A KALEIDOSCOPE OF MARITIME PERSPECTIVES

Essays on the archaeology, art history and landscape history of the maritime world view

D.C.M. Raemaekers (ed.)
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# Table of Contents

Foreword ................................................................................................................................. vii  
*Daan Raemaekers*

Early Maritime Adaptations and the Peopling of the Americas ................................. 1  
*Marjolein Admiraal*

How to cope with a drowning landscape? A research history into changing representations of Doggerland in relation to climate change ................................................................. 7  
*Karla de Roest*

Thermal alteration of red Helgoland flint ..................................................................... 17  
*Linda Kiers*

Beyond boulder clay and cover sand. Insights into the possible meaning of inland streams in TRB-Drenthe (c. 3400–2800 cal. BC) ................................................................. 25  
*Trijneke Sibma*

Changing seascapes. The Aegean seascape from the Stone Age to the Bronze Age .......... 35  
*Theo Verlaan*

Aegina Kolonna. A case study on resilience within changing networks during the Greek Bronze Age (c. 3000-1000 BC) .................................................................................. 43  
*Iris Rom*

Depiction of the sea in the Minoan frescoes from Knossos and Akrotiri (1700-1450 BC) ................................................................. 53  
*Paula Kalkman*

Rivers and Trade in Mainland Greece. A case study based on Corinthian Pottery (8th–6th centuries BC) .................................................................................. 61  
*Jelmer Wubs*

A dead and road? Investigating Iron Age (800–12 BC) routes of transport on the sandy soils of the Netherlands .................................................................................. 67  
*Karen de Vries*

Malta and Sicily. Island identity in the Mediterranean; the 700 BC turning point .......... 75  
*René Brandhoff*

The Samothracian cult and the maritime world (4th c BC – 2nd c AD) ......................... 81  
*Dies van der Linde*

On terpen from Flanders up to Frisia. Two maritime regions from the last centuries BC until the Late Middle Ages compared ................................................................. 89  
*Sophie Thasing*

Beyond a terrestrial view on the Roman period obelisk transport. The social implications of the shipping .................................................................................. 97  
*Remco Bronkhorst*

The Roman Rhine. Trade along and across the border river ......................................... 103  
*Susanne Manuel*
## Table of contents

Maritime Opportunities and their exploitation in antiquity .......................................................... 111  
*Piet Swart*

The economic growth of terp-settlements related to their accessibility through waterways .......... 117  
*Paulien Schrijver*

Transformation in Worldviews along the Mainland Coast of the Dutch Wadden Sea area  
(9th and 10th centuries AD) ........................................................................................................ 125  
*Merit Henriët Snoeijer*

Vegesack. A forgotten Bremen harbour, 1470 AD until today ................................................ 129  
*Annika Kropp*

The port portrayed. Depictions of Naples from the 15th and 16th centuries ............................... 135  
*Lotte van der Toolen*

The meaning and significance of ‘water’ in the Antwerp cityscapes (c. 1550–1650 AD) ............. 143  
*Julia Dijkstra*

A maritime worldview in Jan van Goyen’s ‘View of The Hague from the south east’ ................. 151  
*Noortje Knol*

Mattheus Mzn. Van den Broucke. A 17th century case study of self-representation .................. 159  
*Sanne Roefs*

Shipping disasters and the rescue service on the Dutch Wadden Islands ............................... 171  
*Charlotte Witte*

From intertidal wasteland to international nature area. Shifting policy in the Dutch Waddensea 
from 1950 onwards ..................................................................................................................... 179  
*Mandy van Kouwen*

A sublime force to be reckoned with. The maritime landscape in the works of Bas Jan Ader and 
Guido van der Werve .................................................................................................................. 187  
*Agnes Winter*

Schiemonnikoog. A self-sufficient island in the past and future ............................................. 193  
*Arjan Conijn*
Foreword

In spring 2012 a group of fifteen students of the Research Master in Art History and Archaeology of the University of Groningen followed a course entitled *Representations of Landscapes*. Due to the various backgrounds of the students in terms of disciplines (art history, archaeology and landscape history) and period of interest (from prehistory to the present-day) a focused course on a topic of relevance to all seemed difficult to attain.

In order to bring focus to the course it was decided to select a general theme broad enough to connect to all research interests and focused enough to make the students realize that the disciplinary break-up of the larger research on past societies into archaeology, art history, history and landscape history (to define the current Groningen educational programmes) is not self-evident. The study of the past may be pursued using the methodologies of these disciplines as a grand tool box.

The general theme of the 2012 course was that of *Maritime landscapes*. I proposed that until c. 1900 the world was largely a maritime one. Waterways were the main routes for communication and transport, while in the modern world a terrestrial worldview developed, or perhaps nowadays even an avian worldview. This change in worldview may then result in the notion that a study of the maritime past is by definition the analysis of an outsider.

Looking back I realised that the collection of papers provided an interesting broad scope of the relevance of a landscape perspective on the past. Therefore the spring 2013 course was devoted to the same theme.

The papers in this volume derive from these two courses. They all question the general theme, starting from the specific research interests of the authors. As a result it is evidence of the grand tool box available for the study of the past. Interestingly, many of the papers address a topic which would not have been addressed if the student would have had a complete free choice of topic. As the notion of a worldview shift is not common-place in any of the educational programmes, it is hoped that the authors will retain their open eye and continue to question that which is taken for granted.

I invite you to witness their further academic careers.

Daan Raemaekers
Groningen, June 2013
Early Maritime Adaptations and the Peopling of the Americas

Marjolein Admiraal1

Introduction
When did anatomically modern humans first enter the Western Hemisphere and where did they come from? The general view is that around 13,500 BP (calibrated years before present) humans coming from Asia entered the American continent via the Bering Land Bridge and moved further south through an Ice-free corridor in between the two ice sheets covering North America. People must have spread rapidly across the continent and they developed a distinguishable biface technology. The remains of these people are referred to as the Clovis culture, named after the site where the culture was first discovered in New Mexico. Many archaeologists since the 1920s have believed that Clovis was first (Haynes, 1964; 1969; Martin, 1973).

This theory is challenged by the Coastal Migration Model. It explains the occurrence of pre-Clovis sites south of the ice sheets by suggesting an earlier migration along the west coast of the American continent with the use of watercraft. The debate following the introduction of this theory has centred on the lack of evidence of both the early use of watercraft and coastal sites. This paper addresses the notion that a maritime adaptation is regarded to be of Holocene age. The Monte Verde site of Chile will be examined more closely because this site resulted in a change in thought about both pre-Clovis occupation of the Americas as well as pre-Holocene coastal migration. Special attention will be given to the idea that modern-day worldviews (maritime versus terrestrial) structured the debate on the Coastal Migration Model.

Construction of the Coastal Migration Model
As early as 1590 AD the Spanish Jesuit chronicler Padre José de Acosta proposed the idea of a land bridge connecting the continents providing a migration route for the first Americans (Fiedel, 2000). In 1728 Vitus Bering discovered the separation of the two hemispheres by the Bering Strait. As a result, one of the earliest thoughts about the peopling of the Americas included the use of watercraft, needed for the crossing between continents (see further Easton, 1992).

During these early times the biblical belief in a young earth of approximately 6000 years old was still deeply rooted. As a result, the belief that America’s archaeology could not exceed the age of 5,000 years persisted up to the discovery of the Folsom site in 1926 dated to approximately 9,000 BP. In 1935 the Clovis site proved even older human occupation (13,500 BP). Eric Hulten proved in 1937 that lower sea levels had exposed the Bering Strait during the LGM allowing people to walk from Asia to America.

For the 20 following years most New World archaeologists believed that around 13,500 BP humans from Asia entered the American continent via the Bering Land Bridge. After passing through the Ice-free corridor in between the Laurentide and Cordilleran ice sheets, they stumbled upon the tame megafauna of the North American interior. The lack of fear for humans caused the extinction of the megafauna by human overkill. In return the abundance of easy prey caused a human population explosion. Humans spread rapidly across the continent and developed a distinct biface technology that we refer to as Clovis.

This is a brief description of the Clovis-first, Ice-free corridor and Overkill models. Archaeological proof for any of these theories has remained absent up to this day (Easton, 1992; Klein & Schiffer, 2003; Mandryk et al, 2001; Fiedel, 2000). At the same time, this narrative of related models oppressed any coastal migration proposals or the involvement of watercraft concerning the peopling of the Americas (Easton, 1992; Fiedel, 2000).

The Ice-free corridor, Clovis first and Overkill models suited each other perfectly. However, some archaeologists were convinced of a human presence before Clovis. Even before the archaeological proof of an earlier presence was unearthed the idea of a coastal migration arose. In 1960 Heusser suggested the idea anew. He sketched the scenario of a southward migration along the coast instead of through the conventional interior ice-free corridor. Fladmark (1978, 1979, 1983, 1986) further developed the theory. Fladmark based his theory on the occurrence of pre-Clovis sites located south of the ice sheets. The occurrence of these sites proved that people inhabited areas south of the ice before an ice-free corridor migration was possible. He examined the glaciological evidence on the extent of the Cordilleran Ice Sheet during its last advance along the North Pacific coast of North America (after 23,000 14C BP) and discovered the presence of multiple ice-free refugia (Fladmark, 1979). Heusser (1960) already proposed six refugia (fig.1) on the basis of archaeobotanical evidence. These are basically the same areas that Fladmark suggested:
The evidence on the refugia is mostly of palaeoenvironmental origin and lacks archaeological remains to underline their importance for the colonisation of the Americas. While it has been proven that the ice-free corridor was not viable for human migration before 13,500 BP, this is not the case for coastal migration. Palaeoenvironmental evidence suggests that coastal conditions must have been less harsh than inland conditions due to the moderating influence of the Japanese current bringing warm subtropical water along the continental shelf. This would have resulted in a more temperate and moist environment along the coast. Additionally, the proposed refugia may very well have supported a varied fauna capable of supporting groups of human migrants as early as 16,000 BP (fig.1) (Mandryk et al, 2001). However, as with the ice-free corridor model, there are no archaeological remains of the desired age to strengthen the model. The oldest evidence of a human presence along the northwest coast is dated to 12,500 – 13,000 BP. Nevertheless, these sites are still older than the oldest located in the ice-free corridor (Dixon, 2011). The difference is that the coastal migration model explains the absence of archaeological evidence because the proposed refugia are all located up to 150 meters below current sea levels and are therefore difficult to investigate (Mandryk et al, 2001, Easton, 1992). There is however, in opposition to the Ice-free corridor which has been researched extensively and yielded very little data, a huge potential for discovering sites. The question remains why the research on the coastal route has been primarily palaeoenvironmental and not archaeological?
Is it the difficulty of investigating the coastal route or is there more to the absence of research? Is this the influence of the dominant terrestrial worldview as expressed in the Ice-free Corridor Model?

