation“ (Nissen, 1999). This historical development had a marked effect on Dithmarschen and led to changes and a transformation of farmhouse culture. The „founder years“ of agricultural building activity, which chose to emphasize representative homes as well as farm buildings on an extensive scale from the turn of the century up to the 1930s, led to the demise of a large number of the older „Dwer“ houses. Partial demolition also led to alterations: While the shorter living area of „Dwer“ houses is left intact, the working area is redesigned by building an extension directly onto the half-hip roof which rests on the sill beam. This annexe usually has metal siding with a flat sloping roof. Building alterations of this type are still being carried out today.

The „Barg“ barn with a square four-post construction is based on an older Frisian tradition in Dithmarschen and was built as a supplementary building on farmsteads as early as the first half of the 17th century. „A farmstead in the southern Dithmarschen area is not complete without a Frisian barn“ (SaefteI, 1930, p. 44). At the time of his publication, SaefteI already pointed out that no inventory had been completed. Especially in the north of Dithmarschen, a large number of Barg barns of both modest and more sizeable dimensions still exist today. However, they are threatened by a lack of upkeep. The traditional thatched roofing has given way to Eternit (fire-retardant roofing) or sheet metal (Fig 4.55).

The vibrant history of home building in Dithmarschen with its varying Dutch influences is also testified to through the documentation of 17 „Haubarg“ buildings by SaefteI, of which none have survived.

The East Frisian gulf house, which was the type of dwelling used to settle the Kronprinzenkoog in 1787, has a distinctive building

style with entry to the stables and large hall from the side. It also has an additional hall doorway in the recessed living area of the building, providing a practical solution for passing through the building so typical for the East Frisian gulf house (Fig. 4.56). This building design was brought to this fertile land from East Frisia and has vast dimensions. The abundant crops harvested on the new polders required large buildings with a high-ceilinged storage area for stacking the unthreshed grain. Many of these gulf houses are still preserved on the polder, despite the addition of contemporary farm utility buildings to the complexes.

The most recently dyked polders dating from the 1930s such as Dieksanderkoog, which was renamed from the former name of „Adolf-Hitler-Koog“ in 1945, form a part of Dithmarschen's history.

The farmsteads built in 1933 to exemplify „traditional“ construction of the period still exist today, including the „Neulandhalle“, which served as a cultural focal point and educational retreat for the National Socialist party for disseminating its „race-and-fatherland“ ideology. The dyking of the polder began in 1933 accompanied by party propaganda: „Digging in with spades as their weapons, German youth create new German territory under Compulsory National Labour Service“.

This traditional farming area also attracts tourists due to its attractive location facing the sea. Thus, over time, the buildings are changing in their make-up – at random.

Much as it did in North Frisia, the Dutch windmills of the 18th and 19th centuries took their place as an evolving part of the farm building landscape. In Dithmarschen 15 mills have been converted and thus been preserved within the landscape.

The Dutch outside cap winder „Aurora“ (Latin for „dawn“) dating from 1880 is located in Weddingstedt and stopped operation in 1960. It survived as a derelict torso and has only been restored very recently. In Hochdonn a windmill also named „Aurora“ could no longer operate when the train bridge crossing the North Sea-Baltic Sea canal was built in 1920, blocking the normal path of the wind. It was then electrified and is used as a home today.

The historical and economic factors contributing to the flourishing farmhouse culture in Dithmarschen is distinguished by its continuity. The excellent trade routes of the Elbe and Eider provided convenient access to Hanseatic cities –

particularly Hamburg and Bremen – and led to the establishment of a flourishing exchange of goods as early as the Middle Ages. Land ownership and wealth was wielded by the powerful dynasty of farming clans who worked in cooperative associations.

The region remained independent of noble rule until 1559. Witnesses to this age are the cemetery with vaulted tombs for the ruling class of farmers at the churchyard in Lunden and the excellently appointed main room of the Marcus Swyn house from 1568, who was chief parish warden, farmer, trader and shipowner all in one (Landesmuseum Meldorf). The Schmielau farmstead in Lehe/Dithmarschen dating from 1781 can be visited at the open-air museum in Molfsee near Kiel and its manorial furnishings provide an impression of the wealth at the time. It has also been handed down that geest farmers and the rich marsh farmers avoided contact on the Heide horse market and that marriage between the two classes was frowned upon.

The key requirements for successful farming are met in Dithmarschen: outstanding soil quality which can easily be cultivated and a favorable climate.

The forms of agricultural operations include extensive and intensive farming – both of grain crops and vegetables – as well as fruit orchards. The most commonly found farm produce in Dithmarschen includes cabbage, sugarbeets and potatoes. Horses have always been bred in Dithmarschen as part of its livestock, a tradition which is continued to this day.

Despite the changes of the 19th century, the heritage of agrarian homes in Dithmarschen represents a valuable store of concealed building materials which cannot be catalogued through mere observation and has yet to be cartographically researched. In Bargholz a preserved bay hall house from the 18th century was discovered which was believed to be „extinct“. The greater public's awareness of the importance of these buildings seems to be less deeply instilled. This region has not been as strongly exposed to the numbers of tourists found in North Frisia. The region around Büsum is one exception. When converting these buildings to an alternative use – except for rare exceptions – renovation work unfortunately involves the use of popular sale items found in home improvement centers. There is no special interest group for the preservation of historical buildings found here like in North Frisia, where a special interest group named „Interessengemeinschaft zur Bewahrung his-

torischer Bausubstanz“ [Society for the Preservation of Historical Buildings] has successfully contributed to the preservation of countless historical buildings. Thus, in Dithmarschen no inventory of the farmhouses and barns mentioned above has been completed. The area's farm building heritage is made distinctive by the blend of Saxon and Frisian influences on its building culture.

4.3.3 References

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Fig. 4.37:
Three wheels close to Uel-
vesbüll, Schleswig-Holstein
Photo: W. Raabe



Fig. 4.38:
Lembecksburg,
island of Föhr
Photo: W. Raabe



Fig. 4.39:
Estuary of the river Eider
with the town of Tönning
Photo: W. Raabe



Fig. 4.40:
Haferwisch, a row of settlements in Dithmarschen
Photo: FTZ-Küstenarchäologie



Fig. 4.41:
Village mound Westerbüttel, Dithmarschen
Photo: FTZ-Küstenarchäologie



Fig. 4.42:
Excavation near Wellinghusen, Dithmarschen
Photo: FTZ-Küstenarchäologie



Fig. 4.43:
Church mound
Westerhever, Eiderstedt
Photo: W. Raabe



Fig. 4.44:
Feddersen Wierde,
model of a village mound
of Roman Time
Photo: FTZ-Küsten-
archäologie



Fig. 4.45:
„Uthländisches Haus“
„house Axen“ 1634 con-
struction of inner posts
Lindholm/Bökingharde;
utilization: dwelling
without agriculture



Fig. 4.46:
„Uthländisches Haus“
„In die 5 gebaut“ extended
by barns, built like „5“
utilization: membership
corporation of
North-Friesland



Fig. 4.47:
„Geesthardenhaus“ „Peters-
warft“ North Frisian mar-
schlands Ockholmer Koog,
Nordergosharde;
utilization: agriculture



Fig. 4.48:
„Vierkanthof“ „Nahnhof“
1778, 4-sided-farmstead,
Alter Christian-Albrechts-
Koog Böckingharde; uti-
lization: wellness-hotel



Fig. 4.50:
„Haubarg Matthießen“
1760 Barg-construction, 4
posts, Wittendün St. Peter
utilization: agriculture

Fig. 4.49:
Manor „Hoyersworth“
Oldenswort 1591-94 seat
of the ducal administrator
(Stoller) Caspar Hoyer; uti-
lisation: agriculture and
dwellings for tourism



Fig. 4.51:
„Roter Haubarg“ 1759,
preserved parts of the first
building of 1659 Barg-
construction, 6 posts; uti-
lization: restaurant and
museum of agriculture



Fig. 4.52:
„Haubarg Osterhever“
single „vörhuus“, Barg-
construction 4 posts,
transformed to a cow-hou-
se with financial help for
protected monuments



Fig. 4.53:
North-German-bayhall-
house, 1730 geest translo-
cated to Meldorf 1907,
utilization: museum



Fig. 4.54:
„Dwerhaus“ farmhouse
with cross-passage, Epen-
wörden bei Meldorf
vacant at time



Fig. 4.55:
Large „Gulf-barn“ „Siddel-
deich“ nearby Hemme,
North Dithmarschen No
more agriculture, breaking
off is possible



Fig. 4.56:
East-Frisian „Gulf-house“
adjoining building: „Gulf-
barn“ South Dithmarschen
agriculture

4.4 Lower Saxony

4.4 The Lower Saxony Wadden Sea Region

by Jan-Joost Assendorp, Doris Böker, Gernot Fischer, Elke Först, Falk-Reimar Sängler, Rolf Bärenfänger, Wiebke Dreeßen, Volker Gläntzer, Jörg Eckert, Hermann Schiefer, Gregor Schlicksbier, Wolfgang Schwarz, Friedrich-Wilhelm Wulf;
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4.4.1 The land between Elbe and Weser (Elbe-Weser Districts)

4.4.1.1 Introduction

The marsh areas between the Weser and the Elbe, which for the most part form part of the Cuxhaven administrative district, may be divided into three different geographic and cultural units. In the north, the line of the terminal moraine of the Hohe Lieth, the so-called Wurster Heide, separates the Wurster Marsch on the Weser mouth in the west from the district of Land Hadeln on the Elbe mouth. To the south of Bremerhaven the districts of Landwürden and Osterstade lie along the Weser. Their geological genesis as well as the histories of their settlement until the High Middle Ages are very similar in their essentials, so that these can be described together.

The marshes were formed under the influence of the rise in the sea level after the last ice age and for the most part are barely raised above the mean sea level. Apart from the varied composition of the soil, it is the difference in level between the recent (high) marsh and the old (low) marsh that plays the decisive role for the settlement and the utilization of the marsh. Due to differing conditions for sedimentation before the dykes were built, the marshes are subdivided into highlands with sandy, chalky soils, near the coast or the river banks, and the Sietland behind them which is lower lying as a result of the short supply of sediment, has soils rich in clay, and especially on the geest edge is mostly made boggy from being saturated with water and is therefore inimical to settlement. In the whole region, the Sietland was only put under cultivation very late and with little success. Where it was systematically drained, the boggy subsoil shrank so that in the long run there was hardly any improvement. These days the old marsh lies in front of the higher, sandy geest in the form of virtually unsettled strips of grassland. In the dis-

trict of Land Wursten, directly west of the Hohe Lieth, it is bounded by two distinct lines: in the east by the Grauwall canal that was enlarged in the 1950s, and in the west by the Bremerhaven-Cuxhaven railway line that runs on the eastern edge of the high marsh with its relatively firm ground.

The first settlement on a major scale on the sea walls and surf embankments on the outer edge of the old marsh took place in the last century B.C. Although scattered traces of older settlements from the iron age were found on the higher parts of the banks, only the uptake of land from the first century left behind permanent traces in the cultural landscape. As the farms and villages were first laid out on level ground, the ever increasing tidal storm surges that were running on shore forced the settlers to rebuild their farms and eventually whole villages on dwelling mounds that had to be thrown up higher and higher. In the district of Land Hadeln, Lüd-ingworth and the adjacent sea mounds are impressive examples of the dwelling mounds constructed along the Elbe during the Roman empire. In the district of Osterstade, Aschwarden and Wurthfleth were developed along the Weser. The examples that have been most thoroughly investigated in the district of Land Wursten are the line of village mounds set up in the first century and abandoned in the time of the migration of the peoples: starting from Dingen in the south, through Mulsum and Dorum as far as Alsum in the north. The three big dwelling mounds in the southern district of Land Wursten, the Barward, Fallward, and Feddersen Wierde, still lie vacant in the area today. The excavations of the Feddersen Wierde have produced an impressive amount of evidence on the genesis of settlement on the surf embankment from the late iron age. The extensive finds from Saxon graves from the Fallward emphasize the economic appeal of the marsh settlements. Heightened storm surge activity nonetheless led to the settlement region being abandoned in the fifth century.

A few centuries later, the strings of dwelling mounds again formed the starting point for the renewed acquisition of land by settler groups that then began afresh in the 7th and 8th centuries. In the district of Land Wursten these came from outside for the first time, from the west Frisian North Sea coast (in the Late Middle Ages this was to become much more common with the colonization of the marshes by Hollanders, as the west Frisians were known at the

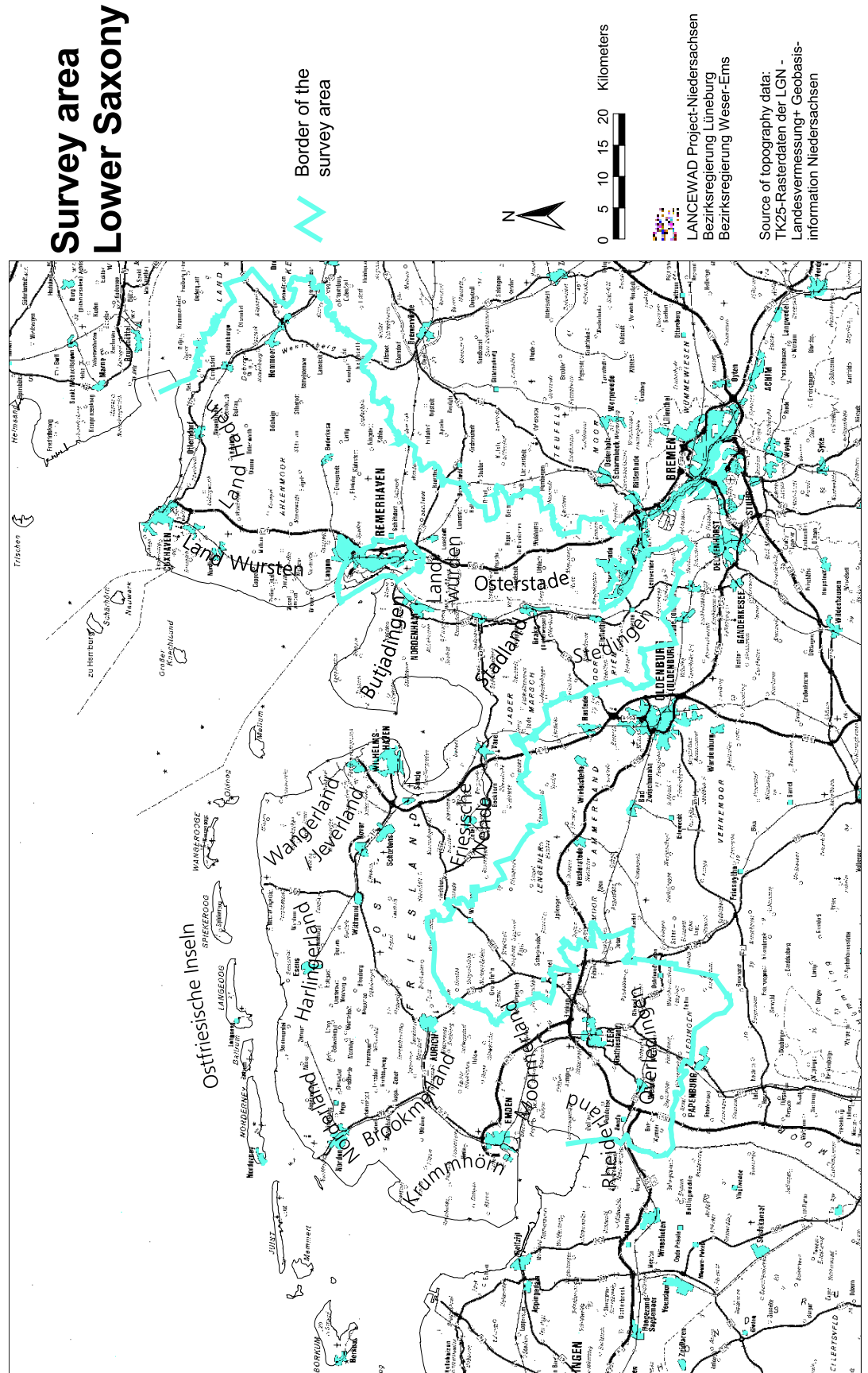


Fig. 4.57:
Survey area Lower Saxony

time). The silting up of the mud flats, however, made it possible for the higher, fertile uncultivated land to be settled quite soon. The two village mounds of Wremen and Misselwarden in the district of Land Wursten attest to this uptake of land, as do Altenbruch, Otterndorf or Belum in the district of Land Hadeln.

The process of establishing settlements on the newly reclaimed land is related to the building of the early dykes in both the districts of Land Wursten and Land Hadeln. We are particularly well informed about the complexity and the chronology of dyke building in the district of Land Wursten. The dyking was carried out along the three main lines of Oberstrich (upstream dyke), Niederstrich (downstream dyke) and Altendeich (old dyke) which run from south-south-west to north-north-east, with ribbon-shaped meadows arranged in perpendicular fashion, and with a drainage canal for each district, all of which together characterize the district of Land Wursten between Solthörn in the south and Deichsende (dyke's end) near Nordholz.

The first completed line of dykes in the district of Land Wursten, the upstream one, is probably a summer dyke, on the inner side of which most of the dwelling mounds today lie deserted. Since the creation of the oldest living levels in the 12th and 13th centuries during the Late Middle Ages, they were thrown up to a height of about 4 m above sea level. The foreshore that was subsequently formed was protected by the downstream dyke, erected in the 14th and 15th centuries as a winter dyke. Therefore the row of dwelling mounds accompanying it reach only a relatively small height. Today only a few fragments of this dyke remain. Its line is followed by the old dyke, also from the Middle Ages, recognizable in many sections as an earthen embankment from one to two meters high.

With the existing line of the sea dyke, recognized as a cultural monument, the development of the land in early modern times reached its conclusion. The building of the present main dyke was begun in 1618. After the storm surges of 1717 and 1825 the dyke was made higher and wider.

Because of their significance for the coastal region, the dykes represent an outstanding cultural-historical document. To a great extent, they contain the construction materials of their predecessors in their core and in their present course they are largely in agreement with that recorded in the land surveys by the Electorate of

Hanover and Prussia. Regrettably, neither in Hadeln nor in Wursten have the historic dykes or their remains been recorded by an archaeological inventory.

As far as the harbor installations, sluices, floodgates or pumping stations are concerned, however, no objects of historical value in the district of Land Wursten have been preserved. In the district of Land Hadeln, in contrast, the measures for controlling the water are clearly visible in many examples in the area (ditches, canal systems up to the Hadeln canal of 1853 and the pumping stations from the 20th century). The stone sluice head from Rechtenfleth has been moved to Osterstade and is preserved there.

Dyke construction and drainage of the land facilitated the increasing settlement and cultivation of the land from the 12th century. In Hadeln, settlers from Holland were brought into the land by the provincial administration. Under their influence, the elongated ribbon or strip villages such as Bülkau were developed. The improvement and stabilization of the natural conditions of the area, culminating in dyke building, led to a clear increase in the economic welfare of the whole marsh region, which may still be seen today, especially in the many churches that have been preserved from the Middle Ages.

The stone churches from the 12th to the 14th centuries form the outstanding type of historic monument in this region because of their number and quality. More often than not, their furnishings are also of great cultural-historical significance. Thus the parish churches of Dedesdorf and Cappel possess valuable Arp Schnitger organs and in Sandstedt there are wall paintings from the 15th century. In the district of Land Wursten, the series of important church buildings begins in the south with Imsum (Ochsenturm) and continues through Wremen, Mulsum, Dorum and Cappel (classicist new building in place of its predecessor from the Middle Ages) to Spieka. To the west lie Misselwarden and Padingbüttel, and to the north Midlum. The plain rectangular hall, covered by a ceiling of wooden beams and with a rectangular or square choir added, was established as a standard type of the massive building being carried out in the 12th century. The choir is joined to the nave by a low arch and usually vaulted only afterwards. The ratio of the length to the width in the Wursten churches is typical of the churches in the settled region of Frisia. The same is true for the arrange-

ment of the portals on the long sides, which are often offset in a westerly direction.

In the district of Land Hadeln, a type of building developed from the 12th century, constructed by means of field stone masonry and consisting of a rectangular hall with a square choir added and a flat ceiling of wooden beams. Churches constructed in this fashion may still be found in Altenbruch, Belum, Ihlienworth, Lüd-ingworth and Nordleda. There are wooden bell towers in Altenbruch, Bülkau, Ihlienworth, Khed-ingbruch, Odisheim, Oppeln and Steinau.

The field stone found on the geest served as building material; almost rectangular stones were dressed from larger erratic granite boulders and used to form the corners of buildings as well as window and portal walls (Midlum, Mulsum, Padingbüttel). In addition to the field stone available in the region, sandstone imported from the Weserbergland region was used. During the 12th century, tuff originating from the Eifel region was used increasingly. Occasionally its use was restricted to single parts of the building (see Midlum, Mulsum). Alone among the churches, the Wremen church displays a complete facing of tuff. The first church building made completely of brick in the district of Land Wursten is Misselwarden (end of the 13th century).

Except for the Hamburg tower at Neuwerk, erected in order to control the waterways on the Elbe, no castles or fortified buildings remain in the marsh regions. The sole historic town hall was erected in Otterndorf in 1583. Also worth mentioning are several administrative buildings like the ones in Neuhaus (1723) and Otterndorf (1771) and the customs house of Dedesdorf (1811/1813).

Only a small number of rural building structures of historical value are preserved on farm establishments. The farms lined up along the various strips of settlement in the district of Land Wursten consist of a main house, which is oriented with the working gable towards the west or north-west, and of several outbuildings. The cobbled farmyard in front of the living and working quarters mostly has on its perimeter two (cattle) barns, of double upright construction, with the direction of the roof ridges at right angles to that of the main house. Unlike in the Hadelner Marsch, in this area brick construction, which has been shown to have been in use in the secular field even before 1612, was dominant both for main buildings as well as for the outbuildings. The few half-timbered buildings tend to be constructions that were transplanted by

farmers migrating from the geest into the marsh in the middle of the 18th century. It is true for all the marsh districts, though, that the historic architecture consists above all of 19th century buildings.

Completely preserved brick buildings have come down only from the 18th century and they are of significant dimensions. The upper half of the steep gable is made of boards and, in the district of Land Wursten, they are usually painted green. Over the whole region, as a rule, the roof was thatched – and this is still the case in parts up to the present. The form of the gables of the main building and the large outbuilding, devoid of any decoration, was maintained during the first half of the 19th century. The only features livening up the wall surfaces are wall supports of wrought iron, or a small sandstone slab above the hall entrance with the building owner's name and the date of construction. Since the fifties of the 19th century the verges have been accompanied by stepped brick friezes. In the latter part of the 19th century it was customary to erect the principal building in the form of a hall-house with four supports.

Essential changes to the cultural landscape took place only in modern times. These were primarily due to the greatly accelerated extension of the road network and the provision of energy in the last century. The development of the region by the Bremen-Cuxhaven freeway and the extension of the federal and country roads have permanently changed the perception of the landscape as have the developments in settlement and infrastructure, which are closely linked to the changing traffic patterns. In very few cases, settlements of new buildings blend organically into the existing structures (e.g. Lüd-ingworth). What is more, they often obscure the views onto the original sights of the locality (e.g. Dorum and Otterndorf).

It goes without saying that considerable alterations to the landscape can also come about in connection with tourism. This is true not only for districts that are exposed to a particularly high level of tourism, such as Cuxhaven (which will not be discussed any further in this regard), but also for smaller sites, such as the Otterndorf bathing lake. Some dwelling mounds from the Middle Ages have been integrated into this setting in „a very special way“.

Numerous wind energy installations have already been erected in both the districts of Land Wursten and Land Hadeln, and more are under construction or are being planned. The main dispute is over the

question of scale – how many wind turbines can a landscape bear? The fact is that the impression of a marsh landscape, flat as a pancake and seemingly endless, with an extremely small number of relatively small vertical elements (e.g. church towers) has been changed drastically as a result of these installations. Today the high, slowly turning wind turbines belong to the modern cultural landscape in just the same way as do the silhouettes of the harbor industry of Bremerhaven or the hotels of Cuxhaven-Duhnen. There are no instances where the individual installations were erected directly on cultural historical monuments, such as dwelling mounds or old dyke lines, and in general they keep a reasonable distance from the individual monuments. The face of the landscape, however, especially in the marshlands, has been radically changed in some districts, and this has occurred within just a few years.

4.4.1.2 Land Hadeln

The district of Land Hadeln is approximately coextensive with the area of what is today the Hadeln and Sietland association of municipalities (Samtgemeinden), with the exception of the town of Cuxhaven. Two geest ridges, the Hohe Lieth and the Lamstedter Geest with the Wingst, run from north to south and attain maximum heights of 38 m and 74 m. The remaining area is flat marshland lying between these geest ridges. This so-called highland reaches a height of about 1.5 m above sea level close to the sea. The old river embankments of the Elbe (from Lüdingworth to Belum), the Medem and the Oste are built to this same height. The sandy marshland, enriched with calcium by repeated deposition, is of outstanding fertility. In contrast the Sietland, situated further inland, lies 0.5 m below sea level and is rather waterlogged.

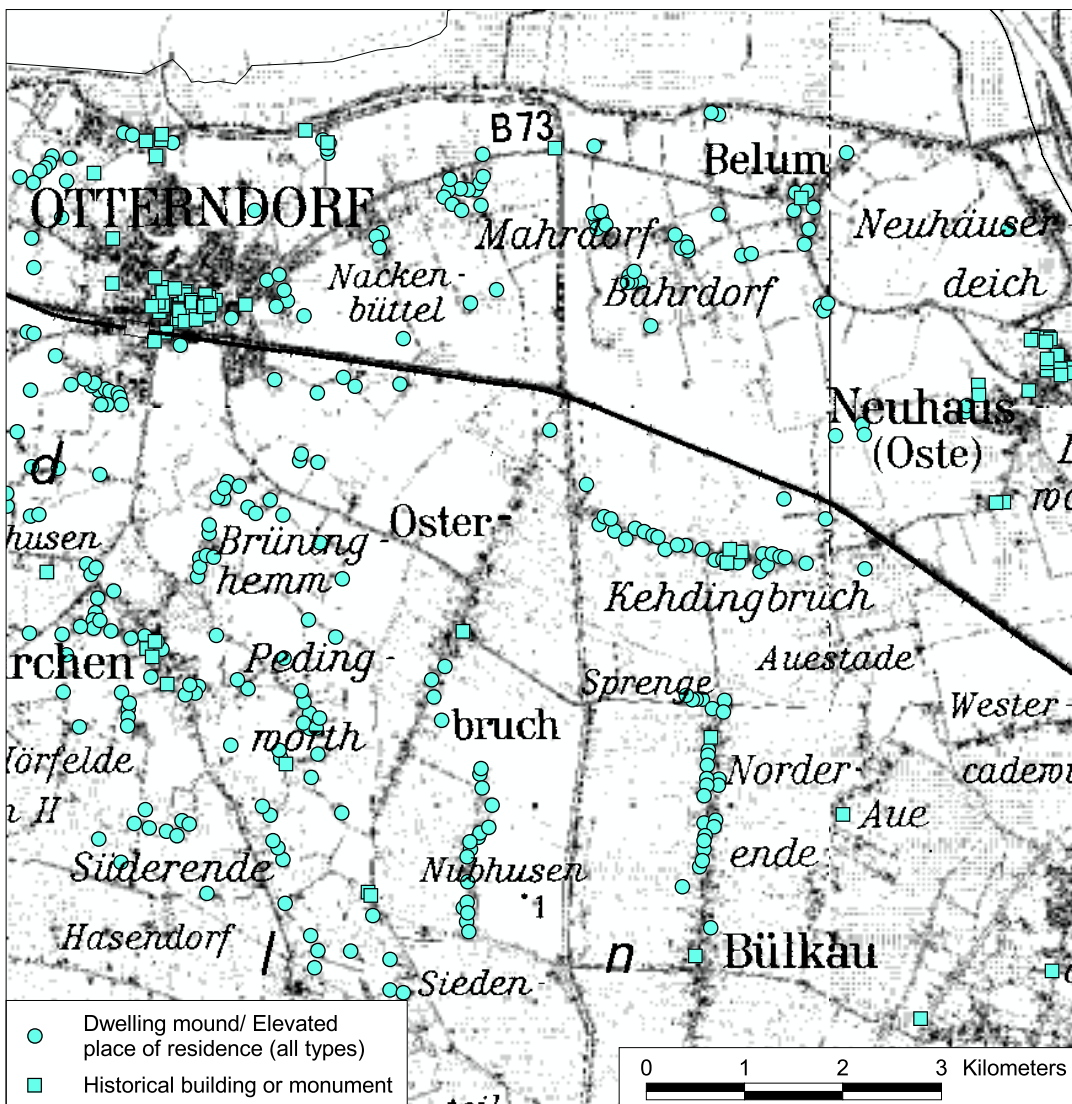


Fig. 4.58:
The elongated ribbon or strip villages Osterbruch, Kehdingbruch and Bülkau
Source: LGN

The name of the district of Land Hadeln is derived from that of the old Saxon district of Haduloha (battle wood). The district's conquest by Charlemagne led to what may be its first mention in the archives. At that time Hadeln apparently designated the whole region below the geest ridges from the Weser to the Oste.

Evidence has been found of a first settlement on the Medem dating back to the 4th/3rd century B.C. The rise in the sea level slowed down from the first century B.C. at the latest, so that a permanent settlement of the marsh became possible, starting from the higher river banks. About two centuries later the settlements on the flats had to be raised to protect them from the water. This first phase of mound construction resulted in some impressive examples, such as Lüdingworth and the sea mounds lying further to the east, where dwelling places were raised significantly until the 5th century, when the settlements had to be given up after all. Successful settlement of the region commenced again in the Early Middle Ages, in the 7th and 8th centuries. Once again it started out with settlements on the flats of the marshes, now silted up even higher, to the north of the old dwelling mounds. From the High Middle Ages onwards these settlements also had to be made higher. Altenbruch, Otterndorf and Belum should be mentioned as large village mounds. More recent mound settlements, probably no older than the early dyke building activities in the region, may be recognized by having names ending in „-büttel“.

The birth of the present cultural landscape of Hadeln is connected to the erection of a completed line of dykes - an operation that is inseparably linked with the draining of the interior. According to our present knowledge the first dyke that supported settlement was built in the 12th century. At the same time draining began by means of ditches, canals (Wettern) and sluices (allowing water to pass through the dyke). In this region this kind of work is ongoing and is still being carried out today, with standards improving continually. The work reached its peak in 1853 with the construction of the Hadeln canal, which had become necessary as a result of the silting-up of the beds of the Oste and Medem rivers. This measure also succeeded in ridding the Sietland of its surface water - but as a consequence of this the clayey and boggy subsoil shrank and the Sietland subsided further, so that the advantage gained by drainage was largely lost again. In 1926 the cultivation works reached another peak, with a total of 28 pump-

ing stations being built in Hadeln, the largest of which also happens to be the biggest in Germany.

From the 12th century, the dyke building and drainage of the district facilitated increased settlement and cultivation of the land. The powers that drove this activity and which set the direction were the dukes of Saxony and the archbishops of Bremen. A principal measure was the drafting of settlers from Holland who contributed their expertise in the field of building dykes and canals. Under their influence the elongated row or strip villages were now developed on level ground. Bülkau may serve as an example out of many. At the same time, the communal work of maintaining the dykes and watercourses fostered the independence of the farmers, who at a very early stage became masters of their own land. However, there were setbacks too. The storm surge of 1717, by no means the only one, broke through the dykes and caused great losses in terms of human lives, cattle and buildings. Nevertheless, on the whole it was a positive development. As early as 1600 Hadeln was described as the most fertile region of Germany that grew the most grain. About 1750 an absolute high point was reached in terms of arable land and the cultivation of grain, a fact that is impressively documented by the records of the land register of the Electorate of Hanover. Hadeln then achieved remarkable surpluses in grain harvests, supplied the big cities such as Hamburg and Bremen and exported quantities of grain to Holland, England and Scandinavia.

The completion of the line of dykes and the positive economic development made possible by this also led to an increase in construction activities, which found expression in the register of cultural historic monuments and heritage buildings. From the 12th century onwards there was an increase in church building activity, which was now carried out in the massive or solid style. In the district of Land Hadeln a type of building was developed which featured field stone masonry and consisted of a rectangular hall with an added square choir or chancel. A flat ceiling of wooden beams enclosed the space at the top. Churches built in this style can still be found today in Altenbruch, Belum, Ihlienworth, Lüdingworth and Nordleda. Among them, the western building in Altenbruch is of a special nature, and it has at times been understood as a symbol of the power exercised by dukes of Sachsen-Lauenburg. Towers were frequently added on to a building at a later stage, as was done in

Nordleda, for instance. Wooden bell towers can be found in Altenbruch, Bülkau, Ihlienworth, Khedingbruch, Odisheim, Oppeln and Steinau. After the Thirty Years War the churches in Altenbruch, Ihlienworth and Otterndorf were renovated to an extraordinarily opulent standard, with the work being funded through donations from farmers. A new phase of construction began as a consequence of the agricultural boom in the 18th century and this brought forth the churches in Bülkau and Osten – the latter being particularly lavish.

Castles or fortified houses were on the decline in the district of Land Hadeln as early as the Middle Ages. The only historic town hall was built in Otterndorf in 1583. Administrative buildings were erected following the style of the baroque manor house, which is not to be found in the district of Land Hadeln. The extravagant administrative building of 1723 in Neuhaus and the rather unadorned administrative building of Otterndorf from 1771 are good examples.

The district of Land Hadeln falls within the area of distribution of the Low German bay hall house, more than a hundred of which are listed in the register of historical monuments. They were predominantly built using a double-joisted structure, most commonly based on the ground plan of a bay hall house with a large passageway and a loft. As a rule, the framework is lined with brick masonry, often featuring thatched roofs. The large houses of marsh farmers can have a length of up to 40 meters, with hallways reaching a width of eight to ten meters. To provide the additional storage space required by good harvests, the roof beams can project up to two meters beyond the row of upright supports.

The period of occupation by Napoleon's troops with all its negative repercussions caused this once flourishing countryside to experience a harsh setback. The economy then suffered further blows as a result of falling grain prices starting in the 1820's. From the middle of the 19th century wages rose as a result of the beginning industrialization and towards the end of the same century large numbers of people began moving away into the larger towns and cities, and many emigrated overseas. As a counter movement, farmers in the district of Land Hadeln gradually moved into cattle raising, which was less labour-intensive. Where there had once been rich cultivated fields, grassland gradually took over again.

However, the splendid houses of the farmers and the beautiful churches, sometimes referred

to as farmers' cathedrals, still bear witness to the former prosperity of this region.

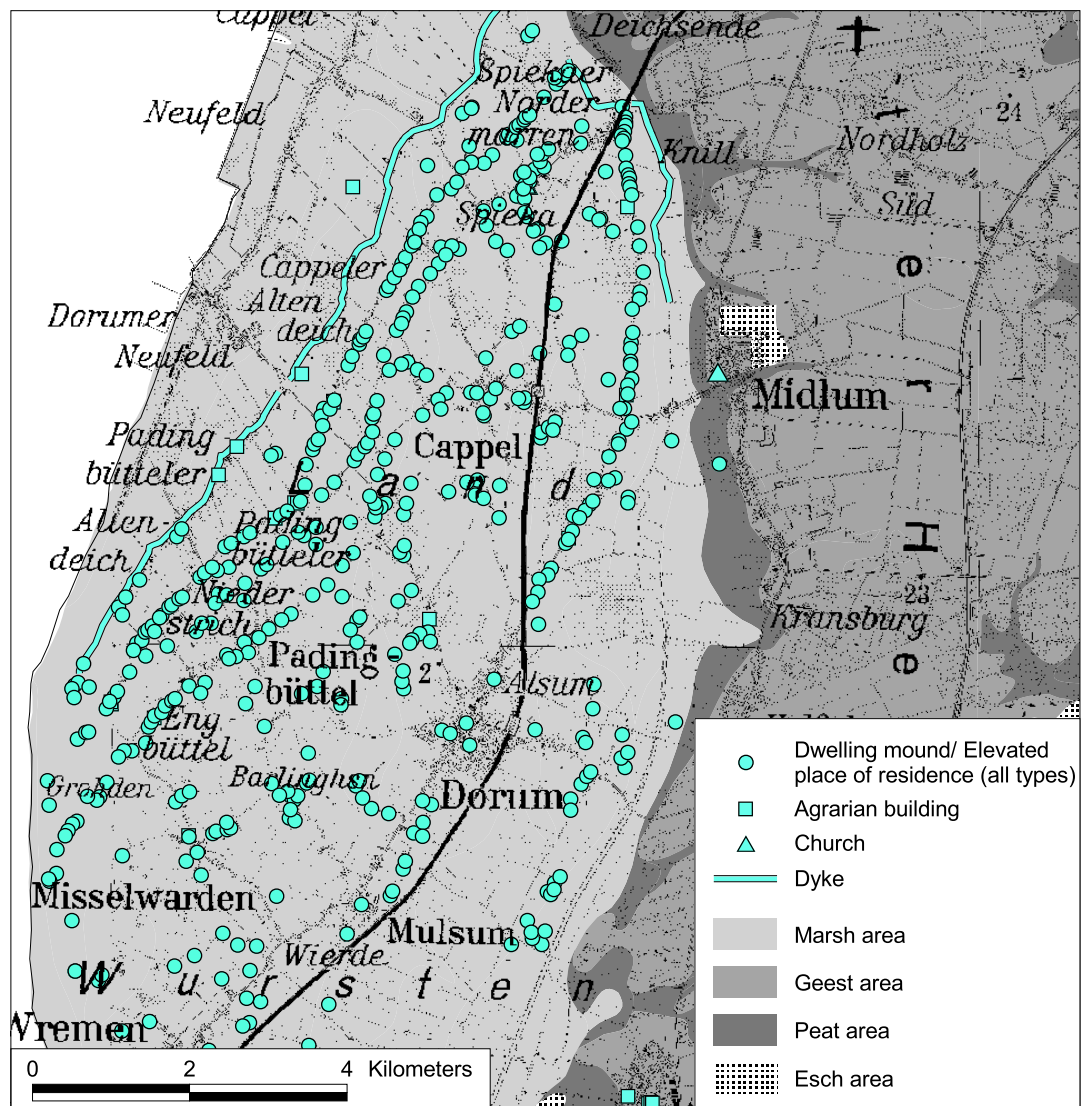
4.4.1.3 Land Wursten

On the right bank of the outer Weser, the Wurster Marsch, which forms part of the Cuxhaven administrative district, extends to the west of the terminal moraine of the Hohe Lieth, the so-called Wurster Heide. This is a belt of salt marsh about 30 kilometers in length, spanning Imsum to Deichsende (dyke's end) and Berensch, which – at Dorum – reaches its maximum width of 9 kilometers. While this area was used for agriculture in many places (especially on the high marsh), due to structural changes since the end of the 19th century it is characterized today by pasture land.

Because they were created relatively recently under the influence of Holocene tides, the marshes are higher than two meters above sea level in only a few spots. Apart from the varied composition of the soil, it is the difference in level between the new (high) marsh and the old (low) marsh that plays the decisive role for the settlement and utilization of the marsh. Due to varying conditions of sedimentation before the dykes were built, the marshes are subdivided into highlands with sandy, chalky soil (good for the cultivation of demanding crops), which is 1-2 km wide at the Weser, and the Sietland behind them which lies lower as a result of a smaller supply of sediment. The Sietland has soil rich in clay (and is therefore primarily used as pasture land) and, especially on the geest edge, is mostly boggy as a result of being saturated with water, and is therefore unfavorable for settlement. The latest layers of sediment were deposited in the northern section of the Wurster Marsch, near Dorumer, Spiekaer and lastly Cappler Neufeld.

The old marsh in the district of Land Wursten is a 1-2 km wide strip of virtually uninhabited pasture land immediately to the west of the Hohe Lieth, which is bordered by two prominent features of the landscape. To the east is the Grauwall Canal, completed in the 1950s, which goes back to the Grauwall (ditch wall), first mentioned in 1312, an inland dyke drained by ditches protecting the marsh from the intruding geest water. To the west lies the Bremerhaven-Cuxhaven railway line, which opened in 1896 and whose route passes the high marsh on the eastern edge on relatively solid ground. The westerly area of the old marsh, cultivated from the old village mounds, shows irregular block fields,

Fig. 4.59:
The dwelling mounds and dykes in the north of the
Wurster Marsch
Source: LGN, NLFb



while the eastern section, which was cultivated later, has land strips of differing width along the Grauwall. The layout of fields from the earliest marshes settled in modern times is also characterized by wide strips. Only two thoroughfares cross the old marsh in an east-west direction. To the south the road K 66 from Wremen to Sievern, which is lined on both sides by a wind park directly west of the Grauwall Canal, and further north the road L 119 from Langen to Dorum. An additional wind park south of this road is an eyesore on this flat land. More wind parks are located around Wremen and in the Dorumer and Spiekaer Neufeld.

Village mounds, thrown up in the 1st century and abandoned during the migration of the peoples, spread in a line to the west of the old marsh, starting from Dingen in the south, through Mulsum and Dorum as far as Alsum in

the north. The three big dwelling mounds in the southern district of Land Wursten, the Barward, Fallward, and Feddersen Wierde, still lie vacant today. Excavation of the Feddersen Wierde has produced an impressive amount of evidence on the beginnings of settlement on the surf embankment since the Late Iron Age. Villages which had originally been laid out on the flats had to be raised on mounds to guarantee their continued existence, starting in the 1st century. Richly adorned old Saxon graves from the Fallward underscore the wealth of the settlements and the economic appeal of the marshes in Roman times. In the course of the 5th century increased tidal flooding led to the abandonment of the area.

In the 7th/8th centuries, the chain of mounds from Roman times formed the starting point for renewed settlement in the old marsh - this time

by groups of Frisian settlers. The silting-up of the shoreline mud flats, however, made it possible for the higher fertile land to be settled quite soon. The village mounds of both Wremen and Misselwarden (first written reference in the vita of the Holy Willehad in 860) are vestiges of this settlement. The results of recent excavations show that the area north of Mulsum was also occupied by an early mediaeval settlement. In the northern part of the district of Land Wursten the filling in of the coastal mud flat area was for the first time sufficiently advanced for settlement and cultivation of the new marsh areas in the 10th century. Starting with a concentration of settlements in the area of the old mound villages, groups of farmstead mounds were spread out to the west on the upper marsh islands, which can also be seen further north around Cappel and Spieka.

The historic parish of the district of Land Wursten can testify to an unbroken history of settlement during the Middle Ages, which finds its counterpart in ongoing settlement of the village mounds down to our day. By the beginning of the 13th century at the latest (a 1238 charter bearing the seal of Wurster Land) the inhabitants of this region had formed a political unit, so that de facto sovereignty of Wursten came to be acknowledged based on Frisian common law until its subjugation by terms of the Peace of Stade of 1525. Because of its increasing economic importance, Land Wursten was reserved a special position (Constitutional Convention of the Marshland Districts, 1668). Stone churches, built following the „second Christianization“ from the 12th to the 14th centuries, bear witness to the economic power of the small parishes. Because of their numbers in this area and the quality of the relics at each location they make outstanding historical monuments. The row begins at Imsum (only the Ochsenturm remains as a relict of the church possibly build in 1218) and continues to the 12th and 13th century churches in Wremen, Mulsum, Dorum and Cappel (a classical modern church replaced its mediaeval predecessor in 1815/26) up to Spieka (incorporated in 1319). The churches of Misselwarden and Padingbüttel, built in the 13th century, lie to the west. Midlum (church dating to the 12th/13th centuries) had special status as a half geest church parish.

The plain rectangular hall, with a ceiling of wooden beams and a rectangular or square choir added, was established as a standard pattern for the solid construction being carried out in the

12th century. The choir is joined to the nave by a low arch (Midlum, Wremen, Mulsum, Padingbüttel and Misselwarden). The chancel choirs of the Wursten churches, with the exception of Midlum (possibly begun before 1200) and Spieka, were usually vaulted only later. In 1510 Dorum overtook the other communities as the site of the largest church by adding the choir hall, taking the Ottendorfer choir as its model.

The length to width ratio in the Wurster churches is characterized by moderate elongation, typical of the churches in the regions settled by the Frisians. The same is true for the arrangement of the portals on the long sides, which are often offset in a westerly direction. Besides the portals, the high rounded arched windows represent the only subdivision of the nave that is 3 to 5 window spans long. Stones available on the geest (granite, gneiss) were used as building material. Large granite boulders were worked into almost rectangular stones used to frame the corners of buildings and the walls of windows and portals. Good examples of this type of masonry are the church in Midlum, probably built in the middle of the 13th century and the least modified of the Mulsum church, as well as the granite facing in the lower area of the nave and throughout the choir in the church at Padingbüttel (probably built in the 2nd half of the 13th century).

Sandstone imported from the Weser uplands was used throughout the Middle Ages. In the 12th century, tuff originating from the Eifel region came increasingly into use. The forerunners of the churches in Mulsum, Dorum and Imsum were made of tuff. At times, its use was limited to individual components such as in Midlum and Mulsum. The only church with a façade made entirely of tuff is the Wremer church, built in the first quarter of the 13th century. The first church recorded as having been built using only brick is the one in Misselwarden (at the end of the 13th century), finally followed by the last of the Wursten churches, the one in Spieka.

In contrast to the ones of the poorer geest parishes, the Wurster church, located mainly on a mound of its own in the middle of a cemetery, shows an abundance of furnishings which as a rule span a period of several centuries and document the history and culture of the land with quality workmanship (e.g. the grave markers from the 16th/17th centuries, showing the name of the farmers' family). There are baptismal fonts from before 1300 in Dorum, Cappel and Midlum, and a group of scenes of the crucifixion (Pading-

büttel, Dorum, Spieka) from the Late Middle Ages. Oldenburg and Bremen were the primary cultural centers of influence for most of the Wesermarsch. The cast iron works in the district of Land Wursten for instance can be traced back to foundries in Bremen. Here, the numerous works by the Klinghe family should be mentioned, as well as the Late Gothic sacrament house in Dorum. Decoration systems from the 13th to the early 16th century, showing how colorful the churches once were, can be found in Midlum, Mulsum and Dorum (the representation of the Last Judgement is especially memorable here). The pews at Misselwarden and Mulsum are examples of fine carving from the 16th century.

An economic boom in the 17th century led to the founding of numerous charities for furnishing the churches. It was at this time that important local artists first appeared. Their works (altars, pulpits, epitaphs) have left a considerable mark on the churches' use of space. Two Ottendorf woodcarvers, Michael Ringkmacher from the first quarter of the 17th century and Jürgen Heidtmann from the second half merit special mention. An instrument built by Arp Schnitger is probably the most significant organ in the region. It is located in the Cappel church, for which it was purchased in 1816.

The chronology of continued settlement on newly reclaimed marshland west of the village mounds can be read from the outlying farmstead mounds placed in the form of rows, which were created in conjunction with the construction of early dykes. The dyking was carried out along the three main lines of Oberstrich (upstream dyke), Niederstrich (downstream dyke) and Altendeich (old dyke) which run from south-south-west to north-north-east, with ribbon-shaped meadows arranged in perpendicular fashion, and with a drainage canal for each district, all of which together characterize the district of Land Wursten between Solthörn in the south and Deichsende (dyke's end) near Nordholz.

The first completed line of dykes in the district of Land Wursten, the upstream one, is probably a summer dyke, on the inner side of which most of the mounds lie deserted today. Since the creation of the oldest living levels in the 12th and 13th centuries during the Late Middle Ages, they were thrown up to a height of about 4 m above sea level. The foreshore that was later formed was protected by the downstream dyke, erected in the 14th and 15th centuries as a winter dyke. As a result, the row of mounds accompanying it reaches only a relatively small height. Today only

a few fragments of this dyke remain. It is also followed by the mediaeval Altendeich (preserved, built before 1518), which is up to two meters high and bordered by several so-called Wehle (pools formed behind dykes). Moreover, a street runs along its crest. Niederstrich and Altendeich are distinguished by tree-lined avenues that follow them over wide distances across the even landscape.

With the existing line of the sea dyke, recognized as a cultural monument, the development of the land in early modern times reached its conclusion. Cappeler-Neufeld represents the last reclaimed land. The building of the present main dyke was begun in 1618. After the storm surges of 1717 and 1825 the dyke was made higher and wider. Due to their significance in the settlement and economic history of the coastal region the dykes represent an outstanding document in cultural history. No hydraulic systems (ports, sluices, locks, pumping stations) worthy of protecting have been preserved in the district of Land Wursten.

Because construction measures followed the new dyke, Oberstrich shows the least (lacking even monuments) and Altendeich the most signs of settlement. These consist of farmsteads together with residential blocks mostly built after the Second World War. The Niederstrich, on which the individual mounds particularly shape the landscape, primarily bears the stamp of the farming complexes located east of the present district road 68, which reflect the agricultural emphasis of the region.

Only a small number of structures of historical value are preserved on the farmsteads. The farms lined up along the various strips of settlement consist of a main house, with the working gable towards the west or northwest, and several outbuildings. The cobbled farmyard in front of the living and working quarters mostly has two (cattle) barns with two posts in the cross-section on its perimeter and the direction of the roof ridges at right angles to that of the main house.

Unlike the Hadelner Marsch, in the Wurster Marsch brick construction, which has been in use for secular buildings even before 1612, was dominant both for main buildings and for outbuildings. The few half-timbered buildings tend to be constructions that were transplanted by farmers migrating from the geest into the marsh in the middle of the 18th century. Historical architecture consists primarily of brick buildings from the 19th century.

Completely preserved brick buildings have come down only from the 18th century, and they are of significant dimensions (e.g. the main building at the Cappel farmstead, Niederstrich no. 17: An ensemble of two barns with two posts in the cross-section, a baking house and a pig sty). The gable is dominated by a basket arch-shaped entrance door with side windows. The manure canal doors are also basket arch-shaped. The slanting sides of the gable triangle enclose embedded keeled triangular layers, so-called Dutch triangles, which were still to be found here during the first half of the 19th century. The upper half of the steep gable is made of boards which are usually painted green in the district of Land Wursten. The roof was generally thatched – and in some places (e.g. Midlum, Nordermarren no. 5, built in 1790) this is still the case even today. The windows, with straight lintels closing the gable, cover up supporting arches.

The form of the gables of the main building and the large outbuilding, devoid of any decoration, was maintained during the first half of the 19th century. The only features livening up the wall surfaces are wall supports of wrought iron (e.g. Wremen, Wremer Specken no. 7, dated 1815), or a small sandstone slab above the hall entrance with the building owner's name and the date of construction (e.g. Midlum, Südermarren no. 29, dated 1849). Since the fifties of the 19th century the verges have been accompanied by stepped brick friezes, the upper half of the gable is still boarded (e.g. Misselwarden, Engbüttleler Straße no. 4, dated 1857). Buildings from the 1860s, however, have steep gables with tiles, as well as friezes on the verges and additional windows staggered in the roof area, each closed with a round window at the top of the gable (e.g. Nordholz, Südermarren no. 30, dated 1862; Dorum, Strichweg no. 16, dated 1867).

In the latter part of the 19th century it was customary to erect the principal building in the form of a bay hall house with four posts. However, buildings from the end of the 19th century (e.g. Dorum, Altendeich no. 14) have retained a relatively modest gable design, doing without horizontal cornices and anchor block arrangements, whose appearance is enhanced only by windows on the wide surfaces of the steep gable wall.

The smaller structures in the Wurster Marsch are of no historical value. An exception to this, even in the rest of the district, is the brick warehouse on the plot Engbüttleler Straße no. 4 in

Misselwarden-Engbüttel, a two-storey brick building from 1764.

4.4.1.4 Landwürden and Osterstade

The cultural landscape of Landwürden and Osterstade takes in the marshland on the right bank of the Weser river between Bremen and Bremerhaven. Viewed from the center of the region, the urban skylines of the suburbs of these two cities form its southern and northern boundaries. The wooded slopes rising up to the geest mark out the eastern margin, while the Weser dyke with its string of small villages and their stands of trees forms the boundary in the west.

As a result of different sedimentation conditions before the dykes were erected in the 12th century the marshland is divided into two parts. One section, the so-called highlands, lies close to the river bank, is raised by about one meter, is one kilometer in width and has sandy, chalky soil. The other section, the so-called Sietland, has soil rich in clay and lies somewhat lower as a result of having less sediment deposited on it. It is mostly rather boggy, especially on the edge of the geest. This manifests itself in the scenery through the fact that the embankment is settled more densely, whereas the broad, rectangular field allotments are used for farming and have a more substantial cover of vegetation, mainly consisting of trees and bushes. The prevailing natural conditions resulted in the development of self-contained villages on the embankment as the typical form of settlement since the 12th century. These villages relied upon Dedesdorf and Sandstedt as administrative centre and market town respectively. The Sietland, by contrast, was not settled until the 18th century, and even then only in the form of a few individual farms.

The landscape is virtually devoid of any buildings of historical significance. There are the church tower of Sandstedt and, somewhat less imposing, the church tower of Dedesdorf, two windmills in Dedesdorf and Aschwarden and five navigational lights on the Weser dyke. For this reason the modern structures have strong visual impact on the landscape. The principal ones are six wind energy installations near Stotel in the east, the Brake nuclear power plant with its wind energy installations and associated power transmission towers in the west, as well as the city's harbor facilities. A high-voltage power line cuts through the entire district running from north to south.

The first known settlement in the region is dated back to the Late Iron Age, consisting of settlements on the flats near Aschwarden and Wurthfleth. Settlement was suspended at the time of the migration of the peoples. Permanent settlement of the region got under way in the Early Middle Ages with the establishment of mound settlements (Rechtenfleth about 860, Sandstedt about 1050). The most impressive dwelling mound, no longer occupied today, is near Aschwarden. The dyke built in the first half of the 12th century is the most outstanding historical monument of this cultural landscape: it was this dyke that allowed permanent settlement to succeed. The slight changes in alignment of 1625 and 1717 remain largely preserved until today, even though the dyke is now considerably higher, and with gentler slopes than in the past. A section about 300 meters long near the village of Auf der Jührde still retains the old proportions.

Canals passing through the dyke, called sluices, were used to drain the Wesermarsch. Originally they consisted of wood, but were made out of stone from the 18th century on. The stone head from one such sluice, the Drepte sluice near Rechtenfleth (1726), remains in good condition, even though it was moved on to the dyke above the water passage which is now closed. The greatest changes to the region in terms of hydraulic works were brought about by the dyking of the so-called Luneplate, of the lower reaches of the river Lune (1921-25), and the realignment of the course of the river in the years 1985-1987. The dredging work to make the shipping canal of the Weser deeper was carried out in the years from 1887 to 1895. Five navigational lights, which once marked out the shipping canal at night (upper beacon in Sandstedt as well as two each of the upper and lower beacons on the Harrier sandbar to the southwest of Sandstedt) have been preserved and remain as built testimony to this operation. These beacons consist of a cylindrical upper level with a walkway around it and topped by a lamp. Of different heights, they are supported by a three-legged base of strut construction.

Only the stone buildings – that is, the churches – have been preserved from the Mediaeval period of settlement. The parish church of St. Laurentius (built around 1150) in Dedesdorf, the main town of the Oldenburg district of Landwörden and its administrative centre until 1879, is the oldest structure remaining in this cultural landscape. The brick hall structure of the nave,

likely to have been a vault construction originally, was built in the second half of the 13th century. There were, however, buildings that preceded it on the church mound (possibly from the middle of the 13th century). In 1838 the chancel (i.e. the choir) was renovated, and the old tower was replaced in 1870. The church also features the most significant item of ecclesiastical heritage in the region, an Arp Schnitger organ from 1697/98. The most important church building apart from Dedesdorf is the church of St. Johannes in Sandstedt, the main town of the district of Osterstade in the state of Bremen. There was an earlier building on that site, built after 1043, and subsequently another was built about 1420, and this one was later integrated in the rectangular hall erected here in 1609-1613 and still in existence today. The west tower originated in 1613 and characterizes the scenery of this place with its high helm roof. The oldest wall paintings in the region (15th century) have remained preserved in Sandstedt. This church also has a valuable organ (1671, B. Huß, the apprentice master of Arp Schnitger). There are smaller church buildings, such as the chapels of Büttel (hall church with polygonal end from before 1506, tower from 1971) and Bruch (late Gothic hall church including a chancel, remnants of the preceding building from about 1200, bell tower formed by three parallel walls, remains of murals). The chapel of Wersabe is also mediaeval in its origin, even though its present appearance has been shaped by more recent building phases (hall church, built in 1769, west tower consisting of three parallel walls, renovated in 1898). The cemeteries which cover the surface area of the church mounds also form part of the visual impression presented by the churches. All of the cemeteries feature old headstones from the 17th and 18th centuries, with a particularly large number in Dedesdorf. A cemetery from the middle of the 19th century is located in Rechtenfleth, although not on the historical site.

Until about 1900 the style of rural architecture was that of the area in which the Northern German bay hall house dominated. Evidence for the manner of construction in the 17th and 18th centuries can only be found in very few instances and even then only in remnants: Indiek no. 20 (near Büttel), an isolated farm, is a house featuring twin posts in the cross-section and an inner post-structure dating back to 1599 (oldest occurrence of a rafter threshold in the Cuxhaven district). The presence of more recent wooden components that date from the year 1653 raises



Fig. 4.60:
The dwelling mounds and agrarian buildings in the north of Osterstade
Source: LGN, NLFb

the possibility that this is reconstruction following destruction in the Thirty Years War. The second oldest inner post-structure (1621) can be found in the house at Dorfstraße no. 6 in Wersabe. Parts of a house from 1638 have been preserved in Wiemsdorf, among them the only remaining history farm gable in the region, featuring the ornamental motif of the fan-like rosette (even at that time it was unusual in urban areas, and rarely found in the region). The building at Osterstader Straße no. 29 in Sandstedt has interior trusses dating back to the second half of the 17th century. A brick storehouse in Büttel can not be dated at present, but its steep roof points to an origin in the Late Middle Ages or early in the modern era.

Built structures found in villages of the 18th century are represented by the work section of the bay hall house with twin posts in the cross-section, located at Deichstrenge no. 11 in Sandstedt (1761). Anything that would compare to the riches of the marsh farmers of Hadeln of the 18th century is completely absent. The farm complex of Wersaber Moor 3 still gives some indication of the first settlement of the Sietland, which took place as late as the 18th century and involved individual farms. The building complex consists of a residential and work building, a sheepfold and a combined storage and stable structure.

While the historical monuments mentioned above are all individual objects which can scarcely convey a picture of the appearance of the cultural landscape in earlier times, the documented historical monuments from the 19th century still form part of an extensive fabric of buildings which shapes both the communities and the land. The buildings were predominantly made of brick and constructed in the four-post style (that is, with ceilings located at the same height as the eaves), and, until the middle of the century, under thatched half-hipped roofs and featuring windows with round arches in the farm gable. Even the barns were of opulent design. Buildings from the early 19th century that deserve to be mentioned are, in Landwürden: Ueterlande, Oldenburger Straße no. 2 (farm complex) and in Osterstade: Büttel, Weserstraße no. 29, Offenwarden, Hauptstraße no. 1 (storehouse and barn) and Sandstedt, Osterstader Straße no. 29. The style of building dating from the middle of the century may be seen at its most characteristic in Overwarfe (Warftenstraße no. 25 and no. 50), and that of the close of the century in Wiemsdorf (Minneörterstraße no. 5). By about

1900 the time of the North German bay hall house had passed, and ideas of living in an urban fashion took hold. This meant the separation of residential and work or business areas, and a shift in the design of dwellings towards that of a town villa with a historical set of forms. Examples can be seen in Fleeste (An der Balge no. 1) and in Sandstedt (Osterstader Straße no. 31). The only surviving village building that does not correspond to the standard type of regional farm house is from the 19th century and can be seen on the church mound of Dedesdorf (Fährstraße no. 14a).

In closing, some individual objects worthy of notice should be mentioned. The first is the customs house in Dedesdorf, dating back to the time of the continental blockade (1811-1813). When the occupation ended, the structure was pulled down and re-erected on the inner side of the dyke. Then there are the village school in Büttel (about 1900) and a small tea house on the farm that was already designed in the urban style in Sandstedt (Deichstraße no. 31). Then there are the buildings and other constructions erected by, or at the instigation of, the poet Hermann Allmers in Rechtenfleth. These include a dwelling built in 1731, renovated in 1842 and in 1859, including interior decoration, a park, a war memorial from 1871 and a monument to Charlemagne from 1897-99. The two windmills in the region are of the type „outside cap winder“ from the middle of the 19th century.

4.4.1.5 Neuwerk

The island of Neuwerk, located in the Wadden Sea off the shore of Cuxhaven and belonging to the Free and Hanseatic City of Hamburg, has preserved the original appearance of its landscape characterized by marshland and salt marshes on the outside of the dykes. Due to its location at the mouth of the Elbe, the island has always been of particular strategic importance. Proof of this can be seen in the former fortified tower which has been used as a lighthouse since 1814. The Neuwerk tower is the oldest surviving secular building in Hamburg and, owing to the history of its construction and ties to the history of the region, can be counted among the important cultural landmarks of both Hamburg and the north-western region. In 1393-94, as a result of feuding and purchase, Neuwerk together with the castle and Ritzebüttel estate fell under Hamburg's control and remained so without interruption until the passage of the Greater

Hamburg Law of 1937. Through this law, the island became a part of the district of Prussia and, after the Second World War, was integrated into the federal state of Lower Saxony. After the war, the first prime minister of the federal state of Lower Saxony, Heinrich-Wilhelm Kopf, drafted the state constitution while on Neuwerk island. A state agreement between Hamburg and Lower Saxony defining the conditions of return of the island to Hamburg was signed in 1962 on Neuwerk.

In 1299, Hamburg received permission from the landowners, the Dukes of Saxony-Lauenburg, to construct a fortified tower as a navigational aid on the „Nige O“ or „Nova O“, as the island was referred to at the time. After completion of the tower in 1309, the tower was supplied with a garrison to collect a toll known as „Werkzoll“ from passing ships. The tower had to be almost completely rebuilt as the result of a fire which occurred between 1376 and 1379. The tower today is a six-storey brick construction based on a quadratic ground plan, located on a high mound. The original entryway was on the first floor and can be reached by means of a wooden stairway. Remains of a previous fortification belt in the form of a moat are preserved northwest of the tower on „Thom Wisch“ meadow.

Between 1556 and 1568, Neuwerk was supplied with dykes and the arable land was leased to three Butjadingen farmers. The house pilings for their farmsteads (Osthof, Mittelhof and Westhof) as well as those for two fisherman's dwellings were completed by 1579. While the house pilings of Mittelhof and Westhof have recently been reconstructed, thereby preserving their original function, Osthof has been abandoned. In the area of the Osthof, the house pilings and the remains of the half-moon shaped inner dyke surrounding the farm are still visible on the surface. The remains of the inner dyke can probably be linked to a breach in a dyke occurring in the 18th century. A fisherman's dwelling resting on pilings is also located on the premises on the southwest side. In the 18th century, Neuwerk experienced a number of tidal floods which resulted in breaches in the dyke. The dyke surrounding the tower known as the „Turmdeich“, which also used to include the outworks, was installed after the tidal flood of 1718.

Another cultural landmark includes the „Cemetery of the Nameless“ which, according to tradition, had been used for the burial of foreign sailors since the 14th century. In addition, there are the „technological monuments“ represented

by the north and east markers which are navigational aids in the form of high wooden structures located in the mudflats and on the unprotected foreshore. The north marker was constructed in its current form in 1904 and restored in 1953. The first known marker on this location was constructed in 1825. The east marker, which was restored in 1956, was constructed in its current form in 1894. The position of this marker had already been recorded as far back as 1846. The bank reinforcement located in front of the west and south dykes and erected using pileworks and glacial boulders is also worthy of classification as a „technological monument“. The bank reinforcement was constructed in its current form between 1795 and 1826 and is continuously being improved in order to protect the coastline and dyke. It is regrettable that neither the markers nor the bank reinforcement have been added to the list of historical monuments. Despite the fact that the markers have lost their function as navigational aids, they remain characteristic landmarks of Neuwerk and are in serious need of repair. The preservation of these markers would not only be gratifying to the 30 inhabitants of the island but to the approximately 120,000 people who visit it every year as well.

Neuwerk island has preserved an extensive amount of evidence testifying to the development of the cultural landscape and history of the island. The isolated location of the island as an outpost of Hamburg at the mouth of the Elbe in the Wadden Sea has contributed greatly to its preservation. The fortified brick tower is a cultural landmark which possesses great importance for this region and beyond.

The beauty of its silhouette is marred solely by the presence of a modern radar tower on the north side of the island which is necessary for ship safety. It remains to be seen what effect the planned construction of a national park building will have on the appearance of the landscape.

4.4.2 The land between Weser and Ems (Unterweser–Jade Districts, Districts of Ostfriesland)

4.4.2.1 Introduction

The East Frisian peninsula appears at first glance to be the epitome of a cultural landscape. The naturally endowed area, shaped as it is by historical and cultural developments, represents an entity that is very distinct from its neighboring areas and which is therefore held to be unique by its inhabitants. Uninterrupted lines of dykes form the boundaries on three sides - in the west towards the Ems, in the east towards the Weser, in the north towards the sea - of this cultural landscape, of which the dune islands also form an integral part. The fourth side is marked out by a belt of what was once boggy moorland which forms an arc from Nordhümmling to the Jade rivulet and which separates East Frisia from Emsland, Münsterland and Ammerland.

Within these boundaries the triad of marsh, moor and geest, with a network of waterways running through them, determines the nature of the land. The idea of not only having shaped this living space, but of having wrested vast sections of it away from nature, the favorable economic situation over past centuries, the part played by the Third Estate as a power in the land, and, apart from other historical peculiarities, above all the memory of „Frisian freedom“ have all given the people a distinct sense of being special somehow. Because of this, the land protection and hydraulic engineering works, the typical settlement forms of the dwelling mounds, polders, fens and harbors and, lastly, the characteristic constructions of the windmills and village churches, especially those of the gulf houses and the homes of agricultural workers, are regarded as true symbols of East Frisia.

As an idea, this view has its own reality and it is effective in the identification with a living space; it does this with all the more justification since it holds within itself not just the uniformity and closedness that are apparent at first glance, but also the multiformity and openness of the cultural landscape that are revealed when we take a closer look.

Right up to the present, the contrast between the districts of Frisia and Wesermarsh, which were formerly part of the Duchy of Oldenburg, and the district (and former principality) of East Frisia has remained alive. This difference developed starting with the formation of territorial

states from early in the modern era, became stronger as a result of their affiliation with different and distant larger countries (Prussia, Russia, Denmark), and eventually stabilized as a result of their integration into two German states (Hannover/Prussia and Oldenburg respectively) until they merged in the federal state of Lower Saxony in 1946.

This division obscures an even older one which was partly based on the natural boundaries of rivers or sea bays and bights. This subdivision of the space into smaller parts goes back to the „Länder“ or „provinces“ of the Middle Ages. Originally these were autonomous local authorities in the form of farming cooperatives until they were superseded by a regime of headmen in the 14th century. Following more recent developments, many of these provinces are no more than historical memories today (e.g. Emsigerland and Federgau in the Krummhörn, or Östringen and Rüstingen in Wanger-/Jeverland). Most of them, however, live on in the present as historic designations of the geographical features (e.g. Rheiderland, Norderland, Harlingerland) or even in the names of large modern communities (e.g. Moormerland, Wangerland, Uplengen), even though their borders may no longer match the historical ones precisely.

This polycentric structure made up of small units is the basis not only for the East Frisian settlement space, but also for that of the whole of Frisia and, with due alteration of details, for the whole settled area on the southern coast of the North Sea. The centrifugal forces inherent in this kind of structure hampered or prevented the formation of a larger political entity of some consequence time and again, but the structure also resisted attempts at territorial division. On the foundations of relatively great prosperity, a relatively high level of education and a quasi-bourgeois ethos, at least among the numerically significant upper social stratum, this structure was a prerequisite for the region to exhibit a high level of openness towards people, ideas, economic and cultural goods.

The characterization of the coast as a region that is remote and closed off from progressive developments may be persuasive from a modern landlocked point of view. The truth of the matter is that there have always been close links between the coastal regions as a result of shipping, and the economic and cultural exchange generated by the maritime trade was particularly lively with the trading centers of Flanders and Holland, and even with England. In the opposite

direction, the traffic flowed far inland by way of the navigable rivers, and even the moorland belt has always been penetrated by major roads and lost its significance as a hindrance to traffic to the extent that it was diminished as a result of cultivation measures. Through the canals, the fen regions in particular had direct links to the coastal ports and, through them, with the more distant trading destinations.

Because of similar natural conditions, similar historical developments and a continuous exchange of culture, many elements of the cultural landscape of East Frisia also resemble those of the rest of the coast. However, both in East Frisia and elsewhere on the coast these landscape features exhibit a high degree of diversity, characteristic regional combinations and numerous local peculiarities.