**Case study: Monte Verde**

Lumbermen discovered Monte Verde in south-central Chile in 1976. Dillehay started excavations and analysis in 1977 together with a team that eventually counted 80 international interdisciplinary experts. Due to the astounding good preservation of organic material, the site enabled archaeologists to reconstruct the life of early, ice-age Americans.

The evidence is truly magnificent. A tent of 18 meters long was uncovered with a frame of wood and anchored by stakes. Some of the stakes and poles were still connected with the junco reed knots. Hides were used for walls and floors. Individual living quarters could be distinguished, each with a brazier pit lined with clay. Outside the structure two hearths were uncovered complete with firewood supply. Mortars and grinding stones were found next to two hunks of meat and some mastodon bones. Several smaller structures were found as well as a ‘wishbone shaped’ structure where mastodon carcasses were butchered, hides were prepared and possibly healing was practised (Dillehay, 1997). Dillehay (1997: 30) points out that the most “dramatic remains” were the footprints of a small adult left in the soft clay. The stone tools were surprisingly crude in comparison to the overall level of sophistication of the site. The majority of the used stone tools are simple rounded pebbles. There were only a few worked tools such as bifacial-flaked projectile points, chopping tools, grooved slingstones and grinding stones. The site was firmly C dated to 13,990 – 14,600 cal. BP (Dillehay, 1997; Dillehay et al., 2008).

Interestingly, Monte Verde shows that maritime resources were of great importance. Nine different species of algae were uncovered together with stone tools bearing remains of seaweed on the working edge. Some species could be traced back to the nearby inland bay, while others originated from the Pacific coast, at the time some 90 km from the site. Some of the algae species are inedible and are in the area nowadays used as medicine. The species flowered at different times of the year, which caused Dillehay (1997) to assume advanced knowledge of coastal resources. Also salt, pebbles worn from wave action, and bitumen for the attachment of wooden shafts to stone tools were found. These resources have a proven coastal origin and therefore show that the Monte Verdeans made use of coastal resources. But does this imply a long history of exploiting coastal resources? The general acceptance of the Monte Verde site renewed the interest in the Coastal Migration Model. The site is special because of its age, location and maritime nature. It also divided New World archaeologists into two camps even more: Clovis-first vs. Pre-Clovis. The early age for the site was not easily accepted. Many archaeologists dismissed the site without any disproof of its authenticity. For years, Dillehay tried to arrange a visit of scholars to the site. Finally, a group of New World archaeologists visited the University of Kentucky in 1997 to examine the artefacts and later travelled to Chile to visit the site and review the stratigraphy. After this visit the Monte Verde 14,600 year old layers were accepted by most of the New World archaeologists (Dillehay, 1997). This made Monte Verde the first generally accepted pre-Clovis site. Most of the debate about Monte Verde has centred on the 14C date. The combination of the earliest archaeological date in the Americas and its southern location makes the site very significant for the discussion on the peopling of the Americas. It may suggest different scenarios such as a trans-Atlantic migration with initial entry into South America. It might also be regarded as proof of an earlier entry from Beringia or it could serve as evidence for the Coastal Migration Model.

Although the authenticity of the site was generally accepted in 1997, in 1999 Fiedel (1999a) published an article stating that the Monte Verde evidence shows inconsistencies, ambiguities and missing information. Fiedel in turn was accused of cherry picking his results to match his thesis (Dillehay et al., 1999). Dillehay et al. (1999: 41) state that: “The site has become the lynchpin in a paradigm change. Thus, it is not surprising that some critics will challenge the site, but unscrupulous challenges are unnecessary”. In response Fiedel published another article (1999b) in which he claimed that Monte Verde was proof that Clovis was actually older than previously thought due to a radiocarbon ‘plateau effect’ (cited in Klein & Schiffer, 2003). In 2007 Waters and Stafford argued that Clovis was actually younger and shorter lived than previously thought (11,050 – 10,800 14C BP). Their work in turn provoked new comments (Haynes et al., 2007). These are striking examples of the scientific ‘battle’ that has been going on between Clovis-first and Pre-Clovis advocates. The offensive tone of certain articles is notable. “Instant-opinion-hurling has become something of a sport among archaeologists who study the first Americans” as Dillehay (1997: p.32) states.

**Terrestrial versus Maritime or the Ice-free corridor versus the Coastal route**

The connecting problem statement of this volume comprises that a terrestrial worldview has been dominant from around 1900 AD onwards. A general question that could be asked is whether modern day archaeologists are biased due to their primarily terrestrial view of the world. While before 1900 AD the worldview is proposed to have been primarily maritime. How does our ethnocentric view affect our interpretation of other (past) cultures? In the case of the initial peopling of the Americas a strong division
exists between the terrestrial focus (Ice-free corridor) and the maritime focus (Coastal Migration route).

Early thoughts about the peopling of the Americas involved the use of watercraft. It might have been a natural idea to early Europeans because Columbus ‘discovered’ America in 1492 AD by watercraft. The exploration of new areas in this era occurred mostly with the use of watercraft (South America, Australia, India etc.). Most long travels involved the use of watercraft. In 1992 Easton wrote an intriguing article titled: *Mal de Mer above Terra Incognita*. Easton claims that the lack of investigation into the coastal migration theory is due to the ideology of the Ice-free corridor and Clovis-first paradigm, and not so much due to the difficulty of conducting research. He states that archaeologists view the ocean as an “incomprehensible landscape” (p.35) and therefore are hesitant to conduct research.

The persistence of the terrestrial paradigm is probably also the result of the landscape settings of the first sites discovered (Folsom and Clovis sites) and the researchers’ interpretation and imagination of an initial migration that accompanied these finds. The initial discoveries shaped the mind of the New World archaeologists into the idea of a terrestrial migration. In the literature of the first half of the 20th century a picture is painted of the first Americans as brave big game hunters that conquered the harsh environments of the Ice age. The passage between two magnificent ice sheets captured the minds of early New World archaeologists. It almost seems like they were eager to believe this story of courage and endurance. However, up to this moment there is no evidence of a pre-Clovis human presence within the Ice-free corridor.

Since the 1960s the Coastal Migration Model has been rejected using various arguments. The foremost argument is the lack of archaeological sites to support it. As stated before, it is difficult to investigate due to the submergence of early sites. Even advocates of the theory have published mostly about the possibility of a coastal migration primarily based on palaeoenvironmental studies. It does seem that the obstacle of conducting underwater archaeology has also played a role in the lack of investigation of submerged coastal sites. As Easton (1992) also acknowledges, the training and costs for conducting underwater archaeology are substantial. Various authors have suggested the possibility of conducting underwater archaeological studies. While Easton states that archaeological evidence might be perfectly preserved due to the rapid sea level rise (Easton, 1992), Erlandson poses that coastal erosion will have destroyed all submerged site contexts (Erlandson, 2002). Either way, the Coastal Migration Model is in need of substantial archaeological fieldwork. As archaeologists in the past have lost their credibility because of their support of pre-Clovis sites that turned out to be of Holocene age (as has been the case with many re-dated sites), many now seem to employ a method of wait and see (Dillehay, 1997).

Beside the difficulty of investigating a coastal migration a favourite argument of sceptics is the lack of evidence of the use of watercraft during this period. The use of watercraft is essential to the Coastal Migration Model. The oldest evidence of the use of watercraft was found in the Netherlands: the log boat of Pesse was dated to 8,800 BP (Lanting, 2000). This leaves a time gap of 6,600 years between the first known appearance of watercraft worldwide and the Monte Verde site. However, indirect evidence of the usage of boats exists in the old world, the strongest of which is the evidence of a human presence in Australia at 30,000 years BP: there is no period in which a terrestrial peopling of Australia is possible. This is also argued by Stanford and Bradley (2012) in their new book ‘Across Atlantic Ice’ in which they propose the idea of an Atlantic crossing by Europeans of the late Palaeolithic period. The lack of evidence of early use of watercraft can partly be explained by the rising sea levels. The archaeological record of the people that lived along the coasts of the world has in many instances been inundated by the rising sea level of the Holocene, no wonder that it seems as if the use of watercraft originates just after modern coastlines were established.

**Discussion & Conclusion**

There appears to be a division between terrestrial and maritime worldviews among New World archaeologists. The Ice-free Corridor Model goes hand in hand with the Clovis-first paradigm and has a terrestrial focus. Advocates of the Coastal Migration Model promote a maritime worldview with an advanced coastal adaptation and use of watercraft in early American prehistory (c. 16,000 BP).

For a long time the terrestrial Clovis-first paradigm was the primary framework of studies on the first Americans starting with the discovery of the Folsom and Clovis sites in the late 1920s and 1930s. Since the acceptance of Monte Verde in 1997, the maritime worldview re-emerged. Before the 20th century the maritime worldview also had its impact on the theories about the initial peopling of the Americas but they were never properly formulated.

It seems that during the largest part of the 20th century a terrestrial worldview has dominated New World archaeology. While ideas of a coastal migration and the use of watercraft did emerge already during the second half of the century, maritime thoughts were not generally accepted until the acceptance of Monte Verde in 1997. Thus if we include the general problem statement of that a maritime worldview was replaced by a terrestrial one by AD 1900, we might say that this study does imply the introduction of a terrestrial focus in the beginning of the 20th century. However, we also witness
the re-emergence of a maritime focus in New World archaeology in the 21st century.

The ultimate problem with the research on the initial migration route remains that both theories rely on palaeoenvironmental studies instead of archaeological proof. The early sites along the northwest coast and Monte Verde can only tell us that an early maritime adaptation did exist, not where these people came from.