Even major landscape formations differ in their characteristics on a smaller scale, with variations in the forms of settlement. The recently formed marsh differs from the older areas in height, soil quality and drainage. As a rule, the latter is low-lying, especially in the Sietland near the geest, and today lies in part below sea level. The soils of the polders and groden, in contrast, are higher, with the more recent ones again being higher than the older ones, which, like the old marsh, could not be thrown up any higher once the dykes were completed. The younger soils, however, are not only drier, but also more fertile, sandier, lighter and therefore very well suited to farming - in contrast to the permanent grassland soils of the old marsh. The type of meadow found in the old marsh is characterized by small, irregular blocks in a network of ditches which follow natural watercourses very closely. The polders have larger, regular blocks or strips, with a ditch system arranged in a geometrical pattern.

In the damp old marsh, settlement is concentrated on the dwelling mounds. Large villages (especially in the Krummhörn) in which farmyards and the houses of agricultural workers cluster about the church as the central point may be differentiated from scattered settlements consisting of smaller farm mounds and church mounds (especially in the Wangerland). On the old coastline (e.g. Nesse and Langwarden) or on the shores of what used to be sea bays (e.g. Groothusen and Grimersum), settlements catering to the maritime trade developed into single-street villages on elongated mounds. Their function, also bound up with inland shipping, was

taken over by the sluice harbors after the dykes were built.

Church villages, most of them quite small, were also built on mounds - along the embankments of the Ems and the Weser. In isolated instances, particularly in the district of Leer, tongues or small ridges of geest that pushed through the marsh provided room for settlements - geest tongues for linear settlements such as Bunderhee, and ridges for small villages such as Tergast. Only after the dyke construction of the High Middle Ages, but well into the 19th and in some instances into the 20th century, were settlements built on the flats of the old marsh and also in the thinly populated Sietland - usually as outlying settlements belonging to dwelling mounds, and in the form of individual farms. In the polders and groden of modern times planned, open linear settlements were dominant, usually along an axis of development roughly in the middle of the land surrounded by newly-built dykes.

The farm and church villages on the sandy soil of the geest are more widely spread, irregularly laid out and green throughout. After the dividing up of the common land, their farming areas often give the appearance of a landscape dominated by boundary hedges (e.g. south of Aurich and around Hesel). The strung-out settlements on the edge of the geest (e.g. in Brookmerland) are a characteristic feature. Larger church villages, small towns and the bigger towns - with the exceptions of Aurich in the interior of the region and Emden on a large mound - also tended to occupy positions on the edge of the geest, originally often with an at least temporary direct link to the sea (e.g. Marienhaf, Wittmund and Jever).

Today, only small remnants have been preserved from the boggy moor regions so inimical to settlement. Since the 17th century the cultivation measures with their fen canals, often extending for kilometers and accompanied by loosely arranged linear settlements, have intruded deeply into the earlier landscape (e.g. Großefehn, Warsingsfehn and Rhaudefehn). The irregular scattered settlements of the moor colonies are without exception more recent, for instance around Aurich, behind Ihrhove or on the southern edge of the Frisian Wehde.

With regard to the built structures, which effectively elevate the landscape and settlement features into the third dimension and so endow the cultural landscape with its extraordinarily expressive sculpted quality, two groups may like-

wise be differentiated. One of them is part of a supra-regional canon of forms which applies along the entire coast. This group includes the works for land conservation and hydraulic engineering, the network of waterways formed by the rivers and canals, the windmills and the castles.

The second group comprises small differences resulting from natural and economic conditions that developed between individual old Frisian districts, individual polders or even individual villages on the one hand. Behind them, however, an even older contrast between West and East appears to be in evidence. The geest ridge jutting out in a wedge shape westwards from the Harlebucht and as far as the old coast clearly separated the regional cultural expressions which had developed in the Middle Ages and which corresponded broadly to the spheres of influence of the bishoprics of Utrecht/Münster and Bremen. The territorial boundary forming later between East Frisia and Oldenburg has no significance as a cause of this cultural difference, because the latter is older than the former and became blurred in the course of the modern era.

In mediaeval church-building of the 12th and 13th centuries, the form of the hall-church with a free-standing, squat bell tower was predominant. Only a few places of significance were an exception to this with a cruciform ground plan (e.g. Stapelmoor, Bunde, Pilsum, Varel, Rodenkirchen), basilical elevation (formerly in Marienhäfe), crossing tower (Pilsum) or mostly with later extensions added (west or east tower). The cultural line of separation here - with Remels in the south and Buttforfe in the north - is marked out by the western boundary consisting of the churches built with square granite blocks. The soaring naves of these churches, erected on the highest points of the villages and dwelling mounds, are visible across vast distances and give an impression of almost archaic monumentality.

In contrast to these, the brick churches to the west of this line, or at least the more imposing ones, possess a richer language of forms, both in their overall architectonic form and in their decorative design. In the early 13th century, that is, before or in parallel to these brick churches, some churches were built out of tuff stone, this material being quarried in the Eifel region and shipped through Utrecht and Deventer in a pre-fabricated size, which was presumably the model for the „cloister format“ of bricks. Along this

trade route, this type of construction arrived in Gotland and, in East Frisia, in places which could be reached by ship at that time (e.g. Rysum, Groothusen, Norden, Arle). For this reason, they occasionally leapfrogged the granite block boundary (e.g. Stedesdorf and, right in the east, Langwarden). On the Weser, however, the Porta sandstone that was shipped along this river was the material of choice at that time (Blexen, Rodenkirchen, Berne), which points to an additional cultural connection.

Less spectacular, but just as instructive from a cultural-historical point of view are differences evident in the gulf house. The gulf house occasionally found its way into East Frisia as early as the later part of the 16th century as a cultural import from Flanders and Holland. Starting with the second half of the 17th century, it became the sole form for all new buildings, and this led to what appears at first glance to be a rather monotonous impression of rural buildings in general. Initially characteristic distinctions can only be made based on the integration of buildings into the different forms of settlement, and on variations in size resulting from social differences, which are also expressed indirectly in a spatial sense between marsh, geest and moor.

The relative monotony is essentially based on the similarity in principle of the gulf barns. Whatever differences may exist are either not visible at all or are of low visual impact from the outside. High frame constructions were used on both sides of the Ems until far into the 18th century, on the geest until far into the 19th and in Jeverland probably only until the early part of the 17th century, while upper frame construction was the rule in all other regions and otherwise in the more recent constructions. In the west the roofs are more broadly based, with gentler slopes and mostly fully hipped, whereas in the east they are somewhat steeper and mostly only half hipped. Finally, drive-through passages appear more often in the farming areas of the west and north.

This is a further indication of the west-east contrast, and it is particularly evident in the older living quarters. In the old marsh of Jeverland there is still a row of gulf houses with low, relatively narrow living quarters, yet still divided into two to three living areas, which have an inner scaffolding with two supports. Their tradition lived on in the distinct elongated front houses, with the chimney protruding from the middle of the roof ridge, even when they were joined to the barns under the one roof.

By contrast, in the west, in the Krummhörn for example, a shorter living section, two rooms deep and with just one living area, was derived from the stone house of the upper social strata and developed and established under the urban influence. Its chimneys are located in the front and/or the fireplace gable. An increase in the number of living rooms took place at the expense of the front part of the stable extension since the 18th century, which led to the typical, multiply recessed eaves walls. Only in the 19th century did large, stretched dwellings appear here, too. This contrast between West and East was eclipsed by a third form with a broadly laid out living section, with a single living area which was, however, three or four rooms deep, whose golden age was clearly in the first half of the 18th century and which more frequently dominated the image of the polders for which dykes were then being built. Finally, around 1900, the structural connection between the two parts of the house dissolved and we find - probably more often in the east than in the west - villas in an urban style with gulf barns added as extensions by way of connecting wings.

Quite comparable to church construction in the Middle Ages in principal, rural buildings exhibited not only cultural links between the forms of building in disparate regions, but far-reaching trade links were also in evidence in the practice of importing building materials, of which only bricks and roof tiles could be manufactured on location in the once numerous brickworks, and reeds for thatching could be reaped locally. Accordingly, from as early as before 1600, construction timber came from Scandinavia and probably from the Baltic, too; sandstones for architectural elements and especially for floor tiles (Bremer Floren) came from the upper Weser and, in the 19th century, roof slates for dwellings from England.

To sum it up, it can be said that the East Frisian peninsula, like all landscapes, has a structure which is distinguished by great complexity on different levels - the natural, the historico-political, the cultural - and by reciprocal interconnections between these levels; that is linked to neighboring landscapes and even to more distant regions through a diverse set of connections of varying closeness; a structure which has always been and still is in a state of dynamic change. Any attempt to separate out individual cultural landscapes from within such a complex overall structure would therefore hardly reflect reality, would mean that differentiations had to

be weighed against each other and categorized, relationships severed - in short, it would amount to an interpretative and judgmental construct.

The descriptions that follow do not attempt to organize the whole region comprehensively according to uniform criteria of similar in content, but to highlight characteristic parts of an area by way of example. Such featured characteristics can therefore stand for different things: the clear outline of the space, the shaping by individual, dominant elements, the complex connection between different elements. In each case the historical elements have to be as intact as possible and clearly recognizable in the present context. These sub-regions tend to be of different, yet generally „middling“ size, as dictated by the various subjects. Just as there are overlapping characteristic structures above them, e.g. in the cases of dyke-building or the network of waterways, there are also clearly defined smaller areas below them, of which only the „Meere“ (meres) and the „Hammriche“ (low lying marsh areas) should be named here.

As a rule, in naming the cultural landscape spaces, the names of old „provinces“ are used, e.g. for Rheiderland or the Wanger-/Jeverland. This is essentially done for two reasons. Firstly, in themselves, or by virtue of their connection with natural areas, these names often exerted an influence on the development of the cultural space, although it must not be presumed that the various boundaries will be found to be in exact agreement. However, where the development of a cultural space crossed over the boundaries of the „provinces“ by a substantial margin, this rule was abandoned, reverting instead to other historic designations of the landscape wherever possible, e.g. for the Krummhörn or the Harlebucht. Secondly - and this applies in both cases - it seems impractical to look for „scientific“ yet artificial names when long-established ones are available. Moreover, the latter, by acting as „mental spaces“, make it easier for the inhabitants to identify with them, whereas cultural landscape space are likely to be accepted by them merely as modern spaces for living - albeit spaces possessing a historical foundation.

4.4.2.2 Butjadingen and Stadland

The northern part of the Wesermarsch district is divided into the two areas of Butjadingen and Stadland, which at the same time are the names of two large municipalities. As the two regions, whose boundaries were not always drawn clearly, shared the same population since the Early Middle Ages and thus to a great extent also shared a common history and development which, through the pressure of external events, only occasionally led them down separate paths, Butjadingen and Stadland should be looked at together.

The two parts of the area comprise the marsh regions between the Jade river in the west and the Weser river in the east, with the southern border of Butjadingen running more or less along the line from Eckwarderhörne to Nordenham. The Stadland in the immediate south of Butjadingen reaches from here as far as the present-day town of Brake.

The soil of Butjadingen consists predominantly of brackish and sea water marshland. Brackish marshland also covers the eastern part of Stadland, while boggy marshland, low lying and high moor marshland can be found in the west of Stadland. While the Weser embankment, several kilometers wide and favorable for settlement, was originally covered by wooded pastures, the low-lying wet land remained largely treeless. In Butjadingen periods of flooding (Dunkirk I Transgression) in the last centuries B.C. formed a sea wall, running in an arc from Eckwarden through Seeverns and Süllwarden to Sillens. A second sea wall formed in the north during the first centuries A.D. This wall runs through Tossens, Ruhwarden and Langwarden, roughly parallel to the present coast. The two sea wall zones played an important role in the settlement of Butjadingen, since short strings of dwelling mounds were built here. Some of these later developed into larger villages, and these became significant in the political and ecclesiastical organization of the district.

While we do have a marshland settlement on the Weser embankment near Rodenkirchen-Hahnenknooper Mühle which dates back to the later Bronze Age and is therefore the oldest known marshland settlement in the coastal region of Germany, according to our present knowledge colonization proper of Butjadingen began around the time of the birth of Christ, during a period when the sea was in regression. As described many times by writers in antiquity,

this process of settlement by the Germanic Chaucian tribe covered the coastal zone from the Ems to the lower Elbe and was characterized by numerous settlements on the flats.

However, the great increase in sea level since the first century A.D., combined with frequent inundations, forced the inhabitants of the coast to gradually give up their settlements at ground level and to erect artificial hills or mounds for their dwellings, which had to be continually raised and enlarged over the succeeding centuries to ensure the safety of people, cattle and property.

The 4th and 5th centuries A.D. saw the breakdown of most of the settlements, not just in the coastal region but also reaching far into the interior, and regions that had been settled for hundreds of years were abandoned. The few known settlement sites that remained occupied did not change the overall picture. This development, which occurred throughout the entire northern zone from the Netherlands to Jutland, was also in evidence in Butjadingen and in Stadland. Not all of the reasons that led to the emigration of a large proportion of the coastal population have been clearly established as yet. Apart from changes in the climate which caused living conditions to deteriorate, a strong migratory movement, especially to England, which had been abandoned by the Romans early in the 5th century A.D., is likely to have played a decisive role. Renewed settlement of the marshland and of the adjacent geest regions did not take place until the 7th century, nearly two hundred years later. In the course of this resettlement the higher areas were preferred and the dwelling mounds built on once again, but as has been shown by excavations in places such as Niens (Butjadingen), in the 7th century settlements were also established on the flats. This can be taken as an indication that the threat from the sea and from inundation was relatively minor at that time.

In the Middle Ages, Butjadingen and Stadland formed part of the Frisian „Gau" or district of Rüstringen (referred to as Riusteri in 787), which extended as far as the river Made in the west (near the present-day Wilhelmshaven), into the Ammerland in the south and, at the turn of the first millennium, perhaps even as far as the river Hunte, until the 12th century when the Counts of Oldenburg pushed the Frisian influence back to the north, as far as the little river Wapel.

The catastrophic floods of the Middle Ages led to the formation of the „Jadebusen", or Jade Bay, and to deep intrusions by the sea which even

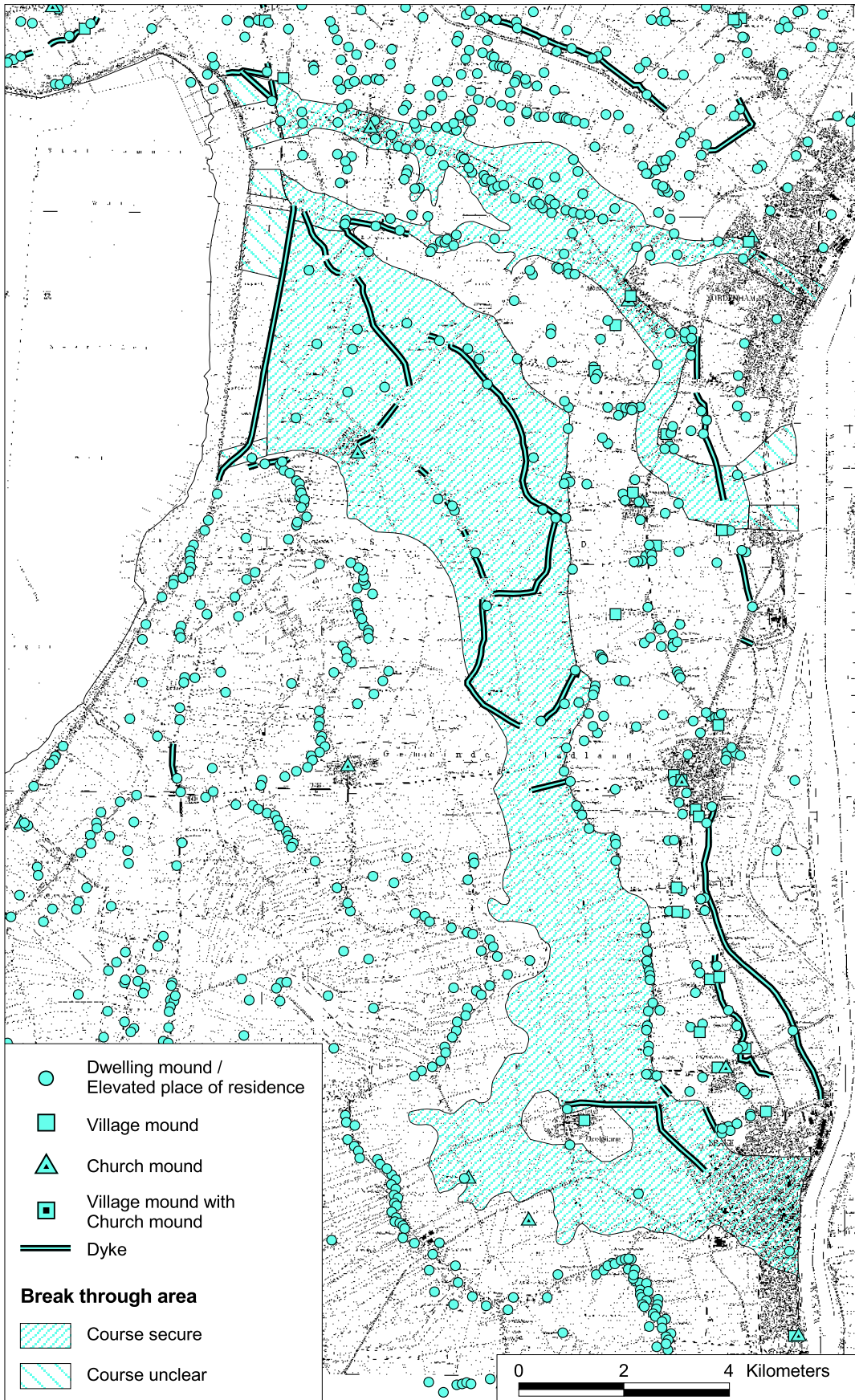


Fig. 4.61:
All types of dwelling mounds and dykes in the Stadland region between Brake and Nordenham. The blue area typify the break through from the Heete and the Ahne-Lockfleth
Source: LGN, Ey 1991

created links between the Jade Bay, and the Weser (Heete, Ahne-Lockfleth). In this way both Butjadingen and Stadland became islands for a time. The loss of land and the dismemberment of the region also led to the disintegration of the region as a political. As early as 1350 the municipality of Boit-Jatha (Butjadingen) issued documents as an independent authority and therefore already functioned as a separate political entity comprising the parishes of Blexen, Burhave, Waddens, Langwarden, Tossens and Eckwarden. The parishes of Rodenkirchen and Golzwarden formed the Stadland, which in 1367 was described as „terra Stedingorum in Rustringia“, that is, „land of the Stedingers in Rüstringen“. Around this time, i.e. in the middle of the 14th century, rule by headmen was imposed on the region, and this signaled the decline of democratically constituted rural freedom. The 14th and 15th centuries were marked by conflicts between the people of Butjadingen and Stadland on one side, and, in changing coalitions, those of Bremen, Oldenburg and even East Frisia on the other. The outcome was that the headmen finally lost their power and the old Frisian institutions were revived. It was only in 1514 that the Count of Oldenburg, in alliance with the Duke of Brunswick-Lüneburg, succeeded in subjugating Butjadingen and Stadland in the battles of Hartwarden and Langwarden. This conquest ended the independence of this Frisian region, which was now dominated and controlled from an Oldenburg fortress in Ovelgönne. The land, devastated by floods and wars, was slow in recovering. In the early 16th century extensive dyke-building was begun by the Counts of Oldenburg in order to reclaim the land lost through the floods of the Middle Ages. The Thirty-Year War was a time of calm and economic blossoming for Butjadingen and the Stadland, thanks to the political skill of the Count Anton Günther. This also manifests itself in the rich, high-quality decorative elements in many churches.

The Christmas flood of 1717 represented a great setback, with disastrous losses of human life, property and land, due in part to the fact that under Danish rule (since 1687) the maintenance of the dykes had been neglected. The influx of new settlers from the geest regions of Oldenburg caused Butjadingen and Stadland to gradually lose their Old Frisian character, and people began to feel part of the state of Oldenburg.

Butjadingen-Stadland is unusually rich in archaeological monuments, and by far the great-

est number of these are farm, village and church mounds, the raised dwelling places in the areas on the edge of the moorland, as well as historic dykes. The so-called Jedutenhügel represent a peculiar feature in the marshlands; a kind of monument that is well worth seeing and whose function has not yet been clarified. The hills are more than 5 m high and have diameters of about 30 m (Volkers and Grebswarden in Butjadingen, Schmalenfleth in the Stadland). Possible explanations are that they may have served as landmarks for seafarers, or that they were tribunal places. The number of archaeological monuments in the whole area of the Weser marshes comes to almost 1500, with the greatest concentration being in the northern part. The Butjadingen and Stadland region is considered one of the best researched coastal landscapes as a result of intensive archaeological investigations over decades, carried out in particular by the Institute for Historical Coastal Research in Wilhelmshaven, but also by the work of the State Heritage Authority. Among these investigations, the great excavations on the village mounds of Langwarden, Niens and Sillens (all in Butjadingen) are of particular significance. However, the many smaller investigations have also made an essential contribution in the writing of the history of settlement of these landscapes from the late Iron Age up until the Late Middle Ages and early modern times. These investigations produced answers to many questions about house construction, trade, handicrafts, infrastructure and the formation of settlements, diet, cultivation, animal husbandry and other topics. Special attention was and is being paid to the issue of dyke construction, whose beginnings in the 11th century can still be seen in the form of ring dykes, such as those associated with the southern string of dwelling mounds at Sillens, and which resulted in the large, continuous line of dykes that has been formed since the 12th and 13th centuries.

The ecclesiastical history of Butjadingen and Stadland is of great significance, as is attested by the large number of mediaeval church buildings. Many churches are stylistically very interesting and reveal influences from Westphalia and the Rhineland, while the building materials used - Porta sandstone from the Weser highlands, Tuff stone from the Eifel - bear witness to the extensive trading links. The mediaeval churches of Butjadingen and Stadland with their turbulent histories are all worth seeing, particularly Golzwarden and Rodenkirchen, which also

served as fortified church sanctuaries and which feature significant decorative elements. The same applies to the churches in Langwarden, Tossens, Eckwarden, Abbehausen and Blexen. Blexen dates back to the 8th century and is the oldest church site and mission church, possibly on the site of a pagan place of worship. The Frisian missionary Willehad died here in 789. Excavations in several of the Butjadingen churches, especially in Blexen, produced important discoveries in the history of construction.

Grassland farming has always been typical of Butjadingen and the Stadland. The luxuriant meadows of the marshland are particularly suited to cattle grazing and the dairy industry, which are very productive in this area. The landscape is dominated by wide marsh expanses in which the scattered farms and villages on their dwelling mounds are visible from great distances. These mounds give the coastal landscape its own unchangeable character even today; along with the dykes, they bear witness to the perpetual struggle of the people against the water and for the security of their existence. In no other landscape is the battle with the forces of nature as conspicuous as here on the coast.

Many areas of Butjadingen and Stadland have kept their original character in spite of the modernization required by the still numerous agricultural enterprises. These mound landscapes have great heritage value. While tourism has been an important economic force on the coast for some time, particularly in Tossens and Burhave, important industrial enterprises, shipyards, harbor industry and also the generation of energy tended to concentrate on the Weser between Nordenham and Brake. Some of these industry sectors have traditions going back to the 19th century. Wind energy installations have not yet had an excessive visual impact in Butjadingen, as they are concentrated in just a few areas. In contrast, the construction of the Weser tunnel at Kleinensiel, north of Rodenkirchen, in conjunction with the extensive construction of new roads and the upgrading of existing ones, as well as the proposed coastal freeway will all lead to massive changes in the landscape, especially in the Stadland.

4.4.2.3 Stedingen

The geographic term Stedingen (derived from German „Gestade“ for shore, coast, bank) was an expression used in the Middle Ages for the southern area of what is today known as the district of Wesermarsch, i.e. the moor and river marsh areas west of the Weser river between Hammelwarden to the north and Schönemoor to the south as well as along both sides of the lower Hunte as far as Holle, a few kilometers east of Oldenburg. The area between the Hunte river and the former Lockfleth, also including the Moorriem area, was called North or Lower Stedingen and the area south of the Hunte South or Lower Stedingen, also including the „Lechterseite“, a separate area between the Weser and the Ollen rivulet, which has the characteristics of an island as it is virtually waterbound (insula Lechter).

The soil in the eastern part of Stedingen consists for the most part of fertile river marsh originating from sedimentation from the Weser, which becomes a strip of moor and marsh towards the west. Adjacent to this is a narrow lower moor zone followed by high moorland plains which continue up to the edge of the geest. Today, the highest points in the Stedingen district are between +1.00 m and -1.00 m above or below sea level.

Like all rivers, the Weser and Hunte also have built up embankments which, although only discernible within the grasslands to the practiced eye, are higher than the surrounding countryside and were favored as places of settlement in pre-historic epochs.

A map of the countryside reveals that Stedingen is a close-knit network of largely artificial waterways, which says more about this landscape than any narrative can. There is scarcely another area in the northern coastal region of Germany which has been transformed to such an extent by human habitation and is the product of such intensive efforts to colonize the land.

Evidence of early settlement of the southern Wesermarsch region are to be found at several sites. Thus, to the north of the Hunte at Gellener Dyke, on the boundary to Moorriem, artifacts dating from the Neolithic Funnel Beaker culture of the second half of the 4th century B.C. and also other artifacts from the Late Neolithic Age indicate that settlements existing there spanned several historical periods. Some artifacts, for example a flat-headed needle from Berne, date back to the following Early Bronze Age. Howev-

er, these are more likely to be signs of sporadic attempts to establish settlements. Continuous settlement can be assumed to have begun in the Later Bronze Age, which is documented by finds at several locations in the south of the Wesermarsch region such as Huntebrück-Wührden and at the St. Aegidius-Kirche in Berne.

A substantial increase is to be seen in discoveries from the pre-Roman Iron Age and particularly from the time of the Roman Empire, when intensive colonization of new territory apparently took place. It was during this period that more attractive environmental conditions allowed settlements to be built on the flats along the Weser and along the lower course of the Hunte as well. No artifacts are known to have been found in Stedingen dating from the 4th or 5th century. The situation here is no different from most other regions in Germany's north-west. There is also little known about the ensuing centuries, during which there are signs of increasing settlement and the establishment of villages in neighboring areas, many of these enduring to the present day. Not until the High Middle Ages can an organized settlement of the marshlands and cultivation of the Stedingen moors be discerned. Stedingen was an endowment made by Emperor Henry IV to the Duchy of Saxony and/or the archiepiscopal see of Bremen. From the 12th century onwards, the Archbishop in Bremen recruited colonists from Holland, who were able to receive parcels of land on favorable terms according to the land grant concession for Dutch immigrants (*ius hollanicum*). These events, for which there is documented evidence from 1106 (for Bremen's Hollerland), 1142 and 1149, transformed the area in the ensuing period and have left their traces. The decisive factor in cultivating the land was draining of the moors and marshes and the erection of dykes. Many settlers came from the Netherlands - a fact which many town names bear witness to - but not all. Among their numbers were also local Stedinger Saxons. They built their farms one next to the other in rows, and tilled the land assigned to them in long narrow strips. These long rows of dwellings shifted many times, evidence of which has been discovered through recent archaeological investigations. The colonization took place over a number of phases in areas specifically defined for this purpose, and is chronicled in its various stages.

Stedingen is first mentioned in the greater region's history, it might even be said in European history, in the 13th century. The freedom-loving farmers who had become affluent denied

the Bremen church its share of the tithe and tribute, thus endangering the church and its sovereign power. Near the mouth of the Hunte, the dukes of Oldenburg built the fortresses of Lienen and Lechtenburg which were destroyed by the inhabitants of Stedingen as early as 1204. In 1229 the farmers of Stedingen defeated troops dispatched to punish them by the archbishop of Bremen, after which the inhabitants of Stedingen were pronounced heretics by the Bremen archdiocese. In 1234, with the approval of Pope Gregory IX, a crusade was declared against the insubordinate farmers - a rare example of a crusade waged against Christians. The farmers' army was overwhelmingly defeated and almost completely wiped out at the Battle of Altenesch by a large invading army of high nobility from Holland, Flanders, Brabant, Westphalia, Rhineland and Oldenburg. The victors divided the land and farms among themselves, although the Oldenburg dukes were able to turn the event to the most benefit for themselves and gained power over the area, except for the „Lechterseite“ which fell to the Bremen archdiocese until it also was annexed by Oldenburg in 1547.

St. Aegidius-Kirche in Berne, also referred to as the „Stedingen Cathedral“, is undoubtedly Stedingen's most important church and was erected in the late 12th century on a mound dating back to the pre-Roman Iron Age that had been inhabited up into the early Roman Empire. After the Stedingen wars the old church with a single nave was enlarged into a three-aisled hall-church in pure Westphalian style. The dukes of Oldenburg built a hilltop fortress that is first mentioned in 1242, traces of which are still evident today. Further examples of mediaeval churches in the Stedingen area, some of which also house interiors of historical and artistic significance, are: Bardewisch, a three-aisled hall-church with late Gothic frescos first entered in a chronicle in 1245; Altenesch, a hall-church built in 1400 whose choir was originally part of the church built at the cemetery square in 1299 - the small Late Gothic brick St. Marien in Warfleth, which was built on the foundations of previous structures dating from the 11th and 13th centuries respectively; St. Marien-Kirche in Neuenhuntrorf, built in 1489, as well as the 15th century St. Nikolai-Kirche in Elsfleth. Archaeologists have carried out excavations in many of the Stedingen churches over the past decades and these have shed light on questions concerning the history of the buildings' evolution.

The mound villages on the Weser and the Ollen, which are protected as archaeological monuments, reveal the earliest settlement patterns dating back to the Early Middle Ages, although in some cases settlements from the time of the Roman Empire may have provided the foundation.

In addition to these old mound settlements, which in many cases evolved into villages during the Middle Ages, the Stedingen of former times is primarily characterized by individual farms (one „hide“ of about 80 - 100 acres could sustain a farm family) and moorland settlements, which in some cases stretch for miles in a long line without a true village centre. An outstanding example of this is Moorriem, but also Neuenhutorf, Oldenbrok-Mittelort, Harrierworp and Sandfeld. Most of the farm sites in these long settlement rows are protected as archaeological

monuments, as is the case with the historical lines of dykes.

The excellently preserved farming settlements of the large community of Moorriem previously mentioned bear witness to the history of the community's settlement and culture. On the boundary separating marsh and moor on the left side of the Hunte, shortly before it flows into the Weser, a moorland settlement of single-family farmsteads stretches out for over 15 km, still very much unchanged by the passage of centuries. The impressive consistency is the result of an historical development to which the soil and water conditions as well as the approach to colonization offered no alternative.

As a result of the geographic conditions, the settlement and cultivation of the Moorriem area gave rise to a pattern of arranging farmland that bears the unique and distinctive stamp of the u-

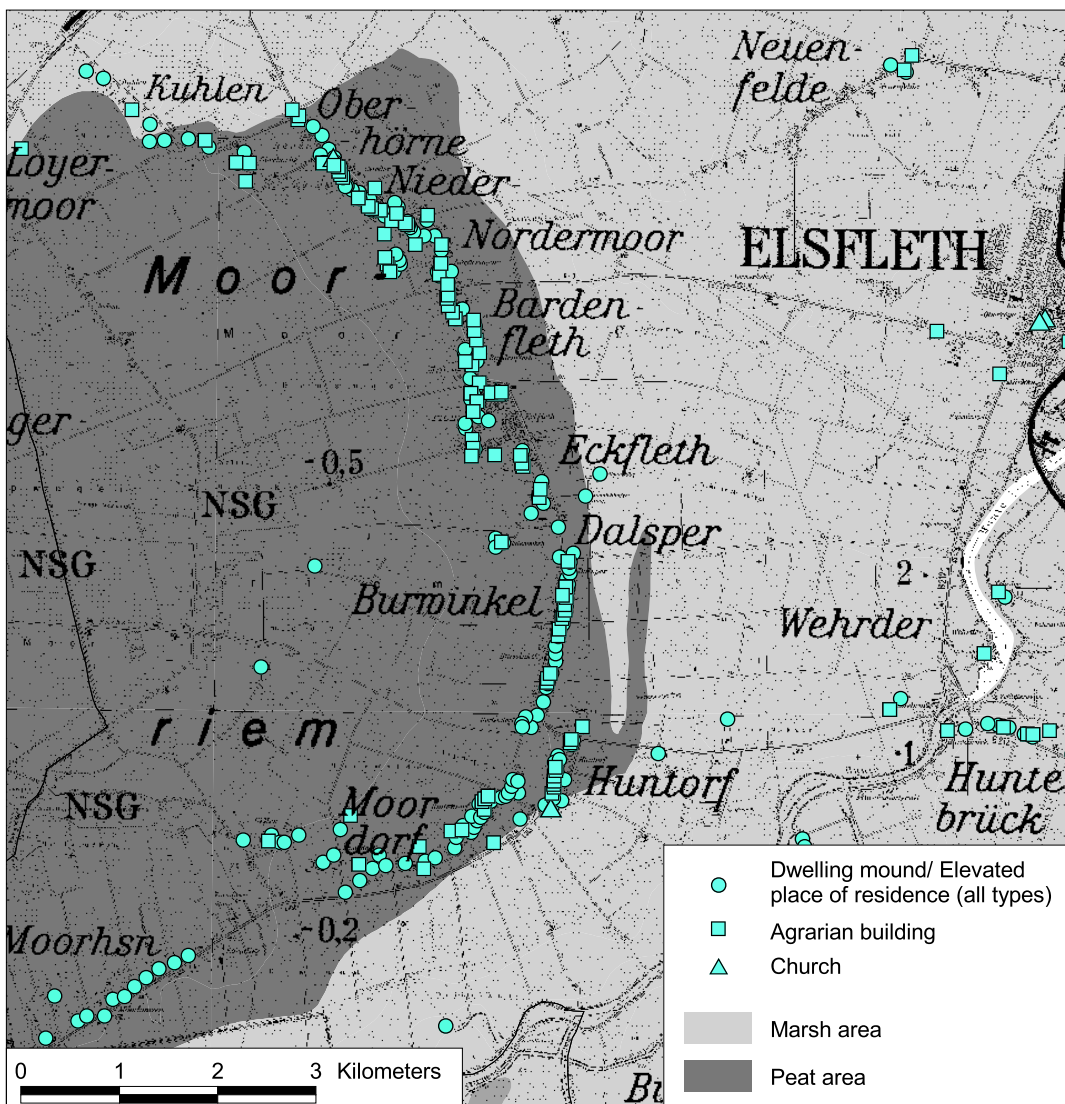


Fig. 4.62:
The elongated settlement
of Moorriem were laid at
the edge of the moor
Source: LGN, NLFb

shaped moorland and marsh farmsteads in general. The location and breadth of the farmsteads strung along the road in a parallel row is determined by plots of land - known as „Baue“ in Moorriem - which were originally laid out upon the completion of dyke-building with borders defined by drainage ditches. This type of farmland design enabled each farmstead to have a more or less equal share of each of the various soil qualities. Areas of new cropland were constantly added to the farmstead property in the direction of the moor. Near the farmsteads, cropland that had been tilled but was no longer arable became pastureland. In this way, the sections of land were marked off in a 20 - 50 m wide strip of up to 8 km in length, making the working of the land an arduous affair due to the distances needing to be covered. Relocating the mound was not possible, because that would have moved it away from the marsh, and the farmsteads themselves would have been set apart on the moorland. Drainage of the land was provided by a system of ditches typical for this type of settlement: These ran in a crisscross pattern and accounted for approximately 15% of the land surface. Narrow ditches flow into ditches running at right angles, which in turn flow into ditches running the length of the field. The long ditches, which frequently serve as a boundary for the farmsteads, empty into drainage ditches, and these flow into sluice canals which as far as possible convey the water to the closest river.

The layout of the farmsteads and type of farmhouse built on them go hand in hand with the Moorriem area's distinctive settlement type and the unique pattern in which land is apportioned. The building style has remained a distinctive feature of large parts of the district up to present times. The various sections of the farmstead - consisting of the main structure containing living and working quarters as well as the stables, smaller buildings, the farmyard and the garden plot - are arranged in a pattern typical for the landscape. They are usually built on earth-covered pilings, mostly on the moorland side of the road running down the middle of the settlement and bisecting it into equal parts. The working quarters face the road. The approach to the farmstead opens out to the road. The location of each farmstead building is determined by its function. The barn, mostly based on a double-jointed frame construction with saddle beams and doors for access on the sides, straddle the farmyard. It is conveniently close to the main

building, so that little time is lost walking between the two. The garden plots are next to the main building, generally next to the living quarters, and hint at local farmers' adoption of baroque garden forms. Pruned lime trees or fast-growing poplars surround the buildings to protect the farmstead from the wind.

Four aspects are generally distinctive about the appearance of the Moorriem farmsteads:

1. Qualities required of the building pilings: pitched high, a sloping approach to the house, close proximity of all buildings.
2. The economic requirements: all parts of the farmstead within easy reach, working quarters of the house open out to the road and the land being cultivated.
3. The necessity of protecting the farmyard from the wind: L-shaped or horse shoe shaped arrangements of buildings, a stand of trees.
4. The desire to display the economic and social importance of the farmstead, as reflected in the gable design and to a certain degree in the layout of the garden.

The farmhouses of the Moorriem area are predominantly from the 18th century, with very few built before or after this time. Most buildings underwent considerable modification in the late 19th and 20th centuries. The most common type of farmhouse is the Northern German bay hall house, predominantly erected as a double-jointed frame structure which could adapt itself to all farm operations required up until the most recent past. Its basic design can be seen in buildings ranging from the smallest cottage all the way to a spacious and representative main building. The exterior design was completed using framework construction which was white-washed in this region and filled with red brick. The gable sides were more richly decorated than the side walls, in order to enhance the appearance of the building. A characteristic feature of the Moorriem farmhouse gable is the hip-roof jutting far out on oversize beams richly adorned with decorative carving. The hall door is painted green and frequently includes a fanlight. Another predominant feature is the thatched roofs, which are increasingly being dispensed with nowadays to reduce maintenance costs.

Normally, a baking house and a well (Soot) formed a part of the farmyard, almost always situated on the right side of the farmhouse near the gable above the living quarters. Until plumbing fixtures were introduced around the close of the 1920s, all of the water had to be drawn from the well.

Among the changes which farmsteads underwent, particularly in the case of the larger main buildings, were such basic modifications as the removal of open fireplaces and alcoves, extensions to the structure through annexes and the replacement of framework panelling by masonry and conventional roofing.

New requirements in farming, especially over the past 30 years, have also brought about more significant changes which impact on the structure of settlements. Thus, loose box stalls came to be built which could only fit into the proportions and size of the buildings with difficulty due to the limited space available on the building pilings. In some cases they were also erected on the adjacent plots of land for which the long field ditches had to be converted to culverts. The increasing incidence of single unit dwellings on unused plots is blurring the historical contours of the settlement to such a degree that a total zoning development plan is urgently required. This would have to be appropriate to the historical and cultural significance of Moorriem while calling for an especially cautious treatment of the existing structures.

The Stedingen district has remained farming-based over the years, with pastures for grazing dominating the countryside. Important industry has developed on the left bank of the Weser: A harbor port economy and wharf operations in Brake and Elsfleth, ship and boatbuilding as well as aviation industry (Airbus) in the Lemwerder area.

4.4.2.4 Wangerland/Jeverland

In the northeast of the „old“ peninsula - originally reaching all the way to the Weser - the Frisian lands of Wangerland, Östringen and Rüstingen were cut up or obliterated by sweeping incursions of the sea at Harlebucht and Jade Bay, which took place during the Middle Ages, and were subsumed by the formation of the Lordship of Jever and the adjacent Lordships of Inhausen and Kniphausen (including the parishes of Accum, Fedderwarden and Sengwarden). Here we are concerned with the 10 km wide and 15 km long spit of old marsh land which borders on the first small outcroppings of geest near Jever and Schortens and includes small portions of Wangerland to the north and Östringen to the south of Crildumer Bucht. Wangerland is the Frisian Gau name „Wanga“ or „Wangia“, meaning a meadow or plain. The area which originally belonged to Rüstingen was purchased in sev-

eral stages from Prussia, beginning in 1854, and served as the site for the marine harbor of Wilhelmshaven south of the Made.

As part of the modern-day landscape, this old marsh area's outlines and features can still be distinguished from areas with new marsh, even in the wake of renewed dyke building on Harlebucht in the west and Crildumer Bucht in the southeast. The three arms which once comprised Crildumer Bucht were formed at the mouth of the Jade river as early as a few centuries before the birth of Christ, and in its northernmost reaches extended along the present-day Hohenstief and Bübbenser Tief almost as far as Hohenkirchen. South of this point, the incursion turned west and ran along the Poggenburg Leide for a considerable distance into the interior towards Tettens, and the southern branch eventually ran alongside the Crildumer Tief as far as the environs of Förriesdorf. Between these two arms were some upland areas of old marsh and the contemporary communities of Oldorf and Neuwarfen. In summary, based on the latest research, it can be stated that as seawaters receded in the 1st century B.C. sustainable settlement of the Wangerland district on the naturally elevated embankments of the bights and tidal gullies commenced with the erection of three-aisle long bay hall houses in flatland settlements. When sea levels began to rise in the course of the 1st century A.D., the inhabitants of the marsh were forced to erect raised dwelling places for separate farmsteads, of which a large number evolved throughout the ensuing centuries of the Early and Late Roman Empire into sizeable village mounds which today still dominate the landscape. Ziallerns deserves mention as both a lovely and unusual example of a Wangerland mound village, lying roughly 3 km southwest of Hohenkirchen. Its oldest stage of inhabitation is marked by a settlement on the flats from the Late Roman Empire. A unique facet of the Wangerland region is the construction of farmsteads in a radial pattern around the center of the mound, the stables facing out towards the surrounding pasture. The remains of a freshwater cistern (Fething) can still be seen to this day at the crest of the mound - the foot of the mound is encircled by a road.

After the departure of the majority of the Saxon population to England during the 5th and 6th centuries, Frisians apparently re-colonized the area around the middle of the 7th century (the village mound of Oldorf) and, according to archaeological finds, also settled the old Roman

mounds. In the course of the Saxon wars waged by Charlemagne (772-804), the Frisian area of settlement on the southern coast of the North Sea was conquered by the Franks and its people converted to Christianity. The churches built as part of the effort to establish the Church were often placed on top of separate mounds surrounded by a graveyard. These striking church mounds were sometimes erected beside the village mounds (Oldorf, Pakens, Wüppels as well as others), but most frequently situated on top of the village mounds which were already up to 5 meters high (Minsen, Tettens, Waddewarden, Wiarden, Wiefels and others). Accompanying the rise in population which occurred during the High Middle Ages, a surge of new settlements were established which have left their mark on the Jeverland to this very day in the form of hundreds of individual farmstead mounds.

Largely wooded, they create the impression of being islands on a sweeping grassland plain, studding the land with rhythmic regularity while being suggestive of a park landscape.

At the beginning of the 11th century A.D., the inhabitants of the marsh entered into a new phase in their fight for existence against the powers of the sea by attempting to protect their farming land from flooding by building the first dykes. Attempts have been made by those with both a historical and geographical as well as a social interest to prove that the ring dyke - the oldest form of dyke construction from the High Middle Ages - also existed in Jeverland; however, these attempts have not yet been successful. Only the ring dyke which surrounded the previously mentioned early mediaeval village mound of Oldorf and its mound extension built in ca. 900 A.D. can potentially be considered of that

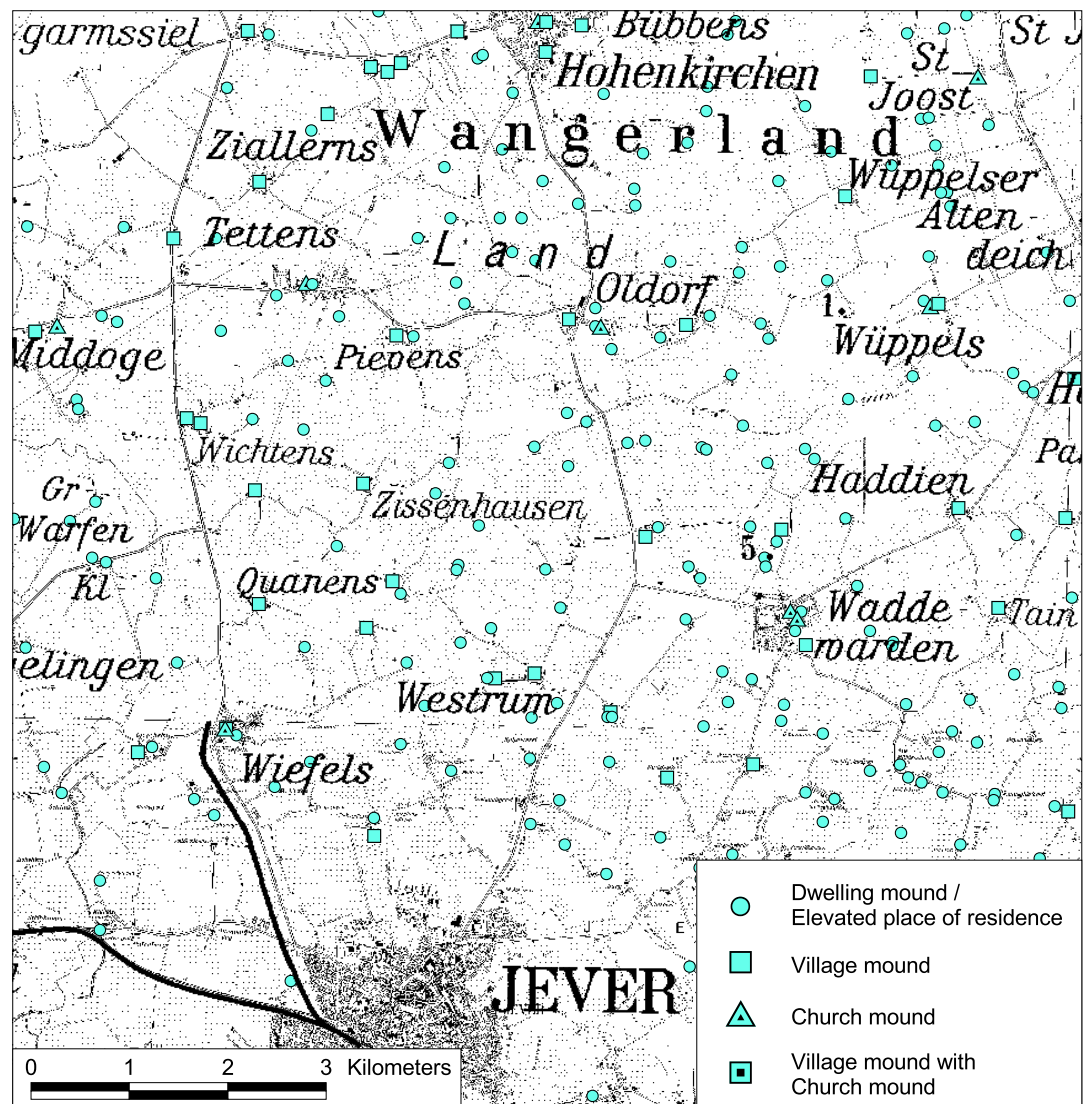


Fig. 4.63:
The dwelling mound
landscape north of Jever
Source: LGN

type. There is clear evidence of the so-called Sietwendungen, low earthen embankments visible above ground along some stretches in that area, which were erected on the banks of the natural tidal gullies. According to soil studies and historical and geographical evidence, the dyke-building carried out on Crildumer Bucht with dyke lines running at right angles to the water courses apparently took place in six steps from the late 11th to the 13th centuries. Through rapid advances in the technology of dykes and sluice building, the 13th century witnessed the completion of the regional dyke - referred to in historical documents as a „golden collar“ - which girded the coast of the East Frisian peninsula and is a distinctive physical feature of the land visible for many miles. This stretch of dyke begins in the southwest of Wangerland as a dyke to protect against Harlebucht at Hammshausen west of Tettens (Tettenser Altendeich) and then follows a long arc through the sluice harbor of Altgarmssiel as Medernser and Funnenser Alterndeich on a path to the northeast in the direction of Minsen and Horum. There it bends in towards the south to Jade Bay and continues as Osteraltendeich, Wiarder, St. Jooster, Wüppelser and Pakenser Altendeich to Hooksiel. In the far north, early dyke works and shifts in their location during the 16th to 18th centuries makes the situation somewhat uncertain; the risk of flooding is also clearly evident at this highly exposed area of the state's protective dyke line.

The area within this ring of dykes - unlike the regular formations in the groden - is covered by a finely meshed irregular network of drainage ditches, through whose winding path the canals can be recognized as natural water courses. Only in the east do smaller areas with a more patterned structure show the position of the Crildumer Bucht which had already dried up by that time.

In the north-west of Wangerland the various dyking operations of modern times to gain more groden in the vicinity of the former Harlebucht are still very easy to discern based on the excellently preserved dyke ramparts. In the northeast, however, part of the groden land that had been gained along the Outer Jade had to be relinquished again after the heavy tidal floodings of 1693 and 1717. The only dyke line which has been well preserved is the section dating from 1591 leading from Horumersiel through Hohenstiefersiel to Hooksiel.

In the well established scattered settlements of the northern Jeverland, church mounds form

the centre of church parishes of various sizes, in fact probably first limited to being the foundation of churches or - as can be proven for Wüppels - limited to this function through the relocation of farmsteads to the surrounding district. Nearly all churches can be dated to the (Late) Romanesque Period and are built of square granite blocks which are relatively intact. Only the small buildings of the same period in Westrum und Wüppels are purely brick structure as are the Late Gothic churches in St. Joost and Middoge which grew out of chapels and were only later established as separate churches after having become part of the extended Hohenkirchen and Tettens parishes. Only in Accum was a new church building erected in Baroque style in 1719.

The stone-built stereotype of parsonages characteristically found in the western part of the region appears to have been less common; remains of such highly modified structures have only been preserved in Hohenkirchen and Sengwarden, though in substantially changed form. It appears that gulf houses more frequently served as parsonages. Stately living quarters dating from the 17th century still stand as gulf house in Wüppels and Waddewarden, while in Middoge and Wiarden gulf houses date to the 19th century.

Over time, this basic building stock has been extended through the addition of a school, tavern and general store. It is especially the small and more remotely situated church mounds which have not developed beyond their most basic form, most tellingly illustrated by the hamlets of Wüppels, Pakens, St. Joost, Westrum and Middoge. By contrast, the centres of the larger parishes, above all Hohenkirchen as the main city in the Wangerland, but also Tettens, Waddewarden, Sillenstede, Sengwarden and Fedderwarden have developed into larger villages since the second half of the 19th century through the building of trade, commercial and residential buildings. Especially here more and more widespread new residential communities have resulted since the Second World War and continue to emerge today.

The former church mound Mederns on the Altdeich north of Tettens is a case of its own. After the majority of their parish was lost to the waters of Harlebucht, the remainder was made a part of the Tetten parish and the church building abandoned. The mound however continued to serve its purpose as a cemetery - thus calling its earlier function to mind at the same time.

The single-family farmstead mounds are most dominant among the mounds, then come those with two to three farmsteads. Larger mounds suggestive of a village with up to 6 farmsteads and secondary buildings are found less frequently by comparison. Ziallerns (northwest of Tettens) is noteworthy for its perfectly circular layout and radial inner subdivisions (see above); Uthausen (east of Oldorf) for its elongated form and the parallel arrangement of the farmstead roof ridges; Uppers (east of Sengwarden) for its square-shaped, block-like sense of direction, with all farmsteads facing one way; Wichtens (southwest of Tettens), Stumpens (northeast of Wiarden), Haddien (to the east of Waddewarden) or Wehlens (west of Sengwarden) for its irregular form and inner sectional design.

With only very rare exceptions at the edges of church mounds, farming sites are scattered across the district on separate mounds. Establishing new settlements on the flat coastal plain or abandoning mounds - which left many mounds lying completely deserted - are relatively rare in the old marsh, but typical in the groden, for example in the dyked groden of the 16th century on the Jade Bay between Horumersiel and Hooksiel or in the groden of Harlebucht.

The older gulf houses can be distinguished from dwelling forms otherwise common to East Frisia due to their long and generally low-ceilinged, four-post-square construction - the use of interior posts remained features of this building style into the early 18th century. If they are in fact from the 16th century, these buildings apparently contain the material substance of previous gulf house living quarters - and when dating from later times, have been modelled on this type of housing. Stone houses based on the prevalent Western style are not to be found here, but instead „Steinenden“, one-room additions with a cellar in Renaissance forms as handed down in Maihausen or (with an imposing chimney) in Stumpens and at Sander Seedeich and in several other cases (Horum, Breddewarden) were included in rebuilding measures. In the 17th century, however, splendid four-room living quarters laid out in a cross pattern already existed with high brick outer walls providing the superstructure.

With only a few examples falling in earlier times, gulf barns were most likely introduced here also from the second half of the 17th century onwards as common way to arrange for work quarters. In the Altmarsch - where farmsteads raise pasture animals or carry out mixed

farming with an emphasis on pasture-grazing - they do not match the length of the same types of buildings in Krummhörn, for example. There, the gulf houses are generally far more modest in their classic and historical lines. There are scattered instances of barns and baking houses from the 19th century as secondary structures.

In nearly all cases, castles or permanent homes of the headmen and early large-tract farmers also blended into the system of scattered mounds. It is difficult to judge the various levels of social strata among those of the upper class because many of the headmen's dwellings were converted into farms and, conversely, some farmsteads came into the possession of nobility. Both post-mediaeval living and working buildings can be distinguished only by fine details from those of the normal farming population. However, the difference between the respective types of living quarters must have been considerably clearer at the time of their construction, as borne out by examples which should probably be considered in this context from the 16th and 17th centuries (Nenndorf near Waddewarden, Maisidden near St. Joost, Stumpens near Wiarden, Putzwei, Heddoburg and Tidofeld near Sengwarden). The same is true of manorial steadings such as found at Maihausen near Pakens. The respective sites were surrounded by moats which in most cases are still extant today.

There is apparently no remaining building material above ground; in the period which follows, the only „true“ castle which could establish itself was Kniphausen in the immediate Lordship of the same name. After the fire of 1708, only the duke's stables and gatehouse of the fortification walls exist from the 16th century. Miss Maria von Jever had a castle built near Sande (Alt-Marienhagen), which was razed in 1826. Only a single gulf house remains as working quarters on a twin-moated island beside a tower visible from afar, both dating from the first half of the 18th century. While considerable numbers of small castles have disappeared (for example Rickelhausen near Westrum or Canarienhagen near Waddewarden), Groß Scheep near Wiefels and the particularly impressive Fischhausen near Wüppels offer a modern-day impression of this type of structure.

The windmills should also still be pointed out as landmarks and also because they were erected on the edge of or beyond the church mounds, of which - sad to say - within our immediate area only the ones in Tengshausen, near Stumpens, near Accum, near Sillenstede and

near Sengwarden have remained fully intact. The water tower on „Landeswarfen“ west of Hohenkirchen is a landmark visible from a great distance, constructed by Fritz Höger in 1936 to serve as Wangerooge's water supply.

Of the above-mentioned scattered settlements characteristic to this region, two set themselves physically apart and therefore represent limited forms within this landscape.

Some sections of the old dyke ring whose land was considered dispensable from a farming or land ownership perspective served as building space for erecting small homes of farm labourers and artisans who otherwise made their homes in small numbers on larger mounds. Among these were the „small houses“ referred to in oral tradition north of Middoge, the Oesterdeich (an early groden dyke), the Medernser Altendeich, the Norderaltendeich and foremost the area west of Horumersiel up to Hooksiel. With few exceptions, the houses themselves are all renovated, however.

The second deviating type of settlement is a sluice harbor. While all sluices on the Jeverland side of the Harlebucht have no real function since dyking has been completed on their seaward side, two sluices on the Jade have at least indirectly retained their function. When the first dyke was constructed in front of the groden in 1542, Horumertief, Hohenstief, Crildumer Tief and Hooktief (1546?) each had a new sluice constructed. With the passage of time the three northern canals were linked up and since 1962 they drain off water via the Wangersiel to the south of Horumersiel. All that is visible of the Crildumer Siel today is the dyke line with a closeable opening. The other two sluices have been shut down. The Horumer sluice harbor has in any case always been of only modest significance, and only a single historical building, a former storehouse, reminds us of its existence. After the silting up of the Hooktief in Jever's harbor rendered it impassable, Hooksiel became the main harbor of the Jeverland, attested to by the harbor bowl with three large warehouses from 1821 as well as numerous inns and residential homes of the 18th and 19th centuries. The sluice itself was renovated (as was the older sluice near Rüschenstede) in 1885. It relinquished its functional role to a new sluice gate facility after dredging works and extensive dyking were completed from 1971-74 at the Voßlapper Groden. The most recent extensive growth of communities is attributable (similarly in Horumersiel) to summer visitors.

With the exception of the northern section's tourist visitors, the Voslapper Groden mainly serves as a sea rampart for Wilhelmshaven's commercial buildings, a function also served by the Rüstersieler Groden (1960-63) and the Hepenser Groden, first laid out as a dyke line from 1936-38, although construction only started in 1955. It remains to be seen whether the historically preserved parishes of Sengwarden and Fedderwarden, now already part of Wilhelmshaven, will come to terms with the consequences of this and the inexorable urban growth through appropriate planning.

The cultural landscape of the Wangerland and the Jeverland has been able to preserve its unmistakable character to a considerable degree. The genesis of landscape forms is mirrored in the patterns of settlement, the lay of arable land and in landmark monuments. The variety offered by this cultural landscape is still largely free from the effects of large-scale intrusions such as extensive commercial or industrial development, while new home development has not yet spilled out into the countryside to mar or destroy the total impression.

In addition to the unavoidable highways, there is unattractive development in the areas bordering the cities of Wilhelmshaven and Jever. The increasing levels of tourism along the coasts have also left their mark on the landscape. A particularly insensitive measure was the establishment of the main garbage tip for the administrative district of Friesland north of Jever.

4.4.2.5 Harlingerland

The Harlingerland covers the whole northern part of the East Frisian administrative district of Wittmund, including the two islands of Spiekeroog and Langeoog. The north-western part of the Harlingerland, formed by what was once the Dornumer Bucht, extends into the Aurich administrative district. In its north-eastern extension large parts of the re-dyked former Harlebucht, which borders onto the Wangerland, already belong to the Oldenburg district of Friesland (Frisia). The border begins near Dornumersiel in the north-west and runs along the Dornum Canal to Dornum. From here it stretches south along the Sielhammer (Accumer) Canal and follows the extension of that canal along the present-day boundary between the districts of Aurich and Wittmund until it reaches the so-called „Ewiges Meer“ (permanent mere). In the south-west the border runs through the Meer-

husen and Tannenhausen Moors to the north of Tannenhausen, Plaggenburg and Middels towards the Norder Tief and the Leerhafer Tief (Harle). Here, the border corresponds roughly to the former boundary between the judicial districts of Friedeburg and Wittmund. In the south-east, Wittmund und Asel, lying on the edge of the geest, are included before the border line bends towards the north-east. The eastern shoreline of the Wittmund and Sandel branches of the Harlebucht, where in mediaeval times the sea had broken in, represents the eastern boundary of the Harlingerland to the Wangerland, which is part of Jeverland. The border between Jeverland, a part of Oldenburg, and East Frisia (the „golden line“) was established in 1666 and finally confirmed in 1743. For the mainland this border line is still in force today and runs virtually through the middle of

the Harlebucht where the dykes have been rebuilt.

Thus, the Harlingerland features every type of landscape that the coastal region of Lower Saxony has to offer. These include the dune islands formed from alluvial sand, the Wadden Sea with its salt meadows offshore from the present mainland, the recent (sea) marshes of the former Dornumer Bucht in the west and of the Harlebucht in the east, the old marsh and the brackish marsh off the geest edges, as well as the regions of geest and boggy marsh in the geest ridge of Oldenburg and East Frisia, formed in the Ice Age, with the large offshore geest island of Esens.

The old moraine landscape of the Pleistocene geest represents the oldest soil and geological formation. According to K.-E. Behre (1995, 7ff) the geest ridge of Oldenburg and East Frisia is

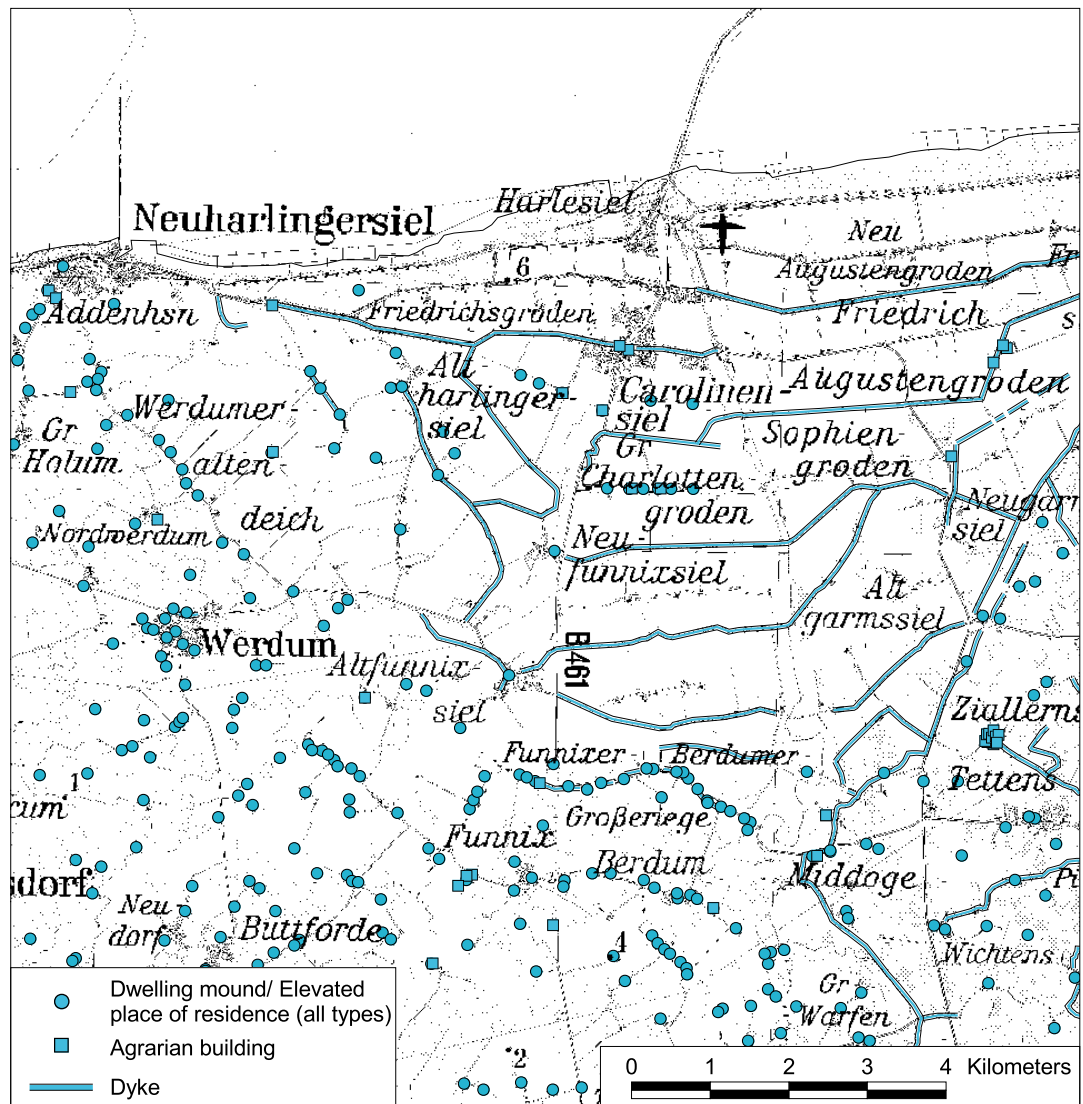


Fig. 4.64:
The dykes and dwelling mounds in the region of the Harlebucht
Source: LGN

thought to have formed during the Elster Glacial period and was definitely laid down during the Saale Glacial period in its final form, with rivulets draining off to the North Sea. The Lauenburg clay from the Elster Ice Age, which is frequently used in the manufacture of bricks, can be found just beneath the surface on the northern edge of the geest between Norden, Esens und Wittmund. In the older phase of the Saale Ice Age large boulders of granite were carried here by the ice. In the Neolithic age these were used in the erection of megalithic tombs and, in the High Middle Ages, were squared off into blocks and used for building churches.

During the Eem Interglacial period that followed the Saale Ice Age, about 125 000 to 115 000 years B.C., the southern coastline of the North Sea extended roughly to what is now the chain of islands. At this time the lower moorland was formed in the geest valleys and on the coastal rim. During the subsequent Weichsel Ice Age East Frisia lay in the periglacial border region, largely free of vegetation, in which westerly winds brought about sand drifts which, over the years, leveled out most of the terrain. Finer material was deposited in the eastern regions as a thin, infertile covering of drifting sand. Important nutrients, especially calcium, were flushed out of the soil as a result of water run-off.

At the end of the Weichsel Ice Age, the land was once again completely covered in vegetation, first with herbage and then with bushes (predominantly juniper) before birches came in as the first tree species in the Alleröd Interglacial Period, followed by pine trees. After a deterioration of the climate in the more recent Tundra Period, the pre-boreal warming at the beginning of the Holocene since about 9000 B.C. caused the land to be finally covered in forest, with poplars, hazels and subsequently with varieties of mixed oak woodland. The first types of cereal grains, established from various pollen diagrams, are an indication of Neolithic agriculture starting in the fourth millennium before Christ.

In the Holocene there was a rise in sea level which was not continuous, but occurred in different phases of transgression and regression. In general it can be said that during the periods in which the sea level rose above the coastal moorland, silt was deposited by the sea. The silt dried out when the sea level was stable. and it was then covered by vegetation, which in turn led once again to the formation of a low-lying moorland. As the water table rose, the lower moorland also reached greater heights on the

edges of the geest. In the second half of the Atlantic period and the subsequent Subboreal a more or less continuous covering of high moorland developed along the peaks of the geest ridge, which remained unaffected by ground water. Old surfaces of the marsh have been discovered by drilling at about 5 m below mean sea level (foundation of the present marsh) as well as between 3 and 2 m below sea level. This latter layer had been covered over a wide area by coastal edge moorland since the beginning of the second millennium B.C. Pollen analysis and, in part, archaeological evidence have shown dates for more recent marshland surfaces of 1000, 500 and 200 years B.C., with the last phase representing today's marshland of hedgerows or brackish water, containing clay and largely devoid of calcium. The recent sea marsh, characterized by fertile calcareous sediments, developed from the renewed rise in the sea level in the Early Middle Ages.

At the time of the birth of Christ, the coastline of the Harlingerland more or less resembled the present one, with the exception of the small Dornumer Bucht. The intrusion of the Harlebucht, almost 15 km wide and at its peak with three arms touching the geest ridge of Oldenburg and East Frisia, did not take place before the 9th century A.D. in the Early Middle Ages. A possible cause for this intrusion is seen in the displacement to the east of the offshore island of Wangerooge which had previously acted as a kind of protective embankment for this low lying section of the coast. Likewise, the protective effect of the displacement to the east of the island of Spiekeroog could provide an explanation for what was initially a natural drying-up process of the coast in the high and Late Middle Ages. In the 11th century the first so-called ring dykes were built around the meadows of the village mounds of Oldorf and Tettens in the eastern Jeverland district, and presumably also around the area of Funnix, Werdum and Eggelingen in the western East Frisian region. This was followed during the high and Late Middle Ages by the establishment of continuous lines of dykes along the sea walls of the bight (the Werdumer Altendeich in the west, the Tettenser, Medernser and Funnenser Altendeich in the east), before the first complete dyking of the separate arms of the bight could be implemented thanks to the progress made in the technology of sluice construction in the 15th century. From early in the modern era until the end of the 19th century the whole Harlebucht was again completely covered

with groden dyke works, in which a new sluice harbor was set up according to plan at each point where the sea dyke crossed the artificially excavated river Harle. These include Altfunnixsiel, which was presumably already established in about 1500, Neufunnixsiel in 1658, Carolinensiel in the year 1729 after dykes were built on the Carolingengroden, and finally Harlesiel in the year 1956. The sluice harbors, the old lines of dykes and the farmsteads surrounded by fertile cultivated fields located between the dykes all are characteristic features of the landscape in this area of the Harlingerland.

In the remainder of the Harlingerland the archaeological monuments that have been preserved above the soil correspond to the diversity of landscapes. The only known Neolithic monument, a megalithic tomb of the funnel beaker culture, is in ruins however. Its remains on a geest ridge near Utarp were investigated in the year 1878 and again in follow-up excavation in 1984. Fields of grave mounds and individual barrows, thrown up here since the latter part of the Neolithic age (e.g. Westerholt), have been preserved and these are the oldest relics in the geest regions. The Radbodsberg in the Brill district near Dunum, the Barkholter Berg barrow directly south of the road from Norden to Esens, as well as a field of six barrows west of Nord-Dunum are representative of these. In the Moorweg district, on the northern edge of the geest, there was once a field that probably had seven barrows and lay on a spur extending into the depression of the Hartsgaster Tief. Evidence of settlement activities at the end of the Neolithic and in the earlier Bronze Age was discovered in nearby excavations. The dune region was used as a burial site from the Bronze Age until the time of the Roman empire.

On the basis of the archaeological survey by the Ostfriesische Landschaft and the compilation of the inventory of archaeological monuments by the Institut für Denkmalpflege in Hannover (now Niedersächsisches Landesamt für Denkmalpflege) nearly 300 dwelling mounds in the Harlingerland district have been recorded. 220 farm mounds, 33 village mounds and 18 church mounds (around the Wittmund district) are well preserved. Most of the village mounds and church mounds were set up on the edge of the geest, while the majority of mounds for individual farms were sited in the recent marsh, with a marked concentration in the area of what used to be the Harlebucht. Several conspicuous strings of mounds can be seen on the lines of

older dykes. It is possible that these „mounds in dyke positions“ are the remains of old dykes which, following their decommissioning, served as the foundations for so-called dyke row settlements. Sluice harbors have already been mentioned as a particular kind of settlement in which the exclusively non-agrarian buildings were built on the inner side of the dyke embankment.

In the high and Late Middle Ages, as well as early in the modern era, several castle complexes or fortified manor houses were built in the Harlingerland in the districts of Berdum, Buttförde, Esens, Funnix, Seriem, Utarp, Werdum and Wittmund. Their more or less impressive remains can still be seen today.

Virtually no recognizable ruins remain above ground of the monasteries of Marienkamp (about 1 km south-west of Esens) and Schoo (in the Moorweg district), both founded in the Late Middle Ages. In the case of Schoo, however, the artificially constructed fish pond with its above-ground dam wall is still recognizable. The site of the Marienkamp monastery is now covered by farmland; building rubble and individual pieces of pottery from the Late Middle Ages and early modern times were found here, in an area about 325 m long and 140 m wide, divided into two halves and raised by about 1.5 m.

A few inconspicuous hills under which so-called field furnaces are concealed bear witness to the manufacture of bricks in former times. These first „brickworks“ were set up either right next to the clay pits or close to the buildings for which the tiles and bricks were to be used.

The activities of permanent rye cultivation and peat digging, which were pursued on a massive scale since the early and High Middle Ages and which did change the landscape, have not yet been recorded as archaeological monuments.

4.4.2.6 Norderland

Norderland, situated in the administrative district of Aurich, once extended across the geest edge and the Arle marsh towards the west, to the place where the sea reigned. In the early Atlanticum the sea advanced to the current chain of islands and gradually flooded the mainland, which was able to stand its ground as the island Bant - probably the ancient „Burcana“ - up to early modern times. South of the island Juist, on the geest between Nordland to the north, Koper Sand to the south and Itzendorfer Plate to the east, the growth of the moor was

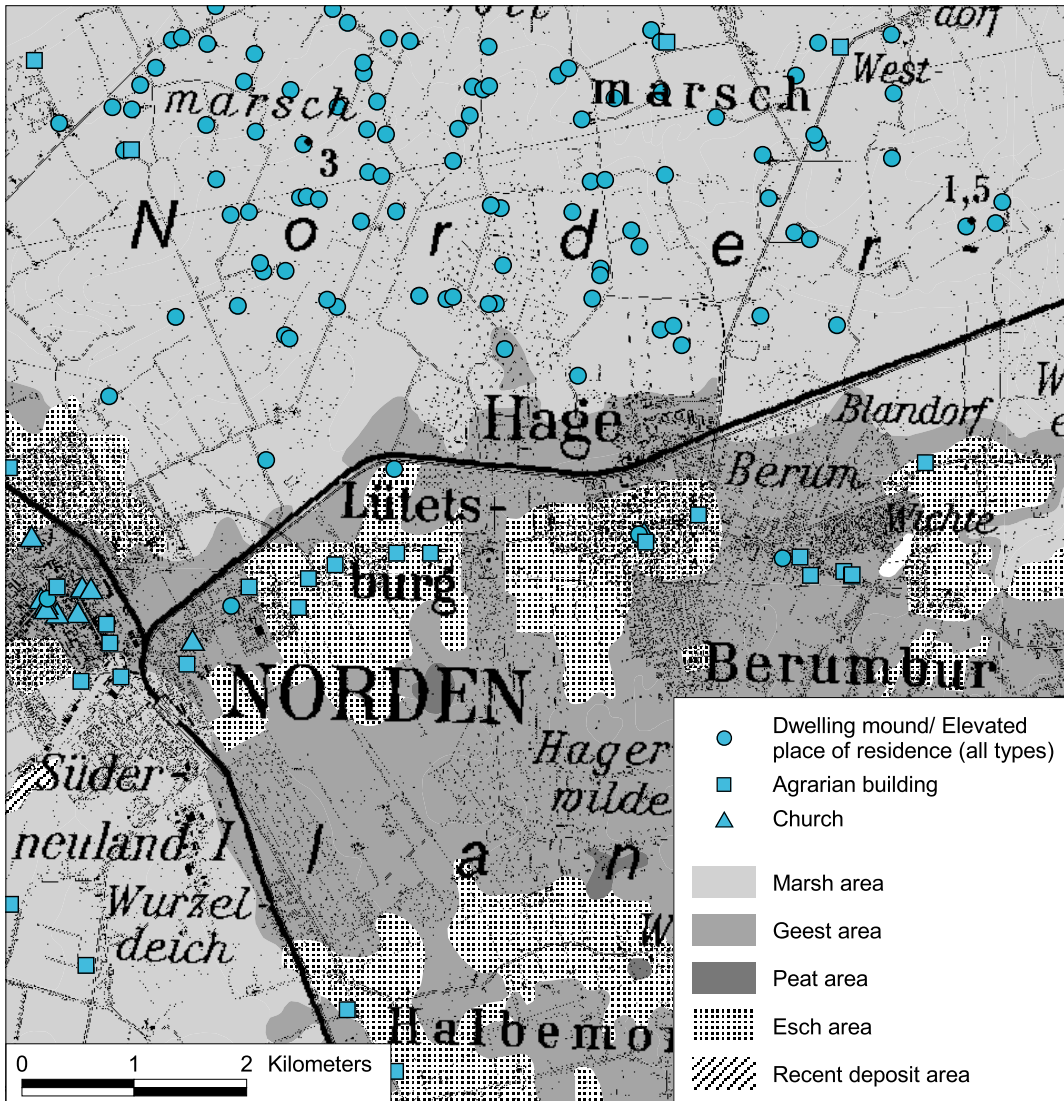


Fig. 4.65:
The elongated settlement
of Hage were laid at the
edge of the geest
Source: LGN, NLFB

first interrupted by the Dunkirk I Transgression in 300 B.C. with widespread flooding and still or flow-through water. The same occurred in the low-lying (up to 2.5 meters below sea level) areas of the East Frisian geest substrate in Norderland. Prehistoric settlement would have been possible up to this period, demonstrated by scattered stone instruments both from the Neolithic as well as the Late to Middle Bronze Age. That sites from the Iron Age and Roman Empire have not yet been found on the higher-lying sandy area near the city of Norden can for now be attributed to a lack of research, because sites dating to the Roman Empire have been found further east at the geest edge.

The history of marsh settlement began after the large losses of land to the sediments of the Dunkirk I Transgression, which in turn created new marshland from moor and clay, as in the

Krummhörn, and above which bights formed from canals worn into the ground during the Pleistocene period. Settlements from the Holy Roman Empire bordered the higher silted-up seashore zone from Westeraccum and Dornum in the east across Ostdorf and Westdorf to Süderhaus in the west. These two latter sites straddled both sides of the bight, which later came to be called Hilgrienrieder Bucht. In the course of the Dunkirk II Transgression all settlements developed into large dwelling mounds, each of which certainly held large numbers of farmsteads up until the migration of the peoples. As in the Krummhörn, it can be presumed that the line of settlements continued further towards the west, following the seacoast, and that settlement also took place on Norden's geest island and the sunken marshland west of the current dyke (Burcana). Ceramic finds at sites in Süderhaus and

Westdorf, on both sides of the bight, were from the same period, allowing the settlement to be dated to the time of Christ's birth. The settlement on the flats in Westdorf was later raised by at least two meters on another three occasions until a humus surface resulted at the time of the migration of the peoples. The same observations were confirmed in a soil analysis taken from a sample in Westeraccum. A reduction in the population density in the 4th and 5th centuries and partial use of the mounds for gardens, farmland and pasture can thus be assumed. These mounds show datable signs of occupation from the Early Middle Ages, the 7th and the 8th centuries, and settlements were probably set up in the low-lying new marsh. As on the shores of Hilgenrieder Bucht, the high and dry marsh areas lying close to the sea - and since inundated - were also probably inhabited. According to research on names the towns of Lintel and Ekel, and Norden itself, were founded in the Early Middle Ages. Even today the patron saint of the Luidgeri church testifies to the rapid growth of Norden's importance. St. Luidger has been beloved as a protector primarily in the 9th and 10th centuries. It is unknown what effect the Norman raids had on the settlements - migrations in any case followed the known examples set in the Krummhörn and the Brookmerland. In the climatically favorable period of time from the 9th to the 11th centuries, when the rise of the sea level came to a halt, increased development was not only aimed at the marsh, where single farm mounds and block-shaped fields were created, but also at the low-lying pasture lands (Sietland, Wischen), which were hard to drain naturally, because they were located behind a high marsh.

As in the Brookmerland the moor near the geest became covered with sediment from the sea. The elongated settlements of Bargebur and Hage were laid out behind the marshy moor, at the edge of the geest. Their fields were up to three kilometers in length and extended to the high moorland. The castle sites of Lütetsburg and Berum were located on the raised area at the end of each row of plots. From the 9th and 10th centuries until the 13th century, the Sietland areas in the moor marsh were also dotted with small, artificial, mound-like hills, providing space for single farmsteads. There were working areas nearby, on the sandy hills in the moor near the streams, which served as places for winning iron from the locally available ores (proven in one case) and for other purposes. This discovery demonstrates that there were additional reasons

for frequenting the moor marsh besides subsistence and pasture farming. It can be assumed that the management of different natural environments was networked and interrelated up to the Late Middle Ages, and that very lucrative economic specialisation had already started in the 9th and 10th centuries, with trade of goods, both near and far, conducted via Nesse and Norden. In this context it is remarkable that the property of the church and the Theelacht (a cooperative society for land administration, located in Norden) are today for the most part still located on reclaimed land behind the late mediaeval dyke, which closed off the Hilgenrieder Bucht, and north of the old settlement area marked by a row of large dwelling mounds. This demonstrates the effects of forces that went beyond agricultural habitation for mere subsistence, combining the economic potential of rich marsh pastures and locally available iron ore and linking it by building dykes and systematically reclaiming land. Norden profited from this and expanded its marketplace (to over 6 hectares) in the first half of the 13th century.

Even today this marketplace is of impressive size, while the outskirts of the city of Norden have overtaken the surrounding settlements. The moor and marsh areas have for the most part preserved the settlement structure of the Late Middle Ages and only a few wind farms have been erected, although on some parts of the coastline summer homes of non-local architecture have been built.

4.4.2.7 Brookmerland

The Brookmerland is situated in the administrative district of Aurich in the western part of East Frisia and covers the edge of the geest from Osteel in the north right down to Forlitz-Blaukirchen in the south. It is not completely certain whether the so-called Zuderland with the villages of Simonswolde, Riepe, Ochtelbur and Bangstede also belonged to it at one stage. In addition to Marienhaf, Aurich was also mentioned as the market town of a provincial district in the Brookmer title (13th century), and so it is possible that the Zuderland and the Auricherland later became autonomous entities.

In the Middle Ages, the central high moor zone of the East Frisian geest ridge dominated the east of the Brookmerland, while the moor marshland spread out to the west of the geest edge. It developed as a result of the rise in sea level during the Holocene era. As in the

Krummhörn, this brought about a dovetailing of peat layers and water sediments until the sea pushed forward during the Dunkirk I Transgression and arrested the growth of the moorland. This resulted in the formation of a small bight into which the watercourse of the Ley flowed. The Dunkirk II Transgression enlarged the bight and, in the 7th and 8th centuries, left behind a cultivable layer of clay in the moor marshland. The Abelitz, originating near Marienhaf, flowed towards the south and drained the Brookmerland and what is today the „Große Meer“ (great mere) region into the Bight of Sielmönken until the dyke construction in the bight during the 12th and 13th centuries necessitated a diversion into the Leybucht. The present „Große Meer“ region was then part of a region of marshland and woods south of the Brookmerland being wedged in between the high marshland of the Krummhörn and the geest edge. This increased flow of water into the bight was a prelude to the enlargement of the Leybucht and the catastrophic loss of land in the late 14th century during the Dunkirk III Transgression.

The beginnings and the nature of the settlement of the Brookmerland remain largely unexplored, but we know that around the year 1000 the conditions for the colonization of the marshland regions were favorable. Archaeological finds and investigations into the geography of settlements point to the fact that even in the Early Middle Ages, in the 9th and 10th centuries, the cultivation of the land was under way. Thus, fragments of earthenware from this time have been found not only on the edges of the geest in Osteel, Tjüche, Uggant, Upende and Fehnhusen, but also in the marshland of the present „Große Meer“ region. Moreover, the study of place names linked the place referred to as „Cuppargent“ in the mediaeval land register of the Fulda monastery (9th to 10th centuries) with the present-day Uggant, and the place named „Uuibodasholta“ in the register of the Werden monastery with Wiegboldsbur.

The dates for the history of settlement known up to now allow the conclusion that the colonization and the settlement of the interior of the Krummhörn marshland completed in the 10th century then moved on to the Brookmerland in the 10th and 11th centuries. Thus the original names of Loppesumwalde for the present Bedekaspel and Südwolde for Forlitz-Blaukirchen - place names of the elongated settlements in the present „Große Meer“ region - give proof of

the origin of the settlers from the Krummhörn, from Loppersum and Hinte.

The geest edge of Brookmerland offered itself as a starting line for the initiators of settlement. Long lines of settlement were formed by the process of elongation (in German „aufstrecken“, rendered in Low German as „upstrecken“). This indicates that the settler, whose allotment of land had a predetermined width, continually drove the cultivation of his land forward into the adjoining high moorland. The length of the allotment remained indefinite until it reached a natural obstruction, such as a watercourse or another settlement, and was thereby terminated. In the silted-over moor marshland lying in front of the geest edge animals could graze without protection from dykes. The settlers were organized into autonomous local district authorities which represented judicial associations with their own administration of justice and political power of decision. This controlled settlement movement reached its peak in the 12th and 13th centuries. Documented evidence shows that in East Frisia alone forty-one villages came into being through this form of settlement. The line of settlement through Bundehee, Boen and Wymeer has a direct continuation on the Dutch side with the elongated settlements of Bellingwolde and Vriescheloo. These settlements carry on along the geest edge through the Dutch provinces of Groningen, West Frisia and North Holland.

The level of prosperity that was attained by the inhabitants of the Brookmerland by farming, cattle grazing and above all by trade manifests itself especially in the churches of the land. The churches of Marienhaf, Osteel, Engerhaf and Victorbur (the latter two of which were preceded by wooden churches) were erected in the middle of the 13th century and were of a size that is difficult to reconcile with the moderate size of the farming communities. Their erection represents a landmark in the history of church building in Frisia.

The Church of St. Marien in Marienhaf, erected as a basilica with three naves, and featuring a length of 72 meters and a width of 32 meters, was the largest church in East Frisia until its partial collapse in 1829. It was comparable to the Osnabrück cathedral in its dimensions. The mighty cathedral vaulting reached a height of 21 meters at its highest point. This church was also famous for its rich architectural sculpture. A circumferential frieze located under the roof cornice consisted of 127 individual pictures of

knightly scenes, satirical images and mythical creatures, and 41 statues stood in niches on the façades of the transept. Apart from the size of the church and its decor, the self-image of the Brookmerland population was also expressed in the extravagantly designed lodge for the dignitaries in the west tower. The wealthy upper class of the population felt that they were perfectly equal to the nobility of the empire.

Less than two kilometers north of Marienhafte the Osteel church was built, likewise a vaulted cruciform church more than 50 meters long and also featuring an imposing west tower. Regrettably here, too, the transept and the choir were taken down in 1830. The third vaulted church in Engerhafte, about 60 meters long, suffered the same fate. In 1806 the apse and the western bay section of the church, formerly five bays long, were pulled down. A good hundred years later

the eastern bay was taken down as well. The church in Victorbur, another member of this group, was largely preserved, however, even though the magnificent west tower is now missing, having been demolished in 1831. Even in their reduced form of today, all these churches allow one to imagine them in their original monumentality, the models for which are to be found in the cathedrals of Osnabrück and Münster.

While these church buildings still document the historical courses of settlement, the ribbon-like structure of the elongated settlements in the district of Brookmerland has completely dissolved in the last decades. Just as the construction of new traffic connections in the 19th century, such as the railway and causeway between Norden and Georgsheil, had severed the eight hundred year old settlement structure, the last 25 years have done as just much harm through

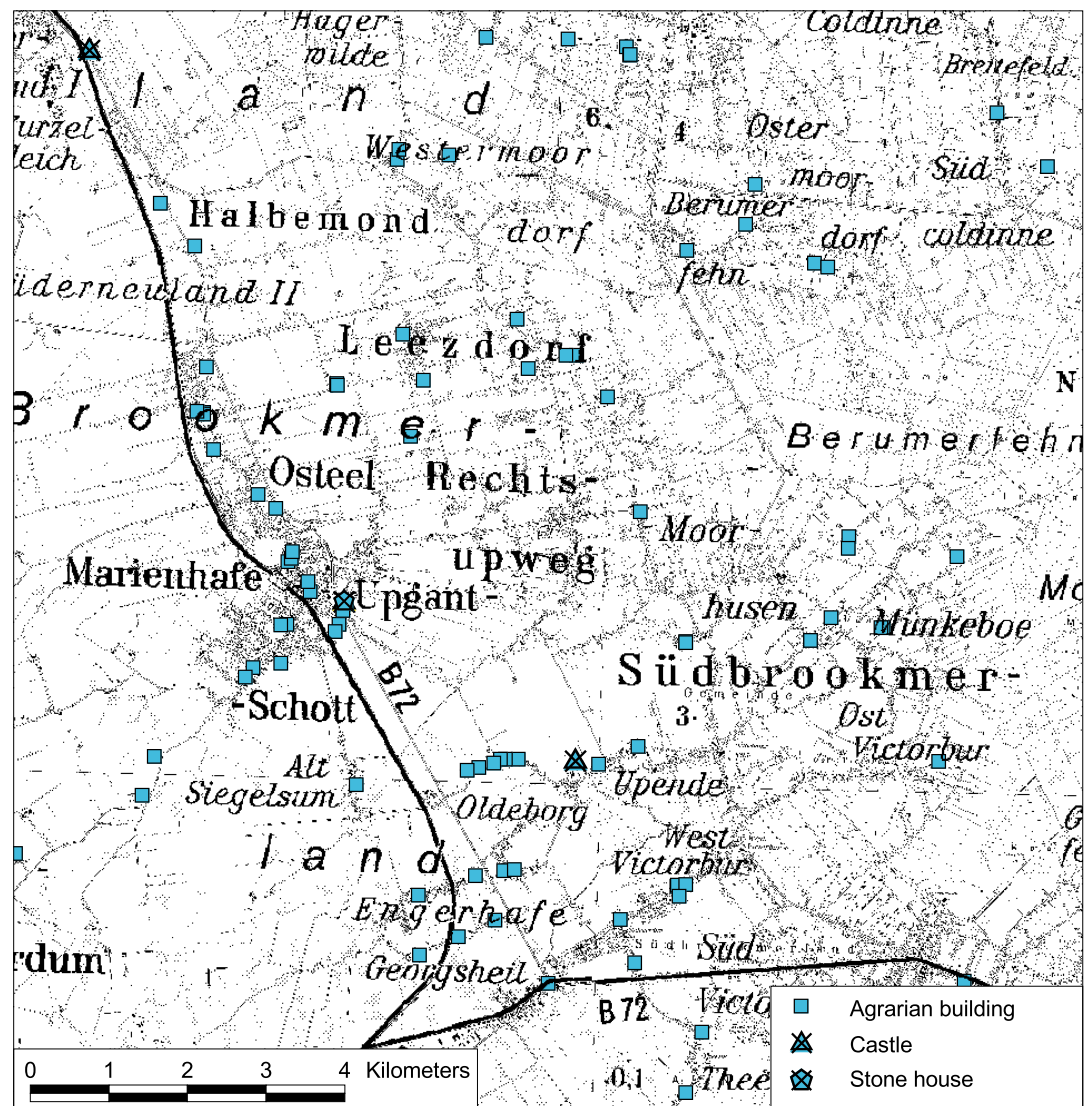


Fig. 4.66: The agrarian buildings, stone houses and castles around Uppgant-Schott Source: LGN

the unrestrained growth in residential and industrial areas. This has been accompanied by the loss of numerous farms featuring the voluminous gulf houses, which by way of the longitudinal orientation of their roof ridges along their farm allotments used to exemplify the historical form of settlement in an impressive way.

On the high ridges of the geest edge of Upgant-Schott the loss of farms significant in cultural history is particularly evident. Little remains of the impressive line of large farms, among them six manor estates, which showed many examples of older structures from the 16th and 17th centuries. In its edition of 1977, the „Dehio“ art guide still describes „Hof Upgant“ no. 64 as featuring a baroque garden layout with gate pillars, pedestals and figures, among which are four marble busts following the antique model - today, nothing remains of this garden. Entities that have been preserved are: a) the Haneburg (Upgant no. 61), a two-storey stone house with a stepped tower, probably built in 1597, with two gulf barns belonging to it, b) the farm complex of Upgant Castle, also a stone house, originally of several storeys, from the time about 1500, with a middle house from the 17th and 18th centuries and gulf barns from the same time. It is thanks to the proprietors that this valuable group of buildings, including their interior furnishings, could be expertly restored in the last few years. Despite the reservations of the heritage authorities, the Brookmerland council granted permission to develop an extensive industrial area on the original open access corridors in front of these farms. This will permanently ruin what is now an instructive view from a distance toward this mediaeval line of settlement.

In Marienhaf, newly established industrial and residential areas made the original main street, oriented as it was towards the market square, utterly unrecognizable and formed new centers. Wind generation parks like the one in Riepe are still the exception in the Brookmerland.

4.4.2.8 Krummhörn and Leybucht

The Krummhörn, which today forms part of the administrative district of Aurich, is situated on the western edge of the Pleistocene sand and loam ridge of the East Frisian peninsula. Here the land slopes down to the valley of the Ems. The marsh of the Krummhörn, formed by deposition during the Holocene rise in sea level, spreads out

over it. As early as 9000 years ago, at the beginning of the Atlantic epoch, the sea extended approximately to the present-day line of islands and created a backwater in the Ems. The water penetrated inland by way of the watercourses in the Pleistocene subsoil and impaired drainage. As a result, the cover of moorland increased over that part of the geest near the sea where the sediments had been deposited. In the Krummhörn an alternation between moorland growth and sedimentation ensued, resulting in an increase in the thickness in the layers of moorland towards the interior and a deepening of the layers of sediment towards the course of the Ems. An amphibious landscape of watercourses, moorland, marshy woodland and wooded meadows developed beyond the Ems until the dry land with a top layer of peat gained the upper hand from 1600 to 800 B.C., followed by the sea from 1200 to 300 B.C. with sedimentation on the mud flats. It is not certain whether the varied landscape was partially settled in the 5th, 4th or 3rd millennium B.C. - for which there appears to be evidence in the form of separate finds from around the Ems embankment - or whether any attempts at settlement took place during the dry land phase in the later Bronze Age. The natural space was completely altered from 300 B.C. at the latest as calcareous sediments were deposited on the mud flats by the Dunkirk I Transgression, the coast line shifted south, the Ems became wider, the intertidal difference increased and the Campener and Sielmökener Buchten were formed. A surface layer of humus (so-called „Blauer Strahl“) formed on the sediments of this transgression which was suitable for settlement at the end of the Iron Age. Since then the Krummhörn has been occupied more or less continuously, probably with only one brief interruption.

The marshy peninsula of the Krummhörn attained its clear outline only in the early modern era. In the Early Middle Ages the band of marshland in the west of East Frisia, up to 15 km wide, had a very rugged coast line caused by the inlets of the sea pushing far inland. These were - from north to south - the Leybucht, the Sielmökener Bucht and the Campener Bucht. While the Leybucht was considerably enlarged by the storm surges of the 14th century and reached almost as far as the geest edge, by about 1300 the narrower inlets were already largely silted up so that by 1561 the coastline could be straightened out into its present form by a dyke in the west. After that, only minor

shifts in the coast line occurred in the south until the beginning of the 20th century, when a straightened coast line was created here as well.

The present-day topography of the Krummhörn is on the one hand characterized by the wet low-lying regions which are not very suitable for cultivation. These were formed where silted-over layers of moorland gradually shrank due to the overburden and due to drainage so that the lowlands lie well below sea level today (Freepsumer Meer), in some cases by more than two meters. On the other hand, the bights of Campen and Sielmönken as well as the Leybucht divide the Krummhörn into the old marshlands, covered in hedgerows and brackish water, and the calcareous, fertile young marsh.

The name Krummhörn appeared only with the formation of a coherent peninsula at the beginning of the 16th century, so that with the passage of time the older division into the Emsigerland to the south of the former Sielmönkener Bucht and the Federgau to its north would be forgotten.

On the edges of the bights into which the watercourses flowed lay the settlements on the flats from the time of the Roman empire, as well as those from the Early Middle Ages. Little is known about the development of early settlement. Thus, at the moment it can only be surmised that with the onset of the Dunkirk II Transgression at the time of the Roman empire dwelling mounds were thrown up and that these possibly lie hidden under the mediaeval layers of the present-day mounds. These large village mounds still characterize the picture of settlement in the Krummhörn today. In the south, a line of mounds had been formed on the Ems embankment. Rysum, Loquard, Woltzeten and Upleward lie on the edge of the Campener Bucht, and both the northern and southern edges of the low-lying Sielmönkener Bucht are lined with a dense fringe of mounds. As early as the 10th century the economic importance of the settlements was such that many of them were recorded in the land register of the Werden monastery or in the register of grants to the Fulda monastery.

The churches are situated in the center of the large village mounds with their concentric structures, thus occupying their highest point. They are of an impressive size, at least in comparison to the size of the parish, and they often originated from the late Roman and early Gothic era. All of these churches are of high architectural standard (e.g. Eilsum or Campen). Particularly

impressive – not least when viewed from a distance – is the cruciform church of Pilsum with its unique crossing tower. The once numerous castles, for example, which could serve as witnesses to the regional domination by families of headmen before the Cirksena were raised to the rank of imperial counts in East Frisia, beginning with Ulrich in 1464, have almost all disappeared, but the allotments on which they stood have often been preserved until today, in the form of open spaces.

In the 16th century the forms of construction began to be differentiated in a development parallel to that of social stratification. An extensive process of consolidation of property ownership into large farms now began. These farms often lie in a continuous row, preferably at the edge of the dwelling mound, with the outhouses overlooking the fields being cultivated. This layout impressively accentuates the sharp boundary between field and village. The few surviving smaller farms often lie in the intermediate ring. In time, the small houses of craftsmen and farm workers took up the positions in the middle of the village as well as between the farms. There often was and in quite a few cases (e.g. in Uttum and Rysum) there still is a windmill, which is very prominent in the long-distance visual aspect of the village. The traffic of the mounds was allowed to flow through ring roads and narrow laneways arranged radially. A system of ditches along the allotments served to collect rain water and also took care of drainage – in all, a structure that has been maintained nearly everywhere until the present day.

As a new form of settlement, three wik settlements, originally trading villages on long mounds right by the sea, were established in the Early Middle Ages, namely Grimersum on the southern bank of the Leybucht, Groothusen on the southern bank of the Sielmönkener Bucht and Emden on the northern bank of the Ems river. Grimersum and Groothusen display their characteristic features right up to the present time, even after the silting up of the bights – with their elongated shape, the village lane on the highest point of the mound, the way in which residential and business houses dominate the rural features, with the church at one end and a castle at the other. While the Grimersum castle has virtually disappeared, leaving only fragmentary remains, in Groothusen the Osterburg with its structure from the late 15th to the early 18th century has been preserved, along with its moat and park. The town, once of some

stratum that was otherwise destroyed after the Reformation.

Here, the structure of the cultural landscape is shaped not only by the old settlements but also by the drainage system. As early as the 14th century Greetziel was established in the north-west corner of the Krummhörn where the northern part of the marsh peninsula was drained through the old and the new Greetmer Sieltief. With its castle and its private foundation church and as the first residence of the Cirksena family, Greetziel developed into a harbor town of great regional importance. In 1891 the new sluice was constructed on the edge of the town. Even though both of the sluices no longer perform their function since new locks and a new pumping station were built in the Leybucht, the historic layout of the sluice dating back to 1798 – temporarily obscured by reinforcements of the dykes – could be restored and shown in a particularly vivid form. The funnel-shaped harbor basin, lined with imposing houses and the small-town manner of building development along a main street, have been preserved. The twin mills on the eastern exit have virtually become an emblem of the town. The agricultural sector is represented, among other things, by the count's so-called „Schatthaus“, the building where farmers delivered their tributes, and by other farms on the edge of town, whereas the castle of the Cirksena was demolished in the Prussian era.

The southern part of the Krummhörn is now drained through the Knockster Tief, which runs in a long diagonal path from the „Großen Meer“ to the Knock river in the south-west corner. It collects the water from the smaller canals which emanate from a series of large mound villages from Pewsum to Rysum and which are named after these. A remarkably rigid and regular system of waste water drains has been formed about them – they are aligned parallel and perpendicular to the canals and drain into them. In the Knock river two old sluices from 1720/64 and from 1881, which were never modified to form a harbor, have been preserved, although they lost their function after the construction of a pumping station in 1968. The two lighthouses erected in 1889-92 as beacons for the Ems are worth mentioning in this connection as technological monuments. They stand on the dyke in front of Campen and Pilsum and are the only lighthouses on the East Frisian mainland.

The region of what was once the Leybucht, lying to the north of the Krummhörn, presents with a completely different landscape and dif-

ferent settlement characteristics. At the time of its greatest extent around 1400, separate arms of the Leybucht reached as far as the town of Norden in the north, almost as far as Marienhafen in the east, and in the south to the hinterland of Wirdum. These places were starting points for the reclamation of the land, probably beginning in the 15th century and becoming more intense in the 16th century (in 1556 the Süderneuland near Norden and the Wirdumer Neuland were reclaimed). The formation of these polders continued into the 19th century, particularly in the northern section, where the Norder Sieltief had to be kept free to provide access to the Norden harbor. These polders were created in a process involving numerous stages, which resulted in an arrangement of over 20 individual small polders. The process can still be clearly discerned today in the system of ditches and fields, in the paths taken by the roads on old dykes or in the numerous remains of the dykes themselves.

The extensive dyke-building of the Schoonortherpolder in 1913, the construction of the Leybucht sluice at Neuwesteel in 1929 (which finally blocked off the Norden harbor and made all earlier sluices superfluous) and of the Leybucht polder in 1950 changed the picture somewhat. While numerous smaller settlements were still being established at that time, the most recent large-scale dyke-building served mainly to protect the land from high water.

In addition to the small houses built along some old dykes (e.g. on the Grimersumer and Wirdumer Altendeich in the south and on the Wurzeldeich in the north) the old polders were generally occupied by large individual farms with rectangular fields or broad strip fields from the 16th to the 19th century. The great distances between individual farmhouses means that even a row of these still gives the appearance of separate farms, as can be seen most impressively in the Schoonorthen-, Südercharlotten- or Schulenburgpolder.

It is the large farm houses in particular that dominate the picture of the settlement of the village mounds and the scattered settlements throughout. In the Krummhörn proper, very old buildings can be found in above-average concentrations. The following structures are worthy of mention: remains from the time before gulf houses were introduced (stone houses from the second half of the 16th century), the oldest gulf barns (one of them dating back to the end of the 16th century), and the first actual gulf houses from the second half of the 17th century, con-

sisting of a stone house and a barn joined together.

Rather imposing even then and later in the 18th century - even though they still featured relatively small living quarters in the tradition of stone houses - the gulf houses again grew in size (up to about 60 m in length) during the last two thirds of the 19th century, as a result of the strong growth in the agricultural economy. Their architectonic form also gained in stature, now boasting living quarters incorporating two storeys, and reaching a high point with their late classical and historical forms.

By this time the gulf houses had passed the peak of their development. Due to the concentration and amalgamation of agricultural enterprises resulting from the structural changes, the preservation of the barns - especially those that were no longer required for farming - became a problem, albeit one that is not restricted to the Krummhörn. This problem can only be solved permanently where the change in their utilization for touristic, industrial and (semi-)public purposes is also supported by planning measures.

Today, the cultural landscape of the Krummhörn is still characterized to a large extent by the contrast between compact mound villages and open areas of marshland, interspersed with only a small number of individual farms that use the marshland for agricultural purposes. The original structures from the Early Middle Ages, supplemented by elements from the Late Middle Ages and early modern times, still dominate the landscape. At their center nearly all the village mounds still display the historical settlement structures, but they are increasingly coming under threat from the large number of residential developments featuring single family houses. As is true for the settlement structures, the views of many of the mounds are being impaired, and in some cases even ruined completely. The development of the city of Emden in particular can only be described as alarming. The city is expanding towards the Ems embankment and is swallowing up not only old village mounds, but also young polders.

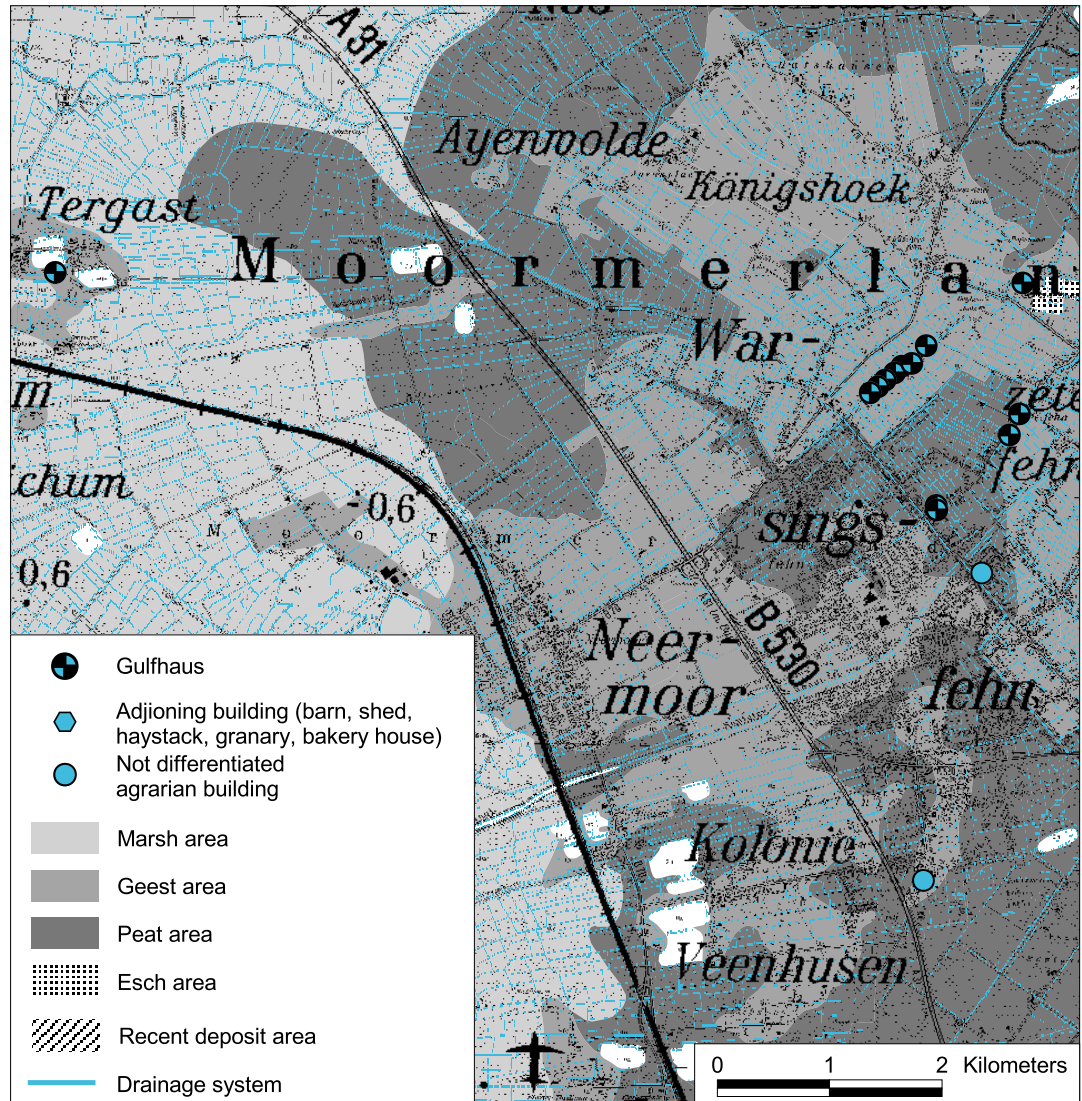
It is evident that there is no coordinating development plan that would designate areas of economic, residential and recreational activities from the point of view of an organically grown cultural landscape.

4.4.2.9 Moormerland

Moormerland is the mediaeval name referring to the East Frisian region which extended past the area to the south and east of the boundaries of today's district of Leer. In the south, the area extended to the waters of the Leda and Jümme and to the west to the Ems, including Leer. The high geest, with places such as Hesel, Holtland and Logabirum, is situated in the centre of this area. Towards the Ems, which has an embankment on this side as well as on the Rheiderland side, the edge of the geest runs roughly parallel to the river on its way from Neermeer to Leer. Located just before the geest edge, there is an area silted up with clay from the Ems, which partially extends into the lower-lying moor areas. The moor areas have been almost completely stripped of peat, transforming the former extensive range of the moors into a characteristic marshland landscape with straight drainage canals, so-called Wieken, and linear settlements (e.g. Warsingsfehn, Iheringsfehn and others). The old geest villages Filsum, Ammersum and Hollen are situated in what used to be the southern part of the Moormerland area, beyond the Holtlander Ede and in the middle of extensive hedgerow areas.

The presence humans in this area began in the Mesolithic period, which was characterized by hunting and gathering. Numerous stone tools found on the surface in addition to excavations of fire and cooking pits attest to the presence of hunters. Charcoal remains from pits of this type in the Hesel forest have supplied the oldest archaeological data for East Frisia discovered so far, going back almost 9000 years. Sedentary life characterized by farming and the holding of livestock began with the Funnel Beaker culture in the middle of the Neolithic period. The remains of megalithic tombs in Leer and Brinkum, as well as numerous surface findings, seem to support this theory. Recently, a crematory grave site from the late period of the Funnel Beaker culture was excavated near Leer. This finding represents the oldest data available today on the practice of cremating the dead in northwest Germany. In the late Neolithic period, an expansion of the settled area seems to have occurred. This is supported by graves attributed to the Single Grave and Bell Beaker cultures excavated in various locations around the geest. Only with the onset of the subsequent Bronze Age does information about prehistoric settlement structures begins to emerge. In Hesel, in the vicinity of which a few

Fig. 4.68:
The linear settlements and
the drainage system in the
moorland around
Warringsfehn
Source: LGN, NLFb



grave mounds are still preserved, various dwelling ground plans from the Bronze and Early Ice Age have been documented which supply exemplary evidence that, in the course of time, rural farms were regularly relocated within this settlement area determined by the surrounding environment and its natural resources. Settlement of the central geest seems to have been abandoned in the middle of the Pre-Roman Iron Age in favour of locations on the river marsh. Areas in Hesel which were formerly cultivated but now covered with drifting sand suggest that over-exploitation of the soil may have led to erosion which made any further use of the land impossible.

The high geest of Moormerland shows few if any signs of settlement during the time of the Roman Empire. Similar to the Dutch Westervolde, the area only seems to have been used for

passage. In contrast, numerous areas of settlement on the right bank of the Ems as well as on the Leda and Jümme provide evidence of a new preferred area of commerce. Roman imported artefacts, such as coins, found in these areas suggest the presence of interregional trade, which probably dealt primarily with livestock. Coinciding with the end of the Roman Empire, these structures began to disintegrate. A distinct decrease in the level of settlement activity might also have been a result of these changes. Nonetheless, some findings from the time of the migration of peoples are available. In Loga, for example, a house foundation dating back to the first half of the 5th century was recently excavated. In the Early Middle Ages, according to current information primarily in the Carolingian period, levels of resettlement began to increase, including the high geest. Excavations, for exam-

ple in Hollen, Hesel, Loga or in the Nortmoorer Hammrich, have shed new light on the history of settlement in the Middle Ages, allowing for a better understanding of these processes. Inexorably connected with this historical development is the change in agricultural use of the geest to the form of cultivation known as perpetual rye cultivation. This was made possible by the onset of a combined form of plaggen farming with regular cultivation of rye from the 10th century onwards. The possibility of fertilizing the fields made regular movement of the farmsteads unnecessary. The farms became fixed in location and formed the nucleus of settlements still present today.

Plaggen manuring was imperative to life on the geest up until the introduction of South American bird manure (guano) in the 19th century. Nonetheless, in some cases the cutting of plaggen from the heath had already led to serious damage to the environment by the beginning of the modern era. The source of this damage was the newly uncovered sand, which was blown about the area leading to the formation of vast areas of dunes. In this way, drifting sand dunes, such as the ones located in today's Hesel forest, were created. These processes had not yet begun at the time the nearby Premonstratensian monastery Barthe was founded. From the early modern era on, vast areas of the moor regions located in the marshlands mentioned above were developed and used for peat mining. Previous construction of the Ems dyke and the creation of a tidal protection system with sluices allowed increased levels of drainage to be achieved for these areas. Today, only a few patches of high moorland have been preserved in this area.

The modern transformation of the Moormerland is primarily being effected by integration of the area into the interregional freeway system. Regardless of the type of landscape, industrial areas with drab steel buildings and large-scale factory sites covering numerous hectares have emerged in almost every community. At the same time, residential areas continue to expand, transforming the former structure of characteristic villages into faceless collections of single-family homes. Even the increased area of arable land continues to lose more and more of its original form due to land allocations. Only the protected hedgerow areas have been able to retain most of their character. Further changes can be seen in the wind farms which continue to be

planned and erected not only on the Ems but increasingly in the geest area as well.

4.4.2.10 Rheiderland

Four different kinds of landscape lying in very close proximity to each other characterize the Rheiderland region. The Lower Ems river, which also forms the region's natural eastern and northern boundaries, divides the geest through its embankment and a narrow strip of marshland from which sandy knolls rise (the Jemgumgaste, the Holtgaste and the Bingumgaste). To the west of the river an originally boggy area of old marsh stretches to the Bunderhee geest tongue and continues at the edge of the geest southwest of Bunde. On the western side of this area stretch the new sea marshes. The western boundary of the Rheiderland area is marked either by the Dollard Bay or the German-Dutch international border.

Since the end of the Ice Age, deposits of sediment have occurred in the Ems valley, mostly caused by rises in sea level. With the melting of the glaciers the sea level rose not only gradually but also in sudden surges. This counteracted the river's natural flow, thereby causing increased silting as well as the formation of boggy areas. Through the effects of the sea, clay carried in by the flood tides was also deposited, mainly in the vicinity of the water courses. In this way a raised embankment was formed that marked the edge of the water course, behind which swamp forests, bogs and reed beds formed in the low-lying waterlogged Sietland of the river valley. During sudden rises in the sea level, the so-called transgressions, these areas were also partly or even completely flooded and covered with clay sediment. During the flood phases not only the river flatlands but also the embankments were unsuitable for habitation.

Depending on the forms of the landscape and above all the soil and the land contours, quite distinctive types of settlement and economic activity developed. The patterns of settlement on the sandy soil followed those of the East Frisian geest. The settlement of the embankments along the river Ems and the northern and western alluvial plains took a different form on account of other ecological conditions.

About 7000 years ago, at the end of the Atlanticum, the hunters and gatherers of the late Mesolithic period were able to visit the amphibian landscape of the lower Ems region, which consisted of bogs, marshes, water courses and

sand islands, and use them for their own needs, as individual archaeological finds show. Whether there were already temporary or even permanent settlements of the Funnel Beaker culture on the Ems embankments in the Neolithic is not yet known. Proven settlement dates only from the end of the Bronze Age and in the Iron Age, which have been partly investigated by archaeologists. Further settlement activities date from the time of the Roman Empire and the Early Middle Ages, the latter continuing uninterrupted into modern times.

In this way, in the 7th century B.C. a settlement that was later rebuilt twice was established at ground level in the marsh near Jemgum. Pastoral farming was established here based on the keeping of cattle, although there was also a limited amount of farming of beans and grain. A second farming settlement is that of Hatzum. As protection against the increasing flooding, the settlement area was filled in several times and the houses rebuilt on the higher ground. Shortly after the Hatzum settlement was abandoned in about 300 B.C. new settlements were established on the embankments. What became of the inhabitants from the 4th and 3rd centuries B.C. is still unclear, especially because, down to the upper layers of the Iron Age settlements, the strata were destroyed by the extensive digging up of clay for brick-making in the Rheiderland area, with the result that continuity with the layers from the Roman times cannot be established.

During the Roman period, areas along the tidal gullies near the high Ems embankments were again utilized for settlement. These kept the area dry and offered navigable passages both to the sea and inland. For a number of reasons it can be assumed that initially a loose settlement of the best land occurred through individual farms, until in the 2nd century, a concentration took place in a small number of places that, as a result of strong tidal floods, had developed into dwelling mounds. Some individual farmsteads developed into large undertakings whose economic success was based on pastoral farming, which enjoyed a period of substantial prosperity in the marsh region due to the markets for the cattle in the cities of the Roman provinces in the Rhineland. In exchange, consumer and luxury goods flowed into the coastal area. The importance of this trade is shown by archaeological finds in Bentumersiel. Here in a protected setting between two tidal gullies lay not a farming property, but a commercial site that has been inter-

preted as a collection point for cattle and a storage area for goods. The pieces of Roman armour discovered here can be related to the expedition of Germanicus in 15-16 A.D.

The early mediaeval settlement of the Rheiderland region is confirmed both by layers of remains in the mounds and also by a burial ground near Oldendorp that dates from the 7th to the 9th century. The Middle Ages settlements also followed a course of development that led to a concentration of settlement and the emergence of village-like group settlements on the mounds.

In the Late Middle Ages the building of dykes made it superfluous to increase the heights of the mounds. Internal colonization followed, accompanied by an extension of the settlements into the Sietland and utilization of the boggy regions, including peat mining.

By the end of the 13th century the Dollart Bay had already begun to broaden, resulting in the constant loss of land. In the wake of this process, which reached its peak with the Cosmas and Damian flood of 1509, large areas of the Rheiderland region were covered with fresh clay. The partial reclamation of this land - and as a result the emergence of polders - began in the southwest (on the German side) with the Bunderneuland in 1605 and the Charlottenpolder in 1682. The process continued with the successive dyke constructions against the Dollart: the Bunder Interessentenpolder and the Norder- and Süder-Christian-Eberhards-Polder in 1707/1708, the Landschaftpolder in 1752, the Heinitzpolder in 1796 and the Kanalpolder in 1885. Most of these dykes still exist: the Heinitzpolder dyke as a secondary protective dyke (and therefore with a closable opening in the dyke where the road enters the Kanalpolder), those from 1707/1708 and 1752 as substantial fragments, and the Bunderneuland dyke as a section of the federal road no. 75.

The soils and the topography lead not only to different economic and population patterns but also to different flow control and drainage systems. The entire Rheiderland region drains into the Ems. In the case of the geest and the old marshes this is the natural situation; numerous short streams originally flowed into the river via sluice gates. Between the Dieler Siel in the south to the Pogumer Siel in the north the existence of 22 historic sites has been proven; in the case of two thirds of these, more or less substantial remains have survived or been superseded by pumping stations.

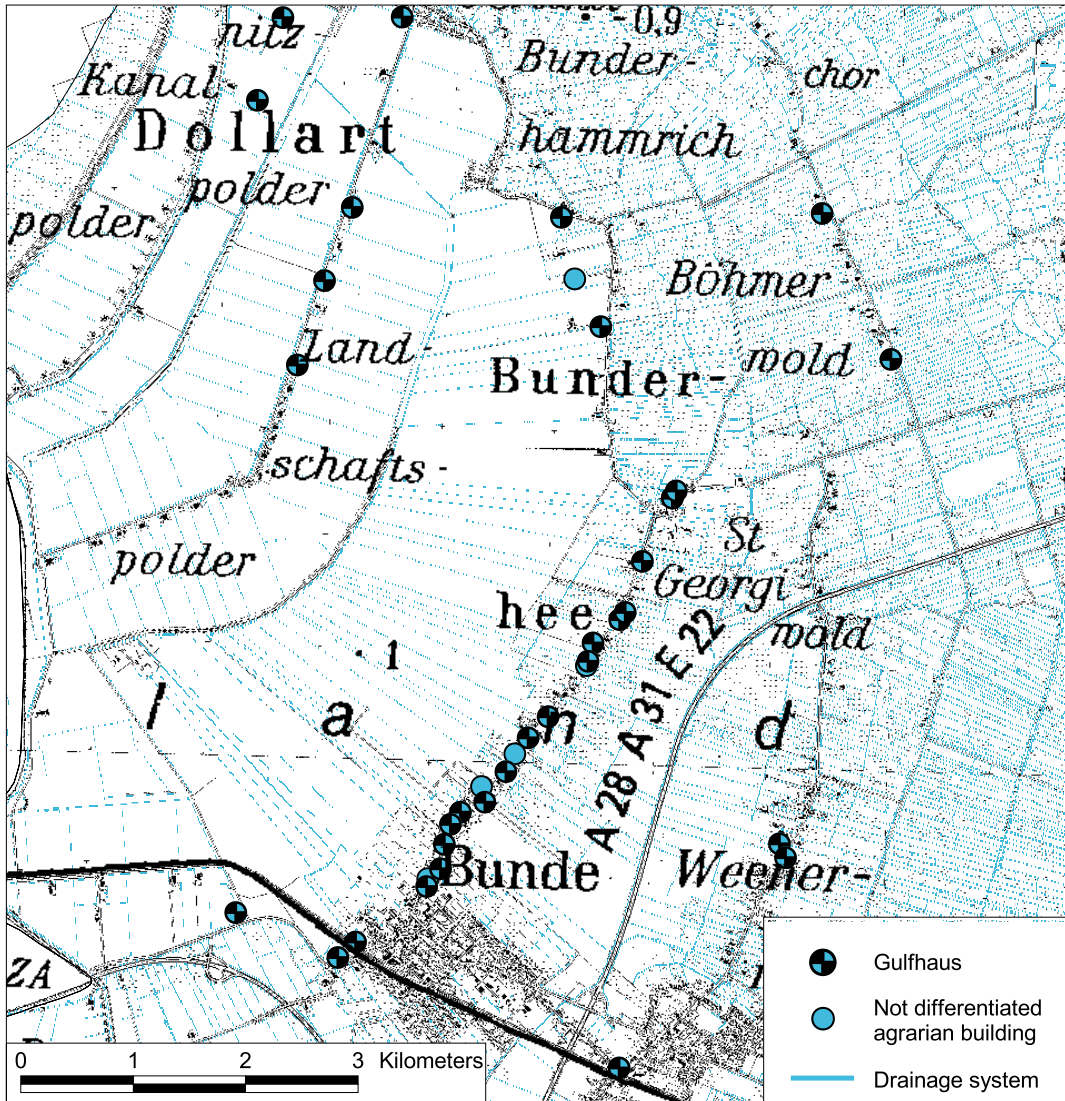


Fig. 4.69:
The agrarian settlements and
the drainage system in the
region around Bunderhee
Source: LGN, NLFb

For the south-western regions and the new polders the Westermold Aa - which is also the western border of the Rheiderland region - would be the natural flood runoff, as indeed it was for a long time, despite the unfavorable relative heights as well as problems that arose from the fact that the river belongs to the Netherlands. Finally and with great effort these problems were solved when the Kanalpolder was enclosed within dykes by digging a canal inside the polder, the Wymeerer Siel, that led north to the Pogumer Siel. In addition, the old Dollard Dyke had to be breached with a sluice so that the canal could flow through in the „wrong“ direction. In a similar way, the Ditzum-Bunder Sieltief flows to the north on the inside of the dyke from the Bunde Interessentepolder to Ditzum on the Ems.

There are also stark differences in the landscape forms within the ditch system that leads the water into the canals. In the marsh areas near the river it forms an irregular network around small block-like land holdings. The water had to be pumped out of particularly low-lying areas of the old marshes by pumping mills, of which one, in the Wynhamster Kolk, a breach in the old Dollard Dyke, has been preserved. The colonization measures in the former boggy marshes have led to a regular system of ditches running parallel to each other at right angles to the particular canal, around very narrow strip-like land holdings. This system was also used in the polders, although in successively newer ones with increasingly broader strips of land, that have in some cases become almost square.

The most important mediaeval settlements are situated on the edge of the geest. Among these

Weener - already mentioned in the 10th century as having a manor house and a church, seat of the Münster provostery since the 13th century, and since 1508 a market town - developed into the main center of the Rheiderland region, although it did not receive the status of a city until 1929. It profited from its favorable location, with the roads running along the edge of the geest from Groningen and Münster meeting here and, utilizing the Ems embankment, ran on to Leer or Emden. In addition, the sheltered Ems harbor, established in 1576 on the northern edge of the city, lay directly on this road. The harbor bowl survives until today, with small residential and warehouse buildings around its rim.

To the south and on both sides of the highway - the old military road - dense settlement has developed. Although this consists to a considerable degree of (former) gulf houses, their stately one- and two-storey residential sections from the 18th and early 19th centuries, fronting directly onto the street, give the impression of a small city. This is reinforced by the dwelling houses and residential/business buildings erected since the middle of the 19th century. In the southern third, this unitary picture is interrupted by an area in which public buildings are located: a church with its churchyard and church portal on the western side, a bell tower and a cemetery and south of that the former town hall on the eastern side. To the west, outside the old settlement, the poor-house with its three wings was built in 1791, highly comparable to the two almost contemporary examples in Leer.

On an older historical level, Stapelmoor has survived as an open small village. Its former significance is testified to even today by an impressive, in its own way unique, collection of three buildings. In the center is the church, a „stately vaulted building in the shape of a cross with a west tower dating from the late 13th century, one of the most remarkable sacred buildings of East Frisia“ (Dehio). The parsonage, a two-storey brick building dating from 1429, is the oldest building of its kind in East Frisia. In the residential section of the Drakemond farmstead, behind rebuilding dating from the 16th and 19th centuries, stands a tower building, probably also from the 15th century.

The town of Bunde forms a topographical and historical link between Stapelmoor and Weener. A heavily built-up town center - consisting of residential and residential/business buildings today - has developed around the historically significant church, which dates from the period

around 1200/end of the 13th century. Its original form as an agricultural linear settlement can still be seen in the shape of the plots and the pattern of building on the outskirts of the town. In the west, the surviving farmsteads follow the edge of the geest and in the north they break off at the Bunderhee geest tongue.

In Bunderhee, originally completely limited to the eastern (interior) side, the long, uniform and relatively close packed row of large farm holdings has been particularly impressively preserved. As the oldest building, the so-called Steinhaus Bunderhee, a multi-storey tower structure from the early 15th century, with a later wing from the middle of the 17th century, fits perfectly into this row. Two gulf houses stem from the middle of the 17th century (one is dated 1662, the other is possibly somewhat older). However, it was not until the enclosure by dykes of the Bunde Interessentenpolder and the accompanying increase in available land that a sudden surge occurred in the introduction of this form of house, as large numbers of examples show. Apart from these old buildings, the classical and historical residential areas primarily determine the current picture. In the 19th century, a few farmsteads and landholdings of retired farmers also came into existence on the west side.

The linear settlements on the edges of the old high moorlands from Weenermoor to Marienchor and southwest from Bunde in Boen and Wymeer are structured in a similar way, although the sequence of farmsteads and the distances from the road are less uniform. Moreover, individual historical buildings are less well preserved. A special feature, at least for the Rheiderland region, is offered by Weenermoor, which in the course of its history as a result of increasing water-logging of the original low-lying boggy areas, „migrated“ in two stages from east to west and had already reached its present location by about 1650 with the construction of the „Steinhaus Weenermoor“. From its first site a few individual farmsteads (Einhaus, Dreehusen), from its second the old cemetery, remain as relics of its history of settlement.

Although as a settlement it comes from a different historical context and is completely different in appearance, the construction of homes along the old Dollard Dyke north of Bunderhee deserves to be mentioned here due to its principle of building along a continuous row. A largely residential area made up of farm workers' homes and other small buildings were initially

situated at the base of the dyke's protected side, but, after additional dykeworks, this area expanded - for the most part in the 20th century - up to the top of what had now become a second-line dyke and road embankment while a small community with a church developed after 1896 around the Ditzumverlaat.

As in prehistoric times, the Ems embankment also offered a favourable place for settlement in the Middle Ages. Like pearls on a string, numerous villages built around churches on mounds stretch one alongside the other from Kirchborgum to the north of Weener to Pogum in the northwest. They are very small and their layout varies from circular (Critzum) through almost rectangular (Hatzum) to irregularly shaped (Nendorp). Farmworkers' houses and other small dwellings are predominantly grouped around a small, modest church. There are few farmhouses on the edges of these villages; most of these are situated between the villages as isolated homesteads or in small groups in the river marshes, where in some cases they make use of geest knolls as a favourable location. Of these, only Holtgaste has been able to develop itself into an independent village with its own church.

Jemgum and Ditzum, whose role in trade and fishing led to a more differentiated and closer pattern of building activity, differ in size and structure from these villages. That this occurred a long time ago is shown by the larger churches, stately parsonages from the 16th and 17th centuries, the purpose-built buildings (sluice operator's houses, the weighbridge in Jemgum, windmills), and isolated buildings featuring an urban style, led by the so-called Albahaus in Jemgum dating from 1562/1812. In Ditzum the harbor itself, with its banked-up canal opening into the Ems and an arched aqueduct dating from 1891, has survived in particularly attractive form even after the dyke and the sluice crown were raised.

A peculiarity of the Rheiderland region are the brickworks situated on the outer side of the dykes and connected with the Ems by tiny harbors (kleine „Muhde-“Häfen). Structural remains of these have survived outside Jemgum and Midlum.

The newest form of settlement, even if they had already begun in the Bunderneuland by 1605, are the polder settlements. Usually, a traffic axis running through the centre of the newly enclosed land parallel to the dyke connects the farmsteads, which are organized into a system of linear plots at right angles to the road - in Bunderneuland these still have varying distances

from each other and to the road, in the Landschaftspolder and the Kanalpolder the system is almost perfectly regular. Where, as in the other polders and especially impressive in the Heinitzpolder, the distances have become larger and the plots more block-like, the picture is more that of individual farmsteads.

In any case, the gulf houses on the farms, whose construction goes back in some cases to the particular establishment phase, although most were rebuilt in the 19th century, are of impressive size and imposing form. Here (as also in Bunderhee or in the river marshes) remains of park-like gardens, that make calling their owners „polder princes“ completely understandable, are also to be found.

A substantial loss of archaeological objects in the Rheiderland region has been caused by the extensive digging up of Ems clay for the manufacture of bricks. As a result, countless stretches of land behind the Ems Dyke have had their surface lowered by approximately one meter over whole areas. Above all in the 19th and 20th centuries, the brick industry was an important economic factor in the region. Deep ploughing in the bog and isolated areas of sand has had a similar effect.

On the whole, however, the outsider status of the Rheiderland region in the state of Hannover, the loosening of the formerly close ties with the Netherlands after 1871, and the economic stagnation in the 20th century have led to a relatively strong preservation of the historical structures of landscape, water and land transport networks, and even settlements. However, an incisive measure in the true sense of the word is the building of freeways. The notorious single family housing developments during the period after the Second World War have in most of the cases been limited to the principal towns of Weener and Bunde and a diffuse settlement of the geest ridge lying between them. On the embankment they have also attached themselves only to a modest degree to the larger or more conveniently located towns of Bingum, Jemgum and Ditzum. In the meantime, however, wind farms are disfiguring the landscape.

Above all in the case of the smaller houses of the mound villages or along the old Dollard Dyke, in contrast to the landscape, buildings have changed markedly - a development that many gulf houses, even when they no longer satisfy the strict criteria of the heritage listing, have so far been able to avoid. As a result, impressive landscape and habitation patterns have been

preserved, especially in the large-scale farming areas of Bunderhee and in the polders. However, in recent times structural changes in agriculture have begun to lead to an increasing number of gulf barns standing empty, without new uses for commercial purposes or tourism being found to the same extent as in other parts of East Frisia. This brought about a situation where achieving acceptable cultural/ecological development in the future will depend less on isolated measures and more on planning provisions.

4.4.2.11 Overledingen

The area along the right bank of the Ems, which lies south of the Leda and Jümme rivers, is known as Overledingerland. As is the case in the Moormerland and the Rheiderland, the marsh villages here are situated on the Ems embankment wall. To the east lies a geest area, covered with moors at the edges, where, amongst others, the old villages of Ihrhove, Backemoor, Collinghorst, Holte and Rhaude are located. On its western boundary an ancient overland thoroughfare, the „Lüdeveg“, ran along the Ems. To the north the geest drops off to the course of the Leda and Jümme. A mighty peat bog grew in the ancient riverbed, which has been covered by flood sediments at the banks of the river. Despite some straightening of the river courses and changes due to land reallocation the „twin-river“

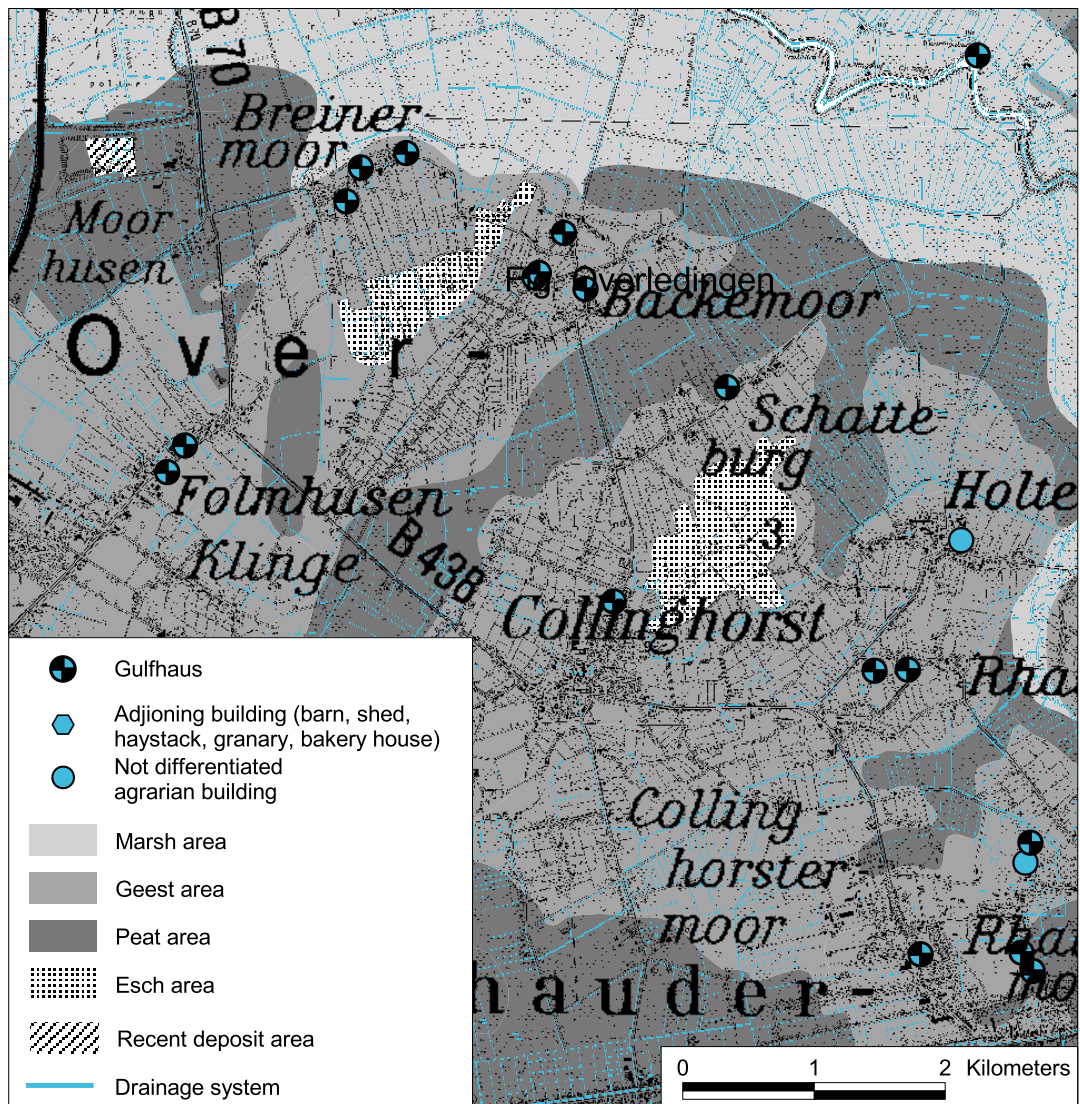


Fig. 4.70: The agrarian settlements, the drainage system and the areas of hedgerows in the region around Collinghorst
Source: LGN

landscape between the rivers, the Jümmiger Hammrich, a low-lying marsh area, can still be experienced in its original scenic character. To the south-east of Overledingerland the Langholter Tief, also known as „Rote Riede“, runs from south to north, today largely through a high moor area, which has been almost completely stripped of peat. Besides the Ems, this watercourse was also an important route for trade and transport, offering a large number of favourable places for settlement on its meandering banks.

Prehistoric and early historical settlement of the geest in the Overledingerland is basically comparable to the Moormerland settlement. In Collinghorst, Backemoor and Schatteburg some Neolithic burial sites from the Single Grave and Bell Beaker cultures have been excavated. Bronze Age graves, partially surrounded by circular trenches, bear witness to an unbroken prehistoric period of settlement at these locations. Late Bronze Age and Early Iron Age urn burial sites surrounded by keyhole-shaped trenches were first found in East Frisia at Holte. In contrast to that, uncertainty still reigns over the remaining course of settlement in the pre-Roman Iron Age. Sites of finds - which are still few and far between and date from the ensuing Roman Imperial period - lie close to the rivers. Only very recently, a rectangular longhouse with two wells encircled by fencing on the geest in Backemoor was documented and dated as coming from the 2nd to the 4th centuries. Today, primarily surface sites containing shards attest to settlement during the Middle Ages. Among these types of settlement are several expanded settlements from the Late Middle Ages situated on the sandy knolls rising from the moor. Examples are Bitzberg in the Holter Hammrich, a low-lying marsh area, and dwelling sites in the Jümmiger Hammrich, which were grouped around the manmade hill with a church. Settlement here ended in the Late Middle Ages after severe floods - identifiable by alluvial deposits - inundated the land and made it unusable. However, the old towns on the geest still have their roots in the Early Middle Ages at the latest, so that this development can also be compared to that of the Moormerland.

The character of the Overledigerland - which likewise can be said of the Moormerland - is essentially determined by the river marsh at the Lower Ems as well as by geest and moor. The pattern of fields and settlements typical to this landscape with their distinctive network of roads

and drainage systems have remained features of the area to this day. The widespread areas of hedgerows on the geest, the canals and linear settlements in the fens are living witnesses to the efforts of human beings to colonize the land. Even here, however, the landscape is endangered by uncontrolled settlement, and the old town structures are threatened by featureless commercial and residential development.

4.4.2.12 East Frisian islands as exemplified by Spiekeroog and Norderney

Scarcely any other inhabited stretch of land has changed its shape and size so frequently as the drift sand and dune islands opposite the East Frisian peninsula.

According to documents from the period towards the end of the 14th century, the East Frisian islands have been permanently settled since the beginning of the modern era. At the mercy of the rigours of nature, the modest living conditions could only be secured by going to sea or engaging in fishing. On various occasions island villages had to be abandoned due to a loss of land in the west and north (Spiekeroog around 1700, Langeoog 1701, Juist 1717, Wangerooge 1854/55).

Because of the constant alterations to the pattern of islands, historical landscapes can only be found to a limited extent and only from recent times. Furthermore, these differ significantly from the well-known types of landscape on the mainland, and are thus in need of special attention.