The difficult acceptance of the Monte Verde site and associated studies clearly shows the entrenched terrestrial based paradigm present in the Americas. In the last decade it seems that a coastal migration has gained more ground when even the strongest opponents could not dismiss the firm evidence of the Monte Verde site. Whereas it certainly has divided strong advocates of both paradigms, it has also provided scientific evidence that demands a more open mind.

It seems that all archaeologists want the jackpot in the search for the first Americans: everyone is looking for the oldest archaeology of the continent. The notion that the colonization of a continent is much more complicated for a single-theory explanation has not nearly been discussed enough. To me it seems that these paradigms should be combined. One does not exclude the other. I strongly believe that at the least both passages into the New World have been used. But who was first? What route did they take first? These questions remain the most debated and intriguing ones in New World archaeology. The environmental evidence points to the coastal route, not because of archaeological remains but because the age of Monte Verde demands a pre-14,600 BP migration and the ice-free corridor was simply not viable for human survival during this time.

This paper has clearly shown that an open mind does not come naturally. Paradigms can influence the objectivity of a scientist. It is important to keep in mind that absence of evidence is not evidence of absence. Just because there is no direct archaeological proof for the use of watercraft during the Palaeolithic, that doesn’t mean that humans must have regarded the ocean as a Terra Incognita like we do today. However, without firmly dated evidence the discussion remains focused on a ‘possible scenario’. This is exactly what the Coastal Migration Model and the Ice-free Corridor Model have in common. There is no evidence for either model but both are quite possible scenarios. Since the beginning of the 21st century the Coastal Migration Model seems to be generally accepted as a possibility. Besides the influence of the Monte Verde evidence the multi-disciplinary character of 21st century studies has given the search for the first Americans a new impulse. But in terms of archaeological fieldwork not much has happened concerning the Coastal Migration Model, yet.

**Notes**

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**References**


How to cope with a drowning landscape?
A research history into changing representations of Doggerland in relation to climate change

Karla de Roest

Introduction
In 2012 the National Geographic Society (NGS) published an article by Laura Spinney on the submerged land in the North Sea Basin titled ‘Searching for Doggerland’, as the sunken part of the southern North Sea is called (Coles 1998; Lübke, Schmölcke and Tauber 2011, 22 fig. 3.2; see also figs. 1 and 2). Spinney (2012, see also 2008a and b) gives an overview of the results of research into the almost mythical Doggerland. Until about 8,000 years ago this was relatively low lying dry land. Some researchers claim that this now submerged region was the heartland of the Mesolithic hunter-gatherers lying in the centre of what was to become Europe. The Mesolithic period started about 10,000 years ago, at the beginning of the Holocene. Doggerland was rich in natural resources, filled with plains, rivers, bogs and trees. When it drowned, ‘Europe’ lost c. 40% of its landmass (cf. Clark 1936; Fitch, Thomson and Gaffney 2005).

Two years previously a dramatized documentary on the same subject had been brought into production by the NGS, called ‘Stone Age Atlantis’ (2010). It showed how people lived in a kind of Mesolithic hunter-gatherers’ paradise, until climate change and the so called Storregatsunami ended it all, around 8,000 years ago. Fights broke out over use of land. People had to leave their dwellings and were left at the mercy of the climate. Direct parallels were drawn with modern climate change and the 2004 tsunami that hit Southeast Asia on December 26th.

Both the article and the documentary are aimed at a wide public. The National Geographic Society is the largest society of popular science worldwide, and thus influences the worldview of many people. What makes these popular contributions to the debate on the submerged parts of Northwest Europe interesting, is the tone in which they were set, and the fact renowned archaeologists contributed to them. In the vision of the NGS the drowning of Doggerland was a dramatic, frightening event: life in a mythical prehistoric paradise ended in a horrible way, which surprised the hunter-gatherers completely. As this image is meant for a large audience, many people will perceive the events as if they happened that way.

Research questions
First of all, we must question if this representation is correct. Did this mass of land drown so fast around 8,000 years ago that people were surprised? Was it really such a sudden life changing event? Had Doggerland really been a paradise for hunter-gatherers? And, if we answer one or more questions in a negative way, then where did this image come from? As said, professional archaeologists contributed to both the documentary and the article. Why would they be creating such an image? What is the research agenda here?

Due to the emergence of the paradigm of ‘interpretive’ archaeology, questions focus on how the Mesolithic people perceived their environment (cf. Johnson 1999, 101-102). Interpretive archaeologists are not satisfied with the idea that people merely respond to their environment, as if they were thoughtless passive actors. People are active and make choices (Maschner and Marler 2008, 109; Cummings 2013, 8; 33). Archaeologists should research why certain choices were made and what factors influenced societies in decision making. Climate change, and as a result of that, environmental change, could be one of the factors. Jim Leary published several papers from this angle, of which the most influential was published in 2009. In short, people and their reaction to their ever
changing environment should be taken in account, if one wants to understand Mesolithic ways of life.

Can we then conclude that the fact that the current interpretive paradigm focuses on (pre)historic mindsets, is the most influential factor in the research agenda nowadays? I think not. It seems to me that the representation of Doggerland is very much influenced by the modern climate debate. The reason archaeologists have a dramatic view on the events that happened in Mesolithic times, may lay in our own worldview. Spinney (2012) writes: “Many have come to see Doggerland as the key to understanding the Mesolithic in northern Europe, and the Mesolithic, in turn, as a period that holds lessons for us - living as we are through another period of climate change.” Calvin (2002, 3) wrote: “One of the most shocking scientific realizations of all time has slowly been dawning on us: the earth’s climate does great flip-flops every few thousand years, and with breathtaking speed [...] We are the improbable descendants of those who survived”.

Calvin’s introduction has the same mindset as the NGS contributions to the prehistoric climate debate. Our approach towards climate change in the past seems filled with fear of the future (Calvin 2002, 275-280). We seem to turn to the past in search for help: how will we cope? My hypothesis therefore is that the current fear of climate change plays as much a part as the influence of the research-paradigm, if not more so. Very possible it is the other way around: modern global warming is heating the debate on reactions of people in prehistoric periods on climate change. The representation of the submerged land beneath the North Sea is a direct or indirect result of the archaeologists contemporary worldview.

In order to establish that present-day climate change is influencing our research into past events, we need to look into the research history. Firstly an outline the long-term developments in the research history of Doggerland is given. This kind of study is relevant because it gives us insights into possible research biases. This in turn might help to make future archaeologists more aware of the fact that they bring their own background into their research. After this, we look at the methods used, focussing on analogy and ethnography. Then, we examine the evidence of climate change during the Mesolithic and turn to the modern climate debate. Finally we draw some conclusions on the possible research bias.

Outline of the research history
This year it is exactly one hundred years ago that the first map of the area was created (fig. 1) by Reid. The view on this land has changed much this past century. Since this is a land lost, we can project everything we want on it. We have by definition an outsiders view. Only in the last decade a ‘real’ representation of what the land looked like starts to emerge (fig. 2).

![Fig. 2 With technological aid the features of the submerged landscape are mapped (Gaffney 2012, still from www.youtube.com/watch?v-kMKUmG7tU7c)](Image 304x666 to 530x785)

The fact that the sea level is not static was not widely known until the late nineteenth century. In 1851 Wilson wrote: “From our insular position it is unquestionable that the first colonist of the British Isles must have been able to construct some kind of boat” (cited in Coles 1998, 45). But, more and more evidence emerged of a land beneath the North Sea. Artefacts and bones from land mammals that got caught up in fishing nets, proved that land must have existed (Verhart 1995). These finds were done too far from the coast to be explained in other ways.

In 1897 Evans was one of the first to conclude that there must have been some kind of landbridge between mainland Europe and the British Isles. For the first time a connection to the Ice Age was made; if sea water was trapped in glaciers, a landbridge could have existed. It was thought to have been near the Doggersbank, because that still proved to be a hazardous place for ships at low tides (Coles 1998, 47). Slowly the idea emerged that perhaps the sea level could have been less static than previously thought.

Reid was one of the first to write on sea level changes and the first to propose a drowned land, with river systems that were the extensions of the known systems in northwest Europe (fig. 1). Based on evidence of drowned trees and peat from freshwater areas found in sea, he concluded that the sea level must have been much lower once. He suggested that after the Ice Age the sea level must have slowly risen and drowned the land between the current British Isles, Denmark and the Netherlands.

The artefacts found in the North Sea were of the same kind as the ones found in Europe from the Mesolithic period. Archaeologists therefore concluded that the artefacts from the sea bottom were Mesolithic as well. Since no younger artefacts were found, they assumed this land must have drowned before the Neolithic period started around 4,000 BC. Reid suggested that the Doggersbank might have been the last island left of this landmass.

Reid still saw the drowned land as a passageway. Coles (1998, 45) writes: "Archaeologists have long been aware of this land, and some have attempted to chart its loss, but there has been relatively little consideration of what the land itself looked like. Little thought has been given
How to cope with a drowning landscape?

to this land as a place to live rather than as a land-bridge between the present-day off-shore island of Britain and the continental land-mass of Europe.” So, although little thought was given of what the landbridge looked like, archaeologists did try to reconstruct the daily life.

Mesolithic hunter-gatherers seemed to dwell near coasts. This idea was and still is widespread (Cummings 2013, 63; 103-105). This view can be seen in a school plate of 1910, used in Denmark and Norway (fig. 3). What we see is a group or tribe sitting on a beach, going about their tranquil daily life. The image is of a kind of ‘noble savage’. In the nineteenth and early twentieth century looking at past times was still influenced by antiquarian and romantic ideas (Trigger, 2006, 110-114). It seems the tranquil tree trunks that still can be seen at low tides near Wales were fuelling an image: they lead past researches to make up an image of a non-hostile Mesolithic society.

The representation of these prehistoric hunter-gatherers can possibly be linked to the optimistic idea of human evolution common in the fin-de-siècle before World War I (Trigger 2006, 211, 218). In this image the Mesolithic forefathers are ‘telling’ examples of where we came from, and serve as a reflection of the idea of the inventive human spirit. In that case we could conclude that these images of the prehistoric people as seen in fig. 3 are a reflection of the early twentieth century (western) worldview (cf. Trigger 2006, 211; 248-260).