The oldest surviving structure on the group of islands is the „Old Light Tower“ on the island Borkum which was built in 1576 for the city of Emden as a navigational aid to increase the safety of shipping on the Ems. A similar navigational aid was built by the people of Oldenburg in 1597 on the island of Wangerooge, which was supposed to mark the entrance into the mouth of the Weser for shipping. This so-called „West Tower“ was blown up for military reasons in 1914. There are only isolated examples of historical islanders' houses and old village churches to be found at the present time. In addition, as a rule they are no longer set within their authentic surroundings. The modern picture of the islands is to a great degree determined by the spa and bathing facilities that developed in the 19th century. In the course of a single century the historical picture of the islands has been transformed into localities with hotels, boarding

houses, businesses and restaurants, with numerous consumer and transport-related businesses.

Spiekeroog (Wittmund district), which is also known as the „green island“, with a number of older buildings and a luxuriant stand of trees in the interior of the village, offers a closed island world. In its proportions the place gives an impression of what an island village looked like in the 19th century.

The historical center of the village was first recorded in detail on a map by the engineer Horst, who made it at the request of the last East Frisian prince in 1738. Individual island houses can be recognized on this map: For example, the structural style of the building, Süderloog no. 4, a house of double-joisted frame construction with two vertical walls under the sloping roof

and striking plank gables, survives until today. The two streets Norderloog and Süderloog can already be identified. Moreover, it can be seen that the little village was surrounded by an earth wall, which was still clearly visible in photos of the northern section taken at the beginning of the 19th century and the remains of which still exist even today. This wall, which was approximately one meter high, did not only serve as a high water protection against tidal floods but also protected the small vegetable gardens against blowing sand. Apart from the south side facing the mainland in the salt marsh area, the place was surrounded by dunes, with the largest group of dunes being found in the north-west. According to Horst's map, the island was treeless.

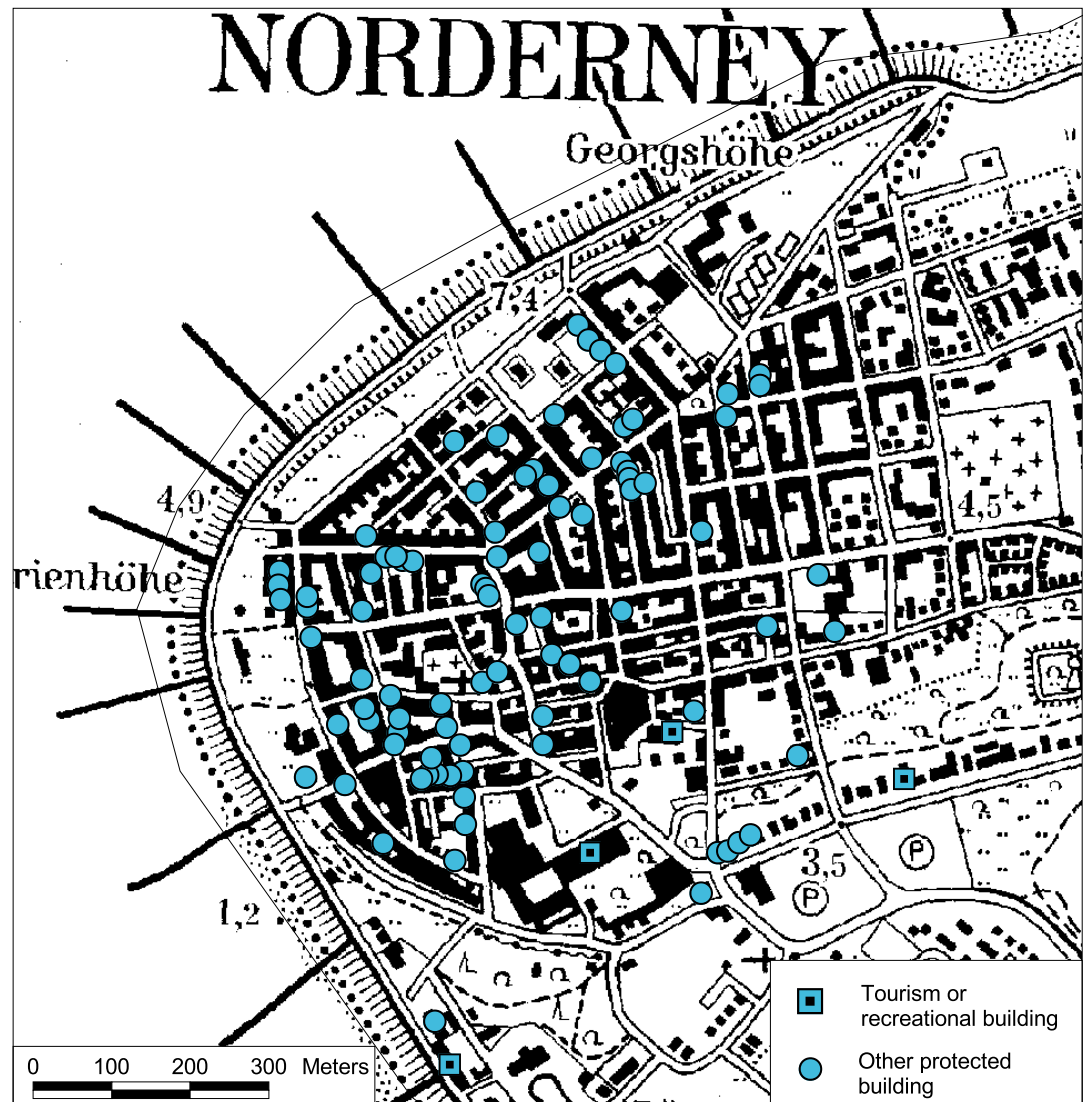


Fig. 4.71:
The historical city of
Norderney
Source: LGN

The strongly vegetated island, as it exists today, is the result of cultivation activities that stretched over generations. It was already forbidden in the 17th century to mow beach grass that covered the dunes with a thin layer of vegetation and thus restricted sand erosion. The first actual sowing of beach grass occurred in the years 1706 to 1711. In the 19th century all islanders were required to plant seedlings. They also protected the dunes with fences against cattle grazing on the salt marshes and in 1860 began the systematic planting of small forests of pines, birches, alders and oaks.

As early as 1900, larger trees had established themselves in the town centre, and they have a lasting positive influence on its appearance today. On the whole, the securing and planting of the dunes has led to a considerable increase in the variety of fauna and flora, a picture which would scarcely have been imaginable on Spiekeroog a hundred years ago.

The oldest building on Spiekeroog is the old island church, a half-timbered building dating from 1696. Parts of the fittings such as altar pictures and sections of the pulpit are said to come from a Spanish ship that was stranded in 1588. In the cemetery, gravestones from the 18th century with ships carved on them are to be found.

The nucleus of three houses (Süderloog nos. 4, 6 and 21, and a fireplace with the date 1763) is said to date from the 18th century. As a group these are referred to as „floating roof houses“. In terms of the history of construction methods they involve what is actually a common form of half-timbered construction, in which the beam heads project over the half timbering and are decorated with curved forms in the Baroque style. Similar constructions are also found on the mainland opposite the island (Neuharlingersiel, Am Hafen West nos. 11/13 and 15).

Around 1860 a period of brisk building activity set in. A good dozen buildings have survived from this period. In contrast to the buildings from the 18th century they have no wooden framework and no plank gable, but are of solid brick construction. Around the turn of the century pensioners' houses were built with their characteristic verandas on the street side, that imbue the local scene with unique flair.

Norderney (Aurich district) experienced its first boom in 1797 when the East Frisian landed gentry followed the advice of the district medical officer Dr. von Halem and decided to build the first German sea baths on the North Sea coast. The seaside spa thus sprang from modest

beginnings. At the time of the French occupation between 1806 and 1815 the baths fell out of favour, but a fresh start was possible through the vigorous support of the new government of the Kingdom of Hannover.

In this way, in 1819 out of the fishing village grew a Hannoverian royal baths. In several phases up to 1861 the original wooden Assembly Rooms (Konversationshaus) developed into the centrepiece of Norderney's spa resort facilities. The extensive plastered building has an arcade in the centre with eight Doric columns. The building is crowned with an octagonal turret.

The second significant building is the grand lodging house, built in the years 1837/38 for the royal family of Hannover, probably with the participation of Laves. However, its architectural qualities have unfortunately been marred by numerous alterations and additions.

Additional buildings of the spa resort include the bazaar building, standing to the northwest and built in 1858 (Blohm/Laves), as well as a spa building standing alongside the lodging house and connected to it, which was initially built in 1854 and then extended and altered from 1884 to 1889. Particularly striking is the filigreed cast iron veranda railing.

Together with the Hannoverian royal family that often visited Norderney in the summer, other famous spa guests also came to Norderney, people such as Wilhelm von Humboldt, Heinrich Heine, Theodor Fontane and the princes von Bismarck and von Bülow.

Under the Prussian regime from 1866 the spa resort grew to become the leading seaside resort of the German Empire. Numerous lodging houses in the urban style of the time were built and one after the other new church buildings were constructed (in 1873 the synagogue of Oppler, in 1879 a new protestant church and in 1884 the catholic church), as well as the telephone exchange in 1887 and the theatre in 1890. Due to an initiative of the doctor, Beneke, the biggest German children's hospital was founded in 1884, the „Seehospitz Kaiserin Friedrich“. From the year 1882, the three-storey façades of large hotels and lodging houses that still set the tone of the island emerged along Kaiserstraße and Viktoria-straße – on the seaward side of the island.

Between the world wars Norderney once again experienced a brief blossoming. The new cultural trends of the twenties made themselves felt. The catholic church „Stella Maris“, a simple cubical building designed by B. Böhm and dating

from the years 1930/31 documents this architectural period.

Building activity in the second half of the 20th century has significantly altered and destroyed the uniformly consistent picture of the resort's architecture as it once existed in the 19th century. Tearing down buildings such as the „Bremer Häuser“ on Kaiserstraße and the „Kaiserhof“, alterations and extensions (spa's Assembly Rooms, spa hotel, „Seehospitz“), but in particular new buildings (multi-storey buildings „North Sea View“, hotel Friese, new hotel buildings on Kaiserstraße) have until now resulted in a disjointed cityscape. Only in the last two decades have there been efforts to preserve the building heritage to a greater degree. In the heritage building register of the city of Norderney, which was published in 1987, 122 individual buildings and groups of buildings are listed.

Unfortunately, even some houses from this group of the most valuable buildings have been replaced by new structures. The loss that is inflicted on the stock of old buildings as a result of changes of use and extensive modernization is difficult to estimate. However, this creeping process of change may well have destroyed more historical substance than the radical tearing down of old houses.

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Fig. 72:
Land Hadeln
Historic town hall built in
1583 in Otterndorf, admini-
strativ district Cuxhaven.
Photo: Stadt Otterndorf



Fig. 73:
Land Wursten
Wheel and windmill on the
Padingbütteler-Altendeich,
municipality Land Wur-
sten-Padingbüttel, admini-
strative district Cuxhaven.
Photo: G. Schlicksbier



Fig. 74:
Butjadingen and Stadland
Village mound Langwarden,
municipality Butjadingen-
Langwarden, administrative
district Wesermarsch.
Photo: Zimmermann



Fig. 75:
Stedingen
Moorriem farmstead on a
elevated place of residence
in Moorriem-Niederhörne,
municipality Elsfleth-
Moorriem, administrativ
district Wesermarsch.
Photo: Gerdau



Fig. 76:
Wangerland/Jeverland
Village mound Ziallerns,
municipality Wangerland-
Tettens, administrative
district Friesland.
Photo: Weseman



Fig. 77:
Harlingerland
Sluice harbor Carolinensiel,
Wittmund, Wittmund
Photo: Stromann,
Soltau-Kurier-Norden



Fig. 78:
Brookmerland
Burg Uppant farmstead
(Stonehouse and Gulfbarn),
municipality Uppant-
Schott, administrative
district Aurich.
Photo: Stromann



Fig. 79:
Krummhörn and Leybucht
Sluice harbor Greetsiel,
municipality Krummhörn-
Greetsiel, administrative
district Aurich.
Photo: Stromann



Fig. 80:
Moormerland
Hedgerow area in the
Moormerland region, admi-
nistrative district Leer.
Photo: Stromann



Fig. 81:
Rheiderland
Polder area in the Rheider-
land region, administrative
district Leer.
Photo: Stromann



Fig. 82:
Overledingen
Linear settlement Rhauder-
fehn, municipality Rauder-
fehn-Westrauderfehn,
administrative district Leer.
Photo: Stromann



Fig. 83:
East Frisian Islands
Spa building in Norderney,
administrative district
Aurich.
Photo: Stromann

4.5 The Dutch Wadden Sea Region

4.5 The Dutch Wadden Sea Region

by Adriaan Haartsen & Dré van Marrewijk

4.5.1 Geographical position of the Dutch Wadden Sea Region¹

The Dutch Wadden Sea Region covers the area between the mouth of the Ems and the North Sea. The current Wadden Sea islands are part of it, as is the former Zuiderzee island of Wieringen. And of course it includes the Wadden Sea itself. The Wadden Sea is the shallow plain of unembanked salt-marshes, mud flats and shoals, cut through by channels and gullies, flooded by the water at high tide, with large areas falling dry at low tide. Furthermore the name 'Wadden Sea' is fairly recent: formerly the entire area to the south of the Wadden Sea islands was called the Zuiderzee. The islands formed the boundary between the North Sea and the Zuiderzee. The Zuiderzee was the largest bay in the entire Wadden Sea Region, and if the Afsluitdijk had not been built, the area covered by this report would probably have been far greater, and the entire Zuiderzee, with the adjoining parts of the mainland, would also have been included in this study. But things turned out differently: the construction of the Afsluitdijk removed the southern part of the Zuiderzee from the influence of the sea and changed it into a fresh water lake - the IJsselmeer - which is no longer necessarily regarded as a part of the Wadden Sea Region.²

However, a large area on the mainland is regarded as part of the region. It was created through the influence of the sea and has had important connections with the sea in the course of its development. This relates to the old maritime polders in Groningen en Fryslân, generally referred to as the terpen- en wierdengebied (dwelling mound district³). In Noord-Holland too, there is an area with large numbers of dwelling mounds: the western part of Westfriesland, in the neighborhood of Schagen. As well as these old residential centers, the more recent polders reclaimed from the sea form an important part of the area.

These three elements, the islands, the Wadden Sea and the mainland, which at first sight are completely different, are so bound up with each other that they can be regarded as part of a greater whole, the landscape of the Wadden Sea Region. This landscape is characterized by the close relationship between man and nature.

In the preceding chapter, Otto Knottnerus described the most important developments in the entire Wadden Sea Region, from Esbjerg to Alkmaar. In some respects the Dutch part occupies a unique position in this larger entity. Before looking at the individual areas which make up the region we would first like to discuss the general characteristics of the Dutch part of the Wadden Sea Region.

One of the special aspects is the enormous extent of the embanked coastal marshes and the peat lands further inland. The Pleistocene subsoil rises only very gradually (if we disregard the boulder clay hummocks of Winschoten, Texel and Wieringen) from north-west to south east, so that a broad girdle of peat bog has developed and the marine clay deposits also cover a large surface area. In the German and Danish areas of the region the Pleistocene soils rise more steeply and the zone containing marine clay deposits and peat bog is generally narrower.

The Dutch part of the Wadden Sea Region is further distinguished by the fact that permanent settlement on dwelling mounds started earlier here than in other parts of the region.

A third difference is that in the Netherlands land loss and land gain went hand in hand, whereas elsewhere the land lost far outweighed the gains. Large-scale land reclamation projects such as the Zijpepolder, the former Middelzee, the Fivel bay and the Dollard polders, are echoed elsewhere on a much more modest scale.

In the fourth place, the Dutch part of the Wadden Sea Region contains a number of specific landscape elements which are not or hardly found in Germany and Denmark, such as 17th century boat canals, duck decoys and cut-away terps. The dense network of waterways is also remarkable.

Fifthly the Dutch Wadden Sea Region is characterized by the development of a number of small towns within the region itself. Appingedam, Dokkum, Leeuwarden, Franeker, Harlingen, Bolsward and Sneek developed into urban centers. We will not consider the West Frisian towns of Medemblik, Hoorn and Enkhuizen here since they are not regarded as part of the Wadden Sea Region for the purposes of this report. In the Dutch part there is thus a greater variety of settlements than elsewhere in the Wadden Sea Region.

The natural environment

After the end of the last Ice Age (some 10,000 years ago) the level of the North Sea rose by around 100 meters. In the current Wadden Sea Region the coastline moved continually southward and eastward. Because the rise in sea level also caused a rise in the level of the fresh groundwater, a zone of peat developed parallel to the coast. This peat girdle shifted ever higher: on the sea side the peat bog or fen was flooded by the rising sea level; on the land side it extended over the higher sandy areas.

Around 5000 BC the Straits of Dover flooded. The currents in the North Sea changed and began to run more parallel to the coast. This created offshore bars, which were divided by later breaches by the sea into smaller pieces, islands. Between the bars and the peat lands there arose an area with gullies, sandbars and salt-marshes, into which the sea penetrated twice per day. The offshore bars have since remained roughly in place. The young dunes which are still a characteristic feature of the Wadden Sea islands today, began to develop in the Late Middle Ages.

Soil and peat subsidence

The rising sea level at the end of the last Ice Age also raised the groundwater table. In a broad marginal zone along the coast it became so wet that swamps were formed. The plant residues in the soil did not entirely perish under the influence of the wet environment, so that the layer of plant material grew ever thicker. At a certain point this layer was so thick that the area became isolated from eutrophic river water. Then began a long period in which the plants could only obtain the nutrients they needed from rainwater. Few plants can survive under such oligotrophic conditions. One such plant is sphagnum moss, a plant which grows on raised bogs and can form thick peat layers. These peatlands were vast, stretching from the dunes in Noord-Holland to the higher ground of Gelderland and Overijssel; the Zuiderzee was not yet in existence. The peatlands ran northwards to large parts of the present Wadden Sea Region. There are large areas in which the peat formation continued unabated until man began to exploit the land, a development which started in the Carolingian era. The landscape, as it appeared before the advent of man, consisted of a number of raised peat bog islands, which lay like slightly bulging cushions in the area. The rainwater from these raised bogs was drained off via moorland rivers, which carried the wet-

land water away towards the Almere and the North Sea.

When the first farmers settled in the peatlands this had serious consequences for the environment. In order to work the land, they first had to drain it. Ditches were dug to lower the groundwater level. Thereafter began the process referred to as soil subsidence, although ground level subsidence would be more correct.

The cultivation of a peatland is inevitably accompanied by ground level subsidence. The drop in the surface level is caused by settling and oxidation. Settling takes place when water flows out of the peat bog as the groundwater table drops, and thus the volume of the peat bog diminishes. This causes the land to sink: the surface sinks along with the groundwater, as it were.

The rate of ground level subsidence is accelerated by oxidation. After drainage the pores in the peat soil fill with air and the non-decayed plant residues are gradually converted by the intake of oxygen into carbon dioxide and water in the drained peat bog. The bog is thus actually very slowly burned. Settling and oxidation can lower the surface level of a bog by a maximum of around two centimeters per year. It is assumed that the surface at the higher parts of the peat bog islands was previously around 4 meters above NAP (Normal Amsterdam Level). The surface of the peatlands in the Wadden Sea Region is around 1.5 meters below NAP. This means that the surface has dropped by around 5.5 meters since it was first taken into use. The speed at which the process can proceed can be seen in an example in England. In 1848 a fen in the East Anglian peatlands was drained. Some distance away a post was driven into the peat so none of it remained above ground. This post, the Holme Post, now protrudes 4 meters above ground level.

Subsidence is greatest at the beginning. The ground level subsidence had consequences for the farmers, since, as the land grew steadily wetter it eventually became impossible to grow grain. The fields were given over to pasture and hay.

Another consequence was that the area became vulnerable to incursions by the sea. Large areas of the original peat bog landscape fell prey to the sea.

Living at the edge of the water

In this dynamic coastal environment Man has tried to wrest an existence since the Neolithic age (5000-2000 BC). Remains of Neolithic settlements can be found in the Groetpolder in Noord-Holland and elsewhere. The settlers were adapted to the coastal environment and lived mainly by catching fish and gathering shellfish. This contrasts with the megalith found under a thick layer of clay near Heveskes monastery in Groningen, which is evidence of agricultural settlement from the mid-Neolithic age without any demonstrable relationship with the coastal environment.

In the Bronze Age (2000-1000 BC) there was settlement on the raised salt marshes in the province of Noord-Holland. The area was relatively densely populated, particularly in the period from 1350 to 900 BC. During this period the sea had no direct impact: the salt-marsh was turned into a fresh-water landscape and was no longer flooded by the sea. Settlement in Noord-Holland came to an end around 800 BC. The area grew increasingly wet, swamps developed and a thick layer of peat was formed. In contrast, conditions in other parts of the Dutch Wadden Sea Region became very favorable for habitation.

From 600 BC people settled in the salt-marsh landscape of Groningen and Fryslân. Initially people only spent the summer there and retreated to the old villages on the sand in the winter. The settlers brought livestock and grew crops. Flooding with salt water would be disastrous for arable farming: the entire harvest could be lost. Evidently the sea had so little impact at this time that the crops were in no real danger. Seasonal habitation eventually became permanent.

With the influx of residents, the settlements were gradually raised up. Manure and household waste piled up, turfs were dug for the walls of farms and to raise the floors. Initially dwelling mounds arose as a result of habitation and there was as yet no intentional raising of the land. When the sea level started to rise again these higher grounds were of course the best suited for arable farming. At a certain point the settlers no doubt switched over to artificial raising and extending of the existing dwelling mounds to protect the fields or extend the area of arable land. Before building a farm or new dwellings they often created an artificial mound (wierde), as evidenced by archaeological excavations of the Tuinster Wierde in Leens (Groningen). The oldest dykes were also primarily intended to protect arable land from the intrusive sea water.

Terps thus arose as a result of - active or passive - raising of individual dwelling places. Such domestic mounds could grow up next to each other into village mounds. The height of the mound gives an indication of the duration of habitation, the number of farms and the construction materials used. The dwelling mounds (terps or wierdes) did not all appear at the same time. This is well illustrated in Westergo. The oldest mounds lie in the center of the area, a long way from the present-day coast. To the north of these is a series of mounds which were first inhabited in Roman times. They are set out in a neat row, because the people chose a higher coastal or salt marsh ridge formed by the sea as a dwelling place. There are mounds from the middle ages on a coastal ridge which was formed later, parallel to the 'Roman' one. There is thus clear evidence that the extension of the coast to the north is closely connected with the development of human habitation.

Digging up the terps

The dwelling mounds were in the past raised using grass sods, domestic waste and manure. An extremely fertile mix, for which there was a sudden and real need when in the 19th century large areas of the moor and cutaways on the sandy soils were opened up for [agricultural] use. The fertility of the poor sandy soils was increased by adding terp earth to the topsoil and this also improved the water-retaining capacity of the soil. To bring one hectare of sandy soil into cultivation required around 120 tons (80 cubic meters) of terp or wierde earth⁴.

Terps and wierdes were dug up on a large scale and the earth was transported to the sandy area by tjalk. It was a profitable round trip for the bargees. It was a huge assault on the terps: large parts of terps, and sometimes entire terps, were dug up and distributed over the sandy areas. In some cases houses were broken up and rebuilt after the terp was dug out. The churches and churchyards were usually spared, but there are stories of digging so close to the churchyard that bones protruded from the steep wall. Needless to say, a treasure-house of archaeological information was lost.

Only the very unusual finds, such as the silver treasure of Winsum (Fryslân), were publicised, but no thought was given to less valuable things, such as pottery, never mind organic deposits and organic residues. This changed when the professional archaeologists started taking an interest in the terp and wierde district. Prof. A.E. van Giffen acquired international fame with his excavation of the Ezinge wierde. The excavation was partly financed by the sale of the terp earth....

Building the dykes

Dykes form another type of protection against salt water. The pattern of the dykes indicates the period when they were built. Dykes were already built very early on, as is shown by an excavation at Peins, where a small dyke was found which predated the start of the Christian calendar. Initially dyke building was restricted to the protection of small residential areas. Later larger areas, encompassing several villages, were surrounded by a ring dyke. The first enclosures of larger areas with dykes date from the 10th or 11th centuries. Later estuaries were reclaimed bit by bit from the sea, as in the Middelzee area, the Fivel bay and the Dollard. Each time new sea defenses were laid to seaward, the old dyke was retained as an inner dyke, a dormant sea defense. Usually the old dyke was maintained, to provide extra security if the new sea dyke should give way. Sometimes such a dyke was even specially built for this purpose, as is the case of the Slachte dijk, which runs straight across Westergo. The pattern of dykes is a splendid illustration of the human occupation of the area.

Thus land was captured from the sea, but the sea also took land back. Large marine incursions led to loss of land, such as the incursions which led to the formation of the Zuiderzee (from the 11th century) and the incursion in the Dollard. Sometimes it was a case of natural processes, but often the hand of man was involved. For example, salt mining was an important activity in the coastal area, using the salty peat layers occurring in the subsoil. It was easier for the sea to penetrate in areas where these layers had been dug. But it was not only salt extraction which made the area vulnerable. In the peat lands subsidence caused by agricultural practices also played a large role (see inset). Also, the dykes were neglected. In the Dollard a lot of land loss was due to poorly maintained dykes during the internal struggles between the Schieringers (Cistercians) and the Vetkopers (Premonstratensians). Large areas of cultural land were thus lost through the action or negligence of man. Some of the estuaries were again reclaimed (Middelzee, Lauwersmeer), in other parts the water remained.

The construction of dykes made the inhabitants of the coastal marshes less vulnerable to floods, although these were not entirely banished. The great flood of 1570 (All Saint's Tide) for example, cost hundreds of lives. This was the spur to raise the dyke, and the initiative was taken by the Spanish governor of Fryslân, Caspar de

Robles (sometimes called Zwarte Kornel). To the south of Harlingen there is a statue of him on the dyke, and stones in the dyke slope also show how the sea dyke has been raised in the course of history.

Breaches in the dykes caused great trouble in the areas behind them, but in general the dykes gave the inhabitants of the area a greater degree of security. Another consequence of dyke construction however was that a solution had to be found for surplus rainwater. Prior to dyking, this water had naturally run off into the sea. now it stagnated where it was. Provisions had to be made to control the polder water. This was done in the form of broad watercourses to store the polder water and sluices to discharge the water. Of course the further an area was from the sea the harder it was to drain off the water. The many monasteries in the area played an important role in the increasingly complex water control system in the area within the dykes. The construction of dykes and dyke locks or drainage sluices (zijlen) caused the appearance of sluice and dyke villages, such as Oudesluis, Delfzijl and Oude and Nieuwe Bildtzijl.

Trade and travel

The development of the Wadden Sea Region was strongly affected not only by the constant battle against the water but also by trade. Even in Roman times there were extensive trading links between the Wadden Sea Region and the Roman Empire to the south. At that time it was mainly agricultural produce (meat, skins) which were supplied in exchange for pottery, jewellery, wine and other specifically Roman commodities.

The significance of trade increased in the early Middle Ages. At that time welfare was not only entirely determined by agricultural productivity. Crafts and industry underwent great development and added numerous high-quality products to the growing flow of goods, such as amber and silver and gold jeweler. Some villages, such as Holwerd, became specialized trading posts, evidence of which can still be seen in the country. The Wadden Sea Region enjoyed a period of great prosperity, which continued into the 11th and 12th centuries. The great concentration of Romanesque churches and monasteries was a consequence of the prosperity and wealth of this period.

For numerous reasons (see Otto Knottnerus's contribution in this report) the Wadden Sea Region lost its leading position in trade during the course of the Late Middle Ages. The area was

also only partially able to reap the benefits of the large-scale peat extraction in the hinterland and the trade in turf, which started in the 16th century and expanded enormously in the 17th century. The major centers of trade and industry lay outside the area: the Wadden Sea Region found itself increasingly marginalized. Apart from Leeuwarden, it did not reach the stage of developing large towns. However, it is striking that the various small, prosperous towns did develop, and in addition to performing a regional market and trade function for the surrounding agricultural area, also continued to play a role in long-distance trade. However the Wadden Sea Region was still characterized by habitation in the many villages.

The use of the land and the sea

Many places on the coast and on the islands developed into fishing ports, such as Oudeschild, Zoutkamp, Den Oever and Harlingen. Den Helder – a naval port from the 18th century onwards – saw great expansion in the 19th century after it became a garrison town and the naval dockyard was transferred to the town from Medemblik.

On the islands income from agriculture and fisheries was supplemented with other forms of activity: the merchant navy and whaling became important activities. The commodores' houses and the whale bones in the island villages still bear testimony to this.

Land use was varied. Agricultural operations traditionally took the form of arable and livestock farming as described above. Gradually this 'mixed farm' disappeared however, and the farmers began to specialize. The oldest inhabited areas, such as the southern part of Westergo, were less suitable for arable farming, due to the continuing problems with drainage, and here the focus shifted to dairy farming. Arable farms are found on the higher raised salt marsh ridges and on the younger polders along the coast, such as the Anna Paulowna polder, and the Bildt and the Oldambtster polders. Sheep farming developed on Texel and Wieringen, where they used a form of field enclosure found nowhere else in the Netherlands: piled up sod banks called tuunwallen.

Recent developments in the countryside

In agriculture we saw the separation of the mixed farm, as in the rest of north-western Europe. This meant not only a specialization in livestock or arable farming on each farm, but also whole regions starting to specialize. In

Groningen the separation led to specialization in arable farming. The Oldambt district developed after 1800 into one of the most progressive arable areas in Europe. Specialization also had an impact on traditional building: arable farming requires a different type of farm to dairy farming. The Oldambt-style farm is thus somewhat different from the characteristic Frisian 'head, neck and barrel' (kop-hals-romp) farm.

The increased scale of agricultural production and European agricultural policy in the twentieth century left their mark on the region. Land reallocation schemes brought and still bring great changes to the landscape. A part of the Oldambt district, 'the grain republic'⁵ of olden times, is being transformed into a „Blue City“, a new urban living environment, built around a newly created lake. In recent decades 'alien' forms of agriculture, such as pig farming, bulb fields and glasshouse horticulture have been introduced to the region. Organic agriculture is also on the increase and more and more regional products are being developed.

Industry and mineral extraction

Industrialisation in the area mainly took the form of factories with links to agriculture, such as dairy and feed factories. Apart from these, the main traditional industries in the Wadden Sea Region are brickworks, tile works, pottery and shipbuilding. The importance of shipping is indicated by the presence of shipyards. Large-scale industry has recently developed in Delfzijl, Harlingen and Eemshaven. Exploratory drilling for gas has taken place both onshore and in the Wadden Sea. Dominant new landscape elements include wind turbines, both concentrated in wind parks and distributed over the agricultural area. Activities in the Wadden Sea which affect the underwater landscape include sand and shell extraction and cockle, shrimp and mussel fishing.

Tourism

One development which has had a huge impact on the landscape of the Wadden Sea islands is tourism. It was not until after the Second World War that the Dutch Wadden Sea islands and the coastal area have become very important for recreation and tourism. The trek to the coast is mainly concentrated on the islands, but here and there (very recently) leisure facilities have been created on and near the sea dyke as well. The facilities take the form of hotels, villa parks, camp sites, marinas, airfields and the like. Cul-

tural tourism is a new trend on the main land: walking and cycling to appreciate the landscape and cultural heritage values. In this context numerous historic buildings, such as manor houses, farms and former town halls now serve a new purpose: they are converted into small-scale tourist accommodation, or sometimes into regional museums.

4.5.2 Sub-regions in the Dutch Wadden Sea Area

In geological terms, the Wadden Sea Region is characterized by the processes which occur in a shallow coastal sea with a predominantly sandy bed. Other important factors in its development are the gradual rises in sea level and the extensive transportation of sediment. The action of the wind and waves created elongated offshore bars, broken only by the mouths of rivers and incursions by the sea.

The location of this coastal barrier was and is still determined by the position of the Pleistocene hills of De Hooge Berg (Texel).

Behind the islands lies the Wadden Sea itself, a shallow coastal sea consisting of channels and gullies, sandbars, mud flats and salt marshes. The tide transports the sediment twice daily via the tidal inlets to the Wadden Sea. The sand carried along with it is deposited a short distance from the mud flat channels on sandbanks, sandy flats or sandy ridges along the channels. The finer (clay) particles are transported further inland by the tidal waters and deposited under more peaceful circumstances on mud banks or on the salt marshes. A great part of the salt marshes has been reclaimed and now forms a part of the mainland.

Further inland still, between the area of marine clay deposits and the sandy Pleistocene soils, is an area of peatland. The width of this area varies: in Groningen and Oostergo the peat strip is fairly narrow in places, in Fryslân on the other hand it is sometimes dozens of kilometers wide. In Noord-Holland, finally, the marshland area gives way to an enormous, elongated area of peat moor. In this area it is hard to decide which areas still belong to the Wadden Sea Region and which do not.

The Wadden Sea Region can thus be divided into a number of landscape zones: the Wadden Sea islands, the Wadden Sea itself, the marshland area (enclosed with dykes) and the peat moors bordering the clay area. The marshland area of Groningen, Fryslân and Noord-Holland is

subsequently subdivided into individual sub-regions which are clearly distinct from one another due to their genesis and their current landscape features.

4.5.3 The Wadden Sea islands

The Wadden Sea islands were created from the natural coastal barrier in an intensive interaction between man and the forces of nature. Man made full use of the opportunities offered by coastal erosion and the deposition of sediment: securing drifting sands by constructing sand dykes at the points where dunes would be formed. The zoning of the islands is a characteristic feature: beach, dune area, inner dune fringe and (former) salt marshes. On the North Sea side the islands have a natural sea defense in the form of dunes. Where the belt of dunes was very narrow or low, people often reinforced the natural defense with artificial defenses, for example using sand dykes. On the Wadden Sea side most islands have a strip of salt marsh which has gradually been brought into cultivation. Often the open salt marsh soils are enclosed by dykes to protect them from flooding by the Wadden Sea, but there are also (parts of) islands which are not protected by dykes, and which are submerged at high tide. Examples include the 'grieën' on Terschelling and Ameland.

For a long time the agricultural lands provided an important but meager means of subsistence for the island population. The inhabitants tried many ways to broaden the basis and sought other sources of income. Trade, fishing and seafaring (including whaling) were all important, and were supplemented with activities such as beachcombing (or 'wrecking') and smuggling. The western Wadden Sea islands served an important function as piloting and supply points for shipping. On some islands whale bones and jawbones, used as fencing in front of the houses, are reminders of the inhabitants' whaling past. Beacons and light houses were built on many islands for the benefit of shipping.

The originally agricultural villages are generally situated on the fringe of the inner dune: the transition from dunes to former salt marsh. The landscape here has a fairly 'closed' nature. The farming villages are different from the harbor settlements (West-Terschelling, East Vlieland, Oudeschild) and the recently developed leisure villages ('recreatiedorpen'). Tourism began to play an important role in the 20th century.

Based on the history of their development and inhabitation it is natural to make a distinction between the islands of Texel and Wieringen, which have a Pleistocene core (boulder clay and wind-borne sand deposits from the Pleistocene age), and the barrier islands of Vlieland, Terschelling, Ameland and Schiermonnikoog. As a result of the construction of the Afsluitdijk and the reclamation of the Wieringermeerpolder, Wieringen is no longer an island, although it has not lost its island character.

The Dutch islands with a Pleistocene core: Texel and Wieringen

The current island of Texel came into being when a sand dyke was created (1629-30) between the original island of Texel, which consisted mainly of boulder clay and wind-borne sand hills, and the barrier island of Eijerland. The salt marsh to its east was reclaimed in 1835 (the Eijerland Polder). Seawards from the first sand dyke, a new sand dyke was created in 1855 which was breached by the sea in three places in 1858. One of the openings, de Slufter, still exists, and is now a nature reserve.

The highest point on Texel outside the dune area is the Hoge Berg at Den Burg (15 m). On the south-western side the island is extended by a series of arched sandbanks with dunes and a connecting sand flat, de Hors, and on the south-eastern side by a salt marsh polder, the Prins Hendrikpolder of 1847. The original very small-scale system of plots was lost as a result of land consolidation schemes. The major settlements are Oudeschild (the old harbor), Den Hoorn, Den

Burg, De Waal, De Koog and Oosterend. The new ferry port at the southern tip of the island is accessible by boat over the Marsdiep from the naval port of Den Helder. The island is famous for its bird sanctuaries and is much-visited by tourists.

The island has specific characteristic features: sod banks (tuunwallen), aisled sheepsheds (schapenboeten) and a diversity of village types. Tuunwallen are field dividers, approximately one meter high, consisting of piled-up grass or heather sods. They date from the 17th or 18th centuries. Sheepsheds, like the tuunwallen, are found mainly on the high Pleistocene part of the island. These are prominent elements in the landscape, which reflect the important role played by sheep farming on the island. Apart from elongated nucleated row villages, which can be found elsewhere on the islands, Texel has a real harbor at Oudeschild. Oudeschild was a naval base for some time until that role was transferred to Den Helder by the end of the eighteenth century. The port dates from 1780, but long before that ocean-going ships lay at anchor here in the Texel Roads while waiting for favorable winds. Water to supply the ships was drawn from the wells of the Brakenstein farmstead at the foot of the Hoge Berg. To the south of Oudeschild lies the Oude Schans (Old Redoubt) from the Eighty Years' War. The center of Den Burg has two 'rings': circular streets. The inner ring is said to date back to defensive works from Viking times, the outer ring is a bulwark from the 14th century.



Fig. 4.84:
Tuunwallen on Texel

Finally, the Russian graveyard is a special cultural heritage element. It harks back to the uprising of the Georgians, who, with the inhabitants of Texel, fought a bloody battle against the German occupation forces from 5 April to 20 May 1945. 565 Georgians were among the dead.

Wieringen is - or rather was - not actually a Wadden Sea island, but a Zuiderzee island. By this we mean that, just like the former islands of Urk, Schokland and Marken, the island has no offshore bars, dunes or beaches. Before it was connected to the mainland the old island consisted of a Pleistocene core of a somewhat smaller scale than Texel with a salt marsh polder on the south side, the Waard Nieuwland polder. The traditional small-scale plots disappeared during a land re-allotment scheme in the nineteen thirties. Practically all the tuunwallen which had been common here, too, also disappeared. It is interesting to note that in recent years new tuunwallen have been built as part of another land re-allotment scheme.

The most important towns are the harbour and fishing town of Den Oever, where the Afsluitdijk begins, Oosterland, Hippolytushoef, Westerland and De Haukes, the former harbor town of the island. The island itself has retained its agricultural character.

Two activities are worthy of special note. First, the harvesting of seaweed, or sea wrack (*Zostera maritima*). This was used for all manner of purposes: roof covering, litter for stalls, dyke-building. When people also started to use it to stuff mattresses, seaweed harvesting became one of islanders' main occupations. The southern dyke of Wieringen still consists partly of seaweed. There are also still some seaweed storehouses, but the finest example has been moved to the Zuiderzee museum. The harvesting of seaweed came to an end following a disease in the 1930s, which seriously affected the seaweed beds. Another activity relates to ducks. In the 17th century there were 15 decoys on the island, two of which remain. Wild ducks for the table were caught in the decoys. Tame ducks were also kept, particularly around De Haukes. They were kept for their down and eggs, and were fed with undersize fish which could not be sold. Duck keeping was thus closely associated with fishing.

In recent years there have been some important finds from the Viking era. The first Viking treasure was found in 1996, in a meadow near Westerkliëf, to the south of Hippolytushoef. An earthenware pot was found, containing a many pieces of jewellery, coins and silver bars. The pot

containing the treasures was buried around 850. In all probability the treasure belonged to a Danish nobleman who took up residence on Wieringen. This is the first indication that the Norsemen or Vikings were not only robbers and plunderers, but also took up residence in the coastal area⁶.

The shape of the farm is a notable feature on both Texel and Wieringen. It is a variant of the Noord-Holland 'cloche'-house (stolp), in which the living quarters extended from the front. In the corner, where the living quarters meet the work areas, we find the chimney of the bakehouse.

Decoys

Decoys⁷ are an original Dutch invention, which has been known for around 700 years. It is assumed that around 145 decoys existed in the Wadden Sea Region. The decoy business is seen as a form of hunting with a clear historical tradition and value. Decoys are strange, centuries-old elements in the landscape and now form recreational and nature areas of international interest.

A decoy consists of a pool of water surrounded by woods, laid out in a quiet place in an area which is rich in water (and waterfowl). The average area is around 2 hectares. Around the generally rectangular cage pool lie 4 to 6 trap ditches. All of this is surrounded by an wall of earth. Duck catching is a type of hunting with lures, unique teamwork between the decoy-man and his tame domestic ducks and the decoy dog, with a smouldering turf and some food. In addition to catching ducks the decoy business involved management and maintenance of the decoy, duck pond, duck decoy tree belt and trap ditches, as well as caring for the tame ducks and the decoy dog.

'Kooirecht' is the right to catch ducks. The 'afpalingsrecht' (demarcation right) is a circular area within which the peace must not be disturbed. The size of the circle varies: in Groningen the circles have a radius of only a few hundred meters, in Fryslân a radius of 1200 meters was common; in Noord-Holland there were circles with a radius of 1130 or 1500 meters. The shape and layout of the decoys also varied, depending on the way they developed, the hunting area and the hunting season. Because the decoys are often found in the open grassland polders the

decoy woodlands are striking and form characteristic elements in the landscape. In the dune areas they form a green contrast to the sloping fringes of the dunes.

In view of the once large numbers of decoys, this was an authentic feature of land use and was a traditional hunting method for catching birds (in addition to goose and plover catching). A survey dating from 1494 shows that half the population of Wieringen was involved in fishing and bird catching. Each Wednesday in the summer a special 'bird barge' left for Amsterdam⁸. Bird catching was thus an important rural activity. In social terms the decoys have added significance because in a number of situations they were in common ownership.

The Netherlands was the birthplace of the decoy, and has the oldest and largest number of decoys. From here decoys and the decoy business were introduced to other parts of the Wadden Sea Region: in the 18th century in Germany and at the end of the 19th century in Denmark.

There were around 175 duck decoys in the Wadden Sea Region as a whole. The majority of these have disappeared entirely and can only be traced on old maps or in historical documents. Others are no longer used as decoys, but are marked in the landscape by the residual tree belt, the duck pond or the structure of duck pond and trap ditches. Of the 33 decoys still in tact, 29 are in the Netherlands and 4 on the German island of Föhr.

The barrier islands: Schiermonnikoog, Ameland, Terschelling and Vlieland

The islands of Schiermonnikoog, Ameland and Terschelling have a very similar structure to that of the East Frisian Islands: an elongated shape, tapering to the east, one or more villages in the shelter of the dunes, hook-shaped sand bars on the western side, an extensive dune and salt-marsh area on the eastern side and an enclosed salt marsh. Here, too, the islands show a marked tendency to shift eastwards. Sand dykes were built to in an attempt to strengthen the adhesion between the islands and the accumulating sand-bars and salt marshes on the eastern side and to gain some control over the process of island movement. Vlieland differs from the other three islands in that it consists purely of dunes with a settlement on the south-eastern side.

The islands now belong to the province of Fryslân. Tourism is very important to all these islands. It began later than on the German Wadden Sea islands and partly because of this it is slightly different. There are no boulevards, few large hotels, but rather guest houses, farmyard and general camp sites and private summer houses for rent. Tourists are not permitted to take vehicles onto Vlieland and Schiermonnikoog.

In addition to these inhabited islands there are other uninhabited ones. Some of them were once inhabited and are relics of far larger islands, as in the case of Griend. Others are 'young' islands.

PROVINCE	DECOY (REGISTERED)	DECOY RELIC	DUCK DECOY NOW DISAPPEARED	TOTAL
Noord-Holland	8	6	27	41
Fryslân	19	5	47	71
Groningen	2	2	26	30
Totals	29	13	100	142

Table 4.1:
Overview of decoys in
The Netherlands in the
LANCEWAD research area

COUNTRY	DUCK DECOY (REGISTERED)	DECOY RELIC	DUCK DECOY NOW DISAPPEARED	TOTAL
THE NETHERLANDS	29	13	100	142
GERMANY	4	11	2	17
DENMARK	-	4	-	4
TOTAL	33	28	102	163

Table 4.2:
Overview of duck decoys in
the entire LANCEWAD
research area

Schiermonnikoog, the smallest inhabited Wadden island has suffered constantly from erosion on the western side. It was already causing concern in the 16th century. The church of the former village of Westerburen had to be moved in 1717, but the new church was endangered by 1760. In 1762 the third church was built and in accordance with the wishes of the then landlord, construction continued in regular 'streken' (strokes) which now characterize the village. It is the only planned village on the Wadden Sea islands. There are still six active farms on the salt march polder adjoining the village.

The island was originally in the possession of the Cistercian monastery Klaarkamp (schier monnik = grey monk, after the color of their habit). Later, in 1638, it fell into private hands. At the start of the Second World War the island was owned by the German Graf Von Bernstorff; but it was confiscated after the war. Since then it has been under the management of the State Property Department, which transferred ownership of the dunes and unembanked salt-marshes to the Society for Nature Conservation in the Netherlands a few years ago. The dune and salt marsh area on the eastern side of the island (Kobbeduinen, Willemsduin and the depressions between them) is an important nature reserve.

Ameland was first named in the 9th century. The island consists of four villages situated in the lee of the dunes: from east to west Buren, Nes, Ballum and Hollum. Formerly each had its own salt marsh polder. The dune area on the eastern side of the island is crowned by the Oerd, a 24 meter-high dune. The first land re-allotment scheme in the Netherlands took place on Ameland in 1924. The typical farmhouses were also built at that time. Before the re-allotment farmers still operated from the villages of Hollum and Ballum. The remarkable broad sandy ridges between the plots were also created during this period. They came into being because the plots in between had to be dug out to get closer to the groundwater.

In the years following 1943 around 200 wells appeared on the beach to the west of Hollum. They originated from the neighborhood of Sier, which was buried under the sand in the 15th century. The site is now submerged in the Borndiep channel again. Over the last three centuries the island has grown in an easterly direction at an average rate of a kilometer per century.

The Ameland polders were not provided with dykes until the 19th century. Even now there is

still a part, the Nieuwlandsreid between the Kooiduinen and the Oerd, which is only separated from the sea by a summer dyke. Unusually this area, like all the wastelands before, is still in common ownership.

Terschelling, at 30 km, is the longest of the Dutch Wadden Sea islands. Due to its strategic position Terschelling was involved in many wars. In 1374, 1396 and 1499 villages were raised to the ground by invaders. From 1569 to 1576 the island was used as a base by the 'Watergeuzen' (Sea Beggars). In 1666, during the Second Anglo-Dutch War, the English set fire to a large number of merchant ships and the village of West-Terschelling. West-Terschelling, like the village of Vlieland, is a traditional settlement of fishermen, pilots and seafarers. The other villages have a more agricultural character. From east to west, in the lee of the dunes, lie the villages of Oosterend, Hoorn, Lies, Formerum, Landerum and Midsland. The villages are built on what was once an offshore bar and some, such as Formerum and Midsland, have a structure reminiscent of the 'Geest' villages in Noord-Holland, with roads which run along the foot of the barrier beach. In addition there are several terp-like settlements in the salt marsh area, such as Kaart, Kinnum and Seeryp.

West-Terschelling and Midsland are densely built, the other villages have a more open structure. West-Terschelling is particularly interesting in terms of cultural heritage due to the many old houses (17th century) and of course the Brandaris (1594), the oldest remaining lighthouse in the Netherlands. The Brandaris was built on the orders of the States of Holland, when the old beacon was lost to the sea. Terschelling was then still part of Holland, and the States considered the island to be of such strategic importance (partly due to the war with Spain), that it ordered the enormous lighthouse to be built. The churchyard is also very unusual, lying at the foot of the Brandaris, where numerous images and inscriptions on gravestones refer to the maritime past of the dead. There is something touching about the graves of the unknown, which are literally left to one side.

Various land re-allotment schemes improved the agricultural structure of the island. The cranberry is an unusual agricultural crop here. It was accidentally washed ashore in the 19th century, and grew abundantly in the humid dune valleys with little maintenance. The large dune and salt marsh area in the east of the island, the Boschplaat, is a nature reserve of European stature.

Vlieland was recorded as early as 1317. For centuries there were two villages, but West-Vlieland disappeared at the beginning of the 18th century. Oost-Vlieland flourished in the 17th century since many ships would lie off Vlieland to wait for a good wind. There are a few 17th century buildings in the village, including the Tromphuis, previously owned by the Admiralty, and now a museum.

The Kroons Polders created at the start of the 20th century, on the western side of the island near the large Vliehors sand bar, are now a nature reserve. The bay itself is a military training ground. The island is prey to erosion practically along the whole length of its North Sea coast, and has to be protected by jetties.

The most important uninhabited islands and sand banks are Rottumeroog, Rottumerplaat, Simonszand, Engelsmanplaat, de Richel, het Balgzand and de Noorderhaaks. In the middle of the Wadden Sea, halfway between Harlingen and West-Terschelling lies the former island of Griend. This island was named in 1215. After the flood of 1287 less than 10 houses remained. In the course of the centuries the population continually reduced: in 1720 there was only a single house standing. Since 1916 it has been a bird sanctuary. What is now left of the island consists of a sand bank with a few low dunes and a small salt marsh. It is moving to the south east. Recently measures have been taken to combat the complete collapse of the island. In working the land people have found shards of pottery from the pre-Roman iron age which indicate that the area, situated in front of the present coastline, was habitable even then.

Rottumeroog was first named in 1354. Ownership was then disputed between two Groningen monasteries. The island was not inhabited until 1483. In 1570 the Watergeuzen had a base here. In 1628 a new schoolmaster was appointed who also had the job of wreck master. However, the island was deserted; from 1738 to 1965 only a wreck master lived there. The island is still decreasing in size and will eventually disappear into the Ems. Contrary to the wishes of those who feel involved in the history of the island, the government has abandoned efforts to preserve it.

Rottumerplaat formed to the west of Rottumeroog. Here some dunes were formed, aided by a sand dyke, and a salt marsh began to form behind the dunes. Active maintenance was continued. The island is largely famous because of

the fact that the writers Godfried Bomans and Jan Wolkers each spent a week there alone in the seventies. The peace, wildlife and bird life left a completely different impression on each of them.

4.5.4 The Wadden Sea

The processes that occur in the Wadden Sea are to a large extent determined by the tidal currents. These have made it a very dynamic area - seen in the human time-scale. Erosion and sedimentation are always occurring in different places, depending on the position and size of the sea inlets and tidal channels, and depending on the amount of sediment. Where there is vegetation to secure the washed-up sediment a salt marsh can attain a reasonable height in a fairly short time. In tidal channels and bays the old peat layers have been lost through erosion. Elsewhere the peat is covered with sand or clay layers.

The Dutch Wadden Sea Region beyond the dykes is bordered on the east by the river Ems. One of its major channels, the Bay (Bocht) of Watum, scours the edge of the dwelling mound area of Fivelingo and is responsible for the erosion there. The North Sea and the Marsdiep border the area on the west side. The intermediate area is indented with a series of sea inlets, which divide the islands and sandbanks from each other.

The last two thousand years have witnessed great dynamism in the northern coastal area. Channels moved about, islands drifted gradually to the east, and various sea bays developed to the south. In fact what we are dealing with here is estuaries, because (with the exception of the Marne bay in Fryslân) in all cases we are concerned with a broadening of the existing lower reaches of rivers. Thus the Dollard basin, Fivel bay and Hunze bay, the Lauwerszee, the Middeleezee and, largest of all, the Zuiderzee developed. Remarkably, these bays did not all come into existence at once, nor can their development be linked to periods of transgression (periods in which sea level rises relatively quickly). What we find is that the formation of the one bay sometimes coincided with the start of a hydrosere in another. The formation of the Dollard happened at the same time as the Fivel bay silted up and was gradually poldered. The development and silting-up of large marine bays has more to do with changes in the pattern of the currents in the main channels than with rises in sea level.

In the course of the centuries man has exerted great influence over the dynamics of the Wadden Sea. By building dykes around residential areas on the mainland and gradually reclaiming land in former marine bays, the natural processes were increasingly kept at bay. In fact it may be said that the mainland was separated from the Wadden (mud flat) system by dyking. The construction of a connecting dam between the Anna Paulowna polder and the island of Wieringen in 1927 and the construction of the Afsluitdijk between Wieringen and the Frisian village of Zurich in 1932 signified a huge breach in the development of the Dutch Wadden Sea Region. The Zuiderzee became a fresh water lake and was renamed the IJsselmeer. The salt marsh areas of Noord-Holland and southern Westergo in Fryslân lost their direct contact with the sea. Since then the Lauwerszee has also been dammed (1969) and of the large marine bays, only the Dollard remains.

The landscape of the Wadden Sea is subject to great changes. At high tide the area looks to the observer like an extensive expanse of water, a real sea, at low tide we see the sparkling surface of the bare clay shoals and sandbanks, cut through by large and small channels and gullies. The salt marsh with its vegetation is only flooded at very high water levels. The great open expanse is bounded by the islands and the coast of the mainland. The large numbers of birds are essential to the Wadden Sea experience: waders, gulls, ducks and geese find food and rest here. In quiet areas it is not unusual to see seals.

In terms of cultural heritage, the Wadden Sea is very important because of the shipwrecks, particularly around the larger channels which give access to the harbors inland. There are also submerged villages, which may be interesting for future research.

Shipwrecks

On Christmas Eve 1593 a severe storm blew up. No less than 44 merchant ships lying off Texel were lost. In the course of the centuries many hundreds of ships have sunk in the treacherous Wadden Sea Region. The continual shifting of the channels and shoals and the lack of buoying are partly to blame.

Practically all the major ports in our country were situated on the Zuiderzee. The IJssel towns also had to pass through the Zuiderzee before sailing overseas. There were two ways to reach the deep water of the North Sea: via the Vlie (the inlet between Vlieland and Terschelling) and via

the Marsdiep (between Den Helder and Texel). The number of wrecks is especially high along these deep channels. The Wadden Sea is therefore very important in terms of marine archaeology. Many of the wrecks are in places where they are covered with a layer of sediment, so that they are reasonably well preserved. Only when a channel moves and a shipwreck is washed free can erosion start up again and parts of the ship and cargo become scattered. The Wadden Sea is thus very important to research into the development of shipping and trade.

Recent developments

Fishing was increasingly important in the Wadden Sea from the 17th century onwards. Even today, shrimp, cockle and mussel catches are important. Due to the serious damage to the seabed, the shipwrecks and to the vulnerable flora and fauna caused by cockle fishing in particular, this type of fishing is meeting with ever greater resistance.

Tourism benefits from of the special qualities of the Wadden Sea Region. The landscape of channels, shoals and mud flats can be admired from the sea, for example from one of the old sailing boats (the 'brown fleet') which are adapted to transport tourists. 'Wadlopen' is another special activity, whereby a guide will take you for a wander around the flats, or even escort you by foot to an island. The area attracts more than 100,000 'wadlopers' (mud flat walkers) per year.

4.5.5 The embanked marshland region

The most striking characteristics of the marshland region are the elements which remind us of man's interaction with the water. In one way the water was a friend to man, for example by providing fish and the means for shipping. On the other hand, the water, and certainly the salt water, was a foe to hearth and home, agricultural land and drinking water supplies. In terms of its development, the marshland area formed a single entity with the Wadden Sea, but the construction of dykes removed it from the dynamics of ebb and flow. In fact it is a fossilized salt-marsh landscape, which is no longer directly affected by the sea.

Both periods (before and after the dykes were built) can be clearly traced in the layout of the landscape. On the one hand the development of the area as part of the Wadden Sea can still be clearly recognized by the numerous winding ditches that are remnants of former mudflat

channels. The position of dwelling mounds is an indication of the geomorphology of the area: often mounds are arranged in long rows on the old salt marsh ridges. On the other hand, the many landscape elements which relate to drainage are reminiscent of the huge efforts which had to be made to get rid of surplus rain-water after the ring dykes in the mound area were closed.

Dwelling mounds (Terps)⁹

Population density has steadily increased since the Early Iron Age. The fertile clay soils were very attractive to the farmers from the nearby sandy soils. Originally the area was only inhabited in summer. Later people began to settle permanently.

The first settlements date from around 2600 years ago. The farmers settled on the highest parts of the salt marsh; the dwelling mounds grew higher and higher as a result of the accumulation of manure, settlement waste and active efforts. The various individual dwelling mounds rapidly merged to form common village mounds. Thanks to their height the mounds offered good protection from the high water, but sometimes it was necessary to protect the farm and the surrounding fields from the sea water with a dyke. The farms were built in such a way that the living quarters were oriented towards the center of the mound while the farm buildings were further down the mound. This ensured good communication between the stalls and the surrounding pastures. Often a road was laid out at the foot of the village mounds connecting the farms together (the ox track).

As sea levels rose, the mounds had to be continually raised. This happened in a number of stages: when flooding increased the mounds were raised, in periods of relative peace no active raising of the mounds was required. However, some settlements were abandoned and gradually silted over.

If a mound was to be raised or extended this was usually achieved using manure and grass sods which were stuck onto the salt marsh. These materials ensured excellent preservation conditions for organic deposits, utensils and relics of habitation in the mounds. The environment is particularly suitable for preserving organic remains, and is thus very different from the conditions of archaeological sites on sandy soils. The artificial dwelling mounds in the former salt marsh area are thus archaeological treasure-houses which still harbor numerous secrets

about the lives and conditions of the former inhabitants.

Farmers and traders

Despite the predominance of the salt water, from the outset the farmers attempted not only live-stock but even arable farming on the salt marshes. Archaeologists have found seeds including barley, flax and beans. Of course the arable fields were on the highest parts, the high parts of the salt marsh ridges and the flanks of the mounds, since most agricultural crops cannot survive in salt water conditions.

The salt environment restricted them in other ways too. Trees and bushes could not grow on the salt marshes, so that all the wood for building houses and farms had to be brought in from elsewhere. Thus there was always intensive exchange of goods with the surrounding areas. Despite the drawbacks, life in the Wadden Sea Region was so successful that the entire area was colonized and became inhabited in the course of the Iron Age (600 - 0 BC) and the Roman Age (0 - 400 AD).

The mound area flourished in Roman times. Population growth necessitated more intensive use of the land. One method was to divide what had previously been common lands. Individual land use generally produces better yields than common use. Ditches were dug to demark individual possessions. This improved water management, which also increased yields. On the mounds ditches were dug in radii from the center to the lower levels (creating radial plots). On the salt marshes use was made of existing channels and gullies. These winding watercourses formed the core of a land-use scheme (involving the division of land into irregular blocks), which may have originated in the Pre-Roman Iron Age, and which is very characteristic of the older parts of the salt marsh area.

After the Roman era, the marshland area shared in the general economic decline. These were the turbulent times of the great migrations. Large groups of Angles and Saxons, Jutes and Frisians left what is now Germany via the mound area to Britain. Many inhabitants of the Dutch part of the Wadden Sea Region also ventured to make the crossing. Some parts of the area were depopulated.

The situation changed in Merovingian and Carolingian times. The western part of the Wadden Sea Region came to lie at the crossroads of important European trade routes: the east-west route between Great Britain, Denmark, and the

Baltic area on the one hand and the north-south route on the other, running from the Mediterranean via the Rhône/Saône, Meuse and Rhine to the Almere (precursor of the Zuiderzee) and the western Wadden Sea. This favorable position was exploited to the full by the inhabitants and their trading partners. Merchants plied up and down the trade routes always seeking goods to buy and sell. The word Fries was at that time a synonym for trader. The activities of craftsmen and tradesmen during this period led to the development of a different form of mound: whereas farming mounds were generally round, the mounds on which many tradesmen and craftsmen lived and worked were often elongated (trade mounds such as Holwerd and Appingedam). The difference between these mound forms can still be seen in the rural areas.

The population grew in numbers and wealth: parts of the Wadden Sea Region were among the most densely-populated places in North-western Europe. Through its great wealth the region became one of the main cultural centers of Europe. However, the wealth of this period did not leave behind impressive cultural monuments. Archaeological finds dated to this time do however paint a picture of far-reaching trading contacts and the high level of craft and trading activity. The numerous Romanesque churches and monasteries from a few centuries later also show that there was great prosperity in the Wadden Sea Region.

The dykes

The history of dyke building in the mound district goes back a very long way. Historical geographer Meindert Schroor distinguishes no less than 6 stages in the laying of dykes¹⁰. Parts of a dyke have recently been excavated in the Frisian village of Peins which date from the pre-Roman Iron Age. Such very old dykes are also known elsewhere in Fryslân. Presumably these first dykes protected only one or a few farms and associated fields. Extensive ring dykes were built in the 10th century which enclose different village areas. These are the oldest polders in the world: these 'core' or 'mother' polders are known from the Frisian district of Westergo. The first ring dykes, which enclosed all of Oostergo and Westergo, date from around 1100. The ring dykes of Middag and Humsterland were built at the same time. The later stages in the history of the dykes relate to building dykes to protect (part of) the bays and land reclamation works along the coast.

The construction of the dykes meant a great improvement for the farmers. Larger areas could be used for cultivation, and dairy production received a boost since the pastures in the fresh-water environment within the dykes produced more grass than when the sea water had free access. The farm buildings were no longer restricted to the mounds, although people remained loyal to the mound villages for a long time to come. After all you could never be entirely certain of the dykes: numerous eddies and pools bear witness to as many dyke breaches. These breach eddies show that man was not always successful in checking the force of the water in good time. Sometimes man was forced by such events to give up part of the enclosed land. In other places the build-up of sediment was such that there were always new polders to enclose. Former estuaries (such as the Middelzee and the Dollard) were thus re-conquered in stages and once again taken into use by the farmers. Old dyke patterns in many places tell the story of the give and take of the Wadden Sea through the centuries. Land reclamation works here and there along the sea dyke are the last stage in the history of land reclamation.

Reclamation was an exceptional activity. Various methods were used (see inset) to trap as much silt as possible. Next the silt was spread out over the salt marsh. If after some years the salt marsh was raised high enough a new sea dyke could be constructed.

Hydraulic works began to be carried out in connection with the construction of the dykes, such as sluices and dyke locks (zijlen). In some parts of the marshland areas monasteries made a significant contribution to the construction of dykes and the associated hydraulic works. The Aduard monastery owned more than 10,000 hectares of land in the 14th century, and built dykes and sluices in the Reitdiep basin in Groningen.

While agriculture benefited greatly from the dykes, trade in advance did not. The construction of continuous dykes meant that many villages lost their open connection over water with the Wadden Sea and so also with the trade centers further afield. Economic life underwent radical change, and the major shipping and trading activities gradually became concentrated in the existing small towns on the coast or in new dam and lock villages. Complex, small-scale economic activity became more concentrated, and for successful development the new economic centers in the Wadden Sea Region clearly could not

compete adequately with the other similar centers in the surrounding area. The consequences of the disappearing links by water were of course most heavily felt in the mound villages themselves, and particularly those which were devoted to trade and industry. This was partly compensated in the course of time by the development of an ever finer network of canals and waterways. Continuous canals were constructed for long-distance traffic. The Delf was dug in Groningen as early as 1200, forming the connection with the Reitdiep, the Fivel and the Dams-terdiep. Thanks to this direct link, the town of Appingedam flourished in the 13th century. Further direct links were created later, like the 17th century boat canals. Approaches were dug to connect individual villages: dead-end waterways which connected a village to a through canal. Later these approaches were used to supply mound earth to the impoverished sandy soils. A great number of terps were wholly or partially leveled in the period from 1850 to 1940 (see inset).

The churches

In the Early Middle Ages missionaries like Boniface and his followers sought to bring Christianity to the inhabitants of the Wadden Sea Region. Many village churches were built. The first churches would have been simple wooden halls but these were gradually enlarged and replaced by buildings which were erected with tuff stone and brick. Tuff stone had to be transported a long way (from the Eifel) and was used until the beginning of the 12th century. After that brick became the main building material, using local clay as the raw material.

Church-building gradually extended further, since every village of any size wanted its own parish church. It is striking that these churches stand at the center of the mound villages. As the dwelling mounds grew, the farms moved further and further towards the edge, leaving room for churches to be built in the center. It is likely that this central space had previously housed the pond (dobbe), which served as a fresh water reservoir for the village.

The old stone churches were built in the Romanesque (or Norman) style. This is further confirmation of the trading links with southern Europe where this architectural style had been in use for far longer. The different orders of monks (particularly the Cistercians and Premonstratensians), who settled in the region from the second half of the 11th century made an impor-

tant contribution to the dissemination of (late) Romanesque architecture. As a result of this large-scale building activity the Wadden Sea Region has a remarkably high concentration of Romanesque buildings.

Floods and loss of land

Man played an important role in wresting new land from the sea, but also contributed to the loss of land, in three different ways: by neglecting the dykes, by extracting salt, or by opening up the peatlands.

Dykes were neglected mainly in times of economic hardship and in wartime. The great loss of land due to the Dollard breach is often attributed to poor dyke maintenance during the struggles between the Schieringers and the Vetkopers (grey monks and cattle-fattening monks). Whether this really was the reason for the incursion of the Dollard is not sure: the often mentioned date of the incursion, 1287, cannot be proved by historical sources and more probably the incursion of the Dollard occurred in the fifteenth century.

Salt extraction was an important economic activity in the coastal region. The form it took was unusual. Whereas elsewhere on the European coast salt was obtained by evaporating sea water in salt pans, in the Wadden Sea Region it was obtained from peat. In places where the sea water came into contact with peat, the peat absorbed some of the salt and it was profitable to use this salt peat for salt production. The peat was thus cut away, dried, bathed several times with sea water and dried until it was saturated with salt. Next the peat was burned and the salt was taken from the ashes. In the Wadden Sea Region this was the only available source of salt. Since a large population had to be supplied with salt, its extraction had serious consequences for the landscape. The cutting of the salt peat layers was practically an invitation to the sea to penetrate further inland. Numerous disastrous floods were caused by salt extraction. In some places traces can be found of this activity in the form of organic deposits or in the form of plots with a great deal of micro-relief. In the north-east of the province of Fryslân alone some 3000 hectares of peat were dug for salt production¹¹, including the low-lying area of De Kolken, between Anjum and Ee.

In addition to salt extraction, agricultural use also lowered the level of the peat areas. The lowering of the groundwater level, which was necessary for agriculture, caused setting of the soil.

Furthermore, the increased aeration of the soil led to oxidation of the semi-rotted plant remains, from which peat was formed (see inset). The two processes reinforced each other and led to a lowering of the surface sometimes of as much as a few meters. Clearly this made such areas vulnerable to the sea.

Polders and 'droogmakerijen'.

The Netherlands has 445 'droogmakerijen', with a total area of over 310,000 ha¹². A droogmakerij is not the same as a polder. A droogmakerij is all or part of a lake or sea which has been drained by pumping. A polder is a piece of land on which the water management is controlled independently of the surroundings. Each droogmakerij is a polder, but not every polder is a droogmakerij. Polders can also come into being through dyking a piece of marshland, which is reclaimed by a dyke or embankment, such as the Wieringerwaard, the Bildt polders and the Dollard polders.

In the Netherlands we distinguish four important periods in which lakes or seas were drained. The first period is the experimental stage, from 1533 to 1565. During this period a number of small lakes in the neighbourhood of Alkmaar were drained. The second period is at the beginning of the 17th century, in which the large lakes in Noord-Holland such as the Beemster (1608-1612), the Purmer (1618-1622) and the Schermer (1633-1635) were created with the help of polder mills.

The third period is in the 19th century, in which among others the Haarlemmermeer (1840-1852) and the IJpolders near Amsterdam were drained by steam engines.

The fourth period is in the 20th century, in which the vast reclamations took place within the framework of the Zuiderzee Project. The Wieringermeerpolder was the first large polder to be drained (1927-1930), before the Afsluitdijk was completed (1932).

There are no large droogmakerijen in the terp district, though a number of small lakes or meres were drained. Examples include the Greate Wergeastermar (195 ha, drained in 1637), the Huningameer (520 ha, 1666), the Hemsermeerpolder (93 ha, 1784/85), the Wieuwertermeer (8 ha, 1834), and the Proostmeer (51 ha, 1870).

The landscape today

The marshland region consists mainly of large open spaces. Large-scale agriculture is practiced on more recent reclaimed polders which have risen high by accretion, as in North Groningen, Oldambt and Het Bildt. The rest of the area is given over to grassland. In these large green spaces the villages rise like green, enclosed islands. Sometimes the mound villages are close together, for example on the salt marsh ridges, but some are very isolated. In the winding ditches and elongated depressions we can recognize the former channels in the mud flats, from which the fertile clay was formerly removed. The dykes can be seen from a great distance and are valuable landmarks, both for orientation in the cur-

rent landscape, and for orientation in time (the high actual sea dykes and the lower, occasionally broken, inner dykes). In spring and summer the vast grasslands are the domain of the meadow birds. In the winter large numbers of geese, ducks and swans descend on the green plains.

4.5.5.1 Groningen

The Pleistocene hinterland is generally fairly flat, with the exception of a low outcrop of boulder clay near Winschoten and the Hondsrug, between the rivers Hunze and Drentse Aa, which runs right into the salt marsh area, without a transitional peat zone. The town of Groningen grew up on the furthestmost point of the Hondsrug, along the Drentse Aa.