Only after Clark published The Mesolithic Settlement of Northern Europe in 1936, the Doggerarea became acknowledged as inhabited, be it for a short while, with hunter-gatherer tribes. In 1931 a harpoon point was caught in a fishnet (Verhart 1995, 291). Clark concluded on the basis of finds like this, comparing them to findings from the Continent and the British Isles, that the land in between must have been the central part. It seemed to have been the heartland of the so-called Maglemose culture. The Maglemosian people had a preference for living near wetlands. The drowning plain was therefore extremely suitable for them (cf. Coles 1998, 47-48). In his later work, Clark (1975) addressed the issue of the effects of losing land to the sea by the Mesolithic people. Even after Clarke’s publication, many archaeologists still had difficulties in acknowledging the fact that neither the coastline nor the borders of Mesolithic regions were the same as those of modern day Europe (Coles 1998, 48-50).

The final realization by archaeologists that Doggerland indeed was a landmass came in the seventies, although the focus on habitation of Doggerland stayed rare for another twenty years (cf. Housley et al. 1997; Coles 1998). Louwe Kooijmans (1971), a trained geologist who turned archaeologist, was to take a ‘fresh look’ at the North Sea Plain and concluded there had been a habitable land in Mesolithic times. Coles (1998, 50) suspects the fact that Louwe Kooijmans has a background in geology gave him

Fig. 3 Danish school plate from 1910 (http://www.digitaltmuseum.no).
the outsiders view on archaeology needed to really appreciate the findings of the sunken land. Whereas archaeologists study artefacts first and landscape second, geologists start with the environment and are probably more used to changing landscapes. Although coastlines are changing, it is still hard to perceive (Rowland 2008, 386).

Archaeologists Rossignol and Wandsnider (1992, vii). wrote: “The last 20 years we have witnessed a proliferation of new approaches in archaeological data recovery, analysis, and theory building that incorporate both new forms of information and new methods for investigating them.” They go on to list the new techniques available. It is this kind of research that dominated the study of the submerged North Sea Plain from the late seventies until quite recently. These were the first attempts to study Doggerland systematically, from several angles. Since 1995 the submerged parts of Northwest Europe have been studied systematically, from a broad perspective.

One of the focuses was on landscape formation processes and how this influences ways of living (David and Thomas 2008, 27-34; Heilen, Schiffer and Reid 2008, 601-608). Coles’ (1998, 45) emphasis that looking at the land as inhabited instead of a landbridge, changed the perspective of research. Archaeologists were no longer focussing on lost contacts between the Continent and the British Isles after losing the bridge. Instead they started to look at lost ways of living: “[...] we may alter [...] our perceptions of the North Sea Plain, its significance to contemporary populations, and the implications of the inundation”. This new way of looking at the submerged land is the reason Coles named the area Doggerland. She wanted to emphasize the fact Doggerland had been a landscape in which people had lived.

As stated above, the research slowly changed from a processual (“what?”) to an interpretive (“who and why?”) paradigm (cf. Johnson 1999, 98-115; Trigger 2006, 386-480). Figures 4 and 5 are concerned with the inconvenience of flooding, and are depicted in an interpretive style. Fig. 4 comes from the Spinney (2010) article, whereas fig 5. was published in a conference bundle of 1995, with topics on Mesolithic life. Rising sea levels or tidal flooding was inconvenient for the inhabitants (Schmitt 1995, 163). Was it? Or can we conclude by hindsight that was one of the first moments the modern climate debate influenced the view on Mesolithic life? In any case, the late nineties of the twentieth century were also the time the modern climate debate on global warming started. We will return to this question later.

In the previous decade Gaffney (cf. 2010; 2011) and others started mapping the submerged rivers and hills of Doggerland. Now they are at the brink of reconstructing the land in 3D and using computer models to predict where we must look for the archaeological evidence that will show us where people most likely lived. For their models they use evidence from ‘land based’ Mesolithic sites. Next to that they look at ethnographic examples of hunter-gatherer groups living nowadays. These methods however provide no blueprint, and cannot be used without caution. We will look at the problems of using such parallels in the next paragraph.

Fig. 4 Depiction of Doggerland from 2012. The text below is as follows: “8000 B.P. After retreating inland from a storm, a group of hunter-gatherers in Doggerland return to find their camp flooded. Eventually there would be no dry land to come back to.” (drawing by: Maleev. National Geographic December 2012)
How to cope with a drowning landscape?

Analogy and ethnography

To reconstruct ways of living, archaeologists look at parallels or analogies. There are two main options. The first is to look at modern examples of indigenous hunter-gatherers (cf. Cummings 2013, 4-9). Ethnological studies have played an important role, since the nineteenth century archaeologists compared “newly encountered people” with prehistoric Europeans, as if they were a living relict of that era (Cummings 2013, 5; see also Lane 2008, 237-238). We might ask if people’s reactions to climate change nowadays is the same as in prehistory. Because we can never be certain that because people do something one way in the present, they necessarily did the same in the past, cultures are to be studied within their space and time context. Ethnographic parallels should be used as inspiration. They can “offer us inspiration for thinking differently about landscapes” (Cummings 2013, 10; 110).

The second method is looking at Mesolithic sites that are not submerged. The thought is simple: we assume the Doggerland people lived the same type of life as their counterparts in similar parts of Europe. As we compare the findings, we can get an idea of what daily life would have looked like in Mesolithic Doggerland. Analogy of dry land sites became very popular in the early twenty-first century (Fischer 2004). Here I will give one example from Denmark. It is thought that these sites were coastal sites. The research shows that the people living there must have witnessed the sea level rising.

The evidence from a Mesolithic site near the coast of Denmark shows a change in food pattern, based on archaeozoological data. It was a slowly drowning environment, with higher places and islands that could have been linked by low tides and canoeing. The diet changed over time: “Apparently, the exploitation of the new fish species did not present a major problem to the Late Mesolithic population” (Lübke, Schmöldcke and Tauber 2011, 35). There is no gap in the phases of habitation. This proofs that when the environment became increasingly wet, the people were able to find new resources.

We can conclude that the Mesolithic people living at this site coped with a changing environment. There are no signs of a sudden move or fighting over land. Something else is striking as well: people actively used water as a source for food, but also as a way of transport. They visited places that could hardly be reached by foot. To do so, one must have a good reason. This could have been an economical one, or a more spiritual reason. Since the current research question seem to focus more and more on ‘ritual meanings’, and explaining peoples behaviours beyond pure economics, we’ll look into these next.

**Persistent places: ritual sites matter more**

The rise of the sea level in Mesolithic times was slow enough to remember the places people used to go. In archaeology these remembered places are known as persistent places. Even when groups had to move further inland, people would still visit significant places, and held on to them. Landscape plays an important role in the memory of oral cultures. It serves as the medium for passing on knowledge (Tilley 2008, 274-275; Van Dyke 2008, 277-278; Cummings 2013, 110). Cummings (2013, 96): “This means the landscape is also inextricably linked to history, as generations of hunter-gatherers have been born, lived and died in the landscape. […] Modern hunter-gatherer groups have demonstrated excellent knowledge of what happened in that landscape, not just in their own lifetimes but also in the past”.

Features of the natural world can be used as focal points for geographical references as well as for some kind of ritual. Cummings (2013, 75): “People’s belief systems have an enormous impact on the way in which they do things.” For instance, in places where there are no rocks standing out in the landscape, modern hunter-gatherers tend to turn to trees as important markers in the landscape (Cummings 2013, 81; 110-111). Maybe the drowned forests we now see on the coasts served this purpose before - and after - drowning. Camps and hunting grounds could easily be moved. Places that had another meaning - ritual sites or burial places perhaps - would have been more persistent (Van Dyke 2008, 279-280; Leary 2011, 77-78; Cummings 2013, 45; 75; 85; 96-103). We do not know for what reasons people deposited e.g. axes into places, but they did and kept on doing it at the same place even after they were only reachable by canoe.

It is thought that these deposition places were wet places to begin with. As in Drenthe for example, where we see that people placed objects in bogs. This deposition pattern shows two things. Firstly, that people were not afraid to get their feet wet, even if they didn't have to and...
therefore were used to being around water. Secondly, and of more importance, when the landscape changed people were not anxious but, kept on doing the things they were used to. The image of poor, lost, home swept inhabitants of Doggerland therefore seems wrong. To see if it is, we have to look at the evidence of climate change. Are the changes in climate change comparable at all? What do the models tell us about the sea level rise 8,000 years ago? After all, it could be that the dramatic picture, as painted by the National Geographic Society, is correct.

Evidence of climate change in Mesolithic times

Fact is that since the end of the last Ice Age (ca. 10,000 years ago) the lowest parts of Doggerland became wetter, more like marches and bogs (cf. Ward, Larcombe and Lillie, 2006). Eventually, the whole land would be flooded. The end of Doggerland was accelerated by the overflowing of the enormous Lake Agassiz in North America, about 8,200 years ago. Due to global warming the level of melt water rose and at some point Lake Agassiz emptied in the sea, known as the "8.2 cal ka event" in the literature (cf. Cohen and Hijma 2008; Calvin 2002, 259; Rowland 2008, 388-389). This caused the temperature to drop worldwide as a result of this sudden mass of freshwater coming into the salt oceans, which changed the currents (Calvin 2002, 211-235; 257-260). The coasts of Doggerland became much colder, with heavy winds blowing freely over it, because it was a low lying plain. People may have retreated to the higher places, near the nowadays coastlines of Europe and further land inwards of the European Continent or the current British Isles.

Some researchers see the Storrega-tsunami before the Norse coast (ca. 6,400 BC) as the final event to flood Doggerland (Cohen and Hijma 2008; Weninger et al. 2008). However, it is not exactly known if there still was anything of Doggerland left to be flooded and if there were people still living here, since it was merely the end phase of a two thousand year process of drowning. Besides, it is not clear how devastating this tsunami has been anyway.

If we leave these speculative final endings aside and look at the long term drowning, we see that the sea level rose by 1,25 cm per year in the early Holocene period (around 10,000-9,000 years ago). This means just over 30 cm per generation (Leary 2009, 227). Later this doubled in some regions: the speed in the period 8,500-8,000 cal BP was up to 2m /100 years (Benjamin et al. 2011, xii-xiii). This is still not anything like the normal tides show in some regions: the speed in the period 8,500-8,000 cal BP was up to 2m /100 years (Benjamin et al. 2011, xii-xiii).

Reactions to climate change in modern times: vulnerability and adaptation

The debate on the ability to cope with climate change can be summarized in two terms: vulnerability and adaptation (Anonymous, 2011; Cameron 2012; Devine-Wright 2013). Vulnerability was the buzzing word in the early days of the debate on modern climate change. Indigenous people were thought to have problems in coping with the effects of global warming. Studies revealed for instance that the Inuit weather forecasters were losing their high status in societies, because their predictions started failing (Weatherhead, Gearheard and Barry 2010). Aborigines of Arnhemland cannot predict anymore when certain flowers will bloom (Petheram et al. 2010).

These reports were (unintentionally?) used to make western researchers feel uneasy over economic progress and the effects of global warming, mostly by popular media. The indigenous people were treated as helpless people, left to the mercy of the rising sea level. It is in this light we must see the two contributions of the National Geographic Society to the representation of Doggerland. Earlier I questioned the role of renowned researchers to this popular project. In fact, it is twofold. Basically, the NGS is funding a lot of research, so attributing is a logical step. To make your research matter and receive a lot of interest, it is wise to ‘team up’. Besides this rather banal argument is the feeling of guilt of western researchers, even if they are not aware of it: we [the western world] may have caused this global warming and the sea level rise that follows. The ‘poor indigenous people’ pay the
largest price. The story of Doggerland serves as a lesson (Spinney 2012; see also Calvin 2002).

The debate on modern climate change, however, took a next step in the first decade of the twenty-first century. As the first atolls are currently drowning, researchers can see how indigenous people are coping with climate change (Farbotko and Lazrus, 2012; Lauer et al. 2012). The drowning of their birthplaces has not lead to outright panic or anxiety. The people in the Pacific changed their ways, and adapted to the new situation. Instead of looking at vulnerability, the researchers now start to look at adaptation. This is a process happening worldwide; the Inuit in the Arctic having to change their ways as well (cf. Cameron 2012; Marino 2012). Although the people are reluctant to leave - which reminds us of the persistent places - they are very capable of making sensible choices and adjusting their lives to new situations (Devine-Wright 2013). Based on this evidence, we must conclude the representation of the unfortunate people of Doggerland is highly overrated.

Conclusions

Based on the evidence from sea level rising curves, analogies with other Mesolithic sites and modern ethnographic parallels, we can conclude that people were not surprised by the drowning of the landmass in the North Sea Basin. The dramatic end of Doggerland through flooding of the Lake Agassiz and the Storegga-tsunami, if we assume there were still people living in the region, is not a pars pro toto for the whole period of habitation. Groups living there knew how to cope with ‘the inconvenience’ of sea level rising. To stress once again the argument made by Leary (2009), environmental change was internally part of the Mesolithic worldview. Perhaps even the verb ‘to cope with’ does not apply, for people did not know a different way of daily life.

We do not know if this land was really the paradise it seemed to be (Fitch, Thomson and Gaffney, 2005; Gaffney, Thomson and Fitch 2007). Maybe it was, but perhaps the fact that the land is forever lost (unless we get another ice age) contributes to the idea of a mythological paradise. The name of the documentary mentioned above says as much (see also Fischer 2004, Spinney 2008a). The point made that losing this land filled with resources lead to warfare, is a modernist view as well. Although we can suspect some fighting over good places, this does not only occur when the rest of the land is drowning, the reasons for it can be manifold (Cummings 2013, 63).

Therefore, we can conclude that the current representation of Doggerland is based on our western fear of climate change and the possible devastating results of sea level rise (and at the same time problems of drought) for our modern overpopulated planet (Calvin 2002, 6). The events of 8,000 years ago are used as a lesson, or maybe a blueprint of reactions on these global environmental changes. The fear of an uncertain future is projected on the prehistory. Even to the extent that modern ethnographic examples -that show people can cope - are not taken into account. The real question seems not to be how the Mesolithic people did cope, but if we will be able to.

Notes

1 Email: k.de.roest@student.rug.nl
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2 Recent studies question if ‘Doggerland’ is a good name, since the sediments of the Doggersbank seem to be younger than 8.000 BP (c.f. Leary 2011). They prefer the name ‘Northsealand’, because it indicates where the submerged landmass is situated. For the sake of clarity I will use the name Doggerland in this paper.

3 In some publications the term ‘hunter-gatherer-fisher’ is used, to stress the importance of fishing. Although fishing might have been very important for the inhabitants of Doggerland, I maintain the traditional term. The term ‘gathering’ can refer to plants, roots, nuts and berries as well as insects (cf. Lübke, Schmölcke and Tauber; Cummings 2013, 19; 22-24).

4 In fact, the documentary is apparently popular enough to have its own Facebook-page, reachable via http://natgeotv.com/uk/stone-age-atlantis.

5 E.g. Simon Fitch, Vincent Gaffney and Benjamin Geary, University of Birmingham, U.K.

6 See also Calvin (2002, 71-72) who turns the argument around and suggest people may in fact thrive at moments of environmental change, because they have to be inventive.

References


Gaffney, V., 2010. On Mapping Lost Worlds. Available at: www.youtube.com/watch?v=kMKUmg7tU7c

Gaffney, V., 2011. Explaining research project Doggerland on film. Available at: www.youtube.com/watch?v=HEQRKL-uQzc


Thermal alteration of red Helgoland flint

Linda Kiers

Red Helgoland flint is instantly recognizable as an exotic type of flint, because of its attractive red colour. It is also very rare: up to this day, 77 finds have been reported in The Netherlands (Beuker 2010, 35). Red Helgoland flint was imported to make larger tools such as polished axes (Neolithic), daggers (Late Neolithic & Bronze Age), and sickles (Late Neolithic, Bronze Age & Iron Age). Since the flint had to be transported overseas from the remote island Helgoland, it has been assumed the red flint was highly valued in prehistoric times (Beuker 1986).

Among the northern flint types, red Helgoland flint is the only type that can be sourced to a specific location (Beuker 1986). Prehistoric trade routes are modelled on the basis of the distribution of artefacts made from this flint type (Drenth 2008; Beuker 1986).

Two different worldviews can be discerned in these trade routes, namely a maritime worldview and a terrestrial worldview. Beuker is a proponent of a terrestrial worldview as he proposes two slightly different versions of a land route. The routes cross the western part of Lower Saxony and reach the Netherlands via the Northern part of Drenthe or, alternatively, via the middle or southern parts of Drenthe (Beuker 1986). Drenth argues that a route via the North Sea and the Wadden Sea is equally or more plausible (fig.1). Further transport, in his version, could have taken place over small rivers by boat (Drenth 2008).

However, there are a number of problems with the distribution of red Helgoland artefacts. Firstly, the number of artefacts found is too small to support either theory. Secondly, it is recognized that the present data set is biased, as it reflects the limited area in which collections were inspected for the material (Beuker 2010, 34–35). Thirdly, the trade routes are based solely on the red Helgoland flint, even though another type of flint was more commonly imported from the island; the brown/grey Plattenflint from Helgoland is less distinctive, but well represented in the archaeological record.

To test the terrestrial route, Drenth examined two collections in the region Dithmarschen for the presence of red Helgoland flint. The coastal region of Dithmarschen is part of both versions of the land route. He inspected daggers and axes from a museum collection and an assemblage of settlement flint. In these collections no artefacts of red Helgoland flint were found (Drenth 2008). Nevertheless, the option of a land route is not refuted in a convincing manner as Drenth did not look for the Helgoland Plattenflint and the scope of his research is limited.

To be able to properly test the maritime and terrestrial versions of the trade route it is necessary to increase the (geographical) scope of the research (so more red Helgoland flints can be studied), to take into account the artefacts made from Helgoland Plattenflint, and to remove other sources of bias. For example, provenance studies focus only on unburnt flint. This focus in the research could have influenced the distribution of Helgoland flint and the results of Drenth’s research as well.

Although the red flint is highly recognizable, it is uncertain whether it is equally recognizable in a burnt state. Jaap Beuker expects that red Helgoland flints with slight fire damage are generally still recognizable. Nevertheless, at present, there are no known prehistoric red Helgoland flint artefacts that have been damaged by fire (e-mail J. Beuker 12–4–2012).

The types of tools that were most frequently made from red Helgoland flint (axes and daggers) fairly often ended up in a burnt state. Throughout the Neolithic period, tools were frequently destroyed by fire. In settlement contexts, axes are more frequently burned than other tools, therefore, it is likely that they were burned intentionally. Burnt axes are sometimes found outside the entrance of megalithic monuments. In addition, there is evidence of mass destruction of axes by fire in southern Sweden (Larsson 2000). At the Dutch site Odoorn (province of Drenthe), dozens of burnt axe fragments were collected (Beuker 2010: 189). As part of an offering, a dagger in a burnt state was excavated (Larsson 2000).

If tools from the red Helgoland flint type are more likely to end up in a burnt state, is it possible that the red Helgoland flint type is actually underrecognized in the archaeological record as a result of this? Experimental research and artefact studies will be employed to address these questions. The effects of experiments with heating on red Helgoland flint and a different flint type will be described. After
these experiments it will be possible to conclude if red Helgoland flint preserves distinguishing characteristics after burning. With these results in mind, several prehistoric burnt axe and dagger fragments will be studied. Of course it is only possible to conclude that Helgoland flint is under-recognized if the following two conditions are true. The red Helgoland flint type is identifiable after fire damage, and the flint type is present in the sample of prehistoric implements. It is hoped that this paper will provide more confidence in the quality of the dataset of Red Helgoland flint. As such, it may serve to delimit the potential for interpretations on the transport route of Red Helgoland flint to the northern Netherlands: across the sea or over land.