In the old marshlands we can distinguish different sub-regions. From east to west: Oldambt, Fivelingo, the Reitdiep area (Middag, Humsterland and Marne) and the Lauwerszee area.

The oldest permanent settlements began in the districts of Fivelingo, Middag and Humsterland where large mounds developed. Excavations have brought Middelstum-Boerdamsterweg and Ezinge to light. Archaeological finds during the excavation of the mound earth show that Ezinge was one of a group of eleven mounds which developed in parallel and are all on the left bank of the Hunze.

In the late Iron Age and Roman times habitation expanded strongly and many new mounds developed, particularly along the right bank of the Hunze, along the edge of the Fivel bay and along the Ems. The mounds between Termunten and Pogum in the German Rheiderland were lost through the penetration of the Dollard.

Many newly established flat settlements and low mounds had to be rapidly abandoned. Examples have been found in Paddepoel, a district in the north of the town of Groningen. A new generation of mounds appeared on the salt marsh ridges which had formed through accretion in the Early Middle Ages to the north of the lower reaches of the Hunze, in the Marne region. An example of these has also been excavated: the Tuinster Wierde near Leens. Finally in the later Middle Ages a few further house mounds were built in the Fivel region which was then silting up.

Many mounds were wholly or partially leveled when they were dug up for their rich soil. The mound earth was transported by boat along the natural watercourses, the former gullies (sometimes called 'maren'), or along specially

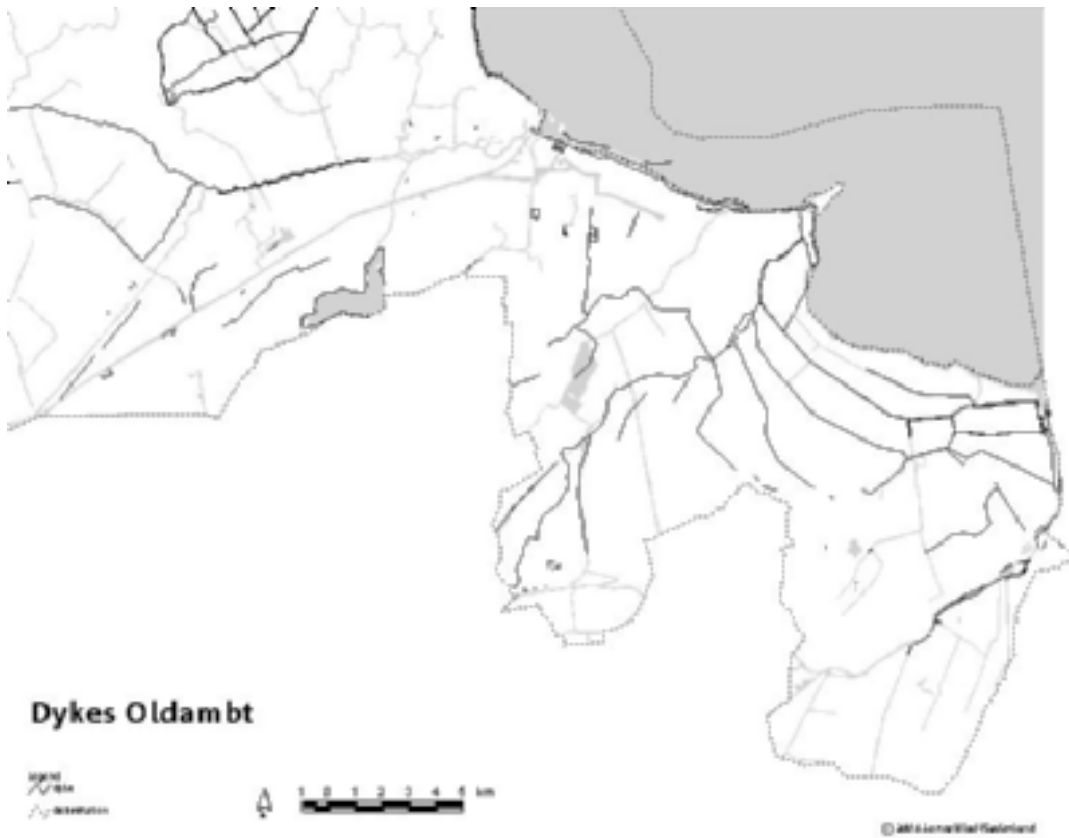


Fig. 4.85:
Dykes in the Dollard basin,
Oldambt

excavated canals or widened ditches. The entire region is criss-crossed with waterways, which are important for drainage and have increasingly been used for boat tours.

Oldambt

The Oldambt is the region to the south of the Dollard. It consists of a few low ridges of boulder clay and wind-borne sand, separated by valley-shaped depressions. The ridges grow gradually smaller to the north until they disappear under the clay deposits of the Dollard. Prehistoric relics have been found in places on the surface of these ridges: a Bronze Age urnfield in Zuidbroek and the megalith of Heveskesklooster from the Neolithic Age, buried under 4 meters of clay.

The depressions between the boulder clay and wind-borne sand ridges, as well as the area north of it, were previously covered with peat. This peat region was inhabited in the Middle Ages, as elsewhere in the Wadden Sea Region. The surface was lowered considerably by agricultural use and salt extraction. This decline, combined with poor dyke maintenance, gave the sea a free hand and many large parts of the region were lost.

In the course of the Late Middle Ages there were various storm surges. As said before it's not sure which flood formed the Dollard bay, but most probable is a flood in the fifteenth century. The Dollard was at its largest at the beginning of the 16th century. When it flooded, the seawater penetrated deep into the land via the depressions of the Munter Ee/Oude Geut and the Westervoldse Aa. These two depressions were separated from each other by the low boulder clay ridge on which Heiligerlee and Winschoten are located. At the time of the maximum expansion of the Dollard this area lay like a peninsula in the water. It is thus sometimes referred to as the 'island of Winschoten'. Here lie the elongated villages of Eexta, Scheemda, Midwolda and Beerta. Some of these villages were previously located more seaward on the peatland. Under the influence of the advancing sea some of these villages were moved landward, while other villages completely disappeared.

From the 16th century on man began to win back the lost territory. The oldest dyke in the western depression is the Scheemderhamrik, which dates from 1542. In 1597 the Scheemderzwaag polder was enclosed by dykes. The area was then reclaimed in seven more

stages, the most recent reclamation being the Carel Coenraadpolder of 1924. More and more silted up salt marshes were dyked in and added to the existing mainland, with the former sea dykes changing into inner dykes. Unfortunately, many of these old dormant dykes have disappeared.

Brickworks

In many places in the Wadden Sea terp and wierde area, clay was extracted for brick-making. The technique of baking bricks was introduced by the monasteries. The clay pan soil, which was deposited by the sea in the lower-lying parts of the marshlands, was an ideal raw material. The clay was dug out, worked into the right shape, dried and finally baked in field kilns. Initially only small quantities were produced. As yet few buildings were made of brick: in the late Middle Ages only monasteries, churches, and manor houses ('stinsen' = brick houses) were built of brick. However, gradually more and more town houses were built of brick (much encouraged by fire regulations) and large-scale brick-making began. Permanent brickworks were founded in which specialist brick-makers from Germany played a prominent role. In addition to the brickworks, businesses also sprung up which made roof tiles and - in the 20th century - drainpipes. A big reorganisation of the brick-making industry in the second half of the 20th century led to the closure of a large number of firms. Many traces can still be found of this activity, which was highly characteristic of the terp and wierde area. Many of the associated buildings - drying sheds, kilns and chimneys - have been converted to other uses.

Fivelingo

The name 'Fivelingo' refers to the area to the north-east of the city of Groningen, from the Punt van Reide in the east to the area surrounding Westernieland, near the former mouth of the river Hunze. The Fivel and the Hunze were rivers which drained the broad peatlands and the Pleistocene hinterland. The river Munte (now renamed Termunter Zijldiep), which flows into the Dollard near Termunterzijl, also belongs to this sub-region. Unlike the Munte however, the Fivel has largely disappeared from the landscape. In the Early Middle Ages the mouth of the Fivel was cut away by the sea and changed into an

extensive estuary, the Fivel bay. At the time when it was at its largest, the water must have reached past Ten Post. The oldest dwelling mounds in the area lie in long rows on either side of this estuary, on the high salt marsh ridges. On the western side the series of mounds extends from Lellens to Usquert, on the eastern side from Ten Post via Loppersum and Leermens to Spijk and Hoogwatum. The Fivel bay began to silt up at the end of the Early Middle Ages, particularly on the western side. A new series of villages dating from that time (from Stedum in the south to Oldorp in the north) shows that people started making use of the fertile marshland soil. From the 12th century onwards the rest of the bay was dyked in, bit by bit, until in 1444 there was a dyke from Godlinze to the coastal ridge of Uithuizermeeden and Roodeschool, so that the Fivel bay was no longer subject to the influence of the sea. Winding watercourses, which are locally referred to as 'maar' and 'tjariet', removed surplus water from the land. Further land reclamation took place in stages from 1718 (Oostpolder and Polder Vierburen) to 1944 (Emmapolder). The design of these fairly recent polders to the north of Roodeschool and Uithuizen is characterized by a striking pattern of roads fanning out to the north, to which the layout of the plots is adapted.

To the south of the actual Fivel bay there is a somewhat lower-lying zone with scattered dwelling mounds. To the north-west of Delfzijl there were fine villages of such mounds, such as Marsum and Biessum: radial land-divisions on the mound, an ox track at the foot, farms built neatly in a circle along the ox track, radial land-divisions which in part extended beyond the mound. Marsum is still very beautiful, Biessum has lost much of its attraction now that it is surrounded by the new urban developments of Delfzijl.

The towns of Appingedam and Delfzijl are also located in this low-lying zone. Apart from Groningen, Appingedam is the only settlement in the province which obtained a town charter (1327). A trade settlement developed on a terp near the first dam in the Delf which flourished in the 13th century. However, the sluice was soon removed to the east and economic activity moved with it to the new discharge point, Delfzijl. In the 16th century Appingedam was economically eclipsed by Delfzijl. Appingedam is characterised by the densely-built houses on the Damsterdiep, with the backs of the houses projecting over the deep. Delfzijl was strategically

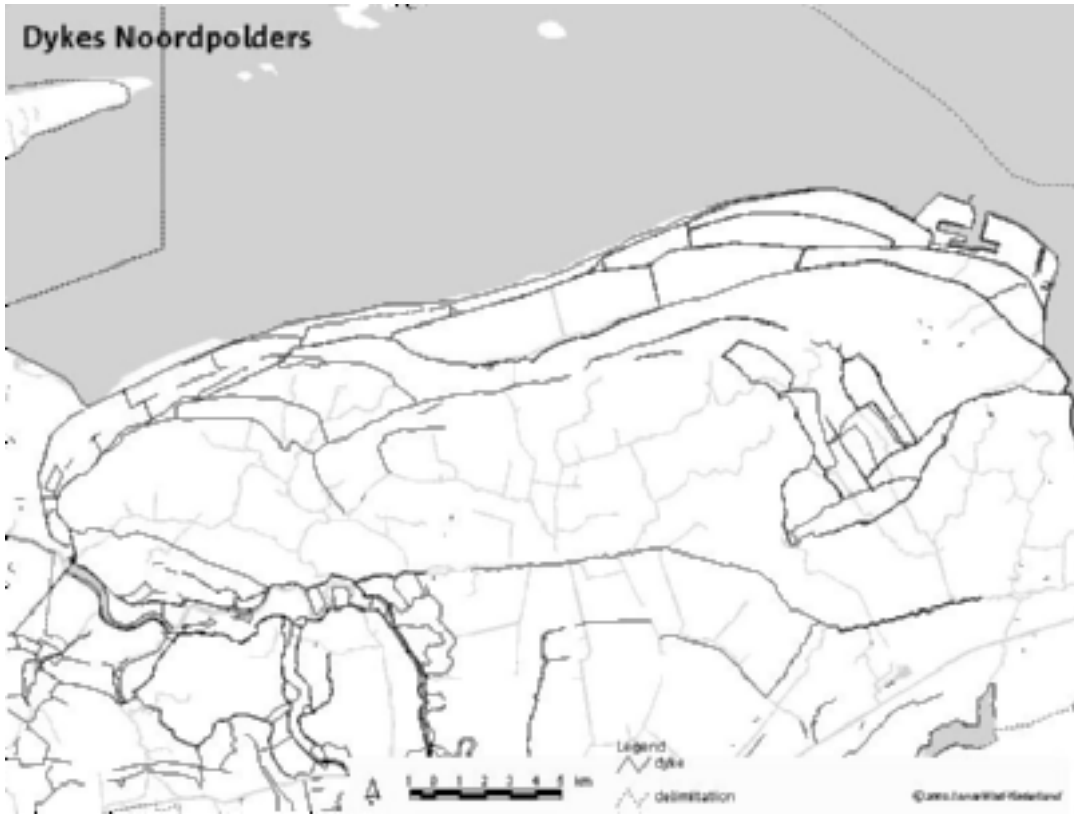


Fig. 4.86:
Dykes in the north of
Groningen

important for military purposes because of its position at the mouth of the Ems. Charles V built a redoubt here as early as 1536, and this became an important stronghold in the Eighty Years' War.

Boat and ship canals

As the towns grew and industry expanded there was a need for rapid and regular transport. This led to the introduction of regular barge services sailing from set places at set times to agreed destinations. In the second half of the 17th century there was a seemingly modern network of through waterways not only in the Western Netherlands, but also in the provinces of Groningen and Fryslân. Some of these waterways, such as the Stroobossertrekvaart (1652), had been newly dug, others were based on existing watercourses, such as the Damsterdiep, which was converted into a boat canal in 1650, and the Bolsward boat canal (1648).

The profile of the boat canals in Holland, Fryslân and Groningen is practically the same throughout. The breadth at water level was fifteen to eighteen meters and the depth around two and a half meters. The dredging from the works were used to erect a narrow quay on one side. Another quay was made on the other side,

but this was far wider, providing space for a tow-path of around 7 meters in width. A drainage ditch was dug behind the towpath.

Trekschuiten (tow barges) were long narrow boats with a covered part with room for 30 to 35 passengers. These barges had a three-man crew. The skipper and his hand worked on the boat itself. The jager (hunter) rode the horse along the towpath. The jager was usually a young lad, but had to be over eight years old.

Although by our standards the barges traveled extremely slowly, it was a fantastic improvement for the 17th century. Before then people had to travel by coach, which was not particularly pleasant on the unpaved roads of the day. Rather the barge anytime! The smooth movement over the water even made it possible to write letters, as Nicolaas Beets remarked in his *Camera Obscura*.

Reitdiep area

The Reitdiep area, sometimes referred to as Hunsingo or the northern Westerkwartier, consists of a number of large, old marshlands surrounded by the former marine bays. The oldest of these bays is the estuary of the river Hunze, which into the Early Middle Ages flowed to the north-west and discharged into the sea around Nijenklooster.

Dykes and watermanagement Middag-Humsterland

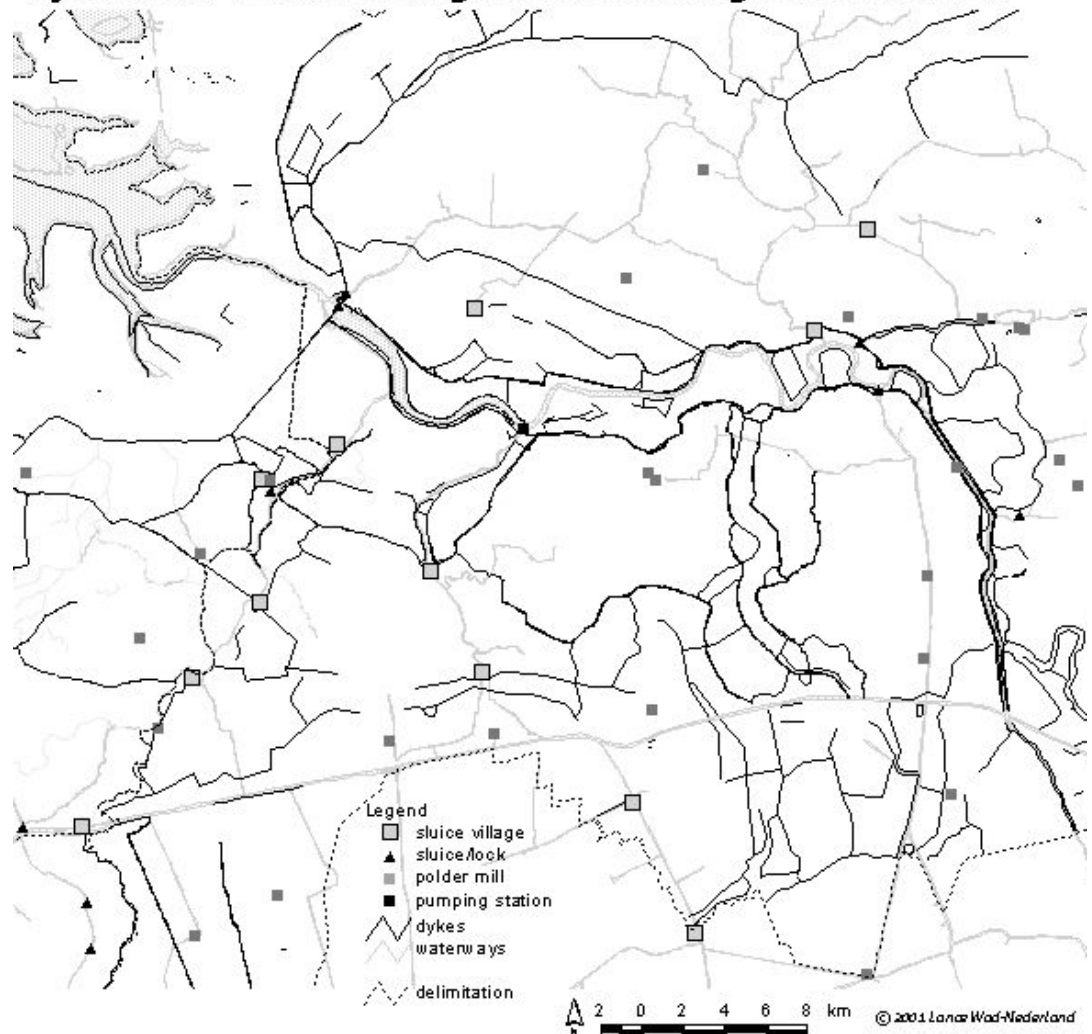


Fig. 4.87:
Water management in the
Middag-Humsterland area

Between 700 and 1000 AD the estuary of the Lauwers was formed more westerly, which penetrated the land through a number of channels. One of these channels adjoined the lower reaches of the Hunze, causing the Hunze to branch off to the west and discharge into the Lauwerszee. The former mouth of the Hunze silted up and was finally completely closed off by the salt marsh ridge of Pieterburen and Westernieland. The rivers Drentse A, Eelderdiep, Peizerdiep en Wolddiep (Oude Diep) which still flowed from the Drenthe plateau, now became left branches of the Reitdiep - as the Hunze below Groningen was called from that time.

In this sub-region of the Groningen marshland area dyke building also began with the construction of ring dykes around groups of villages. Such dykes were laid around the nuclei of Middag and Humsterland in the 11th or 12th century. The Marne area, to the north of the Reitdiep, is also

supposed to have had such a ring dyke. The oldest continuous sea defense dyke along the North Groningen coast was built around 1200.

In 1877 a dam was constructed in the Reitdiep. Until then the ebb and flow had been able to reach the town of Groningen. The drainage of the hinterland was controlled by polder boards (zijlvesten). Along the course of the Reitdiep they built a series of dyke locks (zijlen): along the left bank the Kommerzijl and the Aduarderzijlen, into which the Aduard Deep - dug by the Aduarder monks in the 14th century - discharged, and along the right bank the Wetsingerzijl, the Schaphalsterzijlen, the Schouwerzijl and the Houwerzijl. The preserved locks are a monument to the constant efforts which had to be made in the past to keep the water under control. Often the fine lock houses ('zijlhuizen') where the 'zijlwaarder' or lock keeper lived, are preserved too.

Nowadays the old nuclei, Middag, Humsterland and the southern part of Marne, are part of a small-scale landscape with small villages, pastures and irregular plots. Numerous depressions indicate the course of the old channels. To the north the land division becomes increasingly regular. There is a clear difference between the old marshland nuclei and the later salt marsh ridge of Pieterburen and Westernieland, which is expressed mainly in the way the land is divided into plots. The polders reclaimed from the sea in the last centuries are even more regular and encircle the older land. Particularly where the polders form connecting layers and the dykes are preserved, a very typical landscape has come into being which is in stark contrast to the dwelling mound landscape behind it.

Lauwerszee area

On the map the former, as yet undammed Lauwerszee looks a little like the body of a squid, with the tentacles formed by the rivers that flow into it. The Rietdiep discharges into the Lauwerszee near Zoutkamp, the river Lauwers near Munnikezijl, the Dokkumer Ee at the Dokkumer Nieuwe Zijlen and the Zuider Ee at Ezumazijl. After the damming of the Reitdiep in 1877 sluices were also built near Zoutkamp. The water of the Lauwers now entered the Lauwerszee via the Friese Sluis, the Provinciale Sluis served the Reitdiep and the Husingosluis formed the link with the Husingo Canal. When we also consider that there is a further sluice complex within the enclosing dam of the Lauwerszee, it becomes clear that the Lauwerszee area is characterized by an abundance of hydraulic engineering works. The old marine bay, which came into being in the Early Middle Ages, was closed off from the Wadden Sea by a dam in 1969. Since then the water level in the newly created Lauwersmeer has been kept at 1 meter below NAP (Amsterdam Ordinance Datum). As a result former salt marshes and sandbars were drained. Part of the area has been given over to agriculture, part is in use as military training area while the rest is forest and nature area. A new port has been created near the sluices, which took over the role of the former fishing harbor of Zoutkamp. Next to the new port the youngest village in the Netherlands, Lauwersoog, has developed.

Land reclamation

The deposition of silt on the salt marshes against the sea dyke was promoted by specific measures, so the salt marsh reached the required height more rapidly, and could be made into a polder. Two methods were used. The farmers' method was used from the beginning of the 19th century. In this method, pits were dug in the salt marsh to catch the silt. When the pits were full the silt was distributed over the marsh and the process could be repeated, just until the salt marsh was high enough. In the 1930s another method was adopted: the 'Schleswig-Holstein method'. Here the salt marsh was divided into settlement fields of roughly 400 by 400 meters, which were surrounded by earth embankments or brushwood screens. Ditches were dug in the fields perpendicular to the coast into which the silt could settle. Once or twice a year the silt was shoveled out of the ditches and spread over the salt marsh.

4.5.5.2 Fryslân

The marshland area in the province of Fryslân, between the Lauwerszee and the IJsselmeer, is divided in two by the former Middelzee. This former bay is in fact the estuary of the Boorne, a river which runs from the edge of the Drenthe plateau. It forms a boundary between two sub-regions Oostergo and Westergo. Important areas within these old marshland areas are the depression of the Dokkumer Ee in Oostergo and the Marne, a former marine bay in Westergo.

The marshland area gradually gives way to the flat hinterlands covered with vast peatlands, in which also a number of low-lying parallel ridges of boulder clay and wind-borne sand can be discerned. The ridges are oriented northeast-southwest, as in Groningen and Ostfriesland. One of these ridges, directly to the south of the upper reaches of the Boorne, continues a long way to the southwest and ends in a considerable outcrop, rising to more than ten meters above NAP. This outcrop is Gaasterland, which lies like an island in the peat land. In geological terms Gaasterland is comparable to the Pleistocene boulder clay islands of Wieringen and Texel, but it has never been entirely surrounded by sea, although a cliff coast was formed on the south side following the incursion of the Zuiderzee.

As in the Groningen marshland area, the oldest settlements in the Frisian area date back to the early Iron Age. This applies both to the central areas of Westergo and to the northern part of Oostergo. In this last area a few very high mounds were created. Hogebeintum, at almost 9 meters, is the highest mound in the entire Wadden Sea Region. The Frisian region also saw a broad expansion of habitation in the late Iron Age and Roman times as well as colonization of the newly reclaimed salt marsh ridges in the northern part of Westergo in the Early Middle Ages.

Differences in the physical condition and in the history of habitation made that there are strong contrasts within Fryslân in the appearance of the mound landscape. The relatively far-flung high mounds on the curved salt marsh ridge in northern Oostergo contrast sharply with the far more dense network of scattered, largely low mounds in central Westergo and the strings of low mounds on the salt marsh ridges of northern Westergo.

Some mounds are built in an elongated shape, which can also be seen in a few German trading mounds. Holwerd is one such. In this context Oldeboorn is also interesting: it lies on the Boorne, and may well have played an important role in the colonization of the peatlands upstream.

In the Frisian mound district too, dyke building began with ring dykes to protect houses, livestock and arable land. The 'mother polders' in Westergo are probably the oldest polders in the world, if we disregard the small embanked areas from the pre-Roman era. The oldest continuous sea dykes date from around 1100. The southern part of the Middelzee, in-between Oostergo and Westergo, was already poldered in the Late Middle Ages. The most recent polders, collectively forming Het Bildt, date from post-1500. They are laid out in very regular patterns.

While the entire North Groningen coast, except along the Ems, is surrounded by layers of several recent polders, this is far less common in Fryslân. Here the mound district stretches in various places as far as the current sea dyke, as in Oostergo near Paesens and Wierum and in Westergo in the whole area between Harlingen and Makkum. Where recent polders exist, the polders directly adjoin the villages and are no more than one and a half kilometers deep. The oldest dyke trace often formed a direct link between the mounds or was not far outside them.

While the town of Groningen, located on the Hondsrug, became an important political and economic center for the Groningen mound district, in the Frisian mound district this role was fulfilled by towns which grew up in the mound district itself. The most important are Dokkum and Leeuwarden in Oostergo, and Franeker and Bolsward in Westergo. Next to these towns grew up along waterways in the adjoining peat lands such as Sneek and IJlst, or on the Zuiderzee coast, such as Harlingen, Workum, Hindeloopen and Stavoren.

Oostergo

The marshland area of Oostergo is a 10 - 15 km wide zone, which lies in a great arc around the boulder clay and wind-borne sand landscape of the Frisian forests. On a fairly high salt-marsh ridge along the current sea dyke and the former Middelzee lies a spectacular series of mound villages from Leeuwarden to Ternaard. These are villages of a reasonable size, set about 2 to 3 km apart. Their relatively high position means that the salt marsh ridge is mainly used for arable farming. To the east of Ternaard the salt marsh ridge is less striking, but even here there are villages on the ridge, which veers off to the south in a gentle curve.

The land divisions on the ridge are fairly regular and are not dissimilar to those of the more recent reclamations, which lie like a narrow shell abutting the old land. To the southeast the land is lower-lying. The villages here are smaller and the mounds rise strikingly out of the landscape. The pattern of land division formerly showed irregular blocks, but reallocation schemes in recent decades have spared only small parts of the original layout. This area is used largely as grassland. In the depressions we find traces of natural watercourses: the Dokkumer Ee, Dokkumer Grootdiep, Zuider Ee and Paesens. From the Dokkumer Ee, which previously formed an important link between Leeuwarden and Dokkum, various access ways lead to the different mound villages in the north and to the villages on the edge of the sandy area.

Two of the settlements in Oostergo grew into towns: Dokkum and Leeuwarden. Dokkum is known primarily for the fact that St. Boniface was murdered there. The veneration of this saint has over the centuries brought many pilgrims to the site of his martyrdom. The town flourished on trade from its favorable position at the mouth of the Dokkumer Ee. The typical hexagonal shape of the town center emerged in 1582, when ram-

parts were erected in great haste. Fryslân had aligned itself in 1580 with the insurgent provinces, while Groningen remained Spanish until 1594. Shortly after that, in 1583, a sluice was built which still occupies a striking place in the center of the town. Later new locks were built 10 kilometers to the east of Dokkum: Dokkumernieuwezijlen (Dokkum new locks). The gates were broken off the defences, but the ramparts are largely in tact. The eastern bulwark was transformed into a public garden in the 19th century.

Leeuwarden grew up where the river Ee, that formerly discharged into the Middelzee. The layout of the town is still determined by the course of the Ee and by the three mounds from which the town grew. As early as the 11th century, Leeuwarden was an important center of trade, manifest in the fact that it obtained mintage rights. The town gradually expanded and developed into the capital town of the province. This is seen most clearly in the many secular buildings, such as the Stadhouderlijke Hof (Stateholder's Court), the chancellery, the weigh house and the town hall. And of course the Provinciehuis or county hall. In 1580, during the Reformation, the residence of the abbot of the Bergum monastery was confiscated and was converted in the State Room, where the provincial government since that day meets.

Roodbaard

A man who put his own special stamp on the wierde and mound district was the landscape architect Lucas Pieters Roodbaard. Roodbaard designed dozens of parks and gardens in the north of the Netherlands. He was born in 1782 in Rolde, Drenthe. His father worked as a gardener in Assen and the young Roodbaard followed in his footsteps. He developed a very original style of landscape architecture, in which the forms of the English landscape style were combined with the features of the original landscape. The gardens of Roodbaard and his followers in Groningen were known as 'slingertuinen' (garland gardens). In 1819 Roodbaard and another landscape architect were commissioned to draw up designs for the prince's garden in Leeuwarden. This beautiful garden had been given to the town a few years before by William I on the condition that the garden would be maintained. Around 1824 Roodbaard went to live in Leeuwarden and was involved in plans to landscape the ageing

ramparts. In the green belt which thus arose around the town, provisions were also made for building works which were then sorely needed. In 1830 Roodbaard drew up the design for the Municipal Cemetery on Spanjaardslaan. His plan was implemented in the next few years with a few adjustments. The cemetery was given the aura of a park through a romantic, pseudo-natural layout. The commendations received at the time indicate that Roodbaard's design was a great success. Shortly afterwards Roodbaard also designed a promenading park on the former graveyard in the Oldehoofsterkerkhof (Oldehoofst churchyard).

Around the same period, Roodbaard also worked on private gardens in and beyond Leeuwarden. Roodbaard had a good reputation, not only in Fryslân, but also elsewhere. The Frisian nobility in particular had the gardens for their country seats designed by Roodbaard. He thus gave shape to Beetsterzwaag, Oranjewoud, Wolvega, Oentsjerk and Hoogbeintum, among others. Outside Fryslân a further three gardens were made to his designs in Appingedam, Paterswolde and near Assen. Roodbaard died in 1851 at the age of 69. His name however lives on in his unique designs.

Middelzee

The Middelzee was the estuary of the river Boorne, which probably already existed around 500 BC, but gradually spread out further and further inland. It formed the boundary between the districts we now know as Oostergo and Westergo. Around the year 1000 a western branch in the neighborhood of Bolsward linked up with another estuary that came from the west, the Marne. Westergo was then entirely enclosed by water, or at least by salt marshes which were flooded at high tide.

The ring dykes of Oostergo and Westergo came into being in the 11th century, and at the same time the Middelzee began to silt up. Bit by bit the old tidal inlet was embanked and the reclaimed land converted into farmland. To the east of Bolsward, where the former Middelzee widened, the new village of Nijland (Newland) grew up in the new polder. Further to the north the Middelzee was narrower and the reclaimed land was used by the villagers on the adjoining 'old land'. In the embanked Middelzee a ditch

was dug to form a boundary between Oostergo and Westergo: the Zwette. In later times the Zwette was widened to become a boat canal between Sneek and Leeuwarden.

At the end of the 13th century the inlet had been impoldered as far as the Bildtdijk/Skrédyk (between Beetgum and Britsum) and taken into agricultural use. The marshland area to the north of the dyke continued to silt up and in 1505 the Oude Bildtdijk was erected, reclaiming a good 5000 hectares of agricultural land from the sea. Three villages were founded (Sint Annaparochie, Sint Jacobiparochie and Vrouwenparochie). The new inhabitants came for the greater part from outside the region, which explains the difference between the Bildt dialect and the elsewhere spoken Frisian language. The land was divided in a fairly rational way, though still far less strictly than the old Mastenbroek polder near Zwolle and the later reclamations in Noord-Holland.

Farms were built along the roads, which formed a rectangular pattern. Along the sea dyke habitation arose in Oude Bildtzijl and Nij Altoenae.

The next step was the building of the Nieuwe Bildtdijk (also called the third sea dyke) in 1600. It is noteworthy that the farms in this newly reclaimed area are mainly in the center of the polder, with access roads linked to the through road on the Oude Bildtdijk. The construction of the Poldijk (1715) and the Noorderleegdijk (1754) were the last stages in the reclamation of the Middelzee.

The creation of polders and the continuing silting up of the salt marshes meant that adjustments had to be made to the drainage systems. Het Bildt originally drained into the sea via a sluice in the Oude Rijd near Oude Bildtzijl. In 1600 a sluice was built in the Nieuwe Bildtdijk (at Nieuwe Bildtzijl), but even in 1655 there were already drainage problems due to the high-



Fig.4.88: Water management in Middelzee and Westergo

ly silted up salt marshes. After that the water was for centuries carried off via the old land of Westergo and Oostergo, until a pumping station was built at the Zwarte Haan in 1970 to discharge the superfluous rainfall.

A peculiar feature of both the Oude and Nieuwe Bildtdijk is that the - often monumental - farms are on the south side, at the foot of the dyke, while the workers' housing was built on top of the dyke, on the north side of the road.

Mennonites

The many Baptist Chapels are significant elements in our cultural heritage. The churches of the followers of Menno Simons (Baptists or Mennonites) can be found in many places in the Wadden Sea Region. According to their article of faith, Baptists could not fulfill any role in government, and refused to take oaths or carry weapons. This meant that there were numerous jobs they could not do, and forced them largely into the liberal professions. There was however plenty of scope for people in the liberal professions in the Wadden Sea Region in the 17th and 18th centuries. The Baptists became craftsmen, artists, traders, textile merchants, brewers and eventually even bankers. We find Mennonite chapels on almost all of the islands, such as the handsome examples in Hippolytushoef (Wieringen), Den Burg and Oosterend (Texel). But Fryslân is of course the real home of the denomination.

Menno Simons was born in 1496, the son of a farmer in the Frisian village of Witmarsum¹³. He lived in very turbulent times. Fryslân was ravaged by political unrest and acts of war. Menno came fairly late to the calling of priest. He was already 28 years old when he was ordained as a priest in Utrecht Cathedral. Menno Simons took the post of curate in the village of Pingjum. In 1532 he moved from Pingjum to Witmarsum where he was parish priest.

Menno Simons began to doubt Roman Catholic doctrine concerning the Communion. Through contacts with Baptists he began to immerse himself in the sacrament of baptism. He could find no basis in the bible for the baptism of children. On 31 January 1536 he left the presbytery and joined the Baptists.

Under pressure from his persecutors, Menno had to lead a wandering life. He lived for a time in Cologne and in Wismar on the Baltic, but he was continually forced to flee. He also returned to Fryslân from time to time. Finally, in 1554 Menno found refuge in Wüstenfelde, near Oldesloo, halfway between Hamburg and Lübeck on the Fresenburg estate of Graaf Von Ahlefeldt. Nearby was the Mennokate, a small house where he had his printing press.

He died in 1561. In the garden behind the Mennokate is a stone bearing a plaque which reads:

Hier lebte, lehrte und starb Menno Simons, in demuth fromm und still. (Here lived, taught and died Menno Simons, in humility devout and quiet)

In the early days of the Baptist faith in the Netherlands many adherents were persecuted and put to death for their faith. They met in secret in remote places in the middle of meadows and sometimes on boats. Naturally there are no churches remaining from the earliest days of the Baptists. They did not dare to build them. Even when the worst of the persecutions stopped, Baptists were still not allowed to build churches which could be recognized from outside. They had to look like ordinary dwelling houses, preferably away from the street, and they must not have towers or steeples. The Baptists in the Netherlands did not receive civil rights until the advent of the French in 1795. One of the most typical churches-in-hiding is Menno's Formanje (Chapel) at Pingjum. There is nothing to distinguish this church from a dwelling house on the street. It dates from around 1600.

Westergo

Westergo is the most extensive part of the marshland region of the Netherlands. It is not surprising that it also has the most mounds. The structure of the landscape in Westergo is largely determined by the former bays, channels and depressions. The Middelzee used to form the eastern boundary of Westergo. It connected with the Marne in the neighborhood of Bolsward. The Marne was a channel which already existed in Roman times. Then the channel formed part of the drainage system of the Flevomeer. Although



Fig. 4.89:
Dwelling mounds in
Westergo

the Vlie took over this role in the Early Middle Ages, the Marne was still an important channel.

To the north of these two estuaries lies the core area of Westergo. Here too are the oldest mounds. Some are situated on the salt marsh ridges of the Marne, the Middelzee or the smaller branch channels which penetrated the area at intervals. Others dwelling mounds, such as the mound of Jorwerd, the village made famous by the writer Geert Mak, lie in the middle of the flat land of the salt mark basins. The landscape is characterized by wide open spaces, with an occasional village or farm. The land is used chiefly as grassland, the land divisions are fanciful and the plots often still show small variations in height (micro-relief). This area has not been as strongly affected by re-allotment projects as for instance Oostergo.

Through roads existed only on the salt marsh ridges; for a long time traffic by water was far more important. The area is criss-crossed by numerous waterways, many with whimsical courses because they followed the course of existing channels and depressions. In the 17th century a number of sailing channels were converted into boat or ship canals: the Franeker boat canal and the Bolswarder boat canal in 1648 are examples. The Sneeker boat canal (1652) was created in the former Middelzee, by widening the Zwette.

While the southern part of Westergo is characterized by a fairly random distribution of mounds, the distribution in the northern part is more ordered. Here the mounds are set out in handsome rows, which coincide with the presence of salt marsh ridges that grew up at various stages of the development of the salt marsh. The oldest series of mounds is found between Winsum and Menaldum, on a ridge along a very old channel which was active around 1000 BC, even before the Middelzee was formed. The settlements on the ridges of Tzum-Hitzum, to the south of Franeker, date from the fourth and third centuries BC. The line of settlements Harlingen-Franeker-Peins-Menaldum dates from the last century BC. The mounds on the ridge Wijncaldum-Dongjum-Ried-Berlikum were created two hundred years later. This is the ridge on which the most northerly villages of Westergo are situated: Sexbierum-Tzummarum-Minnertsga. The mounds date from the 6th-7th centuries AD.

The most northerly lying ridges are the highest, as they silted up longest. The majority of arable farming takes place on the northernmost salt marsh ridge, while the lower-lying basins between the salt marsh ridges are mainly used as grassland.

One of the most striking historical features in Westergo is the dyke system. The assortment, age and function of the dykes is very varied.

There are still parts left of the old ring dykes around the 'mother polders', of the dykes along the Middelzee and the Marne, of the famous 'Pingjumer Gulden Halsband' and the Vijf Delen Slachte dijk, and last but not least, occasionally submerged dykes dating from the pre-Roman era are discovered.

The town of Franeker, still lying within its 17th century bulwarks, is renowned for its Fryske Akademy, the university founded in 1585. In 1811 the academy was closed down by Napoleon, but in the 17th century this educational institution was more important than those of Utrecht and Groningen. The academy was accommodated in the former Kruisbroeders monastery.

Harlingen flourished thanks to its port and shipyards. Originally the port consisted only of the current Noorderhaven (North Harbor), but the Zuiderhaven (South Harbor) was dug in 1597. This was necessary since Harlingen had become a wartime naval port. In 1644 the admiralty also moved from Dokkum to Harlingen. In the 19th century the Wilhelmshaven (1852) and the Nieuwe Willemshaven (1877) were built. Of the two old ports, the Noorderhaven is the more impressive, with fine warehouses, sluices and other historical buildings.

Bolsward was an important market and trading center even in the Carolingian era. The town grew up on two mounds: a large, elongated mound to the south of the current main street and a smaller mound where the splendid Sint Maartenskerk now stands. According to an inscription on the town hall it was built in 1616, and it also notes that this was 901 years after the founding of the town. The Sint Maartenskerk was the mother church of Westergo. It was one of the oldest churches established in Fryslân. The current church building dates from the middle of the 15th century, but it had wooden and tuff stone predecessors.

The mound district to the west of Sneek, which does not actually belong to Westergo, is characterized by a large number of small mound villages and hamlets. In the east this area merges into the moorland region of the Frisian lakes, in the south lie the Pleistocene boulder clay hills of Gaasterland.

Not only the villages are small, but so are the old towns of Staveren, Hindeloopen and Workum.

The landscape in this area is very open and spacious and given over entirely to grassland. In

this part of Westergo also some small 'droogmakerijen' can be found.

Outside the dykes are several former salt marshes, the development of which was arrested by the closure of the Zuiderzee. Parts of these are furnished with embankments and are now used for agriculture (Makkumer Zuidwaard, Polder Geele Strand), others are unembanked (Kooiwaard, Makkumer Noordwaard).

4.5.5.3 Noord-Holland

It is difficult to draw the boundary of the Wadden Sea Region in Noord-Holland, as the area of marine clays, deposited by the North Sea, continues quite far south. The southern boundary of the Wadden Sea Region has been chosen where the Zijpe- en Hazepolder meets the old dyke around Westfriesland (Westfriesse omringdijk). Consequently the mound district of Schagen and Barsingerhorn is excluded, while the Groet polder falls within the described area. The Zuiderzee-polder Wieringermeer has also been excluded.

After the Roman period the entire northernmost part of Noord-Holland was covered by peat bog¹⁴. Only the hills of Texel and Wieringen rose above it. The bog was sheltered by the coastal barrier, which lay a few kilometers to the west of the current coastline. The peat bog drained in an easterly direction via the Marsdiep, which was then still a small tributary of the Vlie.

The occupation of the peatlands took place from the areas which were inhabited during the Merovingian period: the present islands of Texel and Wieringen and probably the old dunes south of the Rekere, which have now disappeared into the sea. The first habitation of the moorland, still in Merovingian times, is found along the Marsdiep, the Rekere and along a moorland river in the vicinity of the present town of Medemblik, called the Middenleek. In the Carolingian period there were four large centers of habitation: Texel, Wieringen, northern Westfriesland (between Andijk and Medemblik) and the Geestmerambacht (between Schagen and Warmenhuizen), and a smaller one in the vicinity of Den Helder. The now lost old dune landscape may also have been inhabited, as at that time the coastline between Bergen and Texel was still closed.

Only later was the offshore bar between Bergen and Texel broken at several places by the Zijpe, the Heersdiep and a tidal inlet to the south of Texel, which would later link up with the Marsdiep. Between the newly created inlets north of Schoorl, largely to the west of the pre-

Dykes and watermanagement Kop Noord-Holland

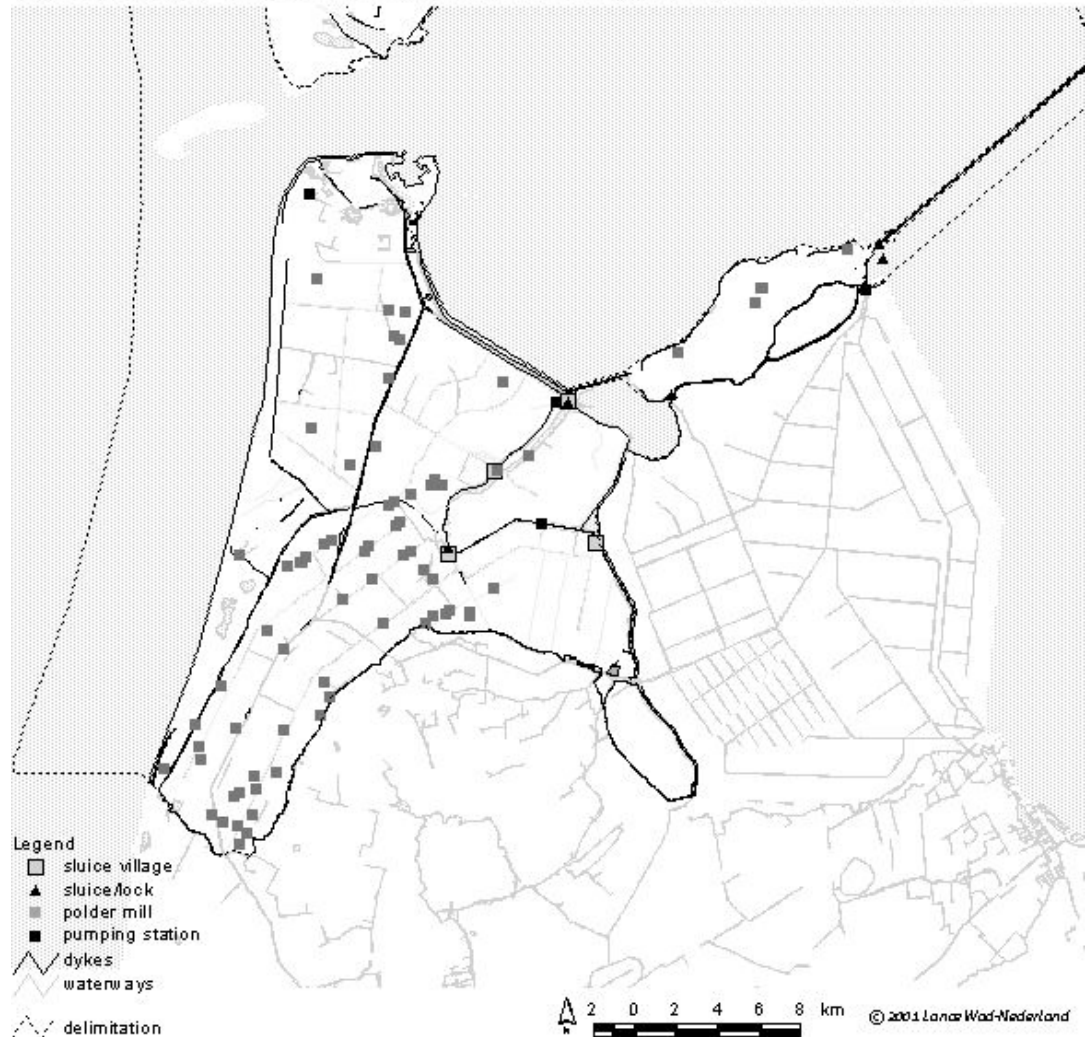


Fig. 4.90: Water management in the north of Noord-Holland

sent coastline, then lay the islands of Callandsoog and Huisduinen. Behind these islands an area of mud flats extended, on which much sand was deposited through the inlets. These sand deposits now lie at the surface of the Koegras polder and elsewhere. In the 16th century the Zijpe and the Heersdiep inlets filled up with sand. Only the Marsdiep continued to exist as an inlet and became wider and deeper. This was increasingly important for shipping and thus had strategic importance, manifest in the 16th century redoubts constructed on either side of the deep, on Texel and in Den Helder.

Traces of habitation from the Neolithic Age have been found in the Groetpolder, the Zijpepolder and the Hazepolder. These valuable archaeological sites consist of settlements from the Beaker Culture and the Single-grave Culture. The sites of the finds are exceptionally important because of the adaptations of the then inhabi-

tants to the marine environment. The circumstances of the finds are so unusual that the Groetpolder is being considered by the Dutch Government for an inscription in the World Heritage List.

Several attempts were made to reclaim the area of mud flats behind the sea inlet of the Zijpe. In 1597 they finally succeeded, and around 6,500 hectares of sandy soil in the Zijpe and Haze polders could be brought into agricultural use. The way the polder is organized is magnificent. The elongated space is divided lengthwise by three axes, along which farms have been built. The eastern axis is formed by the Groote Sloot (Large Ditch) and is also the most historic, not least because of the many fine 'cloche' farmhouses. The Noord-Holland Canal, created in 1819-1825, fits perfectly into the pattern and runs midway between the central (Ruige Weg) and western (Belkmerweg) axes. The polder is

rationally divided with fairly large, rectangular plots. Some east-west roads, at right angles to the three main axes, forge the link between the dunes and the 'old land' of West Fryslân. Along these roads, on the intersections with the Grootte Sloot and the Noord-Holland Canal, lie the villages. The naming of the villages is fairly consistent: the villages on the Grootte Sloot end in 'brug' (bridge), those on the canal end in 'vlotbrug' (floating or pontoon bridge). Near Sint Maarten, in West-Fryslân, moving westwards, we come in succession to: Sint Maarten, Sint Maartensbrug and Sint Maartensvlotbrug. The most recent addition is the holiday village of Sint Maartenszee.

North of the Zijpepolder lies the Koegras Polder or Buitenveld (4000 ha), reclaimed in 1817, just before the construction of the Noord-Holland Canal, which forms the boundary between this polder and the Anna Paulownapolder of 1847. This last polder consists of an east and west polder, divided by the Oude Veer, an old marshland channel. Both polders have a rational layout, the most striking feature being the large rectangular plots in the Koegras polder. The Waard and Groetpolders dating from 1844 echo this pattern; by contrast the 17th century Wieringerwaard is plotted into smaller-scale, strips of land. This region of Noord-Holland nowadays is famed for its colourful bulb-fields.

The town of Den Helder lies at the northernmost point of the mainland of Noord-Holland. This has been a naval port since 1781. Originally its arsenal consisted only of batteries, which commanded the coast. In the French era, the land side was also defended. In the period 1811-1813 extensive defensive works were constructed: Fort Lasalle (later renamed Fort Erfprins), and further south Fort Morland (Kijkduin) and Fort l'Ecluse (Dirks Admiraal). Once the Noord-Holland Canal was finished the forts of Westoever and Oostoever were built. In later times new defenses were added, such as bunkers.

Den Helder nowadays has incorporated the old fishing village of Huisduinen.

Windmills

Mills are such a natural part of the Dutch landscape that we can scarcely imagine a time when they were not there. Yet the first references to mills, at least wind-powered mills, only date back to the 13th century. Generally the topic is the wind right granted by the ruler to the miller. These first references all related to grain mills. The hollow post mill was invented around 1300. A smock mill is a mill in which the entire housing could rotate around a pivot, so that the mill could always be adjusted to catch the wind.

The first polder (draining) mills or wind-and-water mills are mentioned in 1408, in the district of Alkmaar. Another stage of development was the smock mill. In this mill only the upper part, to which the sails are attached, is set to the wind. In the first half of the 15th century smock mills were already being used to drain polders, but Leeghwater made significant improvements to the design to make them more suitable for the drainage of polders. From the 17th century onwards polder mills were built everywhere in the marshland area inside the dykes. Often these were small but prominent mills which we call 'spinnekoppen' (spider mills).

Later further small refinements were made to the drainage system by the tjasker, a small mill for small polders, and the sturdy American windmill, also called the windmotor, which was introduced into the Wadden Sea Region at the start of the 20th century.

4.5.6 The peatlands

To feed the fast-growing population of the Wadden Sea Region in the Carolingian era, people started to open up the peat bogs situated between the marshlands and the higher sandy ground. In order to bring these saturated bogs into use the land first had to be drained. For that purpose parallel ditches were dug close together, from an existing watercourse to deep in the peat bog (creating long, narrow plots). Much water was removed from the peatlands through the ditches, the groundwater level dropped and the soil dried out so that in the course of time it could even be used for arable farming.

There were two distinct forms of land use. On the one hand cultivated blocks, which are very

regular and rectilinear. These contrast strongly with the irregular nature of the adjoining dwelling mound area. Authorities clearly had a considerable say in these works. On the other hand there are small-scale, irregular patches where the peat bog was brought into use. Clearly in these cases it was individuals or small groups of colonists who took the initiative to exploit the peat bog, and who used a natural watercourse to drain, open up and exploit a part of the peat bog. Here there is none of the regularity of rectilinear patterns of the larger planned peat bog developments. The plots are narrow and elongated.

The development and drainage of the peat bogs caused the surface to sink until such time as the peat area was so low-lying, that the polder water began to pose a real problem. The area became so wet that the farmers had to leave. During heavy storm tides the sea could again penetrate and damage the area.

4.5.7 The quality of the cultural landscape in the Dutch Wadden Sea Region.

What then is the quality of the cultural landscape in the Dutch Wadden Sea Region? And which areas are the most important ones, seen from a cultural-historic and landscape point of view? Is Vlieland of greater value than Schiermonnikoog; has Westergo a higher quality than Oldambt? To these questions, many answers can be given. And with each answer given, dispute will arise and new questions will be posed. Because the answer to what is of importance, depends on what is seen as being important, e.g. what criterion is being valued as the most important. Some will say that 'age' is an important criterion ('the older, the better'), while others will stress the rarity of elements ('the only one in the region'). Or should we give priority to the most characteristic elements ('farms of the stolp type 'belong to' Noord-Holland') or rather the rate of conservation ('well conserved versus decayed'). Another criterion can be the spatial context of elements in the physical landscape ('dwelling mounds aligned on a salt marsh ridge') or the functional cohesion of different objects ('harbor-lighthouse-commodore's houses'). Furthermore, one may emphasize the presence of all elements that once were representative for a stage in the regions cultural history ('polder mills and wind turbines both represent a stage in the development of the landscape') or the amount

that is still left. Others will stress the importance of the authenticity of the landscape, which immediately will start a discussion about the question what is meant by authenticity. And finally, a criterion to evaluate can be the perception of the cultural landscape.

A lot of criteria to describe the quality of the landscape can be given, but a solid and unquestioned method to evaluate the landscape has - till so far - never been produced.

When preparing the Belvedere Memorandum - a policy plan by the Dutch government, which deals with cultural heritage and spatial planning - an attempt has been made to map the quality of the cultural landscape in the Netherlands. Being aware of the difficulties involved, it was decided to present different evaluation maps: one representing the archaeology, another representing the historical-geographical features and a third representing monumental towns, villages and estates. These maps are presented here, as far as they concern the Wadden Sea Region. A fourth map is added, depicting the 'openness' of the landscape; not a quality map in the strict sense, but anyhow a map that represents an important aspect of the landscape in the region.

It's not well possible just to 'add up' these maps in order to decide which regions have the highest quality. Doing so would not be a solid and scientifically accepted evaluation. Nevertheless, the question of the quality of the cultural landscape might yet be answered by the Trilateral Wadden Sea Plan, where it states that: „the cultural-historic and landscape heritage and the diversity between the regions are essential for the comprehension of the area's development and identity and the inhabitants' identification with the landscape“. Because that's what it is all about, when we discuss the quality of the landscape: a distinctive character and identity. And also: everywhere just a little bit different. This is exactly what makes the Wadden Sea Region, up to its' remotest districts, to a unique cultural landscape of exceptional quality.

Notes:

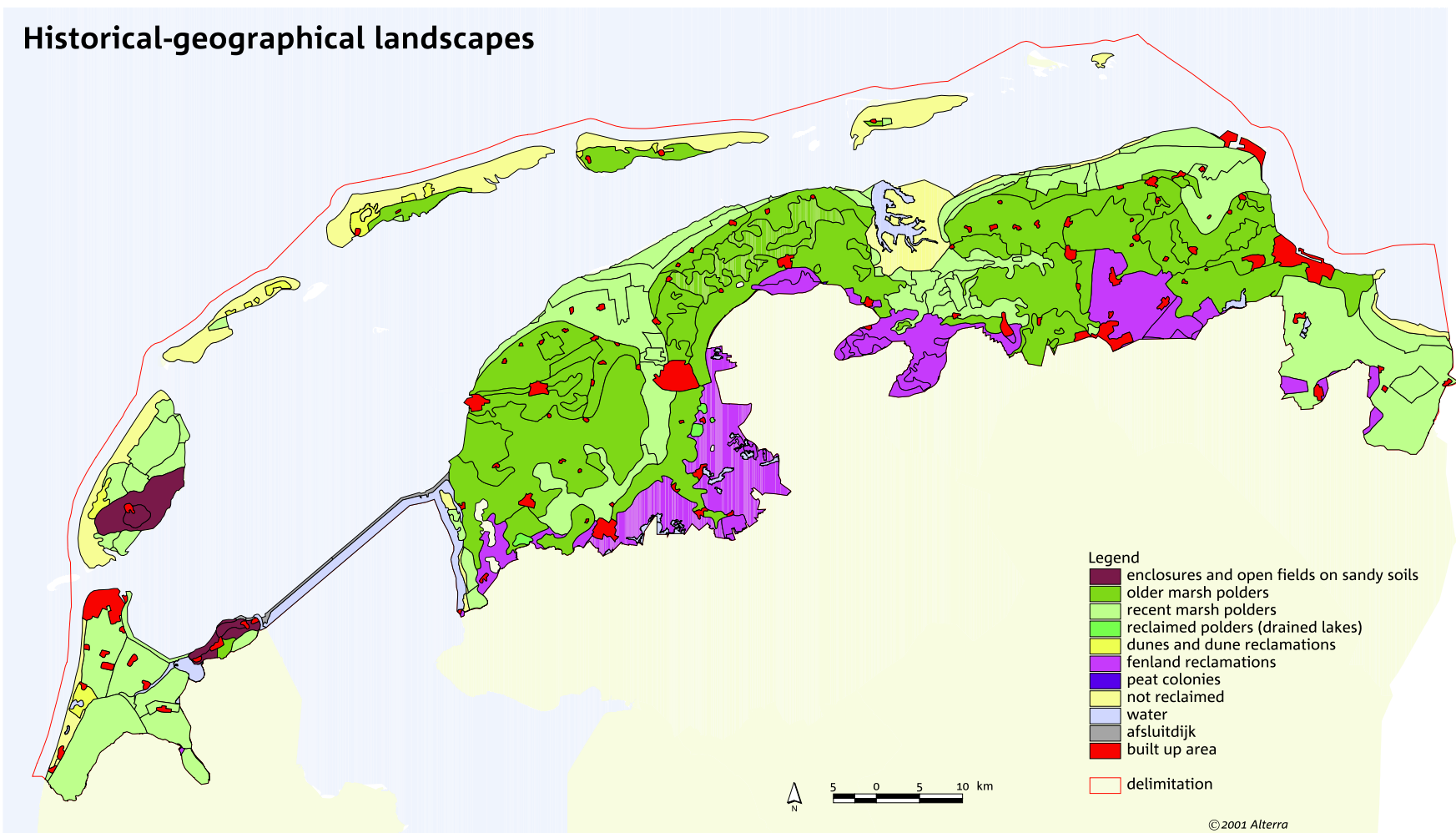
- 1 Taken from an essay by G.J. Borger and H.T. Waterbolk, 1999. De Waddenzeeregio -een uniek cultuurlandschap (The Wadden Sea Region - a unique cultural landscape).
- 2 In 1932 the Minister of Public Works announced that the part of the Zuiderzee to the north of the Afsluitdijk would henceforth be known as the Wadden Sea (J.T. Bremer: van Zuiderzee tot Waddenzee, 1996).
- 3 A dwelling mounds is called *terp* in Fryslân, *wierde* in Groningen and *werf* in Noord-Holland.
- 4 Kooi, P.B., 1988. Leven langs de Fivel, van Helwerd tot Zwart Lap. (Life along the Fivel, from Helwerd to Zwart Lap) In: M. Bierma et al., 1988. Terpen en wierden in het Fries-Groningse kustgebied (Terps and wierdes on the Frisian-Groningen coast).
- 5 Frank Westerman, 1999. De graanrepubliek. (The grain republic) Amsterdam/Antwerpen.
- 6 Jan Besteman, 1997. Vikingen in Noord-Holland? (Vikings in Noord-Holland?) Noord-Holland Province Archeological publication, no. 1.
- 7 This text draws with gratitude on research into decoy and cage operation in the Wadden Sea Region by J.J.H.G.D. Karelse, carried out at the request of Lancewad Nederland.
- 8 Written statement, J.T. Bremer, 2001.
- 9 Although the Frisian word '*terp*' is now commonly used as a name for a dwelling mounds in the marshland area, the term '*wierde*', which is used in Groningen, is historically more correct. It is derived from the old Frisian word '*wir*', which means height. As well as in the word '*wierde*' we also find this root in names used elsewhere in the coastal area: *werf*, *warf*, *wurt*. '*Terp*' is the Frisian word for '*village*'.
- 10 Schroor, Meindert, 2000. Van Middelzee tot Bildt. Landaanwinning in Fryslân in de Middeleeuwen en de vroeg-moderne tijd. (From Middelzee to Bildt. Land reclamation in Fryslân in the Middle Ages and the early modern era)
- 11 Griede, J.W., 1978. Het ontstaan van Fryslân's noordoosthoek. Dissertatie. (The development of Fryslân's northeastern corner. Dissertation).
- 12 Schulz, E., 1992. Waterbeheersing in de Nederlandse droogmakerijen. Dissertatie, (Water Management in Dutch Reclaimed Land. Dissertation) Delft.
- 13 Adapted freely from: Het Spoor van Menno Simons. Een wandeling langs doopsgezinde gedenktekens in Witmarsum en Pingjum. (On the trail of Menno Simons. A walk around the Baptist monumnets in Witmarsum and Pingjum). <http://home.planet.nl/~wunsnet/menno.htm>
- 14 Schoorl, Henk, 1999. De Convexe Kustboog. Deel 1: Het westelijk Waddengebied en het eiland Texel tot circa 1550. (The Convex Bow of the Coast. Part 1: The western Wadden Sea Region and the island of Texel to ca 1550)

4.5.8 References

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Fig. 4.92:
Historical-geographical
regions in the Netherlands



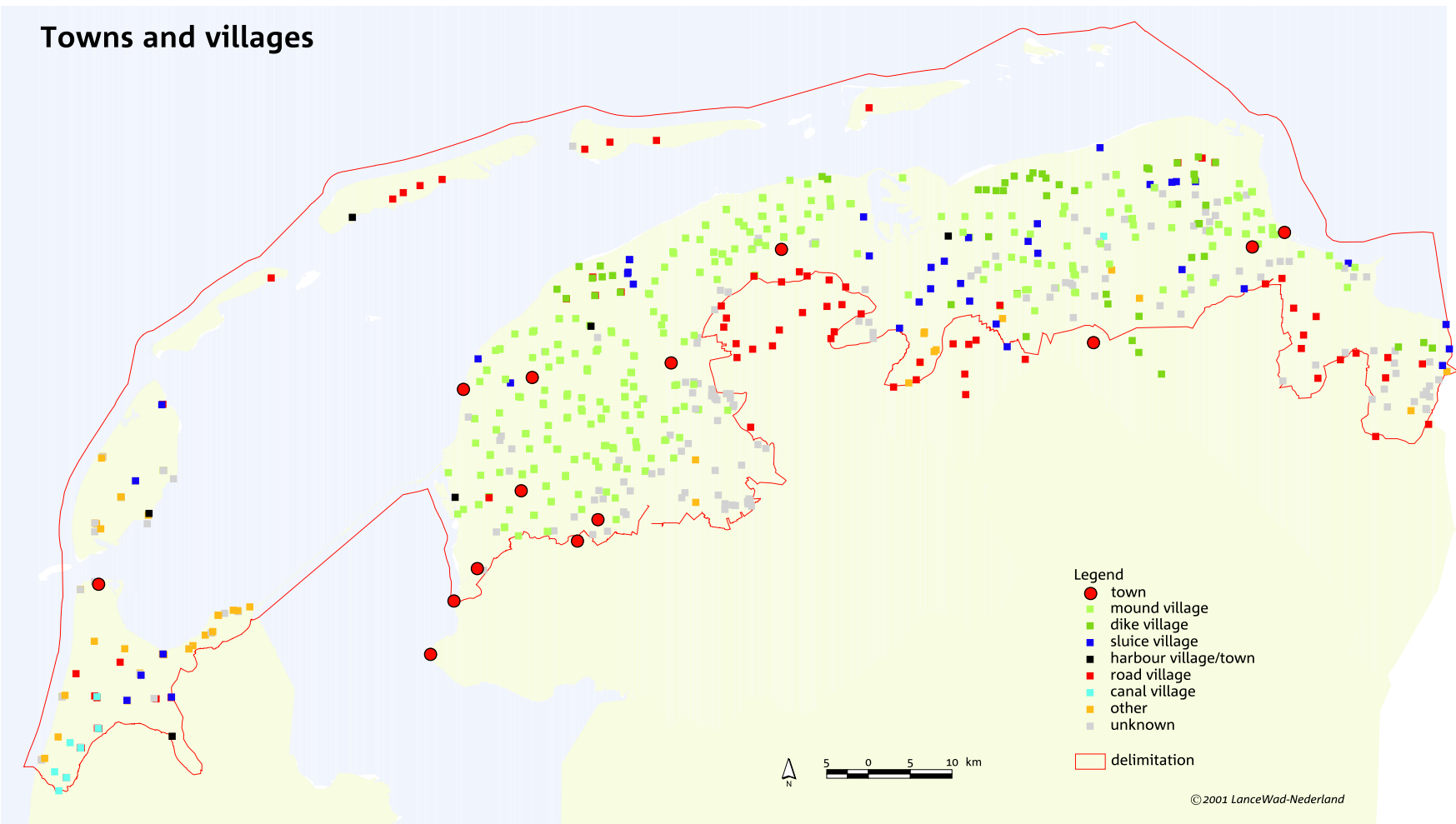
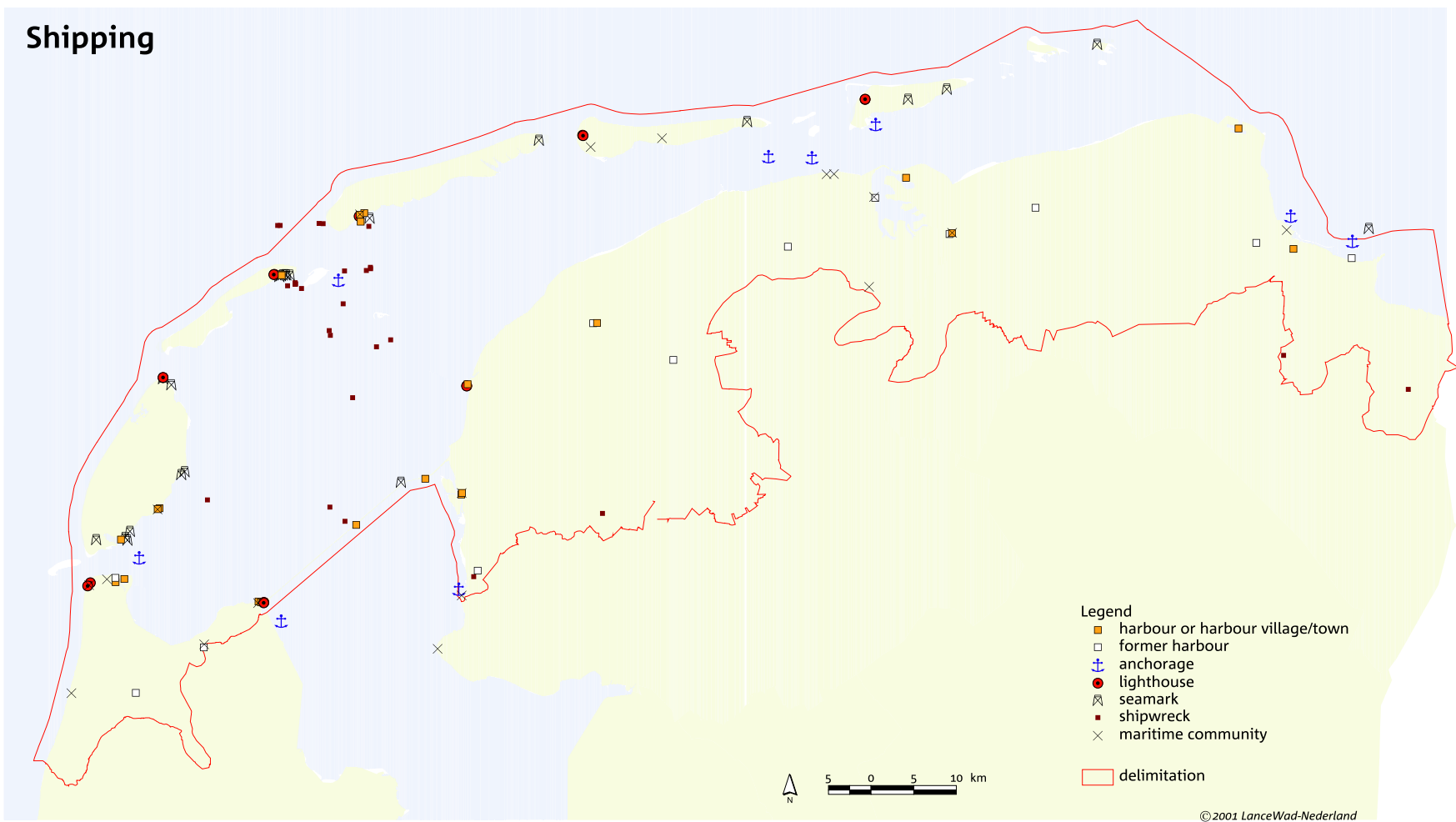


Fig. 4.93:
Towns and villages

Fig. 4.94:
Shipping



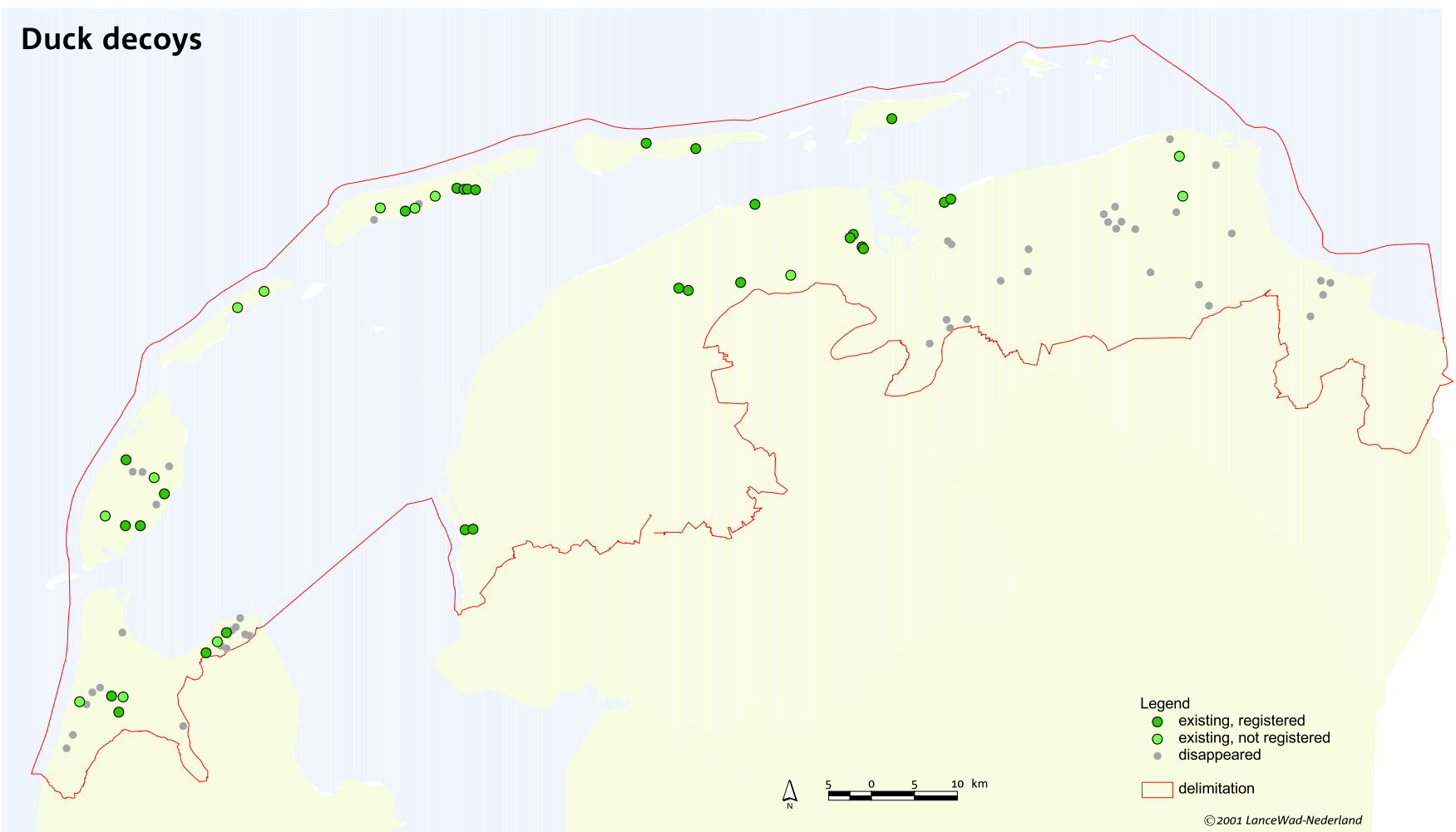


Fig. 4.95:
Duck decoys

Fig. 4.96:
Dwelling mounds

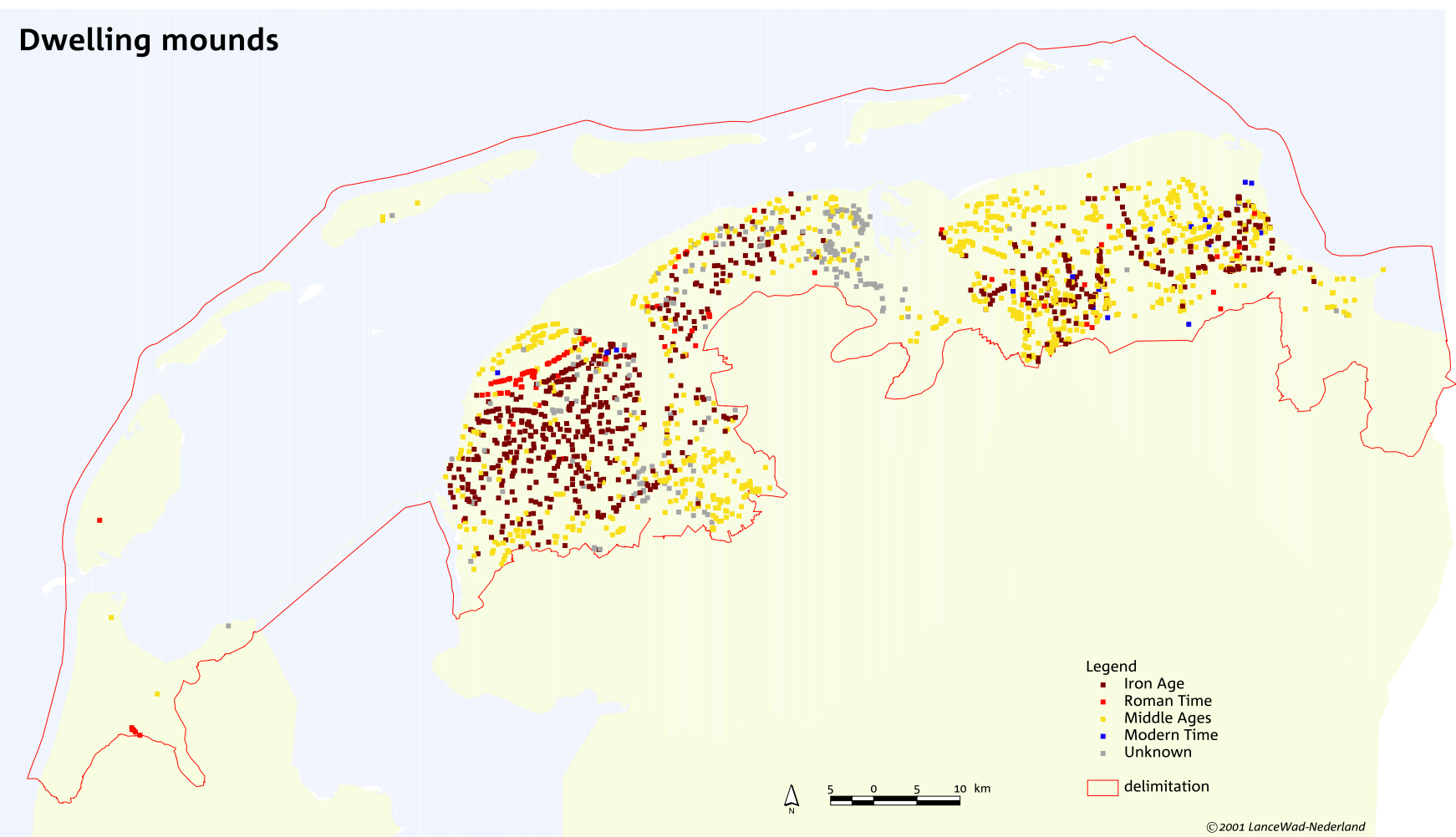


Fig. 4.97:
Farm types

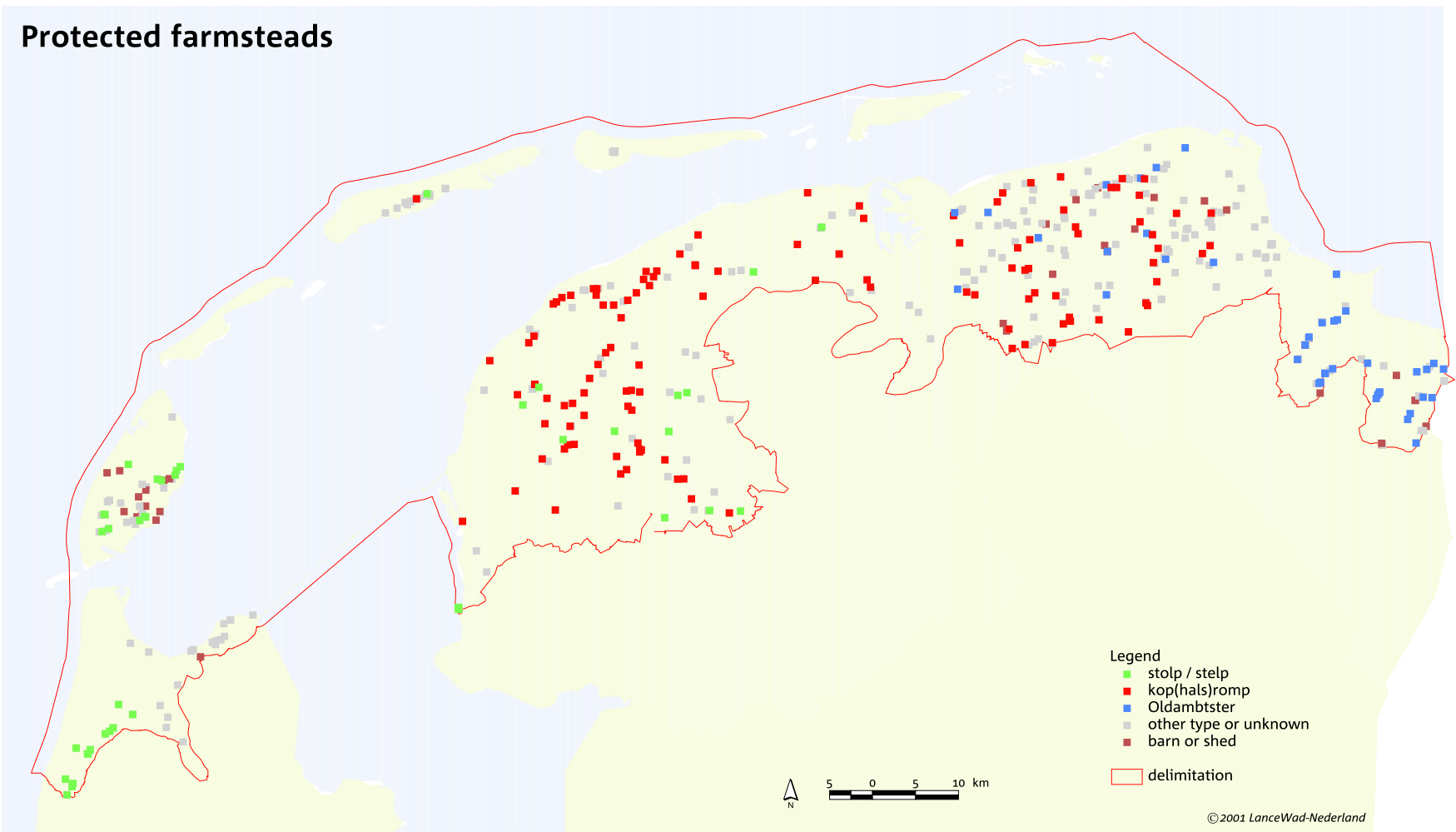
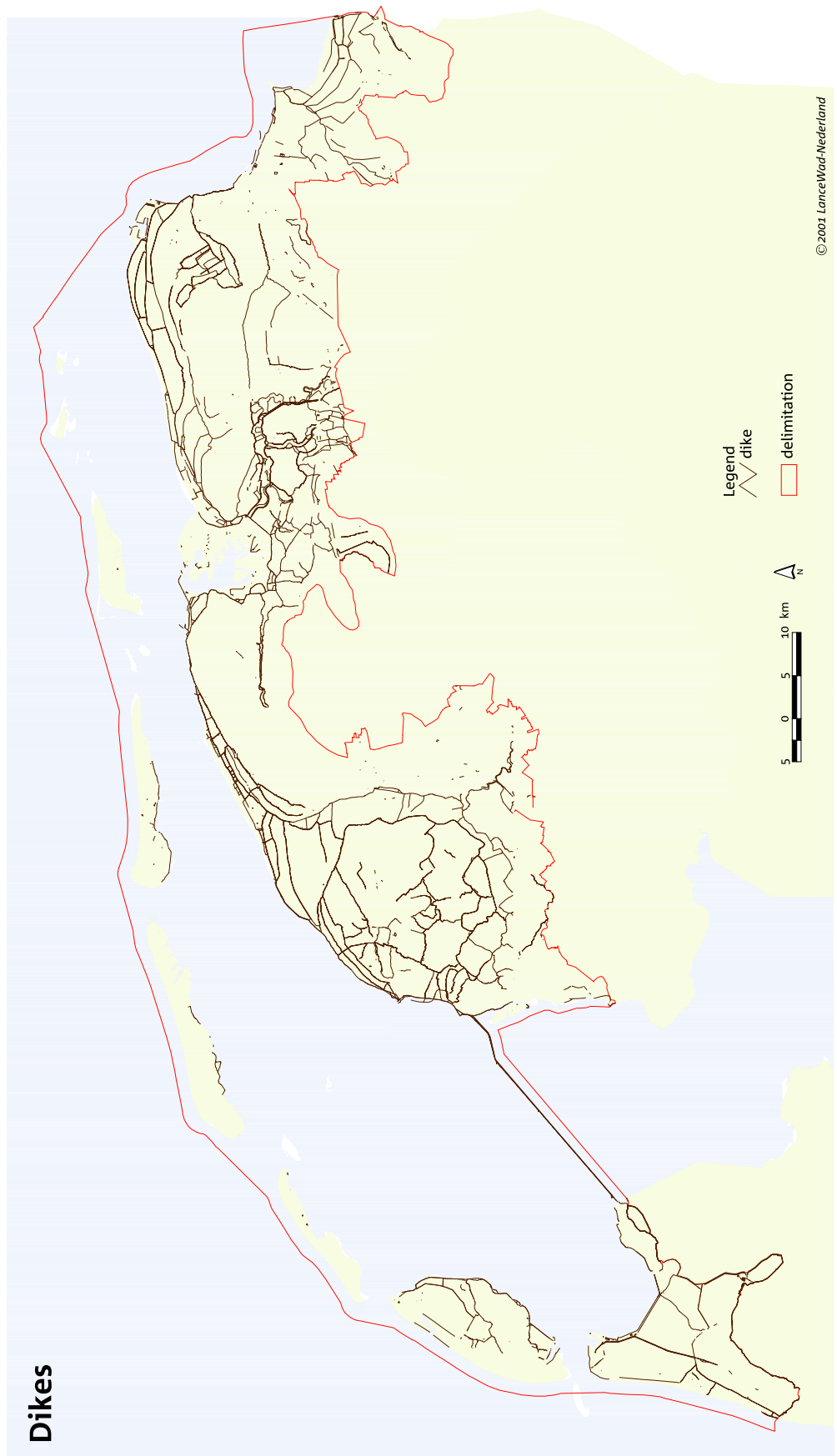


Fig. 4.98:
Dykes



Watermanagement

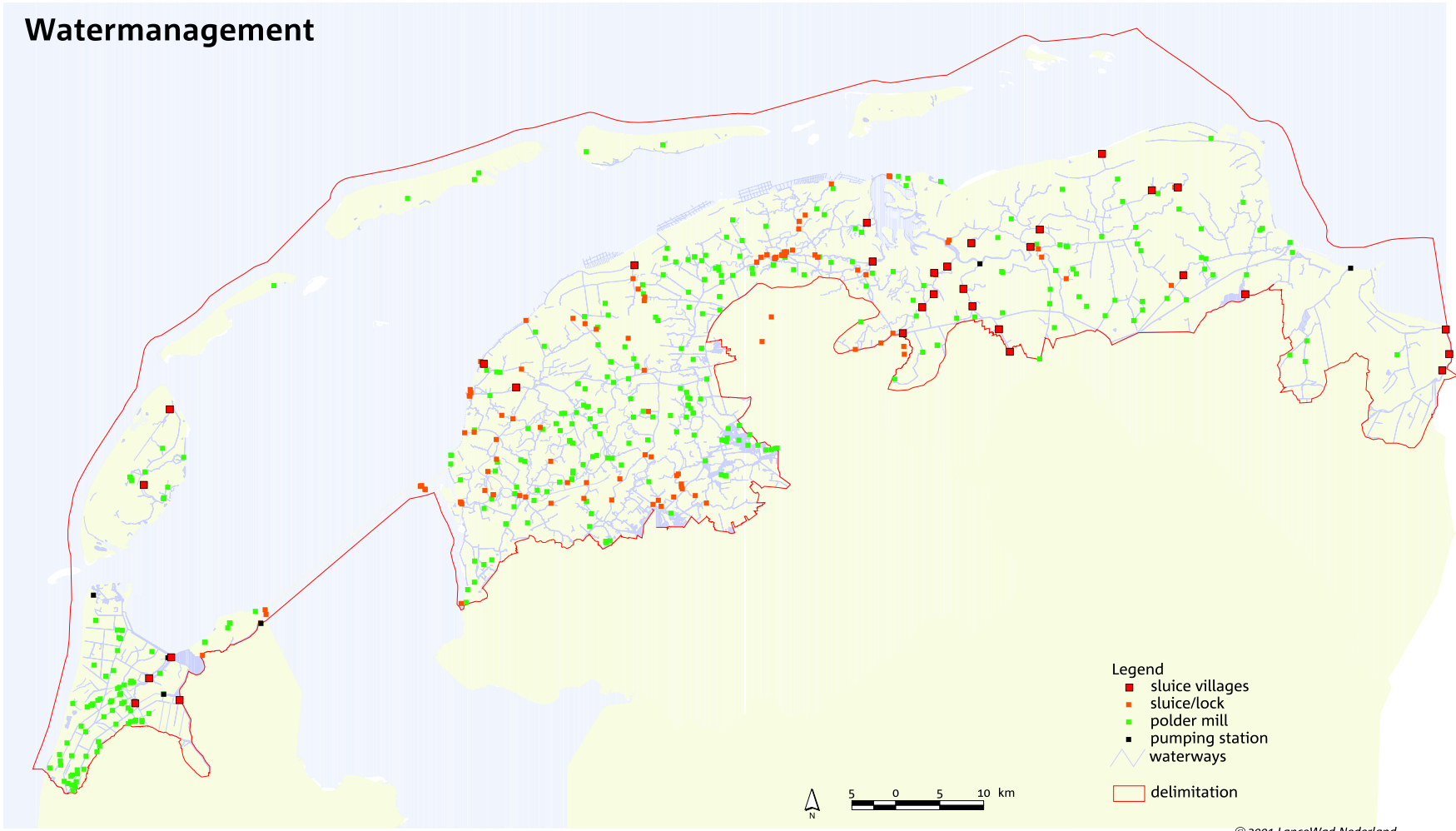
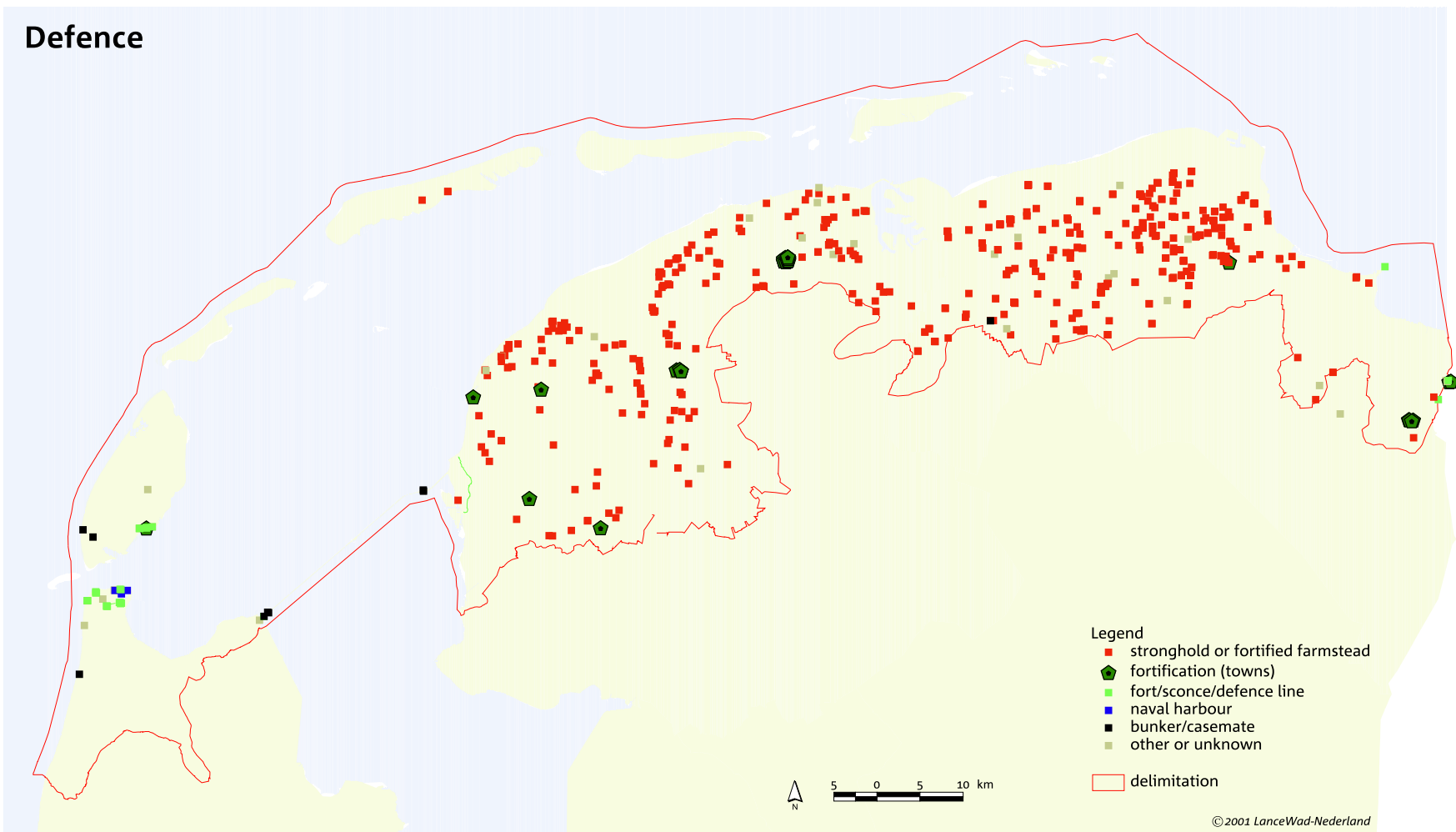


Fig. 4.99:
Watermanagement

Fig. 4.100:
Defence



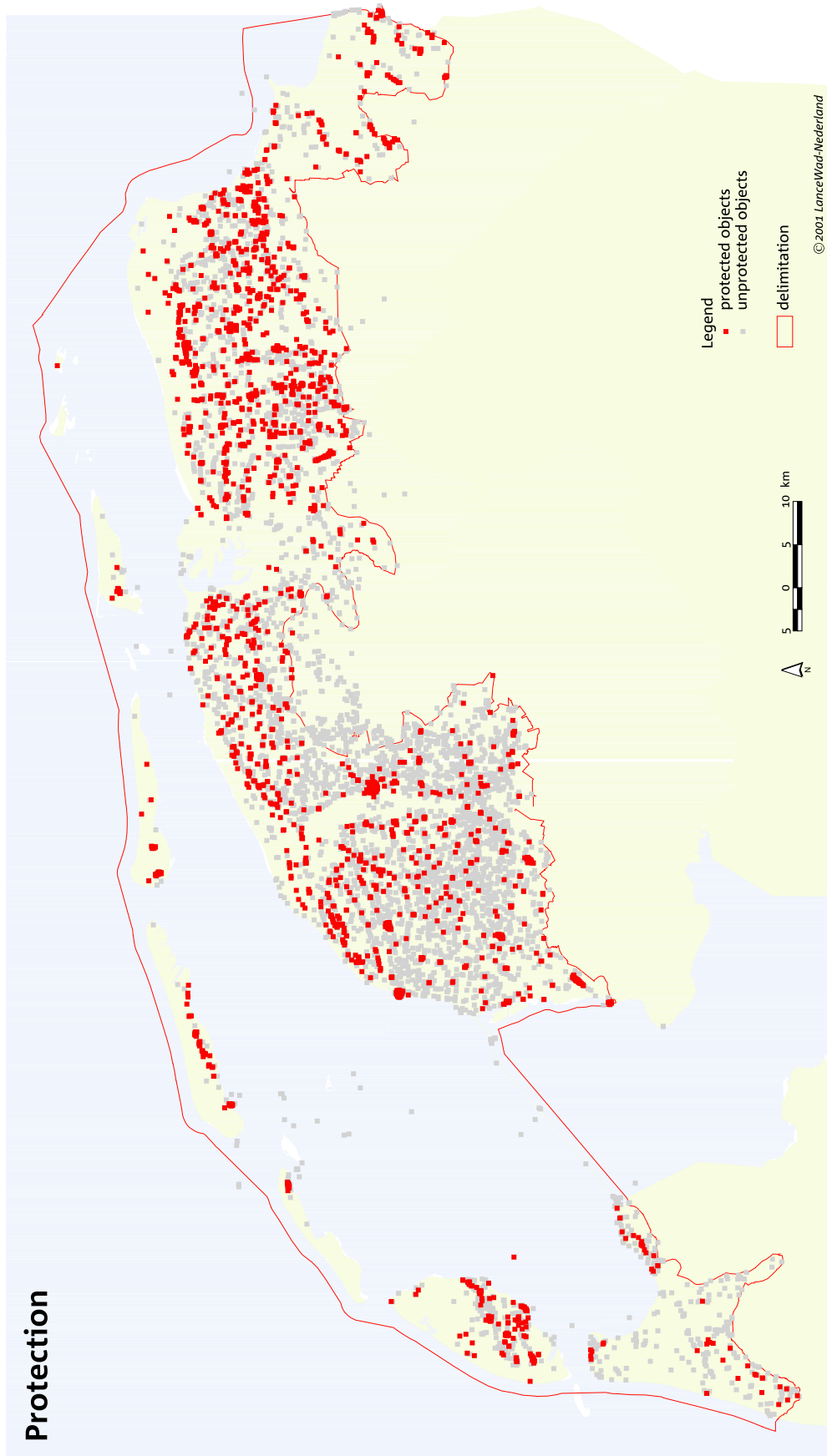
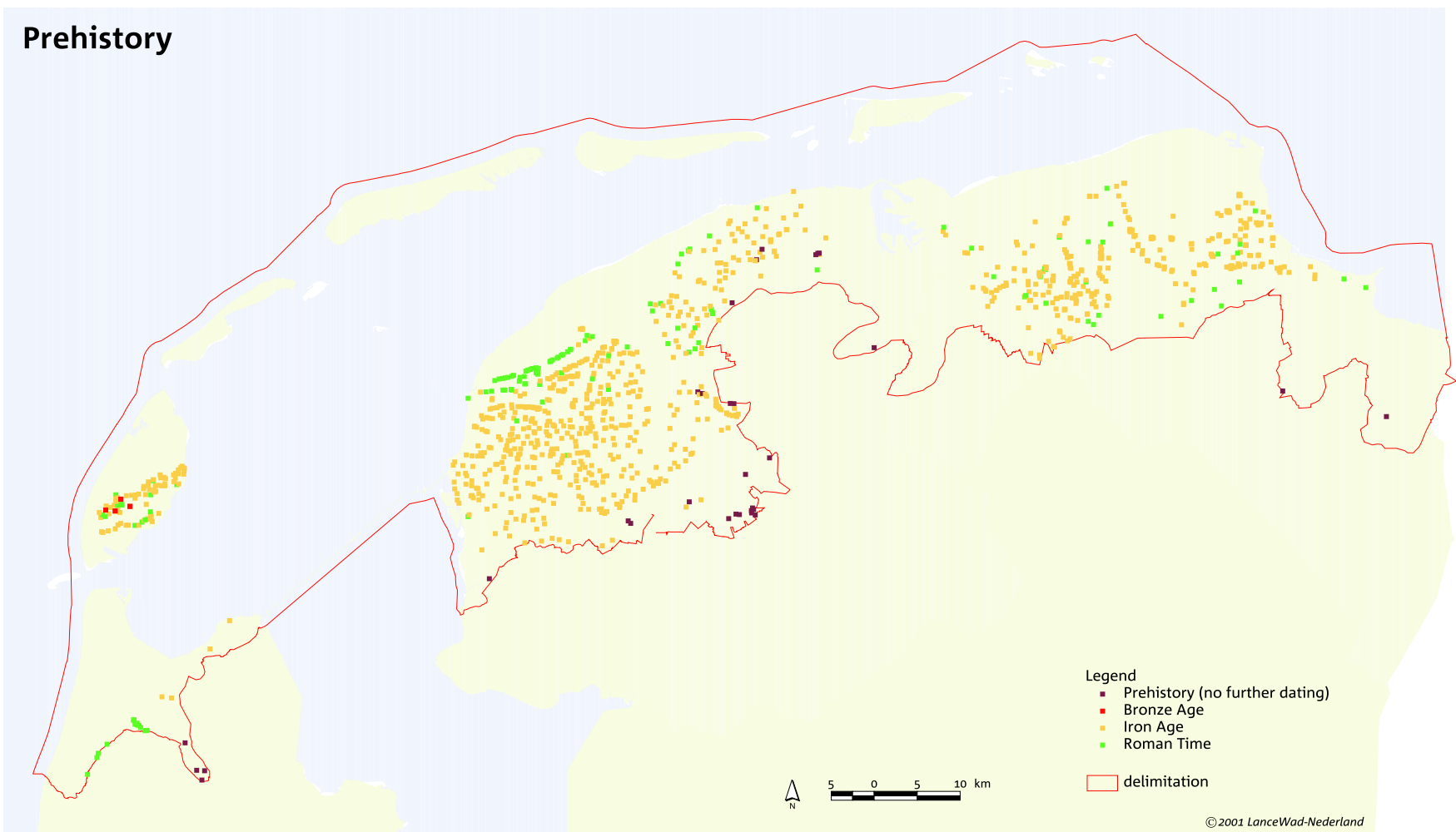


Fig. 4.101:
Protection

Fig. 4.102:
Prehistoric elements



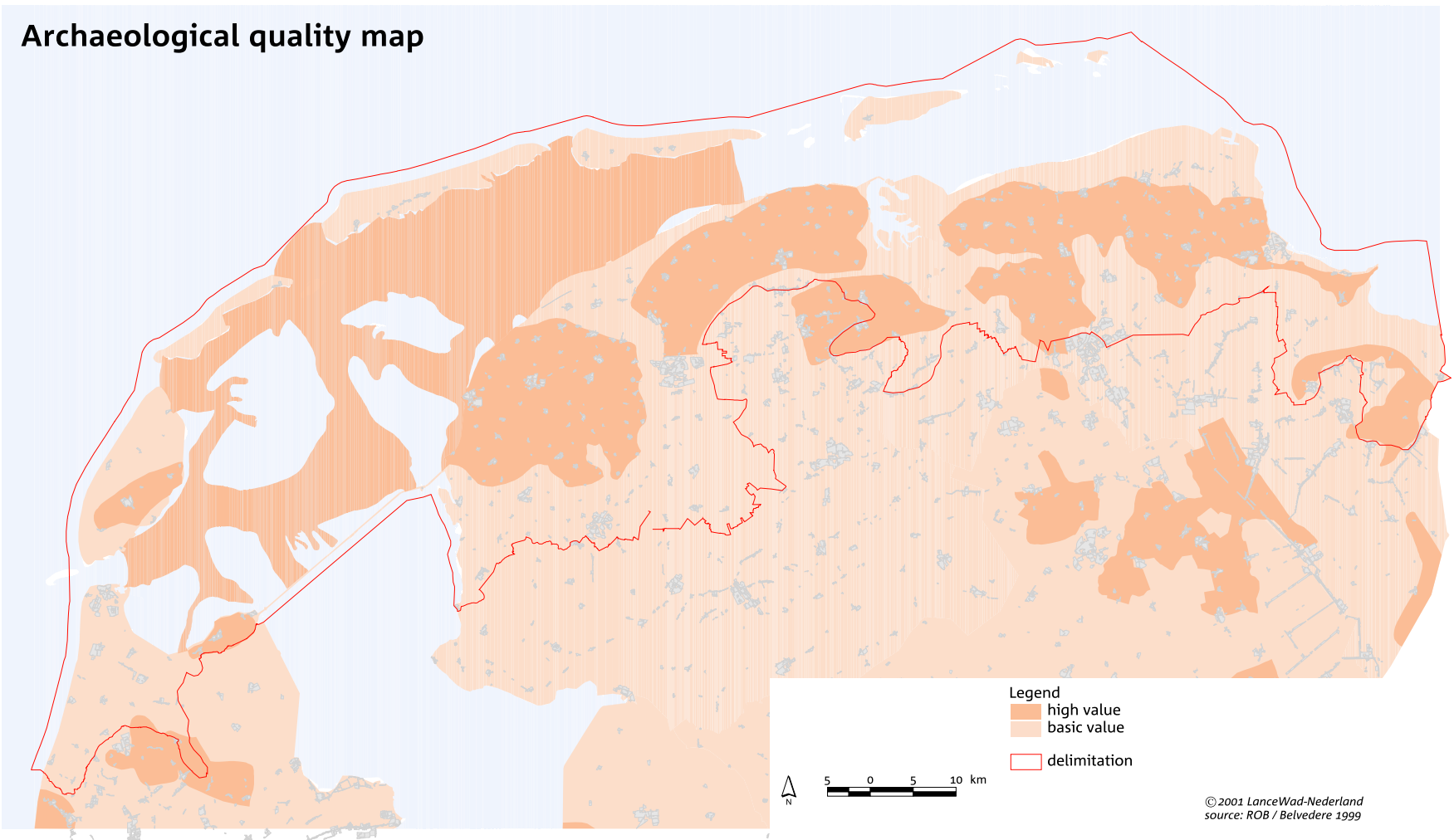
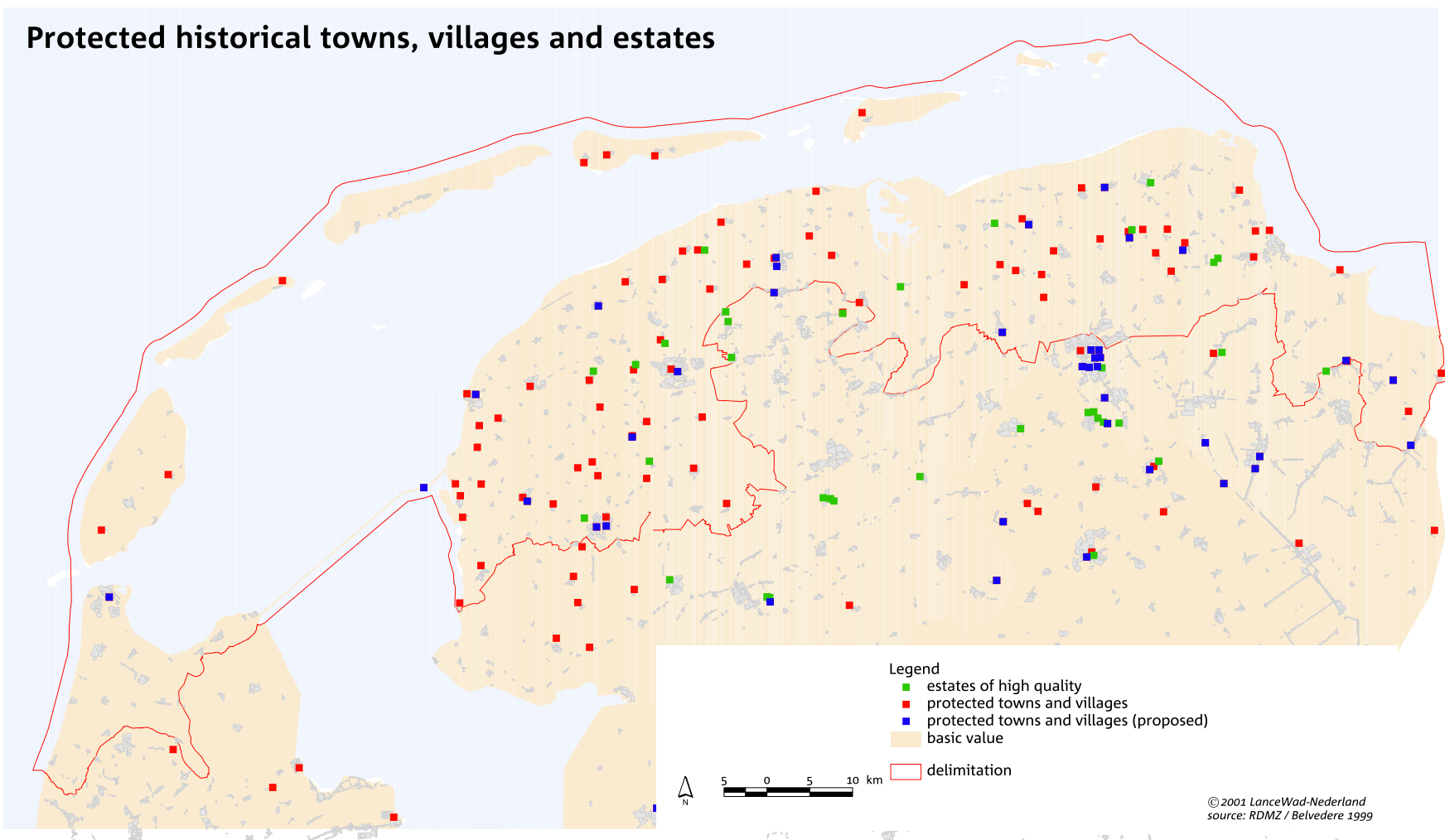


Fig. 4.103:
Quality map: Archaeology

Fig. 4.104:
Quality map: Towns



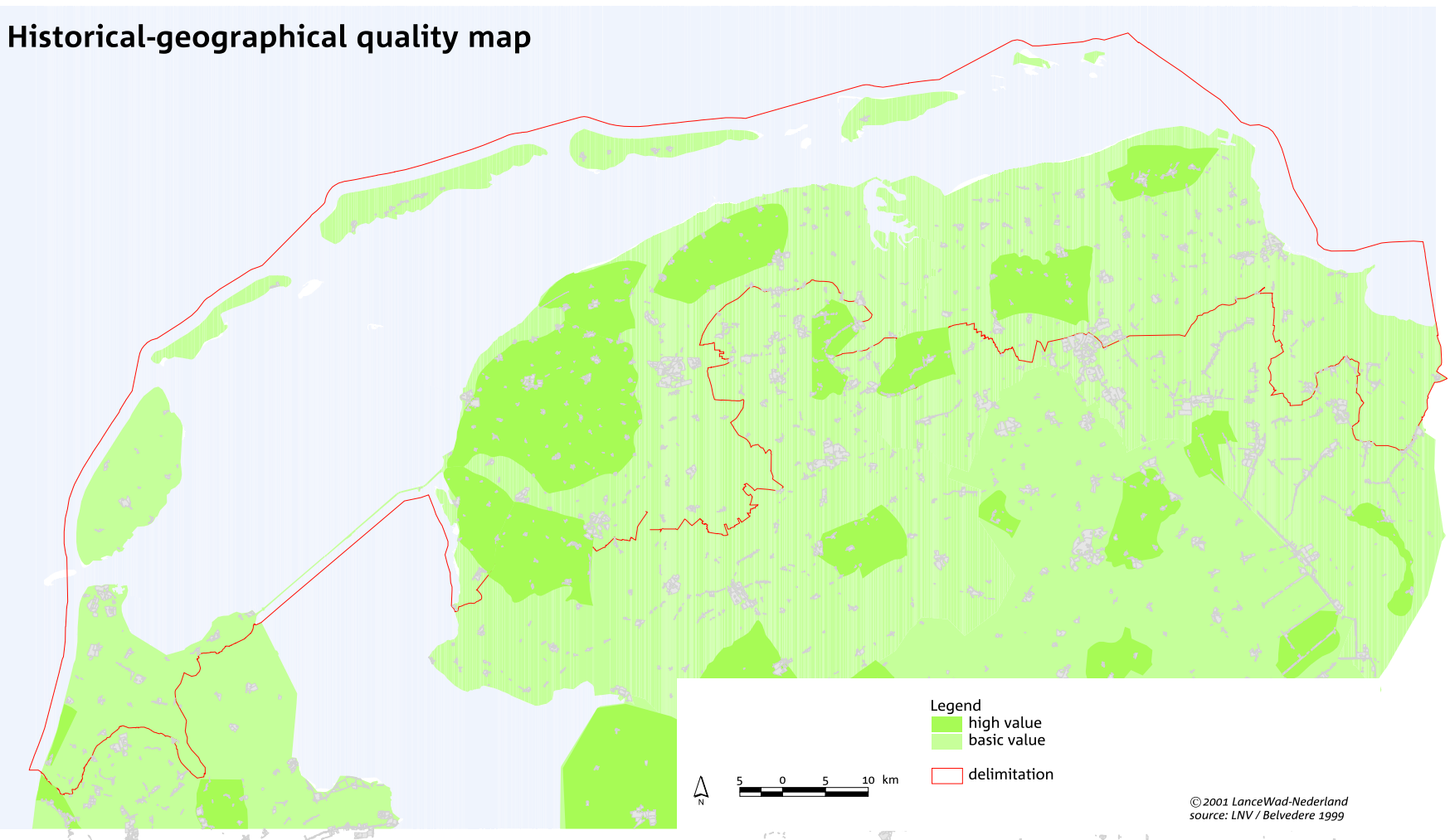
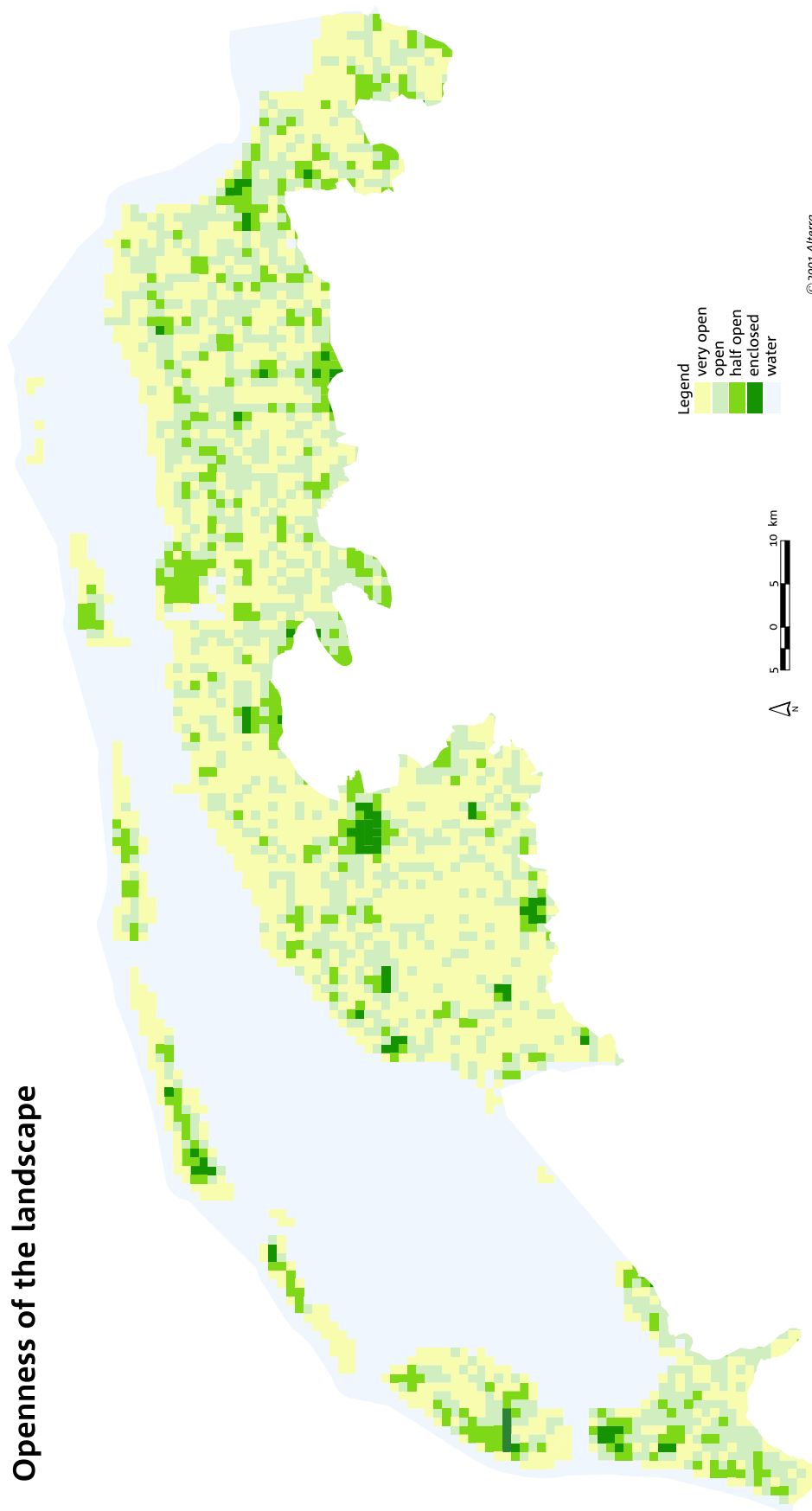


Fig. 4.105:
Quality map: Geography

Fig. 4.106:
Quality map: Openness



5. Trilateral Mapping Results

5. Trilateral Mapping Results

5.1 Introduction

The primary aim of the LANCEWAD project was to make an inventory of the most important cultural-historic and landscape elements in the Wadden Sea Region. With the database that resulted from the inventory, the characteristics of the cultural landscape and the diversity between the regions could be mapped in a Geographical Information System (GIS).

At the start of the project, three major decisions had to be made:

- the delimitation of the survey area;
- the cultural-historic and landscape features to make an inventory of, and
- the sources of data to be used.

In this chapter, it is described how the project dealt with these aspects. Furthermore, explanations are given how each participating country/region managed to fill the database regarding each of the distinguished elements. From a short analysis of this information, it could be concluded that the database still shows some inconsistencies. In some cases, information about elements is lacking completely, sometimes information of types or attributes were hardly available. For a further data collection in order to have complete and harmonized data sets of all element in all regions, time was unfortunately too short.

But, it must be acknowledged that the resulting trilateral database is unique in the sense that it is the first international database of integrated cultural-historic and landscape features.

5.2 Delimitation of the survey area

Denmark: The Danish survey area is made up by the parishes that are either situated along the Wadden Sea coast or in direct connection to the Marsh. To prevent a survey area that is too extensive, in certain areas it has been necessary to use the village territories, not the parishes, as the outermost boundary. Meaning that the delimitation of the Danish survey area either follows a parish boundary or the boundary of a village territory.

Schleswig-Holstein: The area basically consists of the marsh areas of the two counties Nordfriesland and Dithmarschen. Added to these are the Wadden Sea Areas of these counties as well

as all the island and Halligen in the Schleswig-Holstein Wadden Sea area.

The southeastern border is the Nord-Ostsee-Kanal. Towards the landside the mapped area is basically oriented along the Pleistocene ridges as well as former sandbanks and bog areas along the prehistoric coastline and is usually in line with the Pleistocene cores. All river wetlands are left out, e.g. the Elbmarschen and the Treene-Sorge Niederung (Stapelholm). Included are all settlements, which have always been connected historically and economically to the marsh areas and are situated right at the edge between marsh and Geest or on sandbanks.

Lower Saxony: The survey area in Lower Saxony is determined by the 6 Landkreise and 2 kreisfreien Städte in direct connection to the Wadden Sea Coast. The area includes the mainland as well as the islands and the Wadden Sea of Lower Saxony. In addition, there is the parish of Schwanewede (Landkreis Osterholz) and the island Neuwerk from the territory of Hamburg. On the mainland, the mapping area contains the sea marsh areas, parts of the river marsh areas (Weser and Ems), parts of the Geest areas and parts of the peat areas. The outline is made up by the boundary of the parishes. Some parishes on the mainland without marsh areas are excluded (Appeln, Beverstedt [Flecken], Bokel, Firrel, Frelsdorf, Großefehn, Hesel, Kirchwistedt, Neukampfehn, Schwerinsdorf, Stubben, Uplengen, Wiesmoor). Also not included in the mapping area are the city of Bremerhaven and the Landkreis Stade.

The Netherlands: The delimitation has been defined as follows: included in the survey area (or Wadden Sea Region) are the Wadden Sea, the (former) islands and the area on the mainland, where the soil consists of marine clay. Bordering peat and 'Geest' areas are, for the most part, excluded. Municipalities along the inventory border that consist for more than 50-60% of marine clay, are fully included; where the area of clay is less than 50-60%, only the clay area is taken into account. In the province of Noord-Holland, an arbitrary delimitation had to be chosen. The 'Westfriese omringdijk' forms the southern border and the Wieringermeerpolder is excluded.

5.3 Description of elements

5.3 Description of elements, types and attributes

The mapped elements have commonly been selected by the three participating countries. The focus has been on elements and structures in the cultural landscape that are seen as the most important and characteristic for the cultural history and the identity of the landscape in the Wadden Sea Region. For example: dwelling mounds, dykes, sluices, pumping stations and polder mills, lighthouses, beacons and harbors. But also, villages, towns as well as important buildings and historical sites have been mapped to reflect other aspects of the common heritage. The complete list of elements was not available at the beginning of the project but has been the result of an interactive process during the project. This has resulted in a list that none the less contains the most important features of the cultural landscape in the Wadden Sea Region. For most elements a number of types have been attached. In the following they are written in italics. For further attributes to the mapped objects, see Annex 7.2.

Dwelling mound

A dwelling mound is an artificial height (mound) of clay and dung that enables living in undyked salt and river marshes. The size of the dwelling mounds varies from small mounds with just a single church or farm up to mounds with complete villages/towns on it and mounds built on dykes. The highest dwelling mounds rise up to 8 m above the surrounding landscape. Often dwelling mounds were erected on ridges in the salt marsh due to which these mounds are situated in rows. Round dwelling mounds were most often farming villages, elongated/rectangular mounds were often trading villages. Many dwelling mounds are fully or partly leveled, the soil being used as fertilizer. Some mounds are not built on.

Village

A village consists of a group of houses, together with other buildings such as farms, a church, a school and other communal buildings. They can be *concentric/round or elongated/linear*.

A *mound village* is a village on a dwelling mound. They are found in the former salt marshes of Germany and the Netherlands, which were inhabited before dyking was introduced in Late Medieval times. The oldest, agrar-

ian villages had originally a radial structure that sometimes stretched beyond the village into the parcellation of the fields. Rectangular or elongated mound villages can be found as well. At least some of them were trading villages.

A *dyke village* is a village that extends along a dyke. Originally the buildings (farms) were placed inside the dyke; after the dyke lost its defensive function, buildings (churches, workmen's houses) were erected on the dyke or along the outside (former seaside) of the dyke.

A *sluice village* is a village near a sluice or lock. Characteristic are the buildings along the waterway and often also along the dyke. Buildings usually have a trading, shipping or fishery function.

A *canal village* is an elongated structure of serried buildings, on one or both sides of a canal.

A *road village* is an elongated structure of serried buildings, on one or both sides of a road, at a road crossing, or at a crossing of a road and a waterway.

A *harbor village* is a village on the coast with a fishing and/or trading harbor. Where a harbor village arose along a dyke, there is usually a sluice as well, and the harbor is often located at the sea-side of the dyke.

Agrarian building

Different type of farms with features typical for the (sub-)regions in the Wadden Sea Region as well as *adjoining buildings* such as barns, sheds, haystacks, granaries etc. Traditional types are *Uthländisches Haus, Geesthardenhaus, Barghus, Gulfhaus, Hallenhouse, Kop(hals)romp, Ostfiesian/Oldambtster and Haubarg/ Bargscheune/stelp*.

Characteristic field pattern

Only the most characteristic field patterns have been mapped.

By *radial* parcellation the structure of the parcellation is radial, the separating ditches are oriented towards a common point, usually the middle (church) of a dwelling mound.

By *parallel* parcellation the structure of the parcellation is parallel, usually along a road, waterway or canal.

By *block* parcellation the structure of the parcellation is made up of, more or less, rectangular or square plots.

The field patterns can be *regular or irregular*. The plots can be separated by *ditches, trees or*

earthen walls. Ditches are the most common separators in the marshlands. Often the former creeks and gullies can be recognized in the pattern of the ditches. Trees are found on the bordering sand and peat regions; earthen walls can be found in the areas where boulder clay occurs. There can be *vaulted arable land*.

Dyke

A dyke is an earthen bank, usually made of sand and/or clay; rarely of peat or seaweed. An *actual sea dyke* is a primary defense that currently separates the sea from the land. Almost all actual sea dykes have been heightened in the last decades.

Due to land reclamation, the actual sea dyke was shifted seaward, leaving the *old sea dyke* as a secondary or tertiary defense, just in case the actual sea dyke would break. A *summer dyke* is a low dyke or embankment outside the actual sea or river dyke, intended to prevent the land from flooding in summer time so that cows or sheep can graze the land. *Sand dykes* are constructed to strengthen the dunes or to connect two separate islands. A *dam* is a causeway, often in a river or creek, that dams off the waterway. An *embankment* is a thick wall or mound of earth that is built to prevent water from a river or the sea from flooding the area.

Ditch/waterway

Before the embankment of the salt marshes, the area was drained by *natural watercourses*. Later, man started to modify these natural watercourses. After the embankment, artificial waterways, *dug watercourses/drainage* canals and reservoirs for superfluous water had to be dug in order to drain the low-lying marshland. This resulted in a system of waterways that is partly semi-natural and partly artificial. Only in the Wadden Sea itself, the waterways (channels and creeks) are still fully natural.

A *moat/ditch* is a deep and wide ditch filled with water which was built as a defense measure surrounding castles, strongholds and (in later times) towns.

Sluice

Sluices are constructed where a dyke crosses a waterway. The oldest form is a simple draining cylinder with a valve ('pomp') that allows the river water running out at low tide, but prevents the seawater from getting in at high tide. Later constructions have movable doors to let

the water pass (weir). These sluices also make the passing of ships possible by using locks.

Land reclamation

Due to flooding at high tide, sand and clay is deposited on banks and at the seaside of the dykes. When the silting up continues it turns into salt marsh with a specific vegetation that can be used as a summer meadow. Salt marshes only flood at extreme high tide. By constructing dams of twigs, the deposition of sand and clay is artificially stimulated. Pools have to be dug in the reclaimed area to collect freshwater for cattle and sheep. When the area is silted up high enough, a new sea dyke may be constructed and new land is won.

Pumping station/polder mill

A *polder mill* is a wind-driven mill, used to drain the superfluous water from a polder into the sea or the inland system of reservoirs. Polder mills are therefore always situated close to the dyke surrounding a polder. Most common is the '*Dutch*' windmill, but other types made of timber or metal, such as *tjasker* or *American windmill* occur as well, especially in smaller polders. Some wind-driven pumping mills were also used for irrigation and for drinking water supply for animals. A *pumping station* is a mechanically driven pump to drain the superfluous water from a polder into the sea or the inland system of reservoirs. Most pumping stations are driven by electrical or diesel motors. They substituted former windmills and sluices (weirs) and have a much greater capacity.

Freshwater supply

To secure the supply of freshwater in the marsh areas, pools – the so called *fethings* – were dug on the dwelling mounds, on the Halligen and in the reclaimed areas. In areas that were frequently flooded, such as the Halligen and parts of the mainland marshes, *Ring dyke pools* with dykes prevented the water from becoming saline/brackish. *Water towers* have been built since the late nineteenth century, when drinking water was provided as tap-water. A water tower is a tower or standpipe serving as a reservoir to deliver water at a required head. They are usually found in or not far from towns, although they can be found in remote areas as well.

Wells can be both natural and dug/built. A *Scheetel* is a rain water collection system.

Wheel/breach pond

Breach ponds or wheels emerge at the place where a dyke breaks due to high water, usually during storm surges. The incoming seawater scours a deep, round hole behind the dyke. After the dyke is repaired, a bend around the wheel can often still be recognized. When old dykes have disappeared, wheels sometimes still mark the place where a dyke once existed.

City

Historical towns or cities are settlements on a strategic location, such as a higher, sandy place near the shore or the banks of a major river, that grew through trading in the Late Medieval times. Market, craft and toll rights, and in some cases a military or administrative function, stimulated the growth of the town. These towns usually have *town rights*. New towns were planned and built in more recent times. Most new towns in the region are harbor or naval towns (Esbjerg, Wilhelmshaven, Den Helder).

Maritime settlement

Towns, villages and other settlements with dwellings and facilities that can be connected to maritime activities, such as fishing, whaling, overseas trade, shipping and shipbuilding. Apart from a harbor, these settlements comprise, e.g., fishermen's houses, captains' houses, shipyards, fish industry etc.

Fishery and hunting

Fishery is to catch fish, usually by means of fishing gear, *hunting* is to pursue animals. Both is done to provide food or as a sport. One characteristic form is the use of *duck decoys*. These are wooded areas of land with a pool in the middle, used for catching ducks and similar waterfowl. Around a decoy, neither any other form of hunting nor plantations were allowed. A *camp site* is a site used in shorter time periods as base for hunting and/or fishing.

Harbor

A place where ships can call at. Some built harbors are still *in use*, others are *old harbors*. In former times, harbors were not always built but merely a naturally shaped *embarkation* places where it was convenient to call at land. An *anchorage* is a place suitable for casting anchor.

Places of craft and industry

Places where commodities are produced as *craft* with the use of a limited number of engines or as industry such as *shipyards*, *industrial factories*, *milk/fodder factories*, *fish factories* or *mineral assimilation* i.e. a factory where mineral products are processed, such as brick works, peat processing, gas station etc.

Navigation

Devices to help people on sea, such as a *lighthouse* containing a powerful flashing lamp that is built on the coast or on a small island in the sea to guide ships or to warn them of danger, a *rescue station* for housing of the rescue boat or a *sea mark* beacons and buoys, used for navigation and piloting ships.

Bridge, ferry, ford

The marshlands are low-lying and criss-crossed by thousands of ditches and canals. When roads were constructed, they had to cross these waterways. Especially where boat canals were crossed, *movable bridges* had to be constructed. Elsewhere, *fixed bridges* are found. Ferries are used to connect the islands to the mainland, but also to cross wide waterways. The most simple way to cross a watercourse, however, is at a ford, a shallow place that allows passage without the help of a bridge or a ferry.

Mining

Clay mining (and mining of boulder clay) was done to build and strengthen dykes from early times on. Since medieval times, clay was also mined to make bricks and - later - tiles and earthenware. The locally won marsh clay often contains a lot of iron that is responsible for the characteristic deep-red bricks of the Wadden Sea Region.

Clay that contains more lime makes a yellowish brick. Sand is mined on several places and for several reasons, recently especially for preparing building sites for housing and industries. Peat was dug to make turfs and use them as fuel.

Salt mining was done up to medieval times by burning the peat that had been soaked by seawater. Other types are *shells/chalk mining* and *gas/oil mining*

Canal

A canal is an artificial waterway for transport by ship. As trading in the old days was primarily done by water, many of the towns and villages in the marsh area, but also in the geest and fenlands, are connected by canals to the main water transport system. More recent canals only connect the main regional centers. Along the canals of the 17th, 18th and 19th centuries, there is often be a towing path allowing the ships to be pulled by horses. Canals for other purposes than transport are mapped under ditch/waterway.

Road, path, railway

Transport on land took place on a *road, path or railway*. *Towing paths* are paths along the canals for pulling ships, *church paths* are old paths leading to the parish church, *ring roads* are found around the outside of dwelling mound villages, *ravines (Hohlweg)* are old roads with high slopes on each side, *military roads* are mainly for the transportation of troops and *dyke passages* are place, where a road crosses a dyke, either by going over the dyke or through an opening in or the dyke. The cut in the dyke can - if necessary - be locked by beams, that are kept in a dyke storehouse.

Shipwreck

Shipwrecks are ships that are sunken, stranded or wrecked in other ways. Shipwrecks are mostly found *in the sea* but due to land reclamation, many shipwrecks in the Wadden Sea region are located *on land* far from the present coastline.

Place of trade and travel

A place connected to trade and travel such as *market place, inn, station* and *storehouse*.

(Industrial) mill

Mills driven by *wind* or by *water*, the energy being used for different purposes such as *sawing mill, flour mill, oil mill* and *paper mill*. Mills for water management purposes are mapped under pumping station/polder mill.

Castle/manor/estate

A *castle* is a large building with thick, high walls. Castles were built by important people, such as kings, in former times, especially for protection during wars and battles.

A *manor* is a large private house in the country, usually built in the Middle Ages, and the land and smaller buildings around it.

An *estate* is an large area of land in a country which is owned by a person, family or organization.

Church

Places of worship, in most of the Wadden Sea Region in the shape of a Christian *church* or a *chapel* but also *synagogues occur*. A *belfry* or *bell cage* can be attached.

Monastery

A place where monks live as a community under religious *vows*.

Burial place

Places where dead people are buried, in the Wadden Sea Region mainly Christian *churchyards* but also *Jewish graveyards*. Prehistoric types are *burial fields, burial mounds* and *chambered tombs*.

Communal and other building

Under this category are mapped *dwelling houses* in towns and *urban ensembles*. In addition communal buildings such as *town halls, court houses, water board buildings, dyke storehouses* and *schools* as well as buildings that do not fit in any of the other categories.

Historical place

Places of historical significance either a *historical place*, such as battlefield, a *pilgrimage* or a *memorial stone/statue*.

Military object

Places or items connected to military activity such as *naval harbor, bunker/casemate, defense line, fort/sconce* and *fortification* in a town.

Tourism and recreational facility

Object with the main purpose of serving tourist and recreation such as *skating ground, fivel ground, skating tour, walking tour* and *hotel*.

Other

Here are mapped objects which do not fit in under the other categories.

5.4 Data sources

5.4 Data sources

The basis for the registration was the use of existing data. Especially the use of existing databases had a high priority. Below is an account of which data sources have been available in the four regions.

Denmark: In Denmark, only two databases were available to this project.

- The database of the DKC (Cultural-Historical Central Register). This is a national database of mainly archaeological sites and monuments. The database is not finished and in more than 10 parishes in the County of Ribe, there only exist sparse information.
- The database set up by the County of Sønderjylland in connection to the appointment of "Cultural environments" for the regional planning.

In addition to these databases, the Danish project team used different sources:

- List of protected buildings (Forest and Nature Agency). Contains all national protected buildings in Denmark.
- Trap: Denmark. "Trap" is a topographical work in five editions covering all of Denmark, containing information on churches, manors, villages, memorial places etc. The first edition came in the middle of the 19th century and the fifth (almost 30 volumes) in the middle of the 20th century.
- "Kommuneatlas". Atlases containing information on valuable buildings and contexts in the cultural landscape. There exist only atlases of the municipalities of Varde, Esbjerg, Ribe and Tønder.
- Information from the "Tønder-Ballum project" where local working groups collected information for the mapping. The project was organised by the museums of Tønder and Haderslev.
- Information from the marine archaeological project carried out by The Forest and Nature Agency and the National Museum of Denmark.
- Around 250 books, articles, reports and leaflets.

Schleswig-Holstein: Two main sources have been used to gather the information for this project: The federal archaeological register from the federal agency of archaeology and the list of protected buildings from the federal agency of monument protection.

The first consists of the following sub-sources, which are partly published in different sources and partly updated by local surveys:

- Archaeological register of Dithmarschen from D. Meier, partly updated in the 1990ies, partly on GIS
 - Norderhever Projekt of the area of the marsh island and the Halligen from Kühn, Müller-Wille, Harck u.a., 1988, (only archaeological objects up to medieval time)
 - Archaeological register of the North Frisian islands from Kersten, La Baume, 1958 (only archaeological objects up to medieval time)
 - Archaeological survey on dwelling mounds in Schleswig-Holstein by K. Burk, 1940ies (mainly mounds, dykes and connected objects)
 - Map of listed archaeological monuments
 - Some smaller surveys on very restricted areas.
- All of them leave different gaps in the different areas, especially regarding later-than-middle-age objects. The date of the information is sometimes very old, therefore, changes could have occurred. Information on all the different attributes was scarcely available, in most of the sources it was at least limited. Some of the gaps were partly closed by consulting modern maps and additional books.

For buildings to the list of protected monuments of the State Department of Ancient Monuments 2000, some minor sources are added:

- Card register of historical buildings of the District Department of Ancient Monuments. It contains an inventory of preservable buildings, collected 1983-1989, only partly updated 1991-1998.
- Kunst-Topographie Schleswig-Holstein from the State-Departm.of A.M., Neumünster 1969.
- Kunstdenkmäler der Provinz Schleswig-Holstein , Berlin 1939 / Kreis Südtondern / Kreis Husum / Kreis Eiderstedt. These topographies contain former inventories of historical buildings with descriptions and pictures.
- Topographie des Herzogthums Schleswig, Joh. Schröder, Schleswig 1837. It is an inventory of all villages and towns with short descriptions about history and 'actual' development.
- Wohnplatzverzeichnis Schleswig-Holstein 1987, Kiel, 1992; an official inventory of all places, communities and departments, published by the State Department of statistics, with information about the administrative and topographic designation and the number of inhabitants and households.
- Books, reports and magazines.

Lower Saxony: In Lower Saxony for this project has been used only existing databases.

The most important database was the "Verzeichnis der Kulturdenkmale" (§ 4 Niedersächsisches Denkmalschutzgesetz [NDSchG]) called "Niedersächsische Denkmalkartei" (NDK), which is kept by the "Niedersächsisches Landesamt für Denkmalpflege" (NLD) in Hannover. It contains all protected historical buildings and monuments in the whole working area and the most important archaeological monuments in the Unterweser- and Jade-districts. The data for further more archaeological objects in Unit II has been taken from the „Fundstellenkartei“ (FStK), which is kept by the NLD as well and from the "Denkmaltopographie Wilhelmshaven" (Wulf, F.-W. 1996. Archäologische Denkmale in der Kreisfreienstadt Wilhelmshaven. Materialhefte zur Ur- und Frühgeschichte Niedersachsens, Reihe B, Heft 1. Hannover.).

Additionally information has been used from the archaeological databank of the „Archäologische Forschungsstelle der Ostfriesischen Landschaft“ (OLAF). In this databank are information about all archaeological objects in the districts of Ostfriesland.

Most of the information about the archaeological objects in the Elbe-Weser-districts has been derived from the survey of Hadeln and Wesermünde (county Cuxhaven) from H. Aust. In addition to this database has been used the archaeological register from the "Kreisarchäologie Cuxhaven" (Bad Bederkesa) and the "Stadtarchäologie Cuxhaven" (Cuxhaven). More detailed information about historical buildings and monuments in the city of Cuxhaven has been taken from the "Denkmaltopographie Cuxhaven" (Böker, D. [bearb.] 1997. Denkmaltopographie Bundesrepublik Deutschland. Baudenkmale in Niedersachsen. Bd. 19 Landkreis Cuxhaven. Hameln.).

For the island Neuwerk the information about the historical buildings and monuments and the archaeological objects as well, was available at the „Helms Museum Hamburg-Harburg, Staatliche Bodendenkmalpflege“.

Not all registered historical buildings and monuments can be mapped. There exist only coordinates to the archaeological objects. For mapping of historical buildings and monuments it is necessary to check the addresses and the information in the "Automatisierte Liegenschaftskarte" (ALK). The combination of these two sources was complicated and gave a map-

ping result between 63,33 % (Schwanewede) and 97,85 % (Emden) of cases.

In Lower Saxony all historical buildings and monuments and all archaeological monuments corresponding to § 3 NDSchG (Begriffsbestimmung) are protected. Pursuant to § 5 NDSchG (Wirkung der Eintragungen in das Verzeichnis) it is irrelevant if the object is listed in the "Verzeichnis der Kulturdenkmale" (§ 4 NDSchG) or not.

The reasons for some gaps in the Lower Saxony project-database (land reclamation, city, etc.) originated from the used databases (see before).

The Netherlands: In the Netherlands, existing digital databases formed the basis for the inventory. These databases were derived from the State Service for Archaeology (*ROB; archaeological sites*), the State Service for Built Monuments (*RDMZ: historical towns and villages; historical buildings*); the ExpertiseCentrum LNV (*historical-geographical elements and structures*); the provinces of Groningen, Fryslân and Noord-Holland (*historical-geographical and other relevant elements*) and Alterra (*historical-geographical landscapes*). As some of these databases contain the same elements, some overlap may have occurred. The inventory in the province of Fryslân has not been completed yet. Due to this, a small strip in the southern half of Fryslân lacks historical-geographical data.

Additional information was derived from the C.B.S. topographical map and the topographical map 1 : 25.000 of the National Topographical Service. Information about duck decoys was delivered by ing. J.J.H.G.D. Karelse of 'EEN-DenkKOOI Onderzoek'. Information on village types was derived from literature (*Arthur Steegh: Kleine Monumentenatlas van Nederland*). Furthermore, information was delivered by many enthusiastic volunteers and organizations in the region, that were requested to do so. Especially the National Agency for Forestry and Nature Management (*Staatsbosbeheer*), district Friesland, has to be mentioned. On a few elements, hardly any information turned up to be available in the existing databases. Even fewer information was available of the attributes. Many of the lacking information, esp. of objects and sites of local importance, is available in the municipalities, in regional archives and among historical and landscape organizations throughout the region. This information, due to lack of time, unfortunately could not yet be included.