**Thermal alteration**

In this section some thermal alterations are introduced that were observed during experimental research. The thermal alterations observed are often related to maximum temperatures. These temperatures are mentioned here, as in the current experimental program no information is available on the maximum temperatures related to the thermal alterations. A change in colour, for example reddening, is a common form of thermal alteration. When heated, flint reddens due to the oxidation of iron (Purdy 194). The reddening is related to the amount of iron in the flint. The presence of orange and yellowish brown tints in unheated flint points to high amounts of iron (Purdy & Brooks 1971). In experiments the temperature at which colour change took place was measured between 240 and 260 °C (Purdy & Brooks 1971). At this temperature, a decrease in translucency and darkening of the flint are also frequently reported (Ahler 1983; Clemente–Conte 1997). Variability in the mineral content of flint can influence thermal alteration in complex manners. Specifically, the presence of carbon can slow down the oxidation of iron compounds (Shepard 1971 in Luedtke 1992: 101–102). As oxidation of iron is a cause of colour change, the presence of carbon can influence the rate of colour change.

At a slightly higher temperature, around 300°C, the optical reflectivity of fracture surfaces increases (Griffiths et al. 1987). This phenomenon is referred to as thermal gloss (Price et al. 1982).

The development of small cracks that propagate through the flint is referred to as crazing. According to Price et al. the small cracks developed at temperatures around 350°C (Price et al. 1982). However, the rate of heating and cooling down (thermal stress) is the most important factor in crazing.

Thermal extraction describes the detachment of fragments due to thermal stress. The fragments resemble flakes, but they do not show a bulb of percussion (Purdy & Brooks 1971). Because of the form of the detached fragments – round in outline and semi-globular in shape
– they are also known as pot lid fractures (Clemente-Conте 1997). Experimental research shows that pot lid fractures frequently develop at around 350°C (Price et al. 1982). Scales are pot lids that have not yet detached from the surface (Clemente-Conте 1997).

During heating experiments with an open fire, black spots sometimes developed on the upward facing sides of the flints. Occasionally, these black spots microscopically resemble deposits of an unknown substance adhering to the surface, but they are probably not organic. They are currently interpreted as a thermal alteration of the flint surface (Clemente-Conте 1997).

The temperature that is needed to colour the flint white or grey, also known as dehydration, is 600°C or higher (Larsson 2000). Sometimes white coloured flints present with a porcelain appearance. The change in colour is attributed to the loss of inter-crystalline water (Price et al. 1982). Possibly, in some cases the altered appearance reflects a structural change, as Luëdtké suggests that at high temperatures flint can change to cristobalite (Luëdtké 1992: 106).

**Experimental program**

The thermal alterations of red Helgoland flint will be studied by heating experimental flakes. It is expected that red Helgoland flint will show some of the aforementioned thermal alterations after burning, but the effects cannot be predicted. In addition to these unknown thermal effects, it is possible that other flint types develop a red colour like red Helgoland flint. During the experiments, light brown Senonian flakes are burned in a similar manner, in order to be able to compare the results. After the experiments it will be clear if heated Senonian flint is identifiable from red Helgoland flint. Secondly, the question if red Helgoland flint is identifiable after fire damage can be answered.

Archaeology student Jeremy Portier produced the red Helgoland flakes by means of hard percussion. The flakes were struck from a nodule with black patina and a white porous zone under the cortex. The Senonian flakes were collected from the courtyard of the Groningen Institute of Archaeology, where debris from previous knapping experiments can be collected. The flakes from the courtyard belong either to the Scandinavian Senonian flint or Falster flint type.

**Senonian flint from Scandinavia**

Scandinavian Senonian flint is fine grained, highly translucent grey or black flint. Round or oval inclusions are present in the flint matrix, although fossils are rare (Högberg & Olausson 2007, 90). The cortex is thin (up to 3mm) and chalky. The flint is brittle and can easily be knapped (Högberg & Olausson 2007, 91).

Falster flint is a Senonian flint type with similar flaking properties and a similar appearance as Scandinavian Senonian flint. Falster flint can be distinguished from the Scandinavian Senonian flint when light stripes are present (Högberg & Olausson 2007, 98-99).

Unlike the red Helgoland flint type which is not found outside Helgoland, Scandinavian Senonian and Falster flints are common in secondary deposits, for example in moraines and beaches (Högberg & Olausson 2007, 89). The local circumstances in the secondary contexts can alter the visible properties of the flint (colour and cortex).

**Red Helgoland flint**

Flint of the red Helgoland flint type is fine grained and the colour varies between pink and different shades of red (Beuker 2010: 30). Distinguishing properties of red Helgoland flint are its red colour, brown to orange inclusions, and its low translucency. The red colour is believed to be caused by the presence of ferric oxide (Fe₂O₃) (Krüger 1980). In contrast to the translucency of Senonian flint, the Helgoland flint is opaque. According to Krüger, the low translucency is caused by small amounts of bitumen (Krüger 1980).

Orange dots, circles, or waving lines are sometimes visible in the red matrix. Most frequently, these inclusions/impurities can be found under the cortex. Additionally, white, brown, orange, or pink course grained inclusions are often present. The flint does not contain bryozoa (Beuker 2010: 30).

The cortex of red Helgoland flint is thin. Some of the red Helgoland nodules, found on the beaches of the island, show a black coloured layer of flint under the cortex. This colour is most often interpreted as black patina (Beuker 2010: 30).

Black patina develops on the surface or under the cortex of flints that have remained in waters that are devoid of oxygen for a long period of time. The patina consists of iron and sulphur compounds (Johansen et al. 2009). These compounds infiltrate through the porous cortex of the nodules, while the cortex itself remains unaltered by the patina (Stoel 1991). An alternative interpretation was put forward by Krüger. He ascribes the black colour to the presence of carbonated iron (Krüger 1980). Remnants of the black patina are rarely present on artefacts of the red Helgoland flint type (Beuker 1986).

According to an experimental knapper, the red Helgoland flint is less splittery in comparison to ‘standard glassy Northern Flint’ (http://flintsource.net/flint/D_helgoland.html). The flint type referred to is probably Senonian flint. On the scale of knappability (from brittle to tough) employed by Högberg and Olausson (Högberg & Olausson 2007, 76), the Helgoland flint would score as somewhat tougher than Senonian flint.

**Experiment 1**

An experimental flake of red Helgoland flint and one flake of Senonian flint were heated in an electric oven.
The flakes were embedded in a layer of sand in a cooking pan. The oven was slowly heated during one hour to a temperature of 200° C. This temperature was maintained for one hour. After this, the flints were left in the oven to slowly cool down. After this treatment both flints showed no visible alteration.

Experiment 2
The flakes used in the second experiment were heated under an open fire. The flakes were covered with a thin layer of sand. The fire was kept burning for the course of one hour. The flakes were recovered from the sand after two hours of cooling down.

The flakes show crazing and a change of colour. The red colour of the Helgoland flake after the burning was slightly more bluish and pale. The inclusions of this Helgoland flake (orange circular lines, dark inclusions, and light dots) are still visible. The orange circular line framing a small dark inclusion turned red (fig. 2). The black patina was not noticeably affected by the experiment.

The flake of Senonian flint turned darker. In contrast, an area on the dorsal face, bordering on the cortex, turned a light shade of grey. Before the experiment, some dark inclusions were observed under the cortex of the Senonian flake. After the second experiment, these inclusions were hardly visible; therefore, a decrease in translucency is known to have taken place.

Experiment 3
The aim of this experiment was to inflict serious fire damage to the experimental flakes, so as to make sure that the colour would change to white or grey. In order to reach a higher temperature than in the previous experiment three flakes of both flint types were burned in an open fire without a sand covering. Two flakes of each flint type were laid on the sand where the fire was made. These flakes were placed with their dorsal sides facing upwards. Additionally, one flake of each flint type was placed upright in the sand, with about half of the length of the flake embedded in the sand. These flakes were positioned in the sand with the proximal sides facing upwards.

The fire was kept burning for one hour. Weather conditions differed in comparison to the second experiment for it was significantly windier and it rained. It is possible these conditions resulted in a different maximum temperature. The burnt flakes were left to cool down for two hours before retrieving them from the ashes.

The Helgoland flakes and the Senonian flakes show a slight change in colour. The Senonian flakes have become darker in colour and the colour of the Helgoland flakes turned duller. The result is comparable to the colour change in the second experiment. However, in the Helgoland flakes the orange waving lines did not turn red as was the case in the second experiment. Only one of the Senonian flakes, and none of the Helgoland flakes, showed internal cracks after the experiment.

One of the Senonian flakes developed a waxy sheen with small pits on its cortex. The cortex also showed a colour change from grey to brown. The reflectivity of the fractured surfaces of both flint types remained the same.

After the experiment, ash adhered to the surface of the two flakes that were partly buried, but only on the surfaces that were exposed to the fire. These surfaces appeared to have acquired a black and shiny appearance (fig. 3). It proved impossible to remove the black substance completely (by using water and a brush). The cleaning procedure was most successful on the dorsal face of the Helgoland flake. There, it can be observed that the gloss is lasting. The parts of the flint that were buried in the sand have not been visibly altered.

Experiment 4
After experiment no. 3 it was concluded that the setup of the previous experiments, carried out with an open wood fire, would not result in temperatures sufficiently...
Thermal alteration of red Helgoland flint

high enough to obtain a colour change to grey or white. The temperature needed to induce the colour change to white is ca. 600°C (Larsson 2000). It was then decided to burn several flints in a smiths’ fire. The temperature of the fire in the smithery is approximately 1000°C (personal communication L. Masselink 2012). At the smithery of Zweeloo (Drenthe), Mr. L. Masselink was willing to help with the experiment.

Two flakes that were previously slightly burned in experiment no. 3 were used in this experiment. Firstly, the smith fired a Senonian flake for ca. 30 seconds. The flint was clamped with a pair of tongs. The flake exploded as a result of thermal stress. Most of the flake was lost in the fire although a shatter and some small pot lids could be retrieved from the fire.

The colour of the burnt shatter presented with a darker shade of brown in comparison to experiment no. 3. Parts of this fragment turned black. Thermal gloss is visible after the heating. The tiny white pot lids show a porcelain-like appearance.

The fire was slightly tempered to prevent thermal cracking. The Helgoland flake was heated while lying in a shepherd’s shovel. Consequently, more fragments could be retrieved after the flint was burned. A few very small fragments, some quite small shatters, and three large fragments were recovered.