5.5 Inventory

5.5 Inventory registration

The heterogeneity of the data sources is inevitably reflected in the number and types of the mapped objects.

Dwelling mound

Denmark: All known dwelling mounds were mapped.

Schleswig-Holstein: All known dwelling mounds were mapped.

Lower Saxony: All known dwelling mounds were registered and mapped.

The Netherlands: All registered dwelling mounds were mapped. Most relevant types and attribute data are available as well.

Village

Denmark: All villages were mapped – including all known prehistoric ones. All villages situated on the Geest edge have been assigned with the overall assessment: regional.

Schleswig-Holstein: The most important villages with a preserved historical center or an abundant stock of historical buildings and the characteristic types of villages for the Wadden Sea Area were mapped. Archaeological settlement sites that indicate several village-like farmsteads were also included.

Lower Saxony: Some villages had been registered in the lists of archaeological monument. These objects were mapped.

The Netherlands: The most important villages and village types were mapped; the data set is incomplete. Few attributes were available (apart from 'protected villages'). Also, the known prehistoric 'settlements' were included.

Agrarian building

Denmark: All nationally protected buildings and the ones granted the value "highly worthy of preservation" in the "Kommuneatlas" were mapped. Meaning that municipalities without a "Kommuneatlas" are underrepresented.

Schleswig-Holstein: All protected buildings of the list of monuments, 'simple' and 'registered', added by a few characteristic farmsteads which are valued only as 'worth to preserve' were mapped. Uncertain or single-farmstead archaeological settlement sites were included here.

Lower Saxony: All protected agrarian buildings had been registered. Most of them were mapped.

The Netherlands: Only 'protected' farmsteads and adjoining buildings were mapped. On these, many attribute data were available. It was not always possible to distinguish between element types.

Characteristic field pattern

Denmark: Only a few characteristic field patterns had been registered. That does not mean that other field patterns are not interesting and characteristic. They should all be assessed in their context if there is to be any changes or interfering.

Schleswig-Holstein: Only some examples of characteristic field patterns in this area were selected. In consequence there could be and are a lot more of the same type.

Lower Saxony: Some characteristic field patterns had been registered in the monument lists. These objects were mapped.

The Netherlands: Only the most characteristic field patterns, indicated by the provinces and EC LNV, were mapped, also some attributes.

Dyke

Denmark: All known dykes were mapped. Probably, there exist quite a few summer dykes that are not registered. A registration of all summer dykes is desirable.

Schleswig-Holstein: All dykes from the above-mentioned sources were mapped. Some of them already disappeared.

Lower Saxony: All protected dykes had been registered and were mapped.

The Netherlands: All existing data of dykes (of existing as well as disappeared ones) were used. Some overlap may have occurred due to the use of different sources. Information was available on only a few attributes. Where available, dyke-passages were mapped too.

Ditch/waterway

Denmark: Only a few major irrigation and drainage ditches were mapped – for instance the straighten streams.

Schleswig-Holstein: Some major drainage ditches were mapped. Where information was at hand, all former natural watercourses like streams or tidal inlets were mapped. There is almost no additional information.

Lower Saxony: Some ditches and waterways had been registered and were mapped.

The Netherlands: Apart from some individual objects, especially in the province of Fryslân, the dataset of the CBS-mapping, containing all waterways, was used. These data contain no attributes.

Sluice

Denmark: All major and quite a few minor sluices were mapped.

Schleswig-Holstein: All major sluices, but only a few minor ones were mapped.

Lower Saxony: All protected sluices had been registered. Most of them were mapped.

The Netherlands: All available data were used. Omissions may have occurred. Type information was not always available (lock/weir or sluice). Many attributes were available.

Land reclamation

Denmark: A few examples of the most recent land reclamation were mapped – most of them are now serving as coastal protection.

Schleswig-Holstein: The areas of land reclamation along the coast and around islands were mapped.

Lower Saxony: No areas of land reclamation had been registered in the monument lists.

The Netherlands: The main areas (former) of land reclamation were mapped. No attributes were available.

Pumping station/polder mill

Denmark: Not all pumping stations and polder mills were mapped. The most comprehensive information concerns the county of Sønderjylland.

Schleswig-Holstein: Where data was available, it was mapped. Although, it was only a few.

Lower Saxony: All protected pumping stations and polder mills had been registered. Most of them were mapped.

The Netherlands: Most of the polder mills were mapped; of pumping stations, only the historical important ones were taken into consideration. Many attributes were available.

Freshwater supply

Denmark: Due to lack of information, only a few examples of freshwater supply in the marsh area were mapped. In contrast, quite a few water towers were mapped.

Schlewig-Holstein: Only the protected buildings, like water towers, of the list of monuments were mapped. All pools were mapped. Data differed strongly between sub-regions.

Lower Saxony: All protected objects of freshwater supply had been registered. Most of them were mapped.

The Netherlands: Most pools were mapped; only a few water towers were mapped. Only a few attributes were available.

Wheel/breach pond

Denmark: All known breach ponds were mapped. There might be more, but so far, they had not been registered.

Schleswig-Holstein: All available wheels, some bends in dykes that indicate former breaches. Data differs strongly between sub-regions.

Lower Saxony: Some wheels and breach ponds had been registered in the monument lists. Most of them were mapped.

The Netherlands: Quite a few breach ponds were mapped, though still many – especially disappeared wheels – must be lacking. Few attributes were available.

City

Denmark: All towns with privileges were mapped. Including the small town Højer, which had only a limited number of privileges.

Schleswig-Holstein: All towns with an important historical center or an abundant stock of historical buildings were mapped. The historical and protected buildings of the towns are not mapped separately.

Lower Saxony: No towns had been registered or were mapped.

The Netherlands: All towns with privileges and two 'new towns' were mapped. Attributes were only available of protected towns.

Maritime settlement

Denmark: Settlements emerged in connection to the sea were mapped. Including skipper communities and fishing hamlets.

Schleswig-Holstein: There are only a few skipper communities and settlements of fishermen. Mostly these settlements are part of a town/village or a settlement.

Lower Saxony: No maritime settlement had been registered or were mapped.

The Netherlands: Most important maritime settlements were mapped, but the inventory is far from complete. No attributes were available.

Fishery and hunting

Denmark: Primarily material relics like duck decoys and fish weirs were mapped.

Schleswig-Holstein: All duck decoys were mapped.

Lower Saxony: Only two fishing houses registered in the list of historical buildings were mapped.

The Netherlands: All duck decoys with all attributes were mapped. Fishery: only a few objects were mapped. Incomplete.

Harbor

Denmark: All known harbors – including embarkation places without physical relics – were mapped.

Schleswig-Holstein: All existing and former harbors (as far as known) were mapped.

Lower Saxony: Some harbors resp. basins/buildings/docks had been registered in the monument lists. Most of them were mapped.

The Netherlands: All existing and former harbors (as far as known) were mapped. Some anchorages were mapped. Few attributes were available.

Places of craft and industry

Denmark: Only a few important ones were mapped.

Schleswig-Holstein: All protected and only some characteristic buildings with the valuation 'worth to preserve' of the card-register were mapped.

Lower Saxony: Some places of craft and industry had been registered in the monument lists. Most of them were mapped.

The Netherlands: Only some important ones were mapped, due to lack of digital information. Very incomplete.

Navigation

Denmark: Primarily the most important or protected lighthouses, sea marks and rescue stations were mapped.

Schleswig-Holstein: All protected lighthouses of the list of monuments were mapped.

Lower Saxony: All lighthouse and sea marks were mapped. Some of them had been registered in the monument lists.

The Netherlands: All lighthouses and some important sea marks/beacons and rescue stations were mapped.

Bridge, ferry, ford

Denmark: Old or important crossings were mapped.

Schleswig-Holstein: Only protected bridges were mapped. No data on fords were available.

Lower Saxony: All protected bridges and ferries had been registered. Most of them were mapped.

The Netherlands: Many movable bridges and the most important fixed bridges were mapped. No attributes were available. Ferries (from and to the islands) were all mapped. Fords do not occur.

Mining

Denmark: Mostly areas of sand or clay mining were mapped.

Schleswig-Holstein: Some known places of mining, especially clay mining for dyke and mound building were mapped.

Lower Saxony: Two places of peat mining had been registered in the lists of archaeological monuments. These objects were mapped.

The Netherlands: Only some important places of mining (peat, clay, salt) were mapped. Only a few attributes were available.

Canal (transport)

Denmark: All canals that were build to make sailing easier were mapped.

Schleswig-Holstein: All were mapped.

Lower Saxony: Some canals had been registered in the monument lists. Some of them were mapped.

The Netherlands: Incompletely mapped. Especially data in the province of Groningen are still lacking. Only a few attributes were available.

Road, path, railway

Denmark: All railways were mapped. Concerning the roads; only the important ones already pointed at (including the "low tide roads") and the old road-system around Varde were mapped. Only a few paths were mapped.

Schleswig-Holstein: A selection of a few major roads, connecting roads and paths and old railways were mapped. Data differs strongly between the sub-regions.

Lower Saxony: Some roads and paths respectively parts of them (e.g. milestone) had been registered in the monument lists. Most of them were mapped.

The Netherlands: All existing railways and some roads and paths were mapped. Only incomplete and a few attributes were available.

Shipwreck

Denmark: All known shipwrecks were mapped.

Schleswig-Holstein: Almost no coordinates for shipwrecks were available.

Lower Saxony: Some ships and shipwrecks had been registered in the monument lists. Most of them were mapped.

The Netherlands: All shipwrecks in ROB-database were mapped. Recent, non-archaeological shipwrecks (WRAKSYS database) are still lacking.

Place of trade and travel

Denmark: Most inns and ferrymen's houses plus all protected station buildings were mapped. Only one market place outside a town is known and was mapped.

Schleswig-Holstein: All protected railway stations with adjoining buildings, inns, store houses, ferry-houses and only a few not protected ones, but buildings with the valuation 'worth to preserve' of the card-register were mapped.

Lower Saxony: Some places of trade and travel had been registered in the monument lists. Most of them were mapped.

The Netherlands: Some old railway stations and some objects (e.g. inns, weigh-houses) were mapped. Very incomplete. Attributes were included.

(Industrial) mill

Denmark: All existing and almost all known demolished water- and windmills were mapped.

Schleswig-Holstein: All protected industrial mills were mapped.

Lower Saxony: Many mills had been registered in the monument lists. Most of them were mapped.

The Netherlands: All protected industrial mills (flour mills) were mapped; no other mills.

Castle/manor/estate

Denmark: All known existing and former manors plus castles and castle mounds were mapped.

Schleswig-Holstein: All protected castles/manors/estates /gardens/parks were mapped. Archaeological fortifications belong here as well.

Lower Saxony: Most of the castles, manors, and estates had been registered in the monument lists. Most of them were mapped.

The Netherlands: All known and protected castles and strongholds (hege wieren, borgen, stinsen, staten) and estates were mapped; including parks and gardens. Many attributes were available.

Church

Denmark: All known churches were mapped.

Schleswig-Holstein: All protected churches, bell cages, were mapped.

Lower Saxony: All protected churches had been registered and were mapped.

The Netherlands: All old and protected churches, synagogues and vicarages were mapped. Many attributes were available.

Monastery

Denmark: All known monasteries – existing or demolished – were mapped.

Schleswig-Holstein: There were no monasteries in the Wadden Sea Area of Schleswig-Holstein.

Lower Saxony: All protected monasteries had been registered and were mapped.

The Netherlands: All known former monasteries were mapped. Many attributes were available.

Burial place

Denmark: All known prehistoric burial places were mapped. Only churchyards situated by themselves or churchyards with special features in connection with existing churches were mapped.

Schleswig-Holstein: All protected burial places of the list of monuments were mapped. All archaeological burial sites with at least a few burials were mapped.

Lower Saxony: Many burial places had been registered in the monument lists. Most of them were mapped.

The Netherlands: All known pre-historical and a selection of historical (Christian and Jewish) burial places were mapped. Some attributes were available.

Communal and other buildings

Denmark: All nationally protected buildings and the ones granted the value "highly worthy of preservation" in the "Kommuneatlas" were mapped. Meaning that municipalities without a "Kommuneatlas" are underrepresented. In some Towns and Maritime Settlements buildings are joined in Urban ensembles that represents more than two protected dwelling houses in a row or all buildings granted the value "highly worthy of preservation" in the "Kommuneatlas" in the towns of Tønder, Ribe and Esbjerg.

Schleswig-Holstein: All protected communal and other buildings of the list of monuments, some characteristic, not protected but buildings valued as 'worth to preserve' of the card-register, added by a few characteristic urban ensembles were mapped.

Lower Saxony: All protected communal and other buildings had been registered. Most of them were mapped.

5.6 Trilateral maps

The Netherlands: Very many protected objects with attributes were mapped. Where possible, different types (*town hall, court house, water board building, dyke storehouse, school, warehouses and captains house*) were distinguished. Where the selection of types turned out to be not possible, these objects were considered to be 'dwelling houses'. Courts, almshouses and working-class housing-estates were put under 'urban ensemble'.

Historical place

Denmark: The most relevant memorial places for the Wadden Sea Area were mapped. That means flood poles and memorial stones for drowned people. Also, pilgrimages and most local memorial stones were mapped.

Schleswig-Holstein: Very few important historical sites were mapped. Known places of execution were included here.

Lower Saxony: Many historical places and sites had been registered in the monument lists. Most of them were mapped.

The Netherlands: Only a few historical places were mapped. Many interesting sites, statues and memorial stones are still lacking.

Military object

Denmark: Contains primarily relics from World War 2. But only the relics pointed out by the Forest and Nature Agency in "Kulturspor fra 2. Verdenskrig" were mapped.

Schleswig-Holstein: All protected military settlements of the list of monuments were mapped.

Lower Saxony: Many military objects had been registered in the monument lists. Most of them were mapped.

The Netherlands: Military objects from the 16th century (Dutch Rising) on to the Cold War period (air defense towers) were mapped. Especially relics from World War 2 were incomplete. Few attributes were available.

Tourism and recreation facility

Denmark: This category also contains hotels.

Schleswig-Holstein: All protected hotels of the list of monuments were mapped.

Lower Saxony: Many facilities for tourism and recreation had been registered in the list of historical buildings. Most of them were mapped.

The Netherlands: Only a few objects (hotels, sports facilities and tours) were mapped, due to lacking databases.

Other

Denmark: Contains historical boundaries and objects that did not fit in one of the previous categories.

Lower Saxony: Some boundary stones had been registered in the monument lists. Most of them were mapped.

The Netherlands: contains some historical boundaries and boundary stones, as well as 20th century pine plantations on the islands. Few attributes were available.

5.6 Trilateral maps

The trilateral maps presented by the LANCEWAD project are not intended for analyzing the historical, geographical, or cultural context of the Wadden Sea Region. The large scale of the maps as well as the different and nationally not balanced data allow only an overview and impression on the geographical distribution of element objects, taking types, periods, protection status and other attributes into account. To get more detailed information the maps of sub-regions are more suitable.

The titles of the maps are as follows:

1. Names of islands, towns and rivers in the Wadden Sea Region
2. Geomorphology and sub-regions of the Wadden Sea Region
3. Dwelling mounds with period of origin in the Wadden Sea Region
4. Dykes and sluices in the Wadden Sea Region
5. Maritime-related sites in the Wadden Sea Region
6. Foundation of villages and churches in the Wadden Sea Region
7. Protection of buildings in the Wadden Sea Region

6. Criteria and Guidelines

6. Criteria and Guidelines for the Conservation, Management and Sustainable Use of the Heritage in the Wadden Sea Region

6.1 Conservation and management of the landscape and cultural heritage in the Wadden Sea Region

6.1.1 Introduction

An outline of the administrative structures and the legal-administrative and planning instruments including economical instruments of the three countries pertaining to the landscape and cultural heritage of the Wadden Sea Region including relevant sector developments is given in this chapter. The aim is to provide an overview of the main structures and instruments in the countries also with reference to the Wadden Sea Region to enable defining the main issues of conservation and management in conjunction with the evaluation of the conservation and management status of the heritage, and as a next step develop recommendations for common criteria and guidelines. Because of the complexity of the item, the outline is confined to describing the main issues and developments.

6.1.2 Administrative and management structures

In The Netherlands, the overall responsibility for the conservation and management of the landscape and cultural heritage is located at the state level. The Ministry of Agriculture, Nature Management and Fishery is responsible for nature conservation and landscape management including cultural landscapes and the preservation of historical gardens, forests and agricultural land of estates through the Nature Conservation Act respectively the Natural Beauty Act and a number of national policy plans and management regulations.

The Ministry of Education, Culture and Science is responsible for the state policy on archaeology, historical buildings, monumental sites and towns and villages. The most important instruments are the Monument Act and the Cultural Plan. The Monument Act defines tasks and responsibilities of the different authorities. The general principle of the Act is

to give the government level, which is most suited for executing the stipulations of the Act, the responsibility.

The Ministry of Housing, Physical Planning and Environment is responsible for the national physical planning and the protection of the soil according to the Physical Planning Act and the Environmental Management Act. Several national policy plans have been issued including the key planning policy plan for the protection of the Dutch Wadden Sea which are relevant also for the overall management of the landscape heritage.

The provinces and the municipalities have a substantial degree of planning authority within their territory. Whereas the overall national planning is entailed in national policy plans; each province elaborates regional policy plans e.g. a regional physical planning document. The regional physical plans focus, to a larger extent, nowadays on the landscape and cultural values of the region, and the provinces are therefore important actors regarding the management of the landscape and cultural heritage. The municipalities are responsible for the municipal planning taking into account the national and regional policy plans. Contrary to regional plans, the local plans are legally binding for the citizens. Local plans can address also heritage conservation and management.

In Germany, the management of the landscape heritage to the extent defined as natural areas is regulated according the Federal Nature Conservation Act, which is a federal framework law implemented by state legislation. Further landscape management, physical planning and conservation and management of the cultural heritage is basically a competency of the federal states ("Länder") which the federal government has no authority for.

In Lower Saxony, the State Ministry of Culture and Science is responsible for the protection of archaeological sites and build monuments according to the Lower Saxon Monument Protection Act as the supreme authority. The Lower Saxon State Monument Service, which is the intermediate authority in this field identifies and registers the monuments. Their expertise is the legal condition for applying the Monument Protection Act by the monuments protection authorities, which are the county councils being the lower authorities, the district governments being the intermediate authorities, and the Ministry for Culture and Science.

The State Ministry for the Environment is responsible for the State Nature Protection Act, which also provides the possibility to protect cultural landscapes. The counties are the lower authorities applying the law, and the district governments issue the nature protection orders and planning as the intermediate authority. Further hereto there is the physical planning of the state territory and regional plans for the counties. The municipalities are responsible for the local plans and construction plans implementing the local plan into actual use. The local plans are crucial for the management of the heritage and the municipal authorities are therefore essential for the conservation and management of the landscape and cultural heritage.

The administrative and management structures of Schleswig-Holstein are comparable to those of Lower Saxony. An essential difference is that in Schleswig-Holstein there is no district government level. The State Ministry for Environment, Nature and Forest is the supreme state nature conservation authority in the framework of the State Nature Conservation Act. The State Agency for Nature and Environment is the intermediate nature conservation authority, for the territory of the Wadden Sea national park, the National Park Agency is the intermediate authority, and the county councils are the lower conservation authorities. The State Nature Conservation Act is applicable to the protection of nature areas and historical cultural landscapes. The ministry also issues a state program for landscape management and regional landscape policy plans.

The State Ministry of Culture and Science is responsible for the protection of the cultural heritage in the framework of the State Monument Protection Act. The State Agency of Archaeology and the State Agency for Monument Protection are the intermediate authorities, and the county councils are the lower authorities in this field. The intermediate authority of the State Monument Agency is responsible for cataloguing, research, assessment, registration and protection of monuments. The task of the lower authority is the realization of the Monument Protection Act and the approval of actions where the Monument Act is applicable. In the latter case, the intermediate authority must be consulted. Further fields of engagement for the lower authorities are information and consulting with regard to municipal planning.

The Ministry of Rural Areas is responsible for the overall physical planning for the state of

Schleswig-Holstein. An overall state physical planning program has been elaborated in conjunction with five regional programs. The municipalities are responsible for the local plans as in Lower Saxony and in relevant cases, the state agencies for archaeology and monuments will be consulted to safeguard those interests.

The county councils as lower authorities for nature and monument protection have a high degree of planning authority within the framework of the state physical planning programs and regional developing plans. They are however not legally binding for municipal development plans. Aspects in the latter not in line with the supreme plans are not supposed to handicap the aims of nature and monument protection or should be integrated in case it is of major interest for planning.

The intermediate authorities of the Ministry of Rural Areas are the Agencies of Rural Areas. The one responsible for the Wadden Sea area and the coastal areas is the agency in Husum. The lower authorities are the county councils. The responsibility of the Ministry of Rural Areas is the promotion of a modern agriculture and fishery, aiding the rural areas in their economic, social and cultural development and coastal protection. The agency in Husum is responsible for the realization and support of the physical planning, e.g. for agriculture, village development, rural road construction, rearrangement of the rural structure, tourism and coastal protection. Besides the regional plans the county development plans realize the physical planning on the communal level.

In Denmark, the main responsibility for conservation and management of the physical cultural heritage is vested at national authorities. The planning department of the Ministry of Environment and Energy has the overall national planning authority and can issue guidelines for planning to the regional authorities. The National Forest and Nature Agency of the ministry has the overall responsibility for the preservation and conservation of the valuable landscapes, cultural environments, historical monuments including archaeological sites in situ and the conservation of built monuments and of urban preservation. Since the agency is also the responsible authority for, a. o., nature protection and restoration, it has an overall responsibility for aspects, which have an impact on the conservation and management of the cultural landscape. The agency is the sole authority for the preservation of built monuments.

The Ministry for Cultural Affairs is responsible for the protection and rescue of archaeological sites, excavation, and preservation of antiquities. The Ministry of Ecclesiastical Affairs is responsible for managing churches and churchyards.

The county councils are responsible for the physical planning. The plans have a timeframe of 12 years and are revised every 4 years. The county councils have moreover competencies in accordance with the Nature Conservation Act, e.g. registration and protection of specific nature types and protection lines around historical monuments. Even though the counties do not have a specific competence in terms of preservation of archaeological sites and built monuments, they play an important role in the management of cultural landscapes. The municipalities elaborated municipal plans valid for its territory, which can entail stipulations for the preservation of urban areas. The local plans elaborated for specific areas entail binding rules for, a.o., preservation of cultural environments. Basically the county councils are responsible for the planning and management of the rural area whereas the municipal councils are responsible for urban areas.

6.1.3 Legal, administrative and planning instruments

A. Legal and administrative instruments

International conventions and treaties of relevance for the protection and management of the heritage are the Malta Convention (1992), the Granada Convention (1985), the European Landscape Convention (2000), all established within the Council of Europe and the World Heritage Convention (1972), which is a global convention.

The Malta Convention entered into force in 1995 and updates the provisions of a previous Convention adopted by the European Council in 1969. The Convention makes the conservation and enhancement of the archaeological heritage one of the goals of urban and regional planning policies. It is concerned, in particular, with arrangements to be made for the cooperation amongst archeologists and towns and regional planners in order to ensure an optimum conservation of archaeological heritage. The Convention hence basically stipulates that member states embed the archeological values in physical plans and carries out an investigation in case of major development projects, e.g., according to an environmental impact assessment. The aim is to conserve the archeological heritage in situ,

and if this is not possible to conserve it *ex situ* whilst the costs for the excavation is to be born by the originator of the plan. The Malta Convention has not yet been ratified by Germany. It is however expected that the ratification will follow soon.

The main purpose of the Granada Convention, which entered into force in 1987, is to reinforce and promote policies for the conservation and enhancement of Europe's heritage. It also affirms the need for European solidarity with regard to heritage conservation and is designed to foster practical cooperation amongst the Parties.

The European Landscape Convention aims at encouraging public authorities to adopt policies and measures at local, regional, national and international levels for protecting, managing and planning landscapes throughout Europe. It covers all landscapes, both outstanding and ordinary that determine the quality of people's living environment. The text provides for a flexible approach to landscapes whose specific features call for various types of action ranging from strict conservation through protection, management and improvement to actual creation. It also provides for a Council of Europe Landscape Award, to be given to local or regional authorities or a non-governmental organization, which introduced exemplary and long-lasting policies or measures to protect, manage and plan landscapes. The Convention has not yet entered into force.

The primary mission of the World Heritage Convention is to identify the world's natural and cultural heritage considered to be of outstanding universal value. More than 160 states have signed the Convention. It draws up a list of properties called the World Heritage List. States nominate the properties for inclusion in the List and ensure their preservation. Both natural, cultural and mixed properties can be included in the list. To be included in the List a property must meet the criteria as prescribed by the Convention for outstanding universal value. A cultural property must also fulfill a test of authenticity, and a natural property must meet the conditions of integrity. This means that it must be demonstrated that a property is something exceptional not found elsewhere in the world and that it will be preserved for future generations.

Of importance is also the European legislation relevant for nature and environment protection in the Wadden Sea Area, in particular, the Bird and Habitat Directives. Any projects or plans in the designated birds and habitat areas, consti-

tuting the Natura 2000 network, must be made subject to a proper assessment of the impacts and, in case of significant impacts, the plans and projects must not be granted. If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. This will also serve to protect the landscape and cultural-historic values of the Wadden Sea as practically the whole Wadden Sea has been or will be designated as birds and habitat areas, the so-called NATURA 2000 area.

The primary relevant instruments in The Netherlands are the Monument Act, the Nature Conservation Act and the Environment Management Act. The Monument Act enables the designation of historical buildings and archaeological sites as protected monument and village, and cities as protected contours of villages and cities. Currently there are about 46,000 protected monuments and 315 protected contours of villages and cities. 1,600 sites have been protected as archaeological monuments, however there can be more than one object per site. Recently, a large archeological site containing many objects has been legally protected as an archeological reserve as the first of its kind in The Netherlands. The Monument Act allows for granting subsidies for restoration and maintenance of historical buildings only.

The Nature Conservation Acts allows for the protection of natural monuments. Even though the primary objective is the protection of areas and objects of natural importance, the designated areas of which there are more than 200 also encompass areas of cultural-historical value as e.g. grasslands, marshes and duck decoys. Management plans can be established for such areas in collaboration with the manager and the owners. It is also possible to support the management of such areas financially. Since recently the revised Nature Conservation Act offers the provinces the opportunity to designate so-called protected landscape contours, however this possibility has not yet been used.

The large majority of the Dutch Wadden Sea Conservation Area has been declared a nature reserve. This designation will, in conjunction with the application of numerous other instruments, in particular the key planning decision,

safeguard the landscape and cultural-historic values of the area including archaeological values such as ship wrecks in the western Dutch Wadden Sea.

The Environment Management Act enables the designation of soil protection areas. Archaeological and historic landscape elements can, as has been demonstrated in various cases, play a role when a decision is taken on the designation of such an area.

In Lower Saxony, the relevant acts are the Lower Saxon Monument Protection Act and the Nature Protection Act. The Monument Act defines buildings and archaeological monuments or sites including all executive measures requiring their protection. The protection of landscape is confined to an area of the immediate environment of monuments. The classification of a historical landscape as a monument is a mere theoretical possibility. A monument is defined by its monument character itself and is immediately protected by law, which means that an official announcement is not necessary.

The Lower Saxon Nature Protection Act also allows for the protection of historic-cultural landscapes, however, this is used only to a limited extent. The Lower Saxon Wadden Sea Conservation Area is designated national park by state law. The designation will also provide for the protection of the cultural and landscape heritage.

As in Lower Saxony, the relevant laws in Schleswig-Holstein are the State Monument Protection Act and the State Nature Protection Act. The Monument Protection Act enables the protection of the cultural heritage whereas the State Nature Protection Act can be applied for the protection of historic-cultural landscapes. The Schleswig-Holstein Wadden Sea Conservation Area is designated national park by state law. The act was amended in 1999 and entailed, a.o., an extension of the territory of the national park. The National Park law provides in conjunction with the Excavation Protection Order issued for the North Frisian Wadden Sea a protection of the cultural and landscape heritage of the national park including the archaeological values of the area. The stipulations of the law restrict and forbid activities, which potentially destroy the archeological remains, respectively require a permit according to the Excavation Order.

Archaeological monuments according to the Monument Protection Act are all archaeological objects and structures that are beneath or on top

of the soil, bogs or in water. Only the registration in the monument list gives a known object a legal protection. Unmapped objects are subject to announcement to the competent authorities. Within the 4 weeks as of the announcement, they are then under temporary protection. This usually applies to construction sites where archaeological remains are affected. The State Monument Agency is allowed to stop all building actions and to survey and excavate the site. A financial contribution of the originator of the construction is not foreseen. Whereas the duration of the survey should not delay the continuation of work for too long due to financial interests.

Historical gardens and parks are generally protected. The registration in the monument list allows for an area of protection around the object or structure. The procedure of registration into the list of monuments is conducted by the intermediate authorities. Still there is a possibility of the supreme authority, i.e. the ministries, to intervene taking account of and weighing various interests. The State Development Guidelines Act provides a basic framework for the state physical plan and regional physical plans.

In Denmark, the primary relevant acts are the Nature Protection Act and the Listed Buildings and Preservation of Buildings and Urban Environments Act. The Nature Protection Act aims at protecting nature including its landscape and cultural-historic values and at improving, restoring and creating areas of significance for landscape and historical interests. The minister, county councils, municipal councils and the Danish Nature Conservation Council may propose areas to be protected to fulfill the aims of the law including cultural-historic aims. The protection is implemented by the regional protection councils and results, for privately owned land, in financial compensation or purchase by the authorities. The protection of landscape and cultural heritage by order according to the act is rarely used where the cultural heritage is the main interest.

The act entails general protection stipulations for certain habitats and for stone and earth walls. It is not allowed to change the state of those without an exemption from the county councils, which are obligated to register those habitats and the earth and stonewalls. The inclusion of earth and stonewalls contribute to maintaining historical structures in the landscape. If those objects are more than 100 years old, they can also be registered as ancient monuments

which entails a more strict regulation. Also, the construction of public facilities in the rural area must take account of the landscape and cultural historic values.

The acts furthermore entail stipulations on general protection zones. There is a general protection zone of 300 meters around churches and 100 meters around visible ancient monuments. The aim is to protect the landscape environment of the objects and the archaeological values in relations to the objects. It is prohibited to alter the state of ancient monuments. Parceling out, land registration and transfer of ownership of land, whereby new boundaries are established though ancient monuments, is also prohibited. It is prohibited to treat the soil within a distance of 2 meters of those objects. Monuments must, as a rule, be more than 100 years old to be defined as an ancient monument. Most visible monuments have a protection zone of 100 meters.

The act also protects archaeological remains on the seabed as, e.g. settlement sites, fortifications and wrecks. The monuments are protected against direct damage as well as against damage caused by alterations of the seabed.

The Act on Museums stipulates that if tombs, settlements etc. are found during excavation work, the work shall be stopped and be reported to the State Antiquary, which decides whether to perform a research excavation. If it is decided that the monument must be preserved on the spot, it will become subject to the stipulations of the Nature Protection Act.

The Listed Buildings and Preservation of Buildings and Urban Environments Act aims at protecting buildings of a special architectural and cultural-historic value which are more than 50 years old. Buildings may however be listed irrespective of their age when this is due to their outstanding value or special circumstances. The preservation order may include the immediate surroundings of buildings to the extent that they form part of a whole which is to be protected. The National Forest and Nature Agency initiates a preservation on the basis of a systematic inventory of buildings. Currently about 9,000 buildings are subject to a preservation order.

B. Planning instruments and policy plans

In the Netherlands, the state government lays down the overall guidelines for physical planning in national policy plans as the 5th National Policy Plan on Physical Planning of which a draft was issued in January 2001. The plan is subject to a hearing procedure and subsequent approval by parliament. The plan designates major parts of the dwelling mound region in the provinces of Groningen and Friesland as protected areas.

The overall protection and management of the Wadden Sea is also laid down in a national planning document, the Wadden Sea Key Planning Decision. This document is subject to revision in 2001 and it is expected that the revised planning document will entail also the protection of the cultural-historic values, the shipwrecks as one of the central aims. Other relevant policy plans are the Nature, Forest and Landscape Policy Plan, the Culture Note and the Architecture Note, all issued in 2000.

Of particular interest is the Policy Plan on Cultural Heritage and Physical Planning – the "Belvedere" Policy Plan (1999) – which entails the overall policy planning intention for the cultural heritage. The plan launches a new overall planning vision in conjunction with projects and financial support for those initiatives. Furthermore, the Act on the Restructuring of Rural Areas can be used to restructure an area taking account of the cultural-historic values.

Landscape and cultural-historic values are formally comprised by environmental impact assessment studies (EIS) in The Netherlands. However, in practice these values are not always included in EIS. The Belvedere Plan therefore declares that cultural-historic information in EIS should be sufficient and complete and should play an equal role with regard to developing and weighing alternatives. In the revised EIA Decree (1999) protected archaeological sites are added to the list of 'vulnerable areas', for which specific regulations are in force. Apart from the EIS, the Belvedere Plan encourages other authorities to make use of the so-called Cultural-historic Impact Assessment on a voluntary basis, as a support in decision making.

The provincial governments issue regional physical plans in accordance with the national guidelines. To an increasing extent, these plans take account of the conservation and development of the landscape and cultural heritage. The implementation of plans is progressively done by integrated planning, in which all sector aims are combined to a vision on the regional develop-

ment. Landscape and cultural heritage are integrated in the planning and implementation. Therefore, all three Wadden Sea provinces are performing mapping of their cultural heritage and revising their policy. The Province of North-Holland also has its own list of protected monuments.

The municipalities issue local plans, which are legally binding for the citizens. These plans do not always take full account of the cultural and landscape values although recently a significant improvement has been realized. The major problem is not the inclusion of specific conditions in the plans with respect to the landscape and cultural-historic values, but sustaining the conditions in practice.

As a specific example of a planning and management instrument can be mentioned the covenant concluded for the conservation and management of the cultural and landscape values of the Middag-Humsterland marsh area between the state government authorities, the regional governments, municipalities, the landowners and non-governmental organizations. This plan will enable the maintenance of the values and at the same time create development perspectives for the landowners and strengthen awareness and recreational activities.

Lower Saxony has both an overall state planning, as well as regional and municipal plans. The regional physical plan of the counties states the general lines of regional development and is enforced by the county councils. The statements of the regional plan have to be incorporated in the local plans. Mostly the statements of the regional plans are too general to be useful for measures of protection of cultural heritage. The local plans issued by the municipalities are crucial for the protection of the cultural remains in the planning stage. Here a detailed input of expert knowledge is possible with regard to measures for using the parcels of interest for protection. The local plans have to be incorporated in the actual building execution plans, which state the actual use of the parcels and which entail detailed stipulations on the protection.

The planning system of Schleswig-Holstein is similar to the Lower Saxon one. A state physical plan is issued by the Ministry of Rural Areas. This gives the general frame for regionally oriented development plans, also issued by the same ministry. For the North Sea coast, regional plans IV and V apply. The Ministry of Environment, Nature and Forest is responsible for the general land-

scape program. Taking this into account regional landscape development plans are issued for the regions. Plan IV and V apply to the coastal region. Preliminary versions of these two have been issued in 2001. Each community issues their own landscape plan. These plans provide measurements and requirements for nature protection and landscape maintenance. They are also a basis for planning in more thematic plans as building guideline plans (Bauleitpläne) and physical plans (Raumordnungspläne).

Landscape development plans and local landscape plans are also meant to register and assess the natural resources as well as to work out recommendations to support the protection and development of these. Landscape development plans display areas more concrete and differentiated which are pointed out in the landscape development program. Regionally important areas or those which require protection or development are added.

Landscape development plans are supposed to provide complete information on the state of nature and landscape in a municipality. They also offer recommendations for building guideline planning, city and village development in accordance with nature protection. For specific sectors in local planning there are more concrete plans, such as plantation structure plans (Grünordnungspläne). For 75% of the municipalities in Schleswig-Holstein, landscape development plans already exist. In order to ensure the integration into overall planning the items relevant for nature protection have to be included into the physical planning programs and building guideline plans. The state physical planning program of 1998 describes perspectives of general spatial development which have to be made more precise through regional development plans. Communal authorities are supposed to be involved in the process of creating physical plans.

Building guideline plans (Bauleitpläne) are made on a municipal level. Nevertheless, the state planning authorities are involved and supervise the concordance of the local plans with state planning.

The Planning Act in [Denmark](#) aims, a.o., at creating and maintaining valuable urban areas and landscapes through state, regional and local planning. The country is divided into three planning zones: an urban zone, a rural zone and a summer cottage zone. Building in the rural zone requires a permit by the county council. The Minister of Environment and Energy is responsi-

ble for planning on the national level. The state issues directives for the national planning act as basis for planning on the regional and municipal level. The regional plans are an important instrument for protection of the landscape and cultural environment. The regional plan divides the rural area into zones of particular interest. In 1997, the minister stated that the cultural-historic interests must be increased. This has been supported by a project initiated by the ministry on how to make an inventory of the values and to plan for those. Furthermore, the counties must establish guidelines for the establishment of undisturbed zones around churches in the rural area. Regional plans are not endorsed by the ministry any longer, though the ministry can decide to sanction plans which go against national interests.

The municipalities are responsible for the protection and preservation of buildings and urban environments. Municipal plans are not directly binding for property owners of buildings worth preserving but they establish a framework for legally binding local plans. A local plan may prohibit parceling out, construction, regulate urban development including preserving settlements and urban environments. A local plan may contain provisions on preserving existing buildings so that buildings may only be demolished, converted or otherwise altered with the permission of the municipal council. In a local plan, the municipality may point out the total number of buildings worthy of preserving in the municipality.

The local governments are supported in their work in this field by a national inventory project for the registration of buildings and elements of buildings worth of preservation in a municipality. These municipal atlases have been made in the Danish Wadden Sea Region for Tønder, Ribe, Esbjerg and Varde, i.e. 4 out of the 9 municipalities.

C. Financial instruments

In The Netherlands, there is a comprehensive arrangement of financial instruments to support the conservation and management of the landscape and cultural heritage. These include subsidies and tax reductions for owners and other fiscal instruments.

The rules and regulations encompass, e.g., subsidies for the maintenance of historical parks, gardens and estates, contributions to valuable landscapes, nature restoration and management programs and purchase of land also with valuable cultural historic heritage. Examples of such instruments are the Nature and Landscape Management Program, which is a program for supporting financially nature management and agricultural nature management, the 'KOMPAS for the North' generates financial support from national and regional authorities alike. Provinces and municipalities all have their own rules for co-financing the conservation and restoration of landscape and cultural-historic elements such as dykes, dwelling mounds, churches, wooded banks, wheels, pools.

In Schleswig-Holstein, the financial support of monument protection is confined to the monument fund which is financed by private investors. For private monument owners applies the modernization program issued by the investment bank Schleswig-Holstein.

Financial support for nature and cultural landscape protection comes solely from the regular state budget. DM 221.5 million have been spent between 1988 and 1997 for these purposes (DM 20 mill. for nature reserves, DM 74 mill. for land acquisition, DM 116.5 mill. for nature preservation funds, DM 10 mill. for regional planning support). 7-8 % of the area of Schleswig-Holstein is subject to protection programs, which excludes the Wadden Sea National Park. The national support program for nature and landscape provides money for areas of national importance and focuses on land acquisition.

In Denmark, financial instruments are available in the framework of the Nature Protection Act for nature restoration, which will also, in relevant cases, take account of the cultural environment. Subsidies and loans can also be granted for buildings which are preserved according the Monument Act. Owners of preserved buildings can also deduct maintenance expenses in the income tax. The Urban Renewal Act also provides for subsidies for preservation and restoration of houses and buildings. Finally, it can be mentioned that annually an amount is allocated to the restoration and maintenance of ruins and ancient monuments.

6.1.4 Sector developments and the cultural and landscape heritage

The above description entails an overview of how the cultural and landscape heritage is protected and managed in the framework of the relevant laws, regulations and planning instruments. The maintenance and management of the heritage is however, to a significant extent, also determined by the sector developments which have an impact on the protection of the heritage and whether the legal, policy and management instruments for those sectors can be applied to protect and management the landscape cultural-historic values.

The integration of the protection interest in the relevant sectors can occur in concrete cases through a close contact with the relevant sector authorities in the form of making the national interest apparent and visible and by integrating the protection interests in the sector legislation, including providing for financial means. In the following, a brief outline of some of the main issues are given.

In Denmark and also in Germany, it is primarily in concrete cases in which the interests of the landscape and cultural heritage will be taken account of. One of the causes is that there has been designated no valuable cultural environments opposed to natural areas which has made distinguishable the national interests of cultural environments. Whereas there is, in principle, a potential for an integration of the natural aspect, the landscape and the cultural historic values in the Danish policy, because those interests are the responsibility of the same authority - both on the national as well as on the regional level, there are now and have been then conflicting interests in terms of, e.g. nature restoration, which may have implications on the cultural landscape. In Denmark, it is the aim to integrate the cultural environment in the regional physical planning in the forthcoming years. Pilot projects have been carried out to test methods of registration and delimitation of and planning for cultural environments.

In The Netherlands, it can easily be stated that the cultural and historical aspects of the landscape hardly played a major role by the restructuring of the towns and landscape in the period between 1945 and 1985. Housing plans, industrial parks, infrastructure and land re-allocation schemes were carried out with limited concern of the cultural values. Only major monuments and historical towns and villages were protected. At the end of the 1980s, this improved significantly and the awareness of the values of the landscape and cul-

tural heritage has rapidly grown. A totally new trend has been set by the Belvedere Plan, which is now being 'translated' into the regional Physical Planning Plans as well. This means that restructuring the landscape will take place only if the cultural-historic values are taken into account in the planning.

The physical planning is hence an essential element in carefully planning town and industrial developments, which have potentially a significant impact on the cultural landscape including developments in the rural areas.

Farming is doubtless the most essential activity, which has potentially the most significant impact on the maintenance and development of the cultural-historic landscape. Farming is predominantly subject to the common agricultural policy of the European Union and can be regulated only to a limited extent on the national and regional level.

As in other countries in The Netherlands, major changes are taking place in the agricultural structure. On the Wadden Sea islands, a development towards biological production, traditional regional products and agrarian nature management (for geese, meadow birds and vegetation) takes place. Conservation of the landscape and cultural heritage plays a secondary role. On the mainland, agrarian production is changing from bulk-production towards quality-production. Also, a broadening of products takes place. In addition to grassland and traditional products on arable land such as potatoes, sugar beets and wheat new products like bulb-fields, vegetables, maize and greenhouses have been introduced.

The development of greenhouses in, e.g., the northwestern part of Friesland draws specific attention. This development has been stimulated by the national government. The location of these enterprises did not take into account the landscape and cultural-historic value of the region. The Province of Fryslân now acknowledges this development is unwanted. For the allocation of new greenhouses, an integrated planning and design has been planned, in which the landscape and cultural-historic values will be one of the starting points. As the allocation in the small-scale dwelling mound region might be problematic, allocation in Het Bildt remains an alternative.

Incidentally, agrarian nature management and agrarian tourism plays a (minor) role in obtaining an appropriate income. Although there is some awareness of traditional regional products, this is not linked to the landscape and cultural heritage policy.

In Denmark, the county councils must designate environmentally sensitive areas in the framework of the regional plans on the basis of which environmental subsidies can be given. Those designations and other EU agricultural regulations do not take account of the cultural environment, however, it will contribute to the maintenance of the landscape heritage.

On the Dutch Wadden Sea islands, pine forestation took place in the last century to prevent the dunes to be blown away. An enlargement of these forests does not take place. The management of the dunes and the plantations is aimed at a more ecological development. On the mainland, scattered small woods are planted, especially close to villages or on the sites of former castles. A regulation to stimulate the transformation of agricultural land into plantations is hardly used. Forestation of the open marshland is undesirable from a landscape point of view. Therefore, the Province of Groningen has set strict conditions to the location whereas the Province of Fryslân leaves the decision of the allocation to the municipalities.

The network of roads has also been extended in the coastal marsh areas in the past period, both the local, regional and national networks. In Denmark, the National Forest and Nature Agency is consulted on the road constructions of national interests early in the process in the framework of the Nature Protection Law. In the approval of the construction, also account is taken of the cultural historic landscape values.

Overhead electricity cables and wind turbines constitute a potential impact on the cultural landscape. In particular in recent years the construction of wind turbines in the coastal marsh area has developed because of the policy of developing regenerating energy and the suitability for wind energy in those areas. In the Danish Wadden Sea Area, there is a regional planning for wind turbines which allows for the establishment of single turbines whilst prohibiting the establishment of wind turbine parks in the marsh area.

In The Netherlands, new national roads or railways are not planned in the marsh areas. In the approval of local and regional roads the landscape and cultural-historic values (e.g. of a dyke) is progressively taken into account. The discussion on wind turbines primarily focuses on the impact on nature and the landscape versus the environmental benefits. Increasingly policy aims at concentrating wind turbines in large parks, on industrial estates or along main infrastructure installations. The construction of solitary wind turbines is no longer allowed.

6.2 Assessment

6.2 Assessment conservation and management of the landscape and cultural heritage

6.2.1 Introduction

On the basis of the description of the conservation and management of the landscape and cultural heritage in the Wadden Sea Region in the foregoing chapter, a basic assessment is made of the current conservation and management of the heritage mapped in the current project. It provides an outline of the essential issues to be addressed. A further detailed investigation and assessment is necessary on the national, regional and local level to determine the actual issues of concern and the potential solutions to the problems. The objective of the assessment is:

- to determine the (potential) conflict and management issues relevant for the heritage, and on the basis hereof
- to enable the development of an appropriate conservation and management recommendations for the protection, management and sustainable use of the heritage.

The assessment is based on the three categories applied when dealing with the cultural-historic landscape. Landscape has been added as a fourth category because of the essentiality of the landscape dimension in the protection and management of the heritage.

As a next step an overview is given of the relationship between the elements mapped and the (potential) developments in the Wadden Sea Region. The schematic overview is followed by a thematic assessment of the conservation and management status of heritage. This approach will provide an integrated assessment of the values in terms of the objects, status of conservation and the sector impact and the acts and regulations applicable for the conservation of those values.

6.2.2 Assessment conservation and management of the landscape and cultural heritage

Table 6.1 provides a schematic overview of the elements and element types mapped and described in the project in relation to the three categories of disciplines applied.

The table noticeably indicates that the landscape and cultural heritage in terms of conservation, management and sustainable use must be approached from a multidisciplinary view. Therefore, an integrated conservation and management using a broad range of instruments is necessary.

Table 6.2 provides an overview of the potential conflict issues between the elements mapped in the Wadden Sea Region and the spatial and sectoral developments.

The primary objective of the overview is, as indicated above, to determine the main impacts on the heritage as a basis for the development of criteria and guidelines for management of the heritage. The overview demonstrates that the most potential impacts stem from the urban and industrial developments, changes in agricultural practices and infrastructure developments. Other developments can have an impact on specific parts of the heritage as well, however, to a much more limited extent compared to the impacts from the former developments. It is emphasized that the developments and conflict potential differ significantly within the region.

The elements and the element types which have been mapped in the framework of LANCE-WAD are, in principle, all of international importance and essential for the landscape and cultural heritage of the Wadden Sea Region. The overall aim should therefore be to use and, where necessary, conserve the heritage in a sustainable way. In the following an assessment is given of the current conservation and management of the heritage in conjunction with an indication of the solutions based on the thematic approach outlined above

- Landscape heritage
- Archaeological heritage
- Historical buildings and monuments
- Historical-geographic heritage

element	element-types	Archaeological heritage	Historical buildings & monuments	Historical-geographical values
dwelling mound	village/town mound – church mound - farm mound – dyke mound; round – elongated/rectangular ; not built on	+	(+)	+
village	concentric/round – elongated/linear ; mound-, dyke-, sluice(Siel)-, canal-, harbor-, road(Hufen)village	+	+	+
agrarian building	farm – adjoining building (barn/shed/haystack/granary) ; Uthländisches Haus – Geesthardenhaus – Barghus – Gulfhuis - Hallenhouse - Kop(hals)romp - Ostfiesian/Oldambtster – Haubarg/Bargscheune/stelp		+	+
charact. field pattern	radial – parallel - block ; regular – irregular ; ditches – trees –walls ; vaulted arable land	(+)		+
dyke	actual sea dyke - old dyke – summer dyke – sand dyke – dam – embankment/Sietwende	+	+	+
ditch/waterway	natural watercourse - dug watercourse/drainage canal - moat/ditch	+	(+)	+
sluice	lock/weir – sluice (Siel)	+	+	
land reclamation				+
pumping station/polder mill	pumping station – polder mill ; tjasker – Dutch windmill – American windmill	+	+	
freshwater supply	pool (Fething) – ring dyke pool – water tower – well - Scheetel (rain water collection system)	+	+	+
wheel/breach pond				+
city	town rights		+	+
maritime settlement		+	+	+
fishery and hunting	fishery – hunting ; duck decoy ; camp site	(+)	+	+
harbor	harbor (in use) – old harbor – embarkation place – anchorage	+	+	+
places of craft and industry	craft; ship wharf – industrial factory – milk/fodder factory – fish factory – mineral assimilation	+	+	
navigation	lighthouse – rescue station – seamark	(+)	+	
bridge, ferry, ford	fixed bridge – movable bridge – ferry – ford	+	+	+
mining	clay-, sand-, peat-, salt-, shells/chalk-, gas/oil mining	+	+	+
canal (<i>transport</i>)	canal			+
road, path, rail	road – path – railway ; towing path – church path – ring road – ravine – military road – dyke passage	(+)		+
shipwreck	on land – in sea	+	+	
place of trade and travel	market place- inn – station - storehouse	+	+	
(industrial) mill	windmill – watermill ; sawing mill – graining mill – oil mill – paper mill	+	+	
castle/manor/estate	castle – stronghold – manor/estate ; garden/park	+	+	+
church	church – chapel – synagogue ; belfry – bell cage	(+)	+	+
monastery		+	+	+
burial place	church yard – Jewish graveyard – burial field – burial mound – chambered tomb	(+)	+	
communal and other building	urban ensemble - dwelling house – town hall – court house – water board building – dyke storehouse – school	(+)	+	+
historical place	historical place – pilgrimage – memorial stone/statue	+	+	
military object	naval harbor – bunker/casemate – defense line – fort/sconce – fortification (city)	+	+	
tourism/recreational facility	skating ground - fivel ground – skating tour – walking tour - hotel		+	+

Table 6.1:
Elements and categories

Table 6.2:
Elements and sectoral and
spatial developments in the
Madden Sea Region

element	element-types	Town/ Industry	Agri- culture	Forestry	Infra- structure	Tourism/ Recreation	Fishery	Nature/ Water
dwelling mound	village/town mound – church mound - farm mound – dyke mound; round – elongated/rectangular ; not built on	+	+		+	(+)		
village	concentric/round – elongated/linear ; mound-, dyke-, sluice(Siel)-, canal-, harbor-, road(Hufen)village	+			+	+		
agrarian building	farm – adjoining building (barn/shed/haystack/granary) ; Uthländisches Haus – Geesthardenhaus – Barghus – Gulfhaus - Hallenhouse - Kop(hals)romp - Ostfiesian/Oldambtster – Haubarg/Bargscheune/stelp		+					
charact. field pattern	radial – parallel - block ; regular – irregular ; ditches – trees – earthen walls ; vaulted arable land	+	+	+	+			+
dyke	actual sea dyke - old dyke – summer dyke – sand dyke – dam – embankment/Sietwende		+		+			+
ditch/waterway	natural watercourse - dug watercourse/drainage canal - moat/ditch	+	+		+			+
sluice	lock/weir – sluice (Siel)	+			+			+
land reclamation			(+)		+	+		+
pumping station/polder mill	pumping station – polder mill ; tjasker – Dutch windmill – American windmill	+	+		+			+
freshwater supply	pool (Fething) – ring dyke pool – water tower – well - Scheetel (rain water collection system)	+	+		+			+
wheel/breach pond			+		+			(+)
city	town rights	+			+	+		
maritime settlement		+			+	+		
fishery and hunting	fishery – hunting ; duck decoy ; camp site	+	+					+
harbor	harbor (in use) – old harbor – embarkation place – anchorage	+			+	+		+
places of craft and industry	craft; ship wharf – industrial factory – milk/fodder factory – fish factory – mineral assimilation	+	+		+			
navigation	lighthouse – rescue station – seamark	+			+			
bridge, ferry, ford	fixed bridge – movable bridge – ferry – ford	+			+			
mining	clay-, sand-, peat-, salt-, shells/chalk-, gas/oil mining	+			+			+
canal (transport)	canal	+			+			

element	element-types	Town/ Industry	Agri- culture	Forestry	Infra- structure	Tourism/ Recreation	Fishery	Nature/ Water
road, path, rail	road – path – railway ; towing path – church path – ring road – ravine(Hohlweg) – military road (Heerweg) – dyke passage	+	+	+	+			
shipwreck	on land – in sea	+	+		+		+	
place of trade and travel	market place- inn – station - storehouse	+			+			
(industrial) mill	windmill – watermill ; sawing mill – graining mill – oil mill – paper mill	+						
castle/manor/estate	castle – stronghold – manor/estate ; garden/park	+	+		+			
church	church – chapel – synagogue ; belfry – bell cage	+			+	+		
monastery		+			+	+		
burial place	church yard – Jewish graveyard – burial field – burial mound – chambered tomb	+			+			
communal and other building	urban ensemble - dwelling house – town hall – court house – water board building – dyke storehouse – school	+			+	+		
historical place	historical place – pilgrimage – memorial stone/statue	+						
military object	naval harbor – bunker/casemate – defense line – fort/sconce – fortification (city)	+	+		+			+
tourism/recreational facility	skating ground - fivel ground – skating tour – walking tour - hotel	+			+			+

Table 6.2:
continue

6.2.3 Landscape heritage

Assessment and issues of concern

It is difficult to assess the status of the landscape heritage, in particular, in terms of the non-physical aspects such as the open horizon and the natural components. Those non-physical values are basically generally vulnerable since those are difficult to describe and delimiting in terms of what are acceptable changes. The decision is in this respect very much up to subjective assessments. The non-physical landscape values are therefore notably threatened, though those values are perceived as essential values for experiencing the landscape. The legal, planning and management instruments available are generally insufficient to maintain those values.

A major issue of concern in this respect is that the landscape scenery is often viewed as the beautification of the environment. It is not a leading motive for spatial planning in the sense that it needs active attention for maintaining the values. Whereas the landscape scenery is a growing concern in terms of policy and management, there is a lack of a clear description of the characteristics of the landscape scenery, which is suitable as an input to planning, and on which new developments, potentially affecting the landscape scenery, can be assessed.

Potential solutions

The landscape heritage must be addressed in general by a comprehensive application of environmental legislation, sector instruments and planning schemes. The conservation, management and sustainable use of the landscape assume a comprehensible description and characterization of the values including an assessment of the impacts of new developments of the landscape values.

There is additionally a limited wish to use the landscape heritage values in the planning and management of the landscape. Some of the sector legislation gives the ability to cover the non-physical characteristics in an overall description. The scenery of an area is simply included in the protection and new developments are in principle regarded as damaging.

6.2.4 Archaeological heritage

Assessment and issues of concern

Regardless of some differences in the Monument Acts of the four countries, it can be stated that all known archaeological monuments are in general sufficiently protected. In Germany, protection of newly found sites is easier, but this is a point of minor importance having little influence on the archaeological practice. Legal protection means that changing the existing situation is prohibited unless a formal permission is given, which has to implement the goals of monument protection. It has to be acknowledged, however, that the existing situation is not always the best conservation status for the monument. Monument Acts do prevent the conditions getting worse, but cannot improve monument conservation circumstances.

In addition to the appliance of the Monument Acts, the authorities have to consider monuments in their physical planning. These procedures have a large impact on monument conservation, because of the necessary awareness of the officials on all government levels for problems of monument care. By means of physical planning it is also possible to improve the conservation status by implementing specific measures leading to better conditions.

An issue of concern is the protection of archaeological sites ranging in status below the monuments, because of the limited information available. In all countries, these sites must be regarded as highly endangered. In many cases the monument services do not have the appropriate resources for a proper assessment of the value of these sites since such assessments are time consuming and demand sufficient staff.

Another issue of concern is the general absence of adequate procedures with regard to site management, i.e. to protect the monuments against non-visible factors of destruction like drying-out of wetland sites by drainage or lowering the groundwater table. This is to be considered a significant issue because of the losses in the intrinsic monument qualities of the site itself. The main reason for the restricted involvement of the monument services seems to be the disproportion between the huge amount of objects and the limited staff resources.

Potential solutions

Archaeological sites ranging below the monument status can additionally be protected by physical planning procedures by adding them to

the regional and local plans. Theoretically, it is also possible to influence the management conditions in this way, but needed – and mostly missing – is a detailed and well-defined knowledge about the site conditions. This requires, however, a high amount of expert involvement from the archaeologists of the monument services, which is difficult in light of the limited financial and staff resources.

Incidentally applying the Nature Conservation Acts as well as a close cooperation with the nature conservation authorities can be helpful in influencing the vicinity of the monuments. However, it must be acknowledged that the matching of issues of nature and cultural conservation in practice remains a rather random phenomenon. It can be stated that especially the efforts in enhancing the awareness of the cultural heritage for a wider audience is very helpful including raising and maintaining awareness of planning partners, and hence widening the opportunities provided by means of physical planning and nature conservation.

6.2.5 Historical buildings and monuments

Assessment and issues of concern

In general the historical monuments and buildings are appropriately protected and managed. The monument acts provide an appropriate protection of the individual monuments. A concern is the protection of the monuments in terms of their environment. The monument acts can only provide limited protection of the surroundings. The protection of urban settlements and buildings in total can only be provided in the framework of local plans.

Another issue of concern is that a legal protection of a monument cannot ensure that the monument will be protected and maintained to the extent necessary. The owner of the monument has a large say in this respect. Finally, in some areas the registration and hence application of instruments are insufficient.

Potential solutions

An important element in the protection and management of the buildings and monuments are further registration and description of the heritage as basis for applying the available instruments including local plans. Local plans should be applied to a larger extent to ensure that the monuments and their environment is protected in an appropriate way.

6.2.6 Historical-geographical heritage

Assessment and issues of concern

The historic-geographic values are compared to the archaeological heritage and the historical buildings and monuments more endangered in terms of conservation and sustainable use. The typical elements of this heritage, being the dwelling mounds, the old dykes, roads and field patterns, are subject to use and development, as they always have been to a different extent through the entire period of settlement. These developments have continuously been absorbed and now form part of a valuable landscape.

The cultural landscape is however under rapid transformation. A major issue of concern has been and is the development in agricultural praxis within the last generation thorough changes in production. This has resulted in, e.g., enlargement of the parcels, alterations of water courses, excavation of old dykes and leveling of mounds which significantly changes the historic-geographic heritage. Infrastructure projects, urban and industrial developments have potentially similar impacts on the values.

A further issue of concern is the lack of knowledge on the significance and character of the historic geographic elements and structures. They are intricately linked to the landscape and cultural heritage of the region. There is limited knowledge on how to fit in new developments into the existing landscape and yet possibly enhance those values.

Potential solutions

The historic-geographic elements and structures need a comprehensive protection in terms of applying the appropriate legal and management instruments on all levels. Currently a comprehensive protection is only possible to a limited extent within the framework of spatial planning on the regional as well as on the local level. Spatial planning can however provide opportunities for managed development. More comprehensive and in some cases compulsory protection and management schemes are necessary. Such schemes may be combined with management agreement with the relevant stakeholders or may be an alternative to more compulsory schemes.

A further essential element is awareness raising of the historic-geographic values. Many stakeholders carry the responsibility for the protection and wise use of the heritage. In this connection, the development of expertise in the field of combining new developments with the existing heritage is of essential importance.

6.3 Sustainable management

6.3 Sustainable management and use of the landscape and cultural heritage. Visions, targets and strategies

6.3.1 Introduction

The overall objectives of the LANCEWAD project are, in addition to the inventory and valuation of the landscape and cultural heritage in the framework of a geographical information system (GIS):

- to outline the development possibilities, conflict issues and decision-making demands with regard to the rural area of the Wadden Sea Region and to contribute to the development of a spatial vision including land use and proposals for spatial planning to also ensure the integration of the landscape and cultural heritage in the overall spatial planning on levels of government in the Wadden Sea Region;
- to initiate the development of proposals for promoting the future sustainable use of the landscape and cultural heritage of the Wadden Sea Region including proposals for policy and management concepts and measures to further protect and manage the landscape and cultural heritage and the promotion and strengthening of, e.g., cultural tourism; and
- to contribute to raising the awareness of the landscape and cultural heritage of the Wadden Sea region.

Further, the project should contribute to promoting the integrated management of the landscape and cultural heritage within a long-terms spatial vision of the North Sea region.

The Wadden Sea Plan (WSP) entails the joint trilateral policy and management for the landscape and cultural heritage. The Targets are the focal point of the trilateral policies and management. The trilateral conservation policy and management is directed towards achieving the full scale of habitat types, which belong to a natural and dynamic Wadden Sea. Each of these habitats needs a certain quality (natural dynamics, absence of disturbance, absence of pollution), which can be reached by proper conservation and management. The quality of the habitats shall be maintained or improved by working towards achieving Targets, which have been agreed upon for six habitat types. Targets on the quality of water and sediment are valid for all habitats. Supplementary Targets on birds and marine mammals have been adopted, as well as Targets on landscape and cultural aspects (SI, 9 Wadden Sea Plan).

On the basis of the results of the inventory of the landscape and cultural heritage of the Wadden Sea Region including the description and evaluation of the regions and the assessment of the current conservation and management regime, Targets, Visions and Strategies can be developed in terms of recommendations for future sustainable management and use.

The Vision is an overall statement on the future of the landscape and cultural heritage of the Wadden Sea Region. The Targets refer to the Targets for landscape and culture as politically endorsed by the three Wadden Sea countries and entailed in the Wadden Sea Plan. The Targets make the Vision operational and guide the development of Strategies and their implementation. The Strategies encompass the implementation of the Targets guided by the Vision. As indicated in fig. 1 three levels of Strategies can be discriminated: the legal, planning and management level, the (establishment of the) knowledge basis and awareness building. Further hereto issues related to monitoring, research and follow-up projects will be addressed.

6.3.2 The Vision

As indicated in the Wadden Sea Plan, section II, 1 the cultural-historic and landscape values of the Wadden Sea Region are intimately related to the economic and social development of the coastal area and, by international standard, unique and unrivalled. The cultural-historic and landscape heritage and the diversity between the regions are essential for the comprehension of the area's development and identity and the inhabitants' identification with the landscape. It entails a distinctive international dimension comparable to its natural values. The landscape and cultural-historic heritage of the Wadden Sea Area is under rapid transformation because of changes in agricultural practices, amongst others, changes in crops, enlargement of land parcels, urbanization and industrialization, and the associated construction of infra-structural installations. This development interferes with characteristic elements such as the openness, serenity and identity of the landscape, the topography of the landscape and the cultural-historic remnants. Therefore, it was agreed, at the Leeuwarden Conference in 1994, to pay attention to this aspect as the third dimension in the trilateral Wadden Sea cooperation, in addition to the natural and environmental dimen-

sions. The integration of all three dimensions into a coherent policy and management is essential to ensure a sustainable development.

The overall vision recommended to inspiring the long-term conservation, management and sustainable use of the landscape and cultural heritage of the Wadden Sea Region:

The Vision

For already more than 2000 years, the landscape and cultural heritage of the Wadden Sea Region has displayed the richness of the specific nature of the Wadden Sea and the unique interaction with man to its full extent. The overall landscape characteristics entail the wide open skies, the straight horizon, the clear transition between sea and land, the notion of being engulfed by nature on the sea side; and on the land side, the dwelling mounds, dykes and the settlements as green oases in the open fields. In the inhabited areas, the different characteristics of the landscape and cultural heritage of the several sub-regions can be clearly distinguished. The cultural heritage is well kept and (re)used. New developments show new "faces" fitting into the "old portraits" enriching them and telling the continuing story of living in the Wadden Sea Region, a landscape of world uniqueness.

Fig. 6.1:
Vision, targets and
strategies



6.3.3 The Targets

a. Issues

The Targets for landscape and culture as entailed in the WSP are:

IDENTITY- to preserve, restore and develop the elements that contribute to the character, or identity, of the landscape.

VARIETY- to maintain the full variety of cultural landscapes, typical for the Wadden Sea landscape.

HISTORY- to conserve the cultural-historic heritage.

SCENERY- to pay special attention to the environmental perception of the landscape and the cultural-historic contributions in the context of management and planning.

The policy and management of the WSP with regard to landscape and culture entails the following relevant agreements:

- The nomination of the Wadden Sea, or parts thereof, as a World Heritage Site will be striven for, taking into account the natural and cultural historic values of the area.
- The cultural-historic and landscape elements of the Wadden Sea Area will be protected and conserved through appropriate planning and management.
- The awareness of the area's cultural-historic and landscape values will be enhanced, where possible and appropriate, on a joint basis.

In order to implement these agreements, it was acknowledged that, as a first step, it was necessary to enhance the knowledge in this field to ensure that the available information would be on the same level as with regard to natural heritage.

The LANCEWAD project has made an inventory and valuation of the central elements and element-types of the Wadden Sea Region as agreed in §37 of the Stade Declaration. On the basis of hereof, it can be concluded that the Targets for landscape and culture as entailed in the Wadden Sea Plan on IDENTITY, VARIETY, HISTORY and SCENERY are the central targets for joint policy and management in this field. As agreed in the WSP the cultural historic and landscape values are equivalent to the area's natural values.

As LANCEWAD has convincingly demonstrated the majority of the joint landscape and cultural heritage of the Wadden Sea Region is located outside the Wadden Sea Area. In further developing common policies and management for the landscape and cultural heritage, it is necessary to focus on the larger Wadden Sea Region as defined in LANCEWAD taking account of the specific management issues of the Region and hence applying the Targets to the Wadden Sea Region. Though, as indicated below, the nature and environmental policies and the policies for the landscape and cultural heritage must be seen as complementary, it is essential to discriminate between those policy themes.

The Targets as entailed in the WSP are, however, in principle valid for the Wadden Sea Area (the area of the trilateral cooperation). The Wadden Sea Area is basically delimited by the area seaward of the main dyke, or where the main dyke is absent, the spring-high-tide-water line, and in the rivers, the brackish-water limit and an offshore zone 3 nautical miles from the baseline including the corresponding inland areas to the designated Ramsar and/or EC Bird Directive areas and the islands.

b. Recommendations

The Targets for landscape and culture as entailed in the Wadden Sea Plan on IDENTITY, VARIETY, HISTORY and SCENERY are the central targets for joint policy and management of the landscape and cultural heritage of the Wadden Sea Region. It is therefore recommended

A1. To apply the Targets for Landscape and Culture as entailed in the Wadden Sea Plan to the Wadden Sea Region acknowledging that a clear discrimination must be made between the nature and environmental policies applicable to the Wadden Sea Area and the policies and management for the landscape and culture being applicable for the Wadden Sea Region, as expressed in the Visions and the Strategy.

Whereas the Targets for landscape and culture are recommended to be applicable to the Wadden Sea Region, the Targets relevant for the nature and environment are applicable to the Wadden Sea Area. It should be communicated to the stakeholders and the inhabitants in the region that a clear distinction will be maintained between the Wadden Sea Area and the Wadden Sea Region. Though these policy and management disciplines are complementary, they are also dissimilar in objectives.

6.3.4 The Strategies

a. Issues

In regard of the Targets, it is essential to emphasize as has been demonstrated in the LANCEWAD project that the Wadden Sea landscape has been subject to continuous changes throughout history. The Wadden Sea landscape is not static but always evolving. Though the current changes to the landscape and cultural heritage constitute significant impacts also in a historic perspective, the protection and sustainable management of the elements and element types is only conceivable in the framework of a management of the developments. The cultural landscape values can only be maintained by also ensuring its sustainable use by the inhabitants of the region. The overall long-term management strategy underlying the management, and linking targets and management must therefore be managed development ("Schützen durch Nützen"). This strategy is of even greater importance for the current management since the changes in the landscape and cultural heritage in the last decades have

evolved more far-reaching and fundamental than compared to centuries before.

Closely related to this strategy is that nature and environmental policies and management, and cultural and landscape heritage management must be comprehended as complementary components. Though nature and environment management has a different focus than the management of the cultural-historic landscape and its heritage, they are to be conceived complementary and mutually reinforcing. It concerns in principle the conservation and sustainable management of a comprehensive natural and cultural landscape which has been shaped throughout centuries. The landscape of the Wadden Sea Region within the current seawalls and on the islands bears witness of Man's strife with the natural forces, which can best be apprehended in relation to the natural environment of the Wadden Sea outside the current seawalls. Whereas correspondingly the protection of the natural environment of the Wadden Sea can be comprehended as a priority by society, also in relation with the ensuing frictions with the inhabitants of the cultural landscape of the Wadden Sea Region.