The three large fragments and two smaller shatters could be refitted. Overall, during this experiment, the fragments of Helgoland flake turned darker in comparison to the second and third experiments. An isolated spot of thermal gloss was present on the ventral face of one of the fragments. A circular line has turned red on the lateral fracture of one of the larger fragments. It is more difficult to distinguish the circular line where it surfaces on the ventral face, for the line has a brownish red colour and visibility is hindered by the increased reflectivity of the surface. Unfortunately, the proximal part of the flake, which contained light inclusions, was not retrieved after the experiment. Therefore, it is not possible to comment on the effect of serious fire damage on the light inclusions of red Helgoland flint.

One of the two small shatters shows the desired change of colour, for this fragment has turned pinkish white. Interestingly, a red circular line can be spotted on this piece of flint (fig. 6). This red line is interpreted as the remnant of an orange circular line. From this observation, it can be concluded that red Helgoland flint is recognizable even in dehydrated state. However, it is impossible
to exclude the possibility that the inclusion would have become invisible after a slightly longer heating time.

Some interesting changes have taken place in the white blue areas under the cortex (fig. 4 and 5). The light blue has for the most part been blurred with brownish tones. Additionally, this brown colouring affected parts of the white area. The part where the light blue has been preserved is bordered by a line or a crack visible in the photo of the flake taken before it was burned. In the white area, the very small, black, circular lines have altered. After the burning, a small, black dot is visible in a small circle whereas, it was not visible before the burning. Furthermore, some of these specks of black patina are no longer visible.

In short, this experiment leads to the conclusion that characteristic inclusions are preserved in dehydrated red Helgoland flint. However, it is not known whether the dehydration had been completed, as the flint was not white but pinkish white. It is therefore worthwhile to consider the possible effect of carbon in the black patina. As mentioned earlier, Krüger explains the black colour as a consequence of the presence of carbonated iron. He infers the presence of carbonated iron from measurements of carbon (Krüger 1980). Carbon is known to halt the oxidation of other minerals, and, in particular that of iron (Shepard 1971 in Luedtke 1992: 101-102). Thus, carbon influences the colour change of iron when flint is heated. Based on our current knowledge of heat alterations and red Helgoland flint, it is not possible to decide whether the black patina has influenced the outcome of the present experiments in a significant manner.

Artefact studies and discussion

From the experiments it is concluded that red Helgoland flint with slight fire damage is still identifiable. Tentatively it is concluded that even dehydrated flint preserves characteristic features in the form of red circles or waving lines. This positive outcome offers the possibility to test if there are tools of red Helgoland flint that are as yet unrecognized because of fire damage.

To test this, a sample of one dagger fragment (GIA) and sixteen axe fragments (NAD) with fire damage were studied. It is possible that in some cases multiple fragments of the same axe are present in this sample. The results of the artefact studies are presented in table 1. The examination focused on the presence of inclusions or cortex fragments.

This sample consisting of seventeen prehistoric tool fragments does not show the red (formerly orange) circles that are characteristic of the red Helgoland flint type. Nevertheless, the flints frequently retained some characteristics in the form of inclusions and cortex. Unfortunately, in most cases, none of them are characteristic for a particular type of (Scandinavian) flint. Two exceptions are formed by an axe and a scraper made from an axe fragment. The axe fragment is likely of the grey band matte Danian flint type (Högberg & Olausson 2007, 108-111). The scraper shows inclusions that are characteristic of the Helgoland Plattenflint (Beuker 2010, 37).

To answer the question if red Helgoland flint is under-recognized, this research project is dependent on a positive outcome in the experimental stage and in the stage of artefact studies. The outcome of the first stage was positive, as the experimentally burned flints preserved characteristic inclusions and impurities. The outcome of the second stage, however, was negative. Perhaps the sample was too small to find the flint type. Thus, it is not possible to prove that red Helgoland flints are under-recognised. As a result, an influence of the focus on unburnt flint in provenance studies, on the distribution of red Helgoland artefacts cannot be demonstrated.

It is of interest to note that with the exemption of the scraper made from an axe fragment and a flake struck from an axe, nearly all axe fragments show severe fire damage (dehydration). From this information one can infer that in most cases the fire damage was not accidental. The suggestion made by Larsson that the destruction process of axes by fire was designed to obtain a white colour (Larsson 2000) might be valid.

In that light the present experiments might be falling short, as no completely white fragments of the red Helgoland flint type were produced. It is not known if the red Helgoland flint type would have turned completely white, had the heating continued for some time longer. As mentioned earlier, it is also not understood if the black patina has significantly influenced the burning process. It is therefore desirable that similar experiments (including Helgoland flakes without black patina) are conducted in controlled conditions.

Conclusion

The exotic red Helgoland flint was most often employed to make daggers and axes. While many archaeological
Thermal alteration of red Helgoland flint finds make clear that daggers and axes were subjected to intentional destruction by fire, no burnt fragments of red Helgoland flint are known. Possibly, the absence of burnt red Helgoland flint is related to the focus in provenance studies on flint without fire damage. It is hypothesized that this focus influenced the distribution of red Helgoland flint; perhaps red Helgoland flints with fire damage are not recognized. Subsequently, the absence of burnt Helgoland flint in the database may have influenced the spatial distribution pattern and even hypotheses concerning terrestrial or maritime trade routes. It is the aim of this paper to investigate if red Helgoland flint is identifiable after fire damage by means of experiments and to compare the outcome with a sample of axe and dagger fragments.

Table 1. Axe and dagger fragments with fire damage (* = not original size).

<table>
<thead>
<tr>
<th>Tool type</th>
<th>Collection</th>
<th>Inventory number/site</th>
<th>Maximum length (cm)</th>
<th>Maximum width (cm)</th>
<th>Maximum thickness (cm)</th>
<th>Inclusions</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dagger</td>
<td>GIA</td>
<td>Mander</td>
<td>*3,1</td>
<td>*2,0</td>
<td>*0,7</td>
<td>Small grey inclusions</td>
<td>Literature: Stapert 1982, Cortex remnant</td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>D2006-XII.62b, Valthe</td>
<td>*4,0</td>
<td>*5,5</td>
<td>*2,8</td>
<td>Round inclusions and thick waving lines</td>
<td>Large fragment of a square sectioned axe</td>
</tr>
<tr>
<td>Flake from axe</td>
<td>NAD</td>
<td>Oudemolen</td>
<td>1,2</td>
<td>1,3</td>
<td>0,2</td>
<td>Slightly burned flake struck from axe</td>
<td></td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>Oudemolen</td>
<td>*3,0</td>
<td>*2,5</td>
<td>*1,0</td>
<td>Possibly grey band matte Danian flint</td>
<td></td>
</tr>
<tr>
<td>Dive</td>
<td>NAD</td>
<td>1987/X2</td>
<td>*1,8</td>
<td>*2,0</td>
<td>*1,1</td>
<td>Grey inclusions</td>
<td></td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>D2009X.106, Oudemolen</td>
<td>2,4</td>
<td>2,3</td>
<td>0,6</td>
<td>Small light speckles blurred around the edges, tiny grey lines in a group</td>
<td>Slight fire damage, white patina, possibly brown/grey Helgoland flint type</td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>D2001.101</td>
<td>*1,1</td>
<td>*1,7</td>
<td>*0,4</td>
<td>Possibly white inclusions</td>
<td>White patina</td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>2007-V.28</td>
<td>*3,6</td>
<td>*2,9</td>
<td>*2,0</td>
<td>Grey stripes and patches</td>
<td>Fragment of the cutting edge</td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>2007-III.2, Spier</td>
<td>*2,1</td>
<td>*2,0</td>
<td>*1,1</td>
<td>Greyish yellow waving inclusion</td>
<td></td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>19691X</td>
<td>*2,4</td>
<td>*2,7</td>
<td>*2,3</td>
<td>Dark round inclusion</td>
<td></td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>1987/II</td>
<td>*1,2</td>
<td>*2,6</td>
<td>*1,3</td>
<td>Grey spots and bryozoa</td>
<td>Fragment of the cutting edge</td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>1987/II</td>
<td>*1,8</td>
<td>*1,3</td>
<td>*0,4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>1987/II</td>
<td>*1,9</td>
<td>*1,6</td>
<td>*1,5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>1987/II</td>
<td>*2,5</td>
<td>*2,2</td>
<td>*1,4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>1987/II</td>
<td>*3,7</td>
<td>*3,6</td>
<td>*1,8</td>
<td>Large grey patches with dark edge</td>
<td></td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>1987/II</td>
<td>*3,7</td>
<td>*1,8</td>
<td>*0,7</td>
<td>White stripes in darker background</td>
<td></td>
</tr>
<tr>
<td>Axe</td>
<td>NAD</td>
<td>1987/II</td>
<td>*3,3</td>
<td>*2,2</td>
<td>*1,4</td>
<td>Large dark and light grey inclusion, fossil?</td>
<td></td>
</tr>
</tbody>
</table>
flint. This suggests that even dehydrated red Helgoland flint is identifiable. For multiple reasons it is advised the experiments should be repeated. Firstly, the black patina of the experimental flakes could have influenced the outcome of the burning process. Secondly, it is not known if complete dehydration was achieved in the experiments. Thirdly, in the experiments no completely white red Helgoland flint was produced, while it is argued by Larsson (2000) that a transformation to a white colour was an objective in the intentional burning of axes.

A sample group consisting of a burnt fragment of a dagger and sixteen fragments of burnt axes was studied. None of these artefacts showed the red circles that were observed in the experiments. More than a few, however, show inclusions that can possibly be used to establish a flint type. In the sample the characteristic inclusions of Helgoland Plattenflint were recognized in a scraper made from an axe fragment. It is not possible to answer the question if red Helgoland flint is under-recognized as this depended on the presence of the flint type in the sample. This paper has demonstrated that further experiments and a broader comparative dataset may provide new insights in the identification of burnt red Helgoland flint. Such an up-scaled study may provide essential information for understanding the spatial distribution patterns in terms of transport routes.

Acknowledgements
I would like to thank J. Beuker, J. Portier, J.H.M. Peeters (GIA), L. Masselink and E. Taayke (NAD) for practical help and information. H. de Kruyk commented on the paper and ms. S. Blomsma (GIA) made the microscopic photographs, for which I am grateful.

Notes
1. Email: lindakiers@yahoo.co.uk
   Warneerweg 15, 7815 HA Emmen, The Netherlands.
2. New research by J. Beuker, J. Timmer and H. de Kruyk indicates that the Helgoland Plattenflint can also be distinguished from similar northern flint types by a.o. its trace element composition (pers. comm. H. de Kruyk, 2012).
3. The studied axe fragments are all burnt axe fragments present in the first two hangars of the NAD (Nuis) on 16-4- 2012.

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Stapert, D., 1982. A Middle Palaeolithic artefact scatter, and a few younger finds, from near Mander NW of Ootmarsum (province of Overijssel, the Netherlands). _Palaeohistoria_ 24, 1-33.
“Left to itself, the physical landscape “has no form” […] a landscape has no meaningful shape and significance until it is accorded place and identity in the social and cognitive worlds of human experience”

M.W. Helms 1988, 20

Introduction
This article focuses on the dichotomy between a mari-time and terrestrial worldview. The general research problem of this volume is that modern people have a primarily terrestrial worldview while until c. 1900 a maritime worldview was predominant. Because in archaeology we study societies that lived much earlier than 1900, this worldview dichotomy will always be of influence in our interpretations of the past. In fact, in all studies on the TRB-period (c. 3400-2800 cal. BC) - the period on which this study focuses - researchers had to deal with this problem. The following survey indicates that the terrestrial worldview indeed seems to characterize the research on TRB-Drenthe, the case study area of this article. In this article however, I have tried to look for the possible maritime worldview of the TRB people on the Drenthe plateau.

Contextual information
The people from the TRB culture (Dutch: Trechterbekercultuur, in this article abbreviated to TRB) lived from c. 4400 until 2750 BC in a major part of Northern Europe. Their occupation area reached from the Netherlands to Poland and from Southern Scandinavia to Northern Germany. It was one of the first societies in this area in which agriculture played a major role, but hunting and gathering were also still important.
subsistence strategies. There were several regional groups with their own cultural features. I will focus on a research area in Drenthe, the so called “Drenthe Plateau” (figure 1). This is a part of the living area of the TRB Westgroup, from which it is assumed that they occupied the plateau from c. 3400 until 2800 BC. The Drenthe plateau is a boulder clay plateau formed during the before last glacial period, the Saalian glaciation. The deep incised stream valleys which are still visible in Drenthe, originate from the last glacial period, the Weichselian glaciation. They developed through erosion of the boulder clay. Because in the Weichselian glaciation the ice cap did not reach the Netherlands, the rivers and streams could incise their courses deeper and further inland (R. Bakker 2003, 51). Because of their deep incision it is assumed that today the stream valleys are mostly on the same location as they were in prehistory (Dresscher 2011, 45).

**The existing terrestrial view**

As mentioned above, archaeological landscape research on the TRB-period is mainly focused on terrestrial elements. This is not difficult to explain: the megalithic graves were the first elements in TRB-Drenthe that were discovered and they are located on high sandy soils on the Drenthe plateau. Until today, the research focus has not changed much. Although there are some exceptions which I will mention later, most research is related to megalithic graves, settlements, possible roads and the spatial connection between these elements. Other much debated issues are agriculture and deposition activity in bogs. However, in most of these archaeological studies the role of the inland streams is minimal or absent. Van Ginkel and Hogestijn (1997, 39) even assumed that TRB people “did not like wetness” and J.A. Bakker (1982, 88) postulated that the TRB people restricted themselves to the “sandy islands”: their settlements were located on high and dry areas on the cover sand which blew over the Drenthe plateau in the Weichselian glaciation. As mentioned before, their megalithic graves were also located on high areas, near to erosion edges of boulder clay zones.

A typical terrestrial-focused study was done by J.A. Bakker (1982). Bakker tried to define territories of TRB-groups in Drenthe on the spatial distribution of megalithic graves, settlements and flat graves. We can see that waterways are not even marked in his map, as if they did not play a role in the TRB-landscape (figure 2).

Several researchers tried to reconstruct roads from the TRB period in Drenthe (a.o. J.A. Bakker 1982; Jager 1985; Van Ginkel et al. 1999). They assume that megalithic monuments were constructed alongside roads (figure 3). The waterways are marked on the map but it seems that the researchers did not take them into account as possible infrastructure. I think this could be the result of a terrestrial way of looking at prehistory. I agree with Wentink (2006, 39), who thinks it is more likely that prehistoric routes would follow the natural relief. In this respect it is possible that waterways also played a role as a road or a route for transport or communication.

Finally, perhaps the most illustrating example of the terrestrial view we have of TRB-Drenthe is the

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Fig. 2 Possible territories based on the distribution of settlements, megalithic monuments and flat graves in TRB-Drenthe. Waterways are not marked. (Van Ginkel et al.1999, pp. 84, after Bakker 1982).
reconstruction painting made by the illustrator Isings in 1959 (figure 4). We see people living on dry sandy soils and a megalithic grave nearby. The "earthy colours" show what Isings' perception was of TRB-Drenthe. In this respect it is important to notice that Isings' view was mainly based on stories from archaeologists (Van Ginkel et al. 1999, 29). If one considers this reconstruction painting outdated, we can see our terrestrial worldview remained the same: there is a new reconstruction painting by Nijman (2010), also based on the stories from archaeologists (figure 5). As an outcome of new archaeological insights we see new elements like a granary and a cart with cows. But it is clear that the main idea about the TRB-landscape remained "high and dry".

Is this terrestrial view we have on the TRB-landscape an outcome of our modern perception and way of thinking? Or is it right to postulate that the TRB people really had a terrestrial worldview and were mainly focused on terrestrial elements in their way of subsistence? And what was the role of the inland streams mentioned above? Is it possible to look at the TRB-society in Drenthe from a new, more "maritime-focused" point of view? In this article I have tried to focus on these questions.

Research strategies and approach

At the moment it is not possible to answer the questions mentioned above with an analysis of archaeological finds from TRB-Drenthe, originating from the inland streams and the stream valleys. This is impossible because until now, not much research has taken place in these areas. The only finds we have are some 'loose finds' which cannot tell us very much about the worldview of the people. This is probably one of the reasons why the streams mostly have no major role in research on the TRB-period. So if the topic is rather elusive, is this a reason to postulate that the streams had no important role in the society?

I think it is not, but to gain some insights into the possible role of the streams we have to look beyond the border of TRB-Drenthe in time and space. We have to keep in mind that in this case we are dealing with data from different landscape-zones and/or different periods of time, but I think this does not necessarily have to restrain us from using some interesting data. There are some sources which can give us useful information about the perception of inland streams by societies in the Mesolithic period, the Swifterbant period and in TRB-Scandinavia. I have chosen to use these societies as case studies to gather some insights into the possible role of inland streams in TRB-Drenthe because they can all be related to TRB-Drenthe in different ways:

Although the Mesolithic people lived a few thousand years earlier than the TRB people, their subsistence strategy of hunting and gathering still remained important in the TRB-period. Furthermore, when the Mesolithic people lived on the Drenthe plateau, the stream valley landscape was already shaped and so I think it is interesting to look at their perception of the streams. The Swifterbant culture is the link in time between the Mesolithic and TRB culture. It is postulated by several researchers that there are some cultural connections between these cultures (a.o. Raemaekers 1999; R. Bakker 2003). Although there are some differences between the TRB Northgroup (Southern Scandinavia) and the TRB Westgroup (Western Germany and Drenthe), there certainly have been contacts reflected in the occurrence of flint axes of northern origin in TRB-Drenthe.

Fig. 3 A reconstruction of a road, based on the distribution of megalithic monuments in TRB-Drenthe. (Wentink 2006, pp. 40; fig. 3.5 after Van Ginkel et al. 1999, pp. 112).
Fig. 4  Reconstruction painting of TRB-Drenthe, made by J.H. Isings in 1959 (Van Ginkel et al. 1999, pp. 28)

Fig. 5  Reconstruction painting of TRB-Drenthe, made by J. Nijman in 2010 (Photograph of a poster of the painting by T. Sibma, 2011)
I have combined the data to look for perspectives that link the different sources on the basis of new research on TRB-Drenthe. The studies of R. Bakker (2003), Spek (2004), Wentink (2006) and Dresscher (2011) give us some new insights in the spatial distribution of archaeological remains from TRB-Drenthe while taking the stream valleys - to different degrees - into account.

**Insights from the Mesolithic period on the Drenthe plateau**

The Mesolithic period (c. 8800-4900 BC) is known as a period in which waterways were of great importance. People moved from place to place in small groups and hunting and gathering was the mode of subsistence. Because streams and stream valleys could offer (drinking) water, fish, other water animals and water plants, these places were very attractive for the Mesolithic hunter-gatherers. So they were on the Drenthe plateau, particularly because the food sources on the dry sandy soils were not as dense as in the stream valleys. But the streams had more to offer; there are indications that they served as routes for travel, transport and exchange (a.o. Niekus and Rensink 2008).

From the Drenthe plateau there are numerous examples of Mesolithic camps near inland streams. The sandy flanks of the streams seem to be the most attractive places to settle in especially the late Mesolithic period. Niekus and Rensink (2008, 139) postulate that this site location is related to the development of the dense forest further inland in the Atlantic period (7000-3800 BC). In this forest the food sources would not have been as dense and varied as in the stream valleys. This is an interesting point, because the TRB-society on the Drenthe plateau had to deal with this dense forest as well. I will come back to this later.

There are some interesting, well-preserved finds and find spots from the Mesolithic period in stream valleys. The most impressive example is the dugout canoe from Pesse (c.7700 BC); it is the oldest known boat in the world (Louwe Kooijmans 2008, 26). Other interesting finds are some antler-axes, a barbed point and other animal remains (Niekus en Rensink 2008, 139). The most complete source of information from the Mesolithic period is the site Jardinga in the valley of the river Tjonger (Prummel et al. 2002). This late Mesolithic site is located at the western part of the Drenthe plateau. Bones with cut marks have been found, belonging to aurochs, red deer and beavers. Three pointed poles made out of alderwood were found in the stream bed, possibly belonging to a fish