Though it has been agreed to pay attention to the cultural environment as the third dimension in the trilateral cooperation in addition to the natural and environmental management the integration of all three dimensions into a coherent policy and management must be accepted as a guiding management principle to ensure a sustainable development. At the same time however it must be clearly stated that this will also require a specific and differentiated implementation of the three dimensions. Nature and environmental conservation remains the primary objectives for the Wadden Sea Area and the Conservation Area whereas for the Wadden Sea Region, the primary objective is a sustainable use of the landscape and its heritage.

In order to strengthen the policy and management for the cultural-historic landscape and to make it an equal dimension to the natural and environmental dimension, the awareness of the landscape and cultural heritage of the Wadden Sea Region must be enhanced and be an integrated part of the policies and management of all levels of government (national, regional and local). The international importance of the heritage being the expression of a common heritage is an essential element in the awareness building, in particular, because there is also a joint responsibility for the management of the her-

itage. More importantly the local stakeholders must be given a larger say in the management of the cultural-historic landscape in order to give substance to the overall guideline of managed development.

This aim is essential in order to maintain and, where necessary, establish the identity and supporting the attainment of the Targets. This will also contribute to creating an understanding of the perception of the landscape and its values by a broader community and thus support sustainable development and use.

b. Recommendations

The Targets for landscape and culture must be supported by an overall strategy in terms of general management guidelines, which should be implemented as general principles in the overall policy and management. These include the following recommendations:

B1. To implement, as a guiding principle for the conservation and management of the landscape and cultural heritage of the Wadden Sea Region, linking targets and management by the principle of managed development of the heritage ("Schützen durch Nützen").

B2. To use the landscape and cultural heritage as an opportunity for enhancing the spatial quality and improving and reinforcing the social economic structure of the region.

The Wadden Sea landscape has been subject to continuous changes throughout history. Though the current changes to the landscape and cultural heritage constitute significant impacts also in a historic perspective, the protection and sustainable management of the elements and element-types is only conceivable in the framework of a management of the developments. The cultural landscape values can only be maintained by ensuring its sustainable use also by the inhabitants of the region.

B3. To involve stakeholders in the management of the heritage through a participatory and interactive process.

The principle of managed development can only be successfully implemented if the relevant stakeholders (owners, users, visitors and others having a stake in the region) have a say and are involved in the planning and management of the heritage.

B4. To integrate the policy and management of the natural, environmental and cultural environment with regard to the Wadden Sea nature and landscape heritage in order to complement and mutually reinforce conservation and sustainable management.

The management of the cultural-historic landscape and its heritage and the conservation of the Wadden Sea are to be conceived complementary and mutually reinforcing. It concerns in principle the conservation and sustainable management of a comprehensive natural and cultural landscape which has been shaped throughout centuries.

B5. To enhance the awareness of the landscape and cultural heritage of the Wadden Sea Region being the expression of a common transboundary heritage of international significance by responsible authorities in conjunction with an involvement of local interests and expert groups.

Raising the awareness of the uniqueness and disseminating the knowledge of the heritage is an essential prerequisite for strengthening the policy and management for the cultural-historic landscape and making it an equal dimension to the natural and environmental dimension. This can also be achieved by implementing practical transboundary projects for maintaining and where necessary restoring heritage elements.

6.3.5 Conservation, planning and management

The elements and element-types registered and valued in the LANCEWAD project are part of an international important heritage which should in principle all be conserved for current and future generations. They are important for the history and identity of the Wadden Sea Region. The existing national and international legal and planning instruments and management activities should contribute to safeguarding this heritage for posterity.

There are four relevant levels of management

- legal instruments and regulations including international instruments
- physical planning by the national, regional and local governments
- policy plans by governments
- management of the heritage by authorities and organizations

6.3.5.1 Legal instruments and regulations

a. Issues

National legal instruments and regulations

From the description and the assessment of the conservation and management of the heritage, it appears that there is a difference between the legal protection of the elements of the heritage registered. Apparently the most appropriate legal protection is provided for the archaeological and the historical buildings though there are major differences in terms of the number of objects subject to conservation between the regions. A legal protection of a monument cannot always ensure that the monument is maintained in an appropriate state of conservation. Alternatively the object has to be purchased and maintained by state authorities which is mostly an expensive solution. It is recommendable to explore regionally on the basis of the registration within the LANCEWAD project the legal status of protection with a view to assess whether it is necessary to extend the current legal protection. The existing instruments should be applied in an effective, harmonized and consistent way to provide for the best possible protection of the heritage of the Wadden Sea Region. In this context, specific attention should be paid to specific regions with specific values.

The Danish Nature Protection Acts entails interesting stipulations. Certain natural features but also cultural landscape features like earth and stonewalls are generally protected according to the Act, which implies that those features cannot be changed without a permit. The Act also establishes a general protection zone around certain monuments. The German Federal Nature Protection Act and the state nature protection acts also establishes a general biotope protection system, which can indirectly also protect landscape and cultural features. The protection of the latter are however not encompassed by the acts. The implications for the landscape and cultural heritage for the Wadden Sea Region is however very limited. In view of the international importance of many of the elements of

the Wadden Sea Region, in particular, for those not found elsewhere like mounds and dykes such a system of general protection would be advantageous. Such a regime is not a legal protection in the traditional sense but would establish a system of permits for changes to the object. Whether amendments of national legislation to that effect is feasible is doubtful. The current Monuments Laws provide for a protection of the imminent environment but cannot provide for a protection of cultural landscapes.

Most importantly, however, it seems that the legal protection cannot provide for the protection of the entire cultural and landscape environment, which is probably the most essential feature to protect. Without an appropriate protection and management of the entire cultural landscape environment in terms of ensembles, the heritage will lose a significant part of its value. There are only very few examples of the protection of entire cultural landscapes. The protection of the Tønder Marsh is probably the best example, which was made subject to a protection by a separate law in 1988 with the aim to protect its environmental and landscape values. The law has apparently been very successful in maintaining the landscape values in terms of the openness of the landscape and a functioning ditch system whereas the environmental objectives have not been met. The project has been very costly and its objectives can only be achieved in collaboration with the landowners through subsidies and compensation schemes. Such an approach is therefore only applicable in exceptional cases.

The Wadden Sea Conservation Area encompassing the German national parks, and the Dutch and Danish nature reserves, is subject to a legal protection according to the nature protection acts. This regime also provides, to a large extent, a protection of the cultural and landscape heritage, but the protection cannot be extended to the cultural heritage in all cases, as outlined above. The Dutch protection regime for the Wadden Sea as embedded in the physical key planning decision will be amended in the near future. The draft decision, which is currently subject to a public consultation, entails a protection of the characteristic landscape and cultural heritage such as the shipwrecks. On the amendment of the legal regimes in the other countries, stipulations should be included in the relevant Acts and Orders to the effect that the cultural heritage, like ship wrecks and salt extraction sites, is also protected.

The environmental impact assessment as implemented in the countries can take account of the landscape and cultural heritage in case an environmental impact study is carried out. The current practice however is that this is done only to a limited extent and only in specific cases. The Inter-regional Wadden Sea Cooperation (IRWC) exchanges information on studies and assessments carried out in the Wadden Sea Region. The IRWC has promised to study the aspects of the cultural and landscape heritage in relation to the environmental impact assessments after the finalization of the LANCEWAD project. It is therefore suggested that the IRWC does this work in the coming period and develops recommendations for how the landscape and cultural heritage of the Wadden Sea Region can best be integrated in the environmental impact assessments, which will be carried out in the region. This could also include considerations as to whether a special cultural (environment) impact assessment should be made in the case of specific projects, which are not covered by regular impact studies. This could also be considered to be extended to cultural landscapes.

International legal instruments

The European Landscape Convention, the European Convention on the Protection of the Archaeological Heritage (the Malta Convention) and the Convention for the Protection of the Architectural Heritage of Europe (the Granada Convention) are all international instruments. Once they have been ratified and implemented in national law, they can support the conservation and management of the Wadden Sea Region's heritage.

A further important international convention of relevance for the Wadden Sea Region is the World Heritage Convention (1972). The primary mission of the convention is to identify the world's natural and cultural heritage considered being of outstanding universal value. More than 160 states have signed the Convention. It draws up a list of properties called the World Heritage List. The World Heritage Convention links the conservation of nature and culture. Nature and culture are complementary and inseparable. By signing the World Heritage Convention, the three countries have committed themselves to identify and protect the world's natural and cultural heritage considered to be of outstanding universal value. The Wadden Sea represents an area of exceptional worldwide significance. In accordance with the decisions of the 1997 Wad-

den Sea Conference, the inscription of the Wadden Sea Conservation Area in the World Heritage List is currently being discussed.

As has been demonstrated in the LANCEWAD project, the Wadden Sea Region also represents a unique cultural and landscape heritage worthy of greater recognition. A heritage that has potentially an outstanding universal value. The recognition of this heritage by inscription in the World Heritage List would generate benefits for the region in terms of, e.g. tourism. The potential nomination would be in accord with the objective of integrating the three dimensions of policies and management.

The Wadden Sea has been placed on the tentative list, also as a potential cultural heritage. On the basis of the results of primarily the LANCEWAD project, as a first step, it can be ascertained that the Wadden Sea Region would potentially qualify for being inscribed as a cultural heritage and a cultural landscape in the World Heritage List in accordance with the operational criteria of the Convention. Alternatively, if after a more in-depth examination of the properties and the criteria, it would be concluded that the entire area would not qualify for a nomination, the areas that would meet the criteria should be identified and delimited.

As a next step the institutional, legal and management regime required for such areas should be developed in full cooperation with the local stakeholders in order to meet the criteria for a nomination for cultural landscapes. The Operational Guidelines demand that a nomination of a cultural landscape is prepared and submitted in full consent with the local population. It is assessed that a process to establish the pre-conditions for a nomination will extend over several years.

It would be advisable to carry out an independent feasibility study on the nomination of the Wadden Sea Region for inscription in the World Heritage List as a cultural landscape to enable a thorough assessment of the issues raised in the foregoing. The feasibility should hence investigate whether the Wadden Sea Region would qualify for nomination according to the Guidelines, including a proposal for the area to be nominated and an assessment as to whether the requirements in terms of protection and management of the values are met, respectively which further measures are necessary to meet those requirements. Finally, the feasibility study may include suggestions on how to organize the consultation process.

b. Recommendations

In terms of legal instruments and regulations it is recommended:

C1. To examine how the existing legal instruments and regulations can be more effectively implemented to ensure an appropriate protection of the landscape and cultural heritage of the Wadden Sea Region as registered in the LANCEWAD project.

It is recommendable to explore regionally on the basis of the registration within the LANCEWAD project the legal status of protection with a view to assess whether it is necessary to extend the current legal protection of the elements and objects registered.

C2. To include, when the legal protection regimes for the Wadden Sea Conservation Area are amended in due course, as appropriate, the protection of the cultural and landscape heritage in the conservation regime in order to ensure that this will also be covered by legal protection respectively will be subject to a system of permits and exemptions.

The Wadden Sea Conservation regime should also include the protection of the cultural and landscape heritage to the extent this has not yet been done.

C3. To aspire the nomination of the Wadden Sea Region or parts hereof for inscription in the World Heritage List for its universal landscape and cultural heritage and, as a first, to elaborate a feasibility study to assess whether the Wadden Sea Region or parts thereof would meet the criteria as entailed in the UNESCO Guidelines. The study should include an assessment of the area to be nominated and the requirements in terms of the institutional, legal and management regime. The study should also provide suggestions for the consultation process to meet the requirements of the Guidelines.

The Wadden Sea Region or parts thereof would potentially qualify for being inscribed in the World Heritage List. This would potentially provide benefits to the Wadden Sea Region and be in accord with the Vision. These areas must be identified and delimited and their conservation and management must be secured in agreement with the stakeholders. As a first step, an inde-

pendent feasibility study should assess whether the Wadden Sea Region or parts thereof would meet the criteria of nomination, as entailed in the UNESCO Guidelines, and provide a firm basis for the consultation process with the stakeholders of the Region.

C4. To invite the Inter-regional Wadden Sea Cooperation to develop proposals for how the environmental impact assessment can also include the landscape and cultural heritage of the Wadden Sea Region respectively whether the implementation of specific cultural (environment) assessments can be implemented.

The Inter-regional Wadden Sea Cooperation (IRWC) has agreed within the framework of the trilateral cooperation to exchange information on environmental impact assessments carried out in the Wadden Sea Region with a view to share experiences and elaborate suggestions for harmonization. It would also be appropriate to invite the IRWC to look at the landscape and cultural heritage in this respect in terms of as to whether this is appropriately covered by the current environmental impact assessments and/or whether specific cultural (environment) impact assessments could be recommendable.

6.3.5.2 Physical planning

The majority of the landscape and cultural heritage has a spatial dimension and can only be managed through an integrated spatial planning. Physical planning is hence the central planning instrument for ensuring a sustainable use of the cultural and landscape heritage. The regional level is the appropriate level for integrated planning in the three countries for developments with a spatial feature. The regional spatial planning does currently not or only to a limited extent take account of the landscape and cultural heritage of the Wadden Sea Region. It is therefore recommendable that the results of the LANCEWAD project are assessed from the perspective of spatial planning. The cultural and landscape heritage must be included in the plan development to the same extent as other interests.

a. Issues

The main items of interference with the valuable elements, structures and landscape/scenery are the development of towns and industry (new areas, new building), agriculture (enlargement of scale, intensive practice of cropping) and developments in infrastructure (new sections, improving existing infrastructure). In all three countries, physical planning is used for managed protection and development of elements and structures in its (wider) environment whereas the protection of elements itself is mainly ruled by sector legislation with an exception for the historic-geographical elements which are mostly protected by physical plans. Even so, the actual integration of valuable elements and structures and landscape/scenery characteristics in executing physical planning as well as the maintenance of protection need much more attention in all three countries.

On the levels of state and region, attention is still growing for preservation and a proper management of landscape as a whole/the scenery, with items as open space, straight horizons and different identities of areas. Nevertheless, the actual implementation in concrete regional and local (legally binding) physical plans is still a case of great concern. The main problem is often the lack of a proper description of the characteristics of the landscape/scenery suitable for using in planning schemes. Related to this the awareness and the will "to do something with it" are low. Protection of landscape by some of the sector legislation gives the ability to cover the values of the landscape/scenery in an overall description. In physical planning, there is always the need to translate into physical "demonstrable" items.

On the level of wetland archeological elements (sites), the protection by physical planning of, in particular, the environment of the site is more or less adequate; there are problems concerning management in terms of erosion by current use. In addition to legislation, the use of the possibilities of physical planning asks increasingly to solve this. Concerning historical buildings and structures, protection and a frame to consider space for developments is, in principle, appropriately provided for by, in particular, the local planning level. This counts for both individual buildings and building structures. In the Netherlands, as in the other countries, in many cases historic-geographical elements and structures need still more and better protection in the local physical plans in particular. At the

same time, this will give good opportunities for managed development of these elements and structures being of essential spatial importance as carriers of the identity of the area.

b. Recommendations

The majority of the landscape and cultural heritage has a clear spatial dimension and can only be managed properly by integrated physical planning. Physical planning is the best tool to bring "old" heritage and "new" developments together or, when needed, to keep them apart each with its own value. In particular it offers the possibility to preserve ensembles of valuable elements and structures of the cultural heritage. Physical planning is hence to be the central planning instrument for ensuring a sustainable use of the landscape and cultural heritage. The regional and especially the local legally binding levels are the most important for the actual "day-to-day" management. In executing these levels, however, there is currently only taken limited account of the values of the landscape and the cultural heritage. Also, improvement is needed in the maintenance of the heritage. The main overall reason is lack of knowledge very often followed by the lack of vision of how to deal with keeping old values and give space to new developments, and finally no proper description of the values exist.

To improve an effective use of physical planning, it is necessary to enhance the availability of information about the landscape and cultural heritage, to make obligatory the use of knowledge about the landscape and cultural heritage values in developing physical plans, and to demand an equal balancing between landscape and cultural heritage and the other physical interests.

D1. Landscape and cultural heritage must be treated as an equal interest to other interests in physical planning on all levels.

The landscape and cultural heritage nowadays is not only seen as an occasional product of interaction between Man-wanted functions and his environment, but it is also regarded as a function in itself. It is felt as an important factor in the well feeling in the every day live of inhabitants as for recreation and tourism in particular. In fact one of the most important economic functions in the Wadden Sea Region, being tourism, rests to a certain extent on landscape and cultural history values. Therefore, it is necessary to

give landscape and cultural heritage the same weight in the integral weighing of functions in developing physical planning. In fact landscape and cultural heritage should be the basic frame for physical planning, using the characteristics of the specific identity as guidelines for preserving and new developing.

D2. Sustainable spatial management of the landscape and cultural heritage in relation to new developments should preferably be done in the framework of physical planning with special attention to including conditions concerning preservation and re-use of cultural heritage.

Whether on the level of elements, ensembles or overall landscape values as straight horizon, the interests of protection and managed development are best served by using physical planning, especially in areas with intensely developing functions like housing and industry and even agriculture concerning new branches and new cultures. This demands good mapping in advance and making choices of what to preserve and how to use it, e.g., in case of archeological values in nature developing areas. In areas with less (wanted) dynamic, the use of relevant sectoral legislation can be considered, in particular, if the legislation can cover the whole of the values and the greater part of the (whole) of the values, i.e., landscape/scenery is original and practically undamaged. Special attention should be given to including conditions in the physical planning schemes, which are important for preservation or use. For archeological values, maintenance of the groundwater level and restrictions for land use are very important for the sustainable existence. In case of historical buildings or structures, it is important to have the possibilities "to bring in" new forms of uses and to make necessary adjustments since e.g. buildings and structures, in particular, are often products of several periods/styles. The ability of input of new uses is also important for the maintenance of the historic-geographical values. Old church paths and dykes can function as tourist's walking trails; even the old deeps are suitable for canoeing. Since physical planning demands consultations and public hearings, it is often contributing to or even leading the discussion. For both historic buildings and historic-geographical values respecting the historic scale and the connection between element and its "own" spatial environment are important issues to incorporate

in ruling by physical planning, e.g. a medieval center of a city or a dwelling mound village, fields of fire belonging to fortifications and historic field patterns around dwelling mounds.

D3. A proper description of the landscape and cultural history values in spatial terms and a valuation of the effects of new developments supported by professional designing to visualize effects should always be part of physical planning processes.

Awareness of existing values is one of the basics of good physical planning practice. In any physical planning process a description of the values in spatial terms is a must. There are many sources and they should be easily accessible. The LANCEWAD mapping results give information about the characteristics of the landscape and cultural heritage in the different sub regions seen in trilateral and even international perspective. Using this information has the advantage of giving input to maintaining, restoring and using elements, structures and scenery in establishing the spatial identity of an area.

In case of questions whether existing values and new developments can be unified, there should always be made a design of the possible ways of how to handle this in order to create images to decide on whether the new developments can add new quality or at least keep up the existing level. The design(s) should be made by experts, e.g. on the level of architects, and discussed with all parties involved. When designs demonstrate that the quality is diminishing, this should result in adapting the plan or even, if this is not possible, in deciding not to allow the development to take place on this site and to look for alternatives.

D4. To analyze the actual translation of physical planning principles on landscape and cultural heritage into executing physical planning in order to obtain information on potential improvements.

In each country, there should also be a mapping and assessment undertaken of the actual acting of governments concerning protection of and vision on development of the landscape and cultural heritage using individual elements (or category of elements) and the overall landscape characteristics related to the elements mapped by LANCEWAD. This will help to formulate concrete actions on how to stimulate a better use of physical planning.

6.3.6 Sector development – Issue based guidance for management

In addition to the legislation and regulations specifically designed to protect, conserve and manage the landscape and cultural heritage and the integrative spatial and policy planning outlined above, developments in the sector and the sector legislation, plans and management have a significant impact on the sustainable use and management of the heritage. The potential conflicts have been indicated in the foregoing chapter, and in this chapter, the contribution of the different sectors have been outlined.

6.3.6.1 Town and industrial development

a. Issue

Modern times brought many changes in the cultural landscape of the Wadden Sea Region. The impact of modern towns and modern ways of living in urban communities, as well as the industrialization in the vicinity of the urban centers have profoundly changed the former rural landscape in many parts of the area. Even rather small towns like, e.g., Otterndorf have incorporated their former rural surroundings – nowadays a large number of dwelling mounds and the old Medem dyke can be found in the town area between houses. Although it is possible to secure the existence of the monuments, it has proven difficult to conserve traces of the former cultural landscape in a sensible way. Solutions have been found in adapting the lines of the landscape in the layout of urban settlements but in most cases many concessions were also unavoidable. The question remains, if the results are still of relevance for the people living in such settlements.

Industrial development leads to redefining the former landscapes in the most literal sense to industrial areas, and therefore they have mostly been located in landscape parts assumed being of low value. Nevertheless, there is a tangible impact on the whole of the surrounding area in the form of a kind of a chain reaction. Because of the added negative landscape elements, the landscape on a larger scale will be felt of lower value than before.

b. Recommendations

E1. To consider the elements of the former landscape in physical planning in urban surroundings in such a way that the original character of the landscape remains a part of the perception of the inhabitants, and therefore to emphasize the crucial elements by appropriate means so that the awareness of the origins is maintained.

Industrial and town development has to be planned in such a way that the value of the broader landscape will not be diminished. It has to be taken into account that contours and outlooks on typical landscape elements, e.g. views on dwelling mounds, villages or churches for instance should not be devaluated. The chain reaction of diminishing the value of the region by industrial areas has to be taken into account and must be considered as a decision criteria of high importance for the development of the cultural landscape in physical planning.

6.3.6.2 Land use

a. Issues

The main forms of interfering with landscape and cultural historic values in terms of land use are agriculture, forestry, and nature management. They all have more or less an impact on the condition of the soil and the archeological values. The land use has also great impact on the landscape and cultural values in the broader sense. Agriculture is a highly dynamic form of land use both in terms of the cultivation of the land and in terms of crops used. This has a great influence on how restrictions in terms of the "normal agricultural use" like plowing and equalizing must be interpreted. Also, the different demands in terms of new technological developments in agriculture make it difficult to weigh interests with regard to enlarging parcels versus preservation of the historic scale of land use in the long term. Forestry and nature management is a low dynamic land use. Once an area becomes a forest or nature conservation area the soil "gets rest". The primary impact of forests is on the archeological values and openness of the area. Nature conservation areas can have an impact on the historical-geographical values since these may diminish gradually only by a natural management.

Besides protection of landscape and cultural values by legislation, it is of utmost importance

to gain insight into the developments in and around the mentioned forms of land use to be able to recommend possible connections which support both land use and landscape and cultural values.

b. Recommendations Agriculture

E2. To stimulate active planning of locations and forms of agriculture based on landscape and cultural historic values using them as a trilateral/international trademark of specific quality in close cooperation between governments and agriculture.

E3. To stimulate appropriate ways of cultivation to protect the landscape and cultural historic values.

Agriculture has the largest impact on landscape and cultural values being the main form of land use in the countryside. Intensive cultivation does significant harm to the values, especially to the historic-geographical values through the enlargement of parcels and by equalizing of reliefs. Archeological values are even severely threatened by equalizing and plowing. And the fall of water levels in old deeps (landscape/scenery) and in dwelling mounds (archeology) have also their negative impact.

The policy for agriculture and its future is, for the greater extent, determined by the EU agriculture policy and the world trade conditions. In northwestern Europe and in particular the northern coastal area, more and more a certain movement of policy towards quality products from sustainable production and consumer safety, animal welfare, and quality of environment, water, nature and landscape and cultural history can be noticed. This should become the common strategy using the specific qualities of this area as a trademark for a new way of agriculture.

In executing this policy choices are needed in terms of where to produce what kind of products. It necessitates an open discussion and a sustainable cooperation between agriculture and regional government, as well as on the national and even European level. In the case of landscape and cultural history qualities, the characteristics of the regions should constitute a guiding principle. Of the utmost importance is the localizing of greenhouses in specific areas preferably industrial areas, and if localized in the countryside then only in size related to the local scale and with proper design and landscape building measures. Open small-scaled areas are

better suited for dairy-cattle breeding in combination with management of meadow birds and plants and geese.

Forestry

E4. To request extra attention in afforestation and management keeping up existing landscape and cultural historic values using them as inspiration of design.

Forestry is of less impact on the values nowadays. There are no large government afforestation programs and private initiatives are limited. When afforestation is planned this should only be allowed with the utmost care for landscape and cultural values especially concerning landscape/scenery and archeology. Starting point should be the use of the local and regional characteristics as the basic for considering location and design. Specific elements like archeological sites and historic roads must have their "own" place and can be used in the recreational concept. Open areas, e.g. on the marshes and especially along the seawalls, should always be kept open, locations are to be found linked to existing forests or other condensed areas taking account of the size of the areas. Plant material should be of regional origin and preferably consist of foliage trees to get a stable forest and the best fitting in the landscape/scenery.

The management of forests should be as natural (extensive) as possible and, where possible, with transformation into mainly foliage trees. Specific cultural elements and structures ask for special management, which keeps their individual values.

Nature management

E5. To pay extra attention to development and management of nature conservation areas by keeping existing landscape and cultural historic values and using them as an inspiration for design and management.

E6. To stimulate the integration of nature management combined with agricultural use and the maintenance of landscape and cultural history values.

E7. To enhance, as much as possible, a natural nature management fitting into the different forms of land use as a whole.

The land use for nature management on the countryside can be divided in nature conservation areas and nature management combined with agricultural use. Both should always fit the

characteristics of the region and enhance, in particular, the landscape/scenery characteristics (e.g. enhancing keeping green shores along the canals and deepes). Constructing nature conservation areas should always be undertaken on the basis of the natural potential characteristics of the region, e.g. along old deepes and places of salty or fresh seepage. Existing archeological and historic-geographical values should be respected. In designing the plan, clear choices have to be made with regard to what and how – by special measures – to preserve. In the management plan, the management of these values has to be an integrated issue.

About the nature management combined with agricultural use, first of all, there is the link with the developments in the agricultural policy and the choices where to produce what kind of products as described above. In addition to this, special attention should be given to combining archeological and historic-geographical values like dwelling mounds, dikes, small scaled historic field patterns and relief with measures to improve the conditions for the flora and fauna. Sufficient financial means to cover loss of income have to be available.

Considering landscape and cultural history in the Wadden Sea itself and in the natural parts of the islands (dunes, marshes), the basic line of policy and management in this areas is "nature first". Nevertheless, in particular, the cultural historic values, e.g., shipwrecks, submerged old villages and sand dams on the islands have to be taken account of. In case of the historical shipwrecks preservation must be the main target in executing policy and management since they are largely of international value, e.g., the western part of the Dutch Wadden Sea. The values of landscape/scenery are served the best by "nature first" -policy and management.

6.3.6.3 Infrastructure (including harbors, wind turbines)

a. Issues

Roads, motorways, railways, traffic

As of the 19th century, the coastal regions of the Wadden Sea have been more and more intensively connected with the inland regions. Nowadays, these connections are more important than the connections between the Wadden Sea regions themselves. Much of the differences of the regions can be explained by acknowledging these rather recent developments. In many features of the cultural landscape the increased

influence of mainland traditions can be seen, like in building preferences, shopping centers etc., but also a demographic change becomes possible by modern traffic connections. Inland people settled in the region, whether by finding work or as pensioners, original inhabitants went away finding work elsewhere. In the last decades, the people who have immigrated inland were one of the motors of a growing valuation of the typical features of the Wadden Sea regions, as can be seen for instance by their initial efforts in restoring the old houses. They definitely gave new impulses in rising awareness of the values of the coastal areas, a welcome alternative to the pessimistic views of the old inhabitants caused by economic decline. Following this line of argument, modern developments in infrastructure cannot be seen only as losses in identity, but also as a motor for growing appreciation for the cultural landscape. However, this growing awareness of still existing values should not be frustrated by a ruthless modernizing of the land, as the feelings and the identification of the people connected with their environment are of crucial importance for the future.

Harbors, shipping traffic

The Wadden Sea region has a lot of small harbors, many of them very beautiful, suited for fishing vessels and sport boats. The main issue of concern is the permanent danger of silting up, but there is no question of maintaining the harbors in their present form. Larger harbors like Bremen and Bremerhaven, Wilhelmshaven, Hamburg or Esbjerg are closely connected with industrial development, so here problems do arise in balancing the interests of economy and their impact on the cultural landscape. The industrial skyline of the harbor of Bremerhaven causes a clear loss of value in the landscape of southern Land Wursten. Recent discussions about the filling in of parts of the Mühlenberger Loch near Hamburg also displays the difficulties of political decision concerning the use of landscape and nature. Regulation of Elbe, Weser and Ems are dynamic processes changing the balances in the water management, as the danger of silting up the Eastern Frisian harbors caused by the Weser adjustment for larger ships shows. Solving these problems will presumably cause changes in the harbor management of these small harbors.

Wind turbines

The coastal area is well suited for wind energy plants. In all countries, a lot of discussion was raised about the impact on the landscape, related both to the natural and the cultural aspects. As the supply of energy lies in the national interest of the countries – favoring renewable energy most clearly formulated maybe by the German governments – the choice between energy plants and the maintaining of the landscape only could be a compromise. It remains a matter of taste, if one likes the sight of wind turbines or if one sees the landscape destroyed by only a few of them, but undeniable are the big changes caused by them in the image of the landscape. The low old dwelling mounds and old dykes as only vertical elements are almost lost in view of the relatively large wind turbines. One could also argue that a former agrarian landscape is transformed into an industrial one. The practice of placing the wind parks in the landscape nowadays follows the same planning arguments as planning of industrial areas. The political opposition in most of the Wadden Sea regions against the wind parks shows, however, that the found compromises are still biased towards preferring wind parks and the interests of the landscape maintenance fall short. The same as above can be noticed for modern infrastructure.

b. Recommendations

E8. To take account of the perception of the inhabitants with regard to planning and executing infrastructure projects.

The landscape quality is of primary interest for the demographic situation in the Wadden Sea region. Therefore, the feelings of the inhabitants concerning modernization formulated in the political realm has to be taken very seriously in the process of planning the landscape features. Monument and nature protection laws are primarily designed for protecting objects (monuments) and important parts of the cultural landscape. The discussion especially about the impact of wind parks on wider parts of the cultural landscape has shown the shortcomings of the legal instruments for regulating. As the question, what the landscape should look like, remains to be answered, landscape plans incorporating both nature and culture visions of future development should be used more intently as a basis for future planning. A greater involvement of planning partners from the cultural sciences is needed.

6.3.6.4 Fishery

a. Issue

The most significant fishery in the Wadden Sea is the shellfish fishery such as mussel, cockle and shrimp fishery. Other fishery activities are of limited importance and do not constitute an impact on the cultural and landscape heritage. Since shellfish fishery is a bottom fishery, it can potentially entail an impact on the cultural heritage in the Conservation Area like the shipwrecks and the remnants of earlier settlements and salt mining sites.

The current policy and management of the mussel and cockle fishery will also indirectly contribute to protect the cultural heritage in the Wadden Sea. Cockle fishery is prohibited in the German Wadden Sea Conservation Area, whereas it is confined to a small area in the Danish Conservation Area. Mussel fishery is in principle confined to the sub-tidal and larger areas have been closed for this fishery. This has, e.g., resulted in the phasing out of mussel fishery in the former salt mining areas of the Schleswig-Holstein Wadden Sea Conservation Area. Also the Dutch mussel fishery policy takes account of the shipwrecks in the western part of the Dutch Conservation Area. The amended Key Planning Decision will explicitly take account of the cultural and landscape values, in particular, the shipwrecks.

It is recommendable to assess, on the basis of the inventory of the LANCEWAD project, whether and to what extent the landscape and cultural heritage is protected from impacts from shellfish fisheries in the current policy, and if necessary ensure that such a protection is given through legal stipulations, the introduction of new or additional policies and management, and/or through co-management schemes.

b. Recommendation

E9. To introduce an appropriate protection and management of the cultural and landscape heritage in the Wadden Sea Area, where possible, in combination with other initiatives to regulate activities in order to control impacts from bottom fishery, if, on the basis of an evaluation of the current protection regime, it has been demonstrated that it is insufficient to safeguard the heritage from such impacts.

6.3.7 Knowledge building, awareness and public participation

a. Issue

The LANCEWAD project constitutes the first comprehensive mapping and valuation of the landscape and cultural heritage of the Wadden Sea Region. The LANCEWAD-database, which has been established as part of the project, contains a comprehensive and harmonized information collection on the elements and element types in the Wadden Sea Region. The database is unique in its sort and of fundamental importance and a powerful instrument for the further efforts in the field of landscape and cultural heritage management on all levels (trilateral, national, regional, local) in the Wadden Sea Region. The information is essential to maintain and extend the third dimension being the landscape and cultural heritage to the natural and environmental dimension. It will contribute to ensure that the interests related to the heritage management will play an equal role to other interests in planning and decision-making processes.

It is essential that this database will be maintained and extended to include further elements and element types and geographical information on a joint basis and be updated on a regular basis. This information must also be made available to a broader audience of relevant authorities, stakeholders and interested people. The main issue in this case is currently that there are several authorities involved in the management of the heritage and that, in principle, the information is stored differently and in an incompatible way. The LANCEWAD databases are currently basically not embedded in a long-term structure on a national and/or regional basis. It is therefore desirable that, in order to maintain and extend the database(s) and to enable a use for management in those regions where this is not yet the case, a national or regional authority should be appointed lead authority and be responsible for maintenance and extension of the database. This authority should also be responsible for making the information available to a larger audience, e.g. through the Internet. This is a precondition enabling the integration of the information of the heritage in decision-making and planning at an early stage to ensure that it will play an equivalent role compared to other interests.

An appropriate coordination of the joint databases for the Wadden Sea Region should be

continued and guaranteed on a long-term basis. A common data base is necessary for the continuation of the joint policy in this field and therefore the joint LANCEWAD database should be continued to be located at the CWSS

Related hereto is the importance of involving the inhabitants and other interested in the awareness building. The LANCEWAD project has also demonstrated that there is a significant local expertise on the heritage which should be further used. It is important to obtain and process this knowledge for the benefit of the management of the heritage and this can best be done by stimulating the organization of local groups and enter into a communication with those groups.

The awareness of the values are essential for the comprehension of the Targets for landscape and culture as entailed in the Wadden Sea Plan on IDENTITY, VARIETY, HISTORY and SCENERY. As indicated earlier, the cultural-historic and landscape heritage and the diversity between the regions are essential for the comprehension of the area's development and identity and the inhabitants' identification with the landscape. It is therefore essential to further raise the awareness of this heritage throughout the region in order to promote the managed development.

The awareness and dissemination of the information on the heritage can be done in several ways. It seems first of all necessary to make the results of the LANCEWAD project available to a broader audience. This should be done in the native languages. A popular version of the LANCEWAD project report should be published in German, Danish and Dutch in combination with a CD-Rom and/or on the Internet. This would meet the agreement entailed in the Wadden Sea Plan 1.2.2, stating that the results "...will be published in a report in each of the three languages to ensure that the information is easily accessible and will be widely dispersed". Such a publication should be combined with a set of appropriate maps.

Furthermore, a dense network of information and awareness centers exists along the Wadden Sea coast and on the islands. The primary task of these centers is to raise the awareness of the natural environment of the Wadden Sea and the conservation regimes. Many of the centers also include information on the historic-cultural landscape but in most cases this information is not equal to the information on the natural environment. The information on the landscape and cultural heritage in the information centers

should therefore be examined and, as appropriate, be upgraded. Information material on the Wadden Sea could also, to a larger extent than currently the case, entail information on the landscape and cultural-historic heritage.

b. Recommendations

The knowledge building, awareness and public participation is an essential element in the sustainable management of the heritage in the Wadden Sea Region. It is recommended:

F1. To maintain, update and, where necessary, extend the LANCEWAD-database nationally and trilaterally to ensure that the information on the heritage will be available for a balanced decision-making process and awareness by

- making an authority in the four regions responsible for the database and also for the dissemination of the information on a digital basis in so far as this is not yet the case and
- ensuring an appropriate coordination of the information between the regions by maintaining, updating and extending the joint LANCEWAD data base at the CWSS.

Sufficient and up-to-date information on the cultural and landscape heritage in the Wadden Sea Region is a precondition for a balanced decision-making related to the heritage and to raising the awareness of the heritage. The LANCEWAD database is a powerful instrument to ensure that these preconditions will be fulfilled and the information will be made available to a larger audience. The database should be maintained, updated and extended where appropriate nationally and trilaterally. One organization in each of the regions should be made responsible as database authority. The joint database should be located at the CWSS.

F2. To make use of and stimulate the establishment of local groups as an information and awareness resource of the cultural and landscape heritage.

LANCEWAD project has verified that there is a significant local expertise. It is important to obtain and process this knowledge and this can best be done by using and/or stimulating the organization of local groups and enter into a communication with those groups.

F3. To publish a popular version of the LANCEWAD project report or a comparable popular publication in the three languages in combination with a CD-Rom or on the Internet to ensure that the information is easily accessible and widely dispersed.

It is essential to further raise the awareness of the heritage throughout the region in order to promote the managed development. It is necessary to make the results of the LANCEWAD project available to a broader audience. This should be done in the native languages.

F4. To examine the information given in the Wadden Sea information and awareness centers and in publication material with regard to the cultural and landscape heritage and, as appropriate, upgrade this information to ensure a comparable information level to the natural environment.

The dense network of information centers along the Wadden Sea coast and the islands should play a larger role with regard to information on the cultural and landscape heritage. Also in publications and brochures on the Wadden Sea, information on the cultural-historic heritage should be more prominent.

6.3.8 Monitoring

a. Issue

The management of the landscape and cultural heritage requires an appropriate monitoring of the status of the heritage. Opposed to the monitoring of the natural and environmental values, there is currently only very limited monitoring of the landscape and cultural heritage. It is vital, in order to assess the impacts of the developments and the efforts invested to manage the heritage, that a proper monitoring system be designed. Basically this monitoring system should be related to the targets for landscape and cultural heritage and possibly be part of the overall Trilateral Monitoring and Assessment Program (TMAP) on a long-term basis. Information is also essential in order to inform the community on the status of the heritage and provide for the necessary support. The information should also be included in the Quality Status Reports established in the framework of the trilateral cooperation in order to provide for a regular assessment of the heritage on the same level as for the natural and

environmental heritage. A monitoring of the heritage is required if a cultural site and landscape is included in the World Heritage List. The World Heritage Committee requires regular reports on the conservation status of listed sites in order to be able to assess whether the site fulfills the requirements. If the Wadden Sea Region or parts thereof will be inscribed in the World Heritage List, a proper monitoring of the landscape and cultural heritage values, for which the site has been inscribed, is indispensable.

There are several possibilities to design a monitoring system. One way is to monitor all the elements systematically on an annual basis. This is a resource demanding system, which is probably not very realistic. Another option is to monitor the elements and element types in selected areas being areas valued in the LANCEWAD project on a regular basis, e.g. every 5 years. This could be linked to the LANCEWAD database, and an assessment could be given on the status of the heritage in comparison to the previous period. A third option is to monitor different elements with different intervals, e.g. some of the elements annually whereas others would only be monitored every 5 years and others with a larger time span. In the forthcoming period, a suitable monitoring strategy should therefore be developed and implemented hand in hand with the further development of the conservation and management of the heritage.

b. Recommendations

The monitoring of the landscape and cultural heritage of the Wadden Sea region is essential to provide a continued information on the management status of the heritage, an assessment of the measures applied and information to the larger public. It is therefore recommended:

G1. To develop and implement a strategy for monitoring the landscape and cultural heritage on the basis of the Targets and the results of the LANCEWAD project, and taking account of a potential nomination of the Wadden Sea Region or parts thereof as a World Heritage Site.

G2. To include an overview of the landscape and cultural heritage in the Quality Status Reports Wadden Sea to enable an assessment of the implementation status of the Targets in line with an assessment of the targets for habitats and species.

6.3.9 Follow-up projects

a. Issue

The current LANCEWAD project has carried out an inventory and maps of the most important landscapes and cultural heritage elements of the Wadden Sea Region. Furthermore, proposals for maintenance and promotion of the valuable landscape and heritage have been elaborated. Now, the project results are a sound basis to implement regionally and locally applied projects and to develop further strategies to integrate the cultural issues in an overall management plan. With the available quality maps and the assessment of the cultural values of the Wadden Sea Region, a basis is at hand to contribute to a sustainable spatial planning process.

To preserve, maintain and restore the characteristic cultural elements, structures and ensembles, appropriate measures should be further developed and internationally coordinated to aim at proposals for integrated management plans for local up to international levels. Follow-up projects should aim at both, a top-down and a bottom-up model in the field of spatial planning and integrated management. This means in more concrete terms, common approaches are transformed into local application, and the experiences of the applied demonstration projects will provide a feed back to further update the common guidelines and strategies.

b. Recommendations

Follow-up projects on the landscape and cultural heritage in the Wadden Sea Region are essential for a consolidation of the data base structure to be used for management and spatial planning. Furthermore, new projects can contribute to a sound preparation for a nomination of the Wadden Sea Region as a cultural World Heritage Site. It is therefore recommended:

H1. To strive for a transformation of the outcome of the current LANCEWAD project into practice by implementing demonstration projects on the regional and local level.

H2. To develop common guidelines for management and sustainable use, as well as strategies for conservation, restoration and better awareness of the heritage and landscape values.

H3. To elaborate adequate tools for a better promotion of the outstanding values.

H4. To contribute with a new project to a nomination of the Wadden Sea Region as a World Heritage Site.

For the realization of the recommendations, a project application under the Interreg IIIB North Sea Program should be made.

7. Annexes

7.1 Types of farmhouses of the Wadden Sea Region

7.1.1 Bay hall house / Fach-Hallenhaus / Danish gards / Hallehuis

2 main forms:

- the narrow North Frisian **bay house**
- the broad Northern German **bay hall house**

construction:

A longhouse with 1 nave and two low-side areas, built by two rows of posts and cross-beams (super-imposed tie-beam). Two posts, one cross-beam and two rafters are together a constructive truss: the transversal bracing. The rafters are set on the beam (rafter-roof with load-bearing ceiling). The low-side rafters lay on the main rafters. two transversal units bound one bay. The addition of bays forms the hall. The longitudinal bracing is built by purlin. The distance of the post in the length corresponds to the distance of the rafters.

organization:

Dwelling and stall/barn under one roof. First without division between both areas and with an open fire-place (Rauchhaus / los hues). The high developed type of the bay hall house with divided bays for dwelling-rooms (Kammerfach), and the bay with the hearth divided into a living-space with entrance on the side, often with pointed gable or fronton above the entrance.

forms of extension:

Projection of the beam to widen the house in the cross-section. More than two posts in the cross-sections. Extension of the dwelling-bays to a cross-house. A two-storied cross-house.

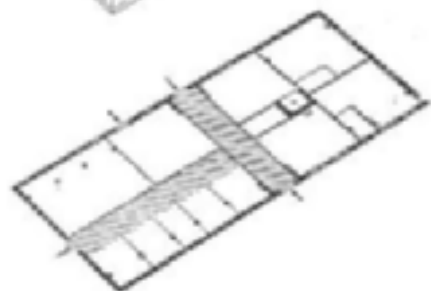
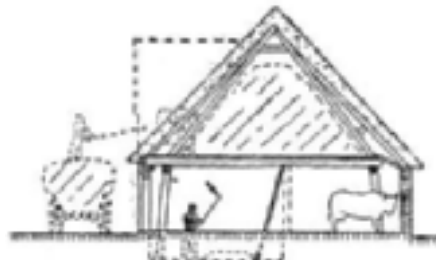
North Frisian bay house

A longhouse with very narrow low-side areas. The posts stand near the outer wall of brick-work; thatched hip-roof or half-hip-roof.

Uthländisches Haus

The longhouse of the marshlands, the islands and Halligen of Nordfriesland. The dwelling-space is separated from the stall by a narrow cross-passage and well developed. The stall has a longitudinal passage with a door at the gable, and only a small threshing place.

The houses of the skippers or the captains on the islands and Halligen show a comfortable dwellings-space and only a small working area.



Geesthardenhaus

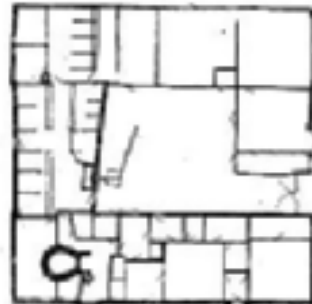
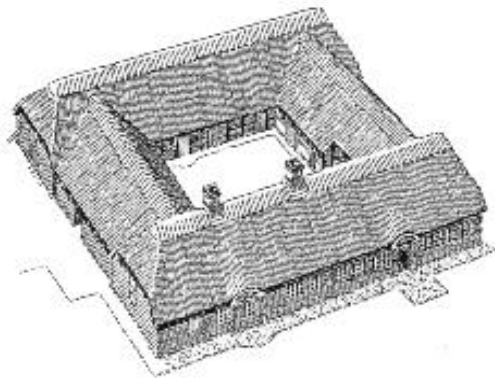
The longhouse of the geestlands, but also sometimes found in the marshlands of Nordfriesland. It is nearly the same type as the Uthländisches Haus, but the stall has one or two broad cross-passages. This cross-orientation is an influence of the type of longhouses of Denmark/South-Jutland. The working area is larger than of the Uthl.H. There is also a real threshing-space.

angular farmstead; 3-/4-sided farmstead of Nordfriesland

These are always forms of an extension of the Uthländisches- or Geesthardenhaus.

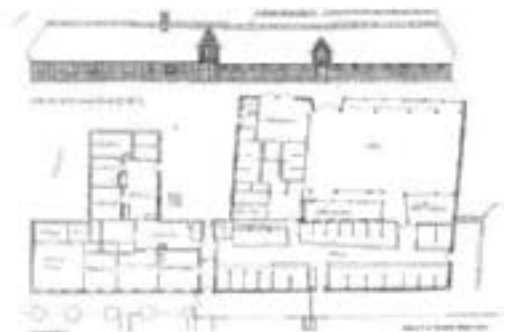
Danish types of the bay house

Gard fra Vestjylland four-sided farmstead (a)

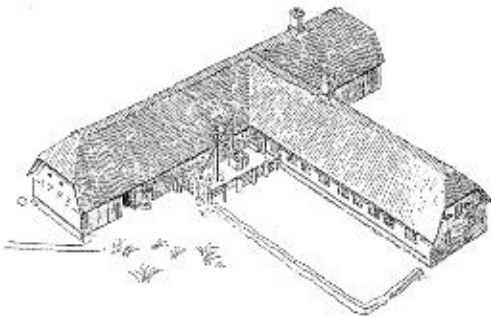


A special Danish form of longhouse, built as a farmstead around an inner yard. The four wings of the houses look similar to the North-Frisian longhouses but are organized in another way. The outer walls are bricked or of framework and have thatched half-hip roofs.

Gard fra Sonderjylland farmstead with two yards (b)



This is another form of Danish farmsteads with two yards, an open and a closed one, built by two parallel longhouses linked by two annexes and a separate angular annex to the dwelling-space. The longhouse is organized and constructed similar as described at the Uthländisches Haus with longitudinal passage to the stall, and a narrow cross-passage between dwelling and stall.

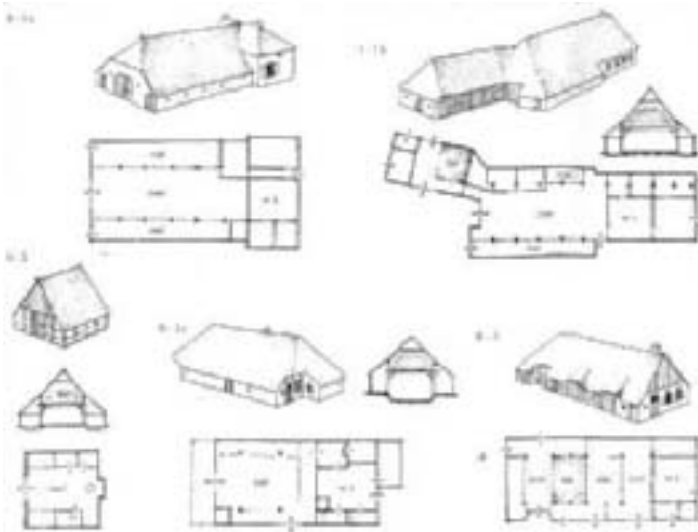
Gard fra Romo (c)

A T-shaped farmhouse, built of two connected longhouses with cross-passages. The outer walls are bricked; thatched half-hip roofs.

Skipperhus fra Fano(d)

A longhouse with comfortable dwelling and small stall, divided by a narrow cross-passage between both spaces. The roof lays on the outer walls. The rafters are set on a wall-beam of the outer walls of brickwork, visible under the eaves. Thatched half-hip roof.

Dutch types of bay house
Woonstalhuis met tas op erf

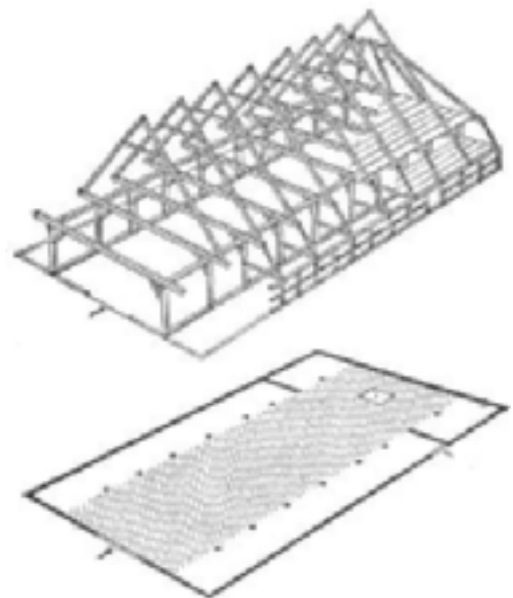


Longhouse with haystack in the yard. The early form (1500). In the provinces of Noord-Holland north of Haarlemmeer, Friesland except for Stellingwerf and Opsterland, and Groningen, except Westerwolde and Gorecht, there was a longhouse differing little in principle from the prehistoric type having a narrow passage between open-box stalls for feeding and manure removal and a haystack situated in the yard:(2)

Northern German bay hall house

The form with a wide hall, serving as threshing floor and deep low side, stalls for the animals. The early form shows no separation of dwelling and stall/barn.

Characteristic for the later form is 'the hall which is made up of the area around the hearth and the working area, together with the low side recesses. The working area is a long space in the middle of the house with a floor of trodden mud. The carts laden with the harvest were driven in here and the hay and corn were forked through the openings in the hall ceiling up into the loft for storage. The hall could also be used as a threshing floor for corn'. In the low side areas (Kübbungen=recesses), there were the stalls for the animals as well as small rooms for servants and fodder.



Opposite the main door, going across the upper end of the hall was the hearth and its surround (Flett) This was paved and included the fireplace and on both sides of it the light open areas (,Luchten'/ in Dithmarschen: Siddels). Divided by walls, behind the hall lay the living and sleeping-space.(1)

The outer walls: posts, wooden planked; or framework with compartments of mud or brickwork; or walls of brickwork. Roof: hip roof, half-hip-roof or saddle roof, thatched or pantiled.

occurrence:

Dithmarschen / Elbmarschen / Lower Saxony

special regional types

Dithmarschen:

An area with combined types of construction.

Querdielenhaus, the hearth area and surround is developed to a cross-hall and Luchten (space of the niches of the bay on both side mostly living and sleeping area with windows), called ,Siddels'. On one side is now the entrance to the dwelling with fronton above the entrance.

Dwerhaus, a bay hall house with cross-passages, influence of Danish-/South-Jutland. But about 1800 the dwerhouse construction changed to a Gulf-construction.

Elbmarschen:

Husmannshus (bay hall house of the Wilstermarsch)

Vierländer Hallenhaus (bay hall house of the Vierlande), a type of Flettdielenhaus (the hearth area and surround is developed to a cross-hall and Luchten, separated living rooms with windows on both sides).

Hufnerhaus und Hallenkaten the bay hall house of the poor farmers with smaller dimensions.)

Kreuzhaus (bay hall house with cross-house: the dwelling-bays are developed to a broader house before the working hall with a crossing roof and three gables.)

Lower Saxony:

Rauchhaus (house with open fireplace)

Kübbinghaus oder Zweiständerhaus (house with recesses or house with two posts in the cross-section)

Flettdielenhaus (bay hall house with a cross-hall and Luchten)

Hufnerhaus and Hallenkaten / Kätnerhaus (the bay hall house of the poor farmers with smaller dimensions)

Längs-Durchfahrtsscheune (barn with longitudinal passage)

(barn with cross-passage)

Dutch bay hall house called:
Aisled-house-group

occurrence:



in a broad strip in the middle of the country from the German border in the east to the North Sea coast of South-Holland in the west.(2)

types:

loes house(II-2) (house with open fire place):' the dwelling area was not separated from the rest and the smoke from the fire preserved the grain stored above the nave, the hay being kept in a barn in a yard.(2)

Middenlangsideeltype(II-1a) (,threshing-nave types with crop storage in the yard')(2)

Stellingwerfs-en Staphorstse dwarsdeelentypen (II-4)(Midstrey types of Stellingwerf and Staphorst.)(2)

Drenste-en Noordwest-Overijsselse dwardeelentypen (II-8a) (Midstrey types of Drenthe and northwestern Overijssel.)(2)

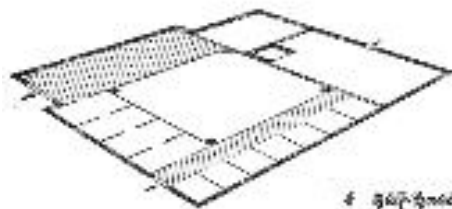
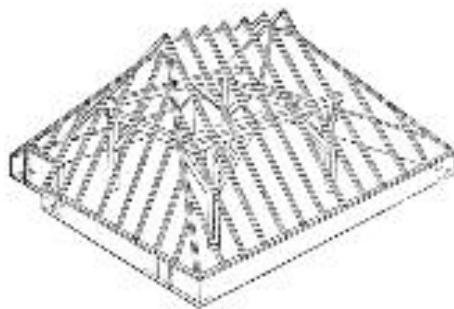
7.1.2 Four-post-square-house

Frisian-house group (Gulphaus, Gulfscheune, Barghaus, Bargscheune, Haubarg, Friese Schuur, stelp or stolp)

construction:

Gulf / Barg / Vierkant / stelp / stolp is the name for a four-post-square construction, an open storage area for corn and hay. The origin of this type is the open four-post hay barn with its adjustable roof (Vierutenberg)(1)

The transversal bracing is built by a tie-beam truss (Ankerbalken), the longitudinal by a purlin, projecting on both ends bearing the rafters of the saddle roof and a beam for the leaning shed-roofs.



organization:

Around this central space the threshing floor, stalls for animals, and separate the living-space, in German named ‚Vorhus‘, were grouped; integrated in the main roof, but with pointed gables on the sides and above the entrance in the middle of the front.

form of extension:

Addition of ‚Gulfs‘: Type: Gulfreihehaus or East Frisian house

The distance between the posts was widened by taking strong posts and beams, and projecting the beams on both sides. This is the type: Haubarg of Eiderstedt with mostly four posts, but also six or eight.

German types

Haubarg / Eiderstedt / former: also sporadic in Dithmarschen and Nordfriesland

A type with mostly four posts, but also sometimes with six or eight posts, with a wide distance between the posts. There are always a separated dwelling part with passage (Vorhus) and the working area (Achternhaus) with the central ‚Vierkant‘ and the threshing floor and stalls around. Characteristic is the pointed gable above the entrance and the barn-/stall-doors.

Haubargscheune (Haubarg without dwelling space) / Eiderstedt (former also: North-Dithmarschen)

Südfriesisches Gulphaus / Gulfscheune (Gulphaus of South-Friesland / Gulf-barn) Köge in Dithmarschen.

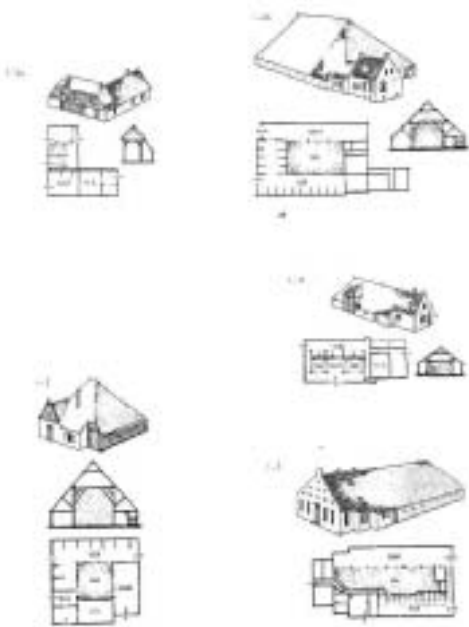
Das lange Gulfreihehaus (the long house of a row of Gulfs) This type spreads from East-Friesland to South-Dithmarschen in the western part of Barlt and Marne (18.cent.) It is a three-aisled type with an addition of ‚Gulfs‘: A very broad building. The living space, two storied, is part of the main nave and has a broad gable.

Gulphaus / Gulfscheune (Gulf-house / Gulf-barn) /Lower Saxony drawings: references no 3

Barghaus / Bargscheune (Barg-house/Barg-barn) special type of Elbmarschen-Wilstermarsch

Gulfscheune mit Längsdurchfahrtsdiele (Gulf-barn with longitudinal passage) / Lower Saxony.

Dutch types called: Frisian house group stolp (1-3)/ a type, in which all the parts were grouped under a pyramidal roof with the haystack in the middle'(2)



Area between Haarlem and Amsterdam / outside the mainland of Noord-Holland / island of Texel / and the former West-Vlieland

voorenhuis / in Wieringen
a special type were, the single-aisled barn was built at right angles to the stall.

Kop-hals-romp(1-2b) (head-neck rump) type / Friesland / western part of Groningen

stjelp (1-3)/ Friesland / western part of Groningen, in the Stellingwerf and the area between Kuinre and Blokzijl.

This type shows the final form: under whose high-hipped roof, there were several bays in the nave for the storage of crops'(2)

Olddambt-type (1-4)/ western Groningen
This type, is characterized by an enlarged house part with grain-lofts and an attached, equally high but broader aisled Frisian barn'(2)

Type of Ameland and Terschelling (1-5)
This type is characterized by a low house part and a high, attached working part.

7.1.3 House with load bearing wall-posts, Wandständerhaus

construction:

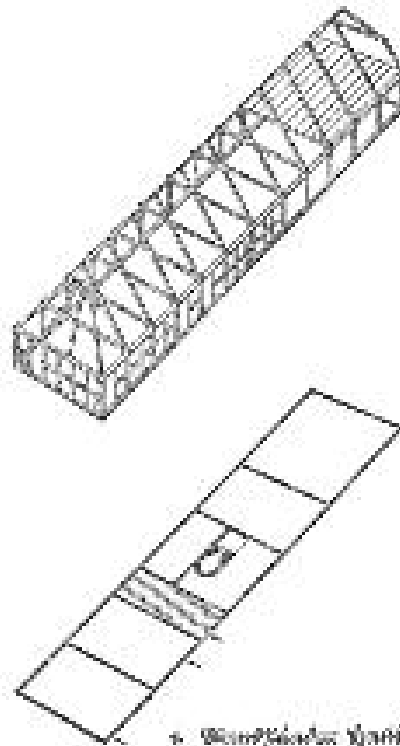
House with two rows of posts in the outer wall, which carry the beams and the roof. A narrow longhouse-type. The developed type with outer walls of framework.

occurrence:

Lower Saxony, region of Weser-Ems and Elbe-Weser.

types:

Houses of agricultural laborers, small huts.



7.1.4 References

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Myrthe, Anders 2001. Odense Bys Museer, information.(4)

Wolf, Gustav 1940. Haus und Hof Deutscher Bauern . Bd. 1 Schleswig-Holstein, Berlin(3)

Guldberg, Mette 2001. Fiskeri-og Sofartsmuseet, Esbjerg, information by the Open-air Museum of the Danish National Museum (5)

7.2 Data base description

7.2 Data base description

Trilateral database structure used for the mapping of landscape and cultural heritage objects.

For the mapping of landscape and cultural heritage objects the LANCEWAD project stored the geographical location and additional information on the objects. The geographical data has been collected in so-called 'shape files', which can be used in special programs like ArcView® or MapInfo®. The information on the objects is stored in a relational database. The connection of object location (shape files) and object information (database) is guaranteed by a unique and specially composed object ID.

The task of the trilateral database is to store the object information delivered by the countries Denmark, Schleswig-Holstein/Hamburg, Lower Saxony and The Netherlands. The content of the database is a compromise based on national inventories, availability of data and objectives of the LANCEWAD project. Therefore and of pragmatical reasons the database has been kept simple to avoid too much effort in data transfer data handling and data adaptation.

The following description gives an overview and a description of the LANCEWAD database structure.

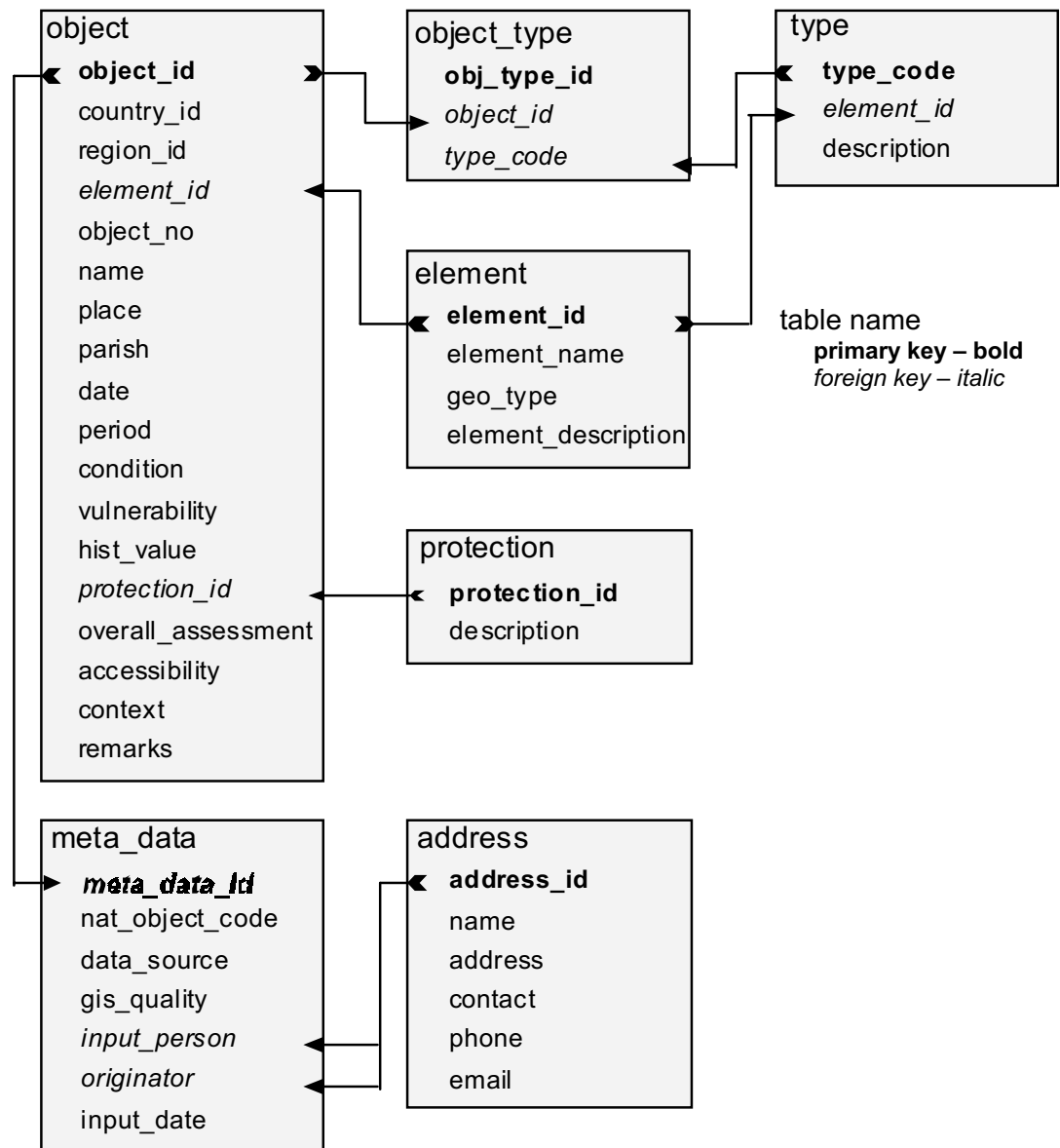


Table 7.1: Object

The table 'object' is the central description of each object. As primary key 'object_id' is used. The field 'object_id' has the format: CREE00000 (C-country, R-region, E-element, O-objectnumber). For administrative reasons in the trilateral

database the primary key will be separated into the fields 'country_id', 'region_id', 'element_id' and 'object_no'. This fields have not to be delivered from national level.

Field	Data type	Description
object_id	long integer	primary key (CREE00000)
country_id	char[1]	country id (this field will be used only in the trilateral database). C- 1 - Denmark 2 - Schleswig-Holstein/Hamburg 3 - Lower Saxony 4 - The Netherlands
region_id	char[8]	R- region code (this field will only be used in the trilateral database).
element_id	char[8]	E- id of the element the object belongs too (this field will only be used in the trilateral database).
object_no	char[8]	O- number of object (this field will only be used in the trilateral database).
name	char[128]	topographic name of the object.
place	char[128]	name of the location.
parish	char[128]	name of the parish/community, where the object is situated.
date	char[16]	the date of the erection of the object.
period	char[16]	time periods: PH - PreHistoric Age, covers SA to RT SA - Stone Age BA - Bronze Age IA - Iron Age RT - Roman Time/Roman Iron Age EME - Early Medieval Time/Migration Period/Viking Age LME - Late/High Medieval Time EMO - Early Modern Time MOT - Modern Time
condition	char[1]	physical state of the original object: G - Good M - Middle P - Poor D - Disappeared I - Invisible
vulnerability	char[1]	vulnerability of the object: H - High M - Middle L - Low
hist_value	char[1]	connection to a known historical event of the object: L - Local R - Regional N - National
protection_id	long integer	Element protection.
overall_assessment	char[1]	degree of how representative and expressive an object is: L - Local R - Regional N - National
accessibility	char[1]	access for the public, take into account the necessity being in, out or even far away of the object: G - Good M - Middle P - Poor
context	char[128]	Larger context of the object.
remarks	char[256]	General description of the object.
meta_data_id	long integer	Foreign key from table meta_data

Table 7.2:
Elements

Table 7.3:
Element_ID

Field	Data type	Description
element_id	char[8]	primary key
element_name	char[64]	name of element
geo_type	char[1]	Geographical type: P - point L - line A - area, polygone
element_description	char[128]	Description of element

Table 7.4:
Meta_data

Field	Data type	Description
meta_data_id	long integer	primary key
nat_object_code	char[64]	national code of object
data_source	char[128]	sources used for information about the object: age or date of data, name of the book, the data comes from, etc.
gis_quality	char[1]	quality of GIS data: H - High M - Middle L - Low
input_person	long integer	person, who has filled in data of object.
originator	long integer	owner of the data.
input_date	char[16]	date, when data has been entered into system.

Table 7.5:
Data originators

Field	Data type	Description
address_id	long integer	primary key
name	char[80]	name of institution
address	char[80]	address
contact	char[80]	contact person
phone	char[20]	phone number
email	char[60]	email address

Table 7.6:
Object_type

Field	Data type	Description
obj_type_id	long integer	primary key
object_id	long integer	foreign key from table object
type_code	char[64]	foreign key from table type

Table 7.7:
Type_code

Field	Data type	Description
type_code	char[64]	name of the type
element_id	char[8]	element_id the type_code belongs to
description	char[128]	description or definition of specific type

Table 7.8:
Protection

Field	Data type	Description
protection_id	long integer	primary key, code for form
description	char[255]	description of kind of protection

Abbreviation	Name of Period	Time Period
PH	PreHistoric Age, covers SA to RT	BC
SA	Stone Age	≥ 2000 BC
BA	Bronze Age	2000 – 1000 BC
IA	Iron Age	1000 BC – 0 AD
RT	Roman Time, Roman Iron Age	1 – 400 AD
EME	Early Medieval Time/ Viking Age	400 – 1050 AD
LME	Late (and High) Medieval Time	1050 – 1500 AD
EMO	Early Modern Time	1500 – 1800 AD
MOT	Modern Time	1800 – 2000 AD

Table 7.9:
Division of time periods
for the project

7.3 Working groups

7.3 Working groups

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Fiskeri- og Søfartsmuseet i Esbjerg
Den Antikvariske Samling i Ribe
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Apart from the above mentioned, a number of other persons have contributed to the project. Thanks to all who contributed.

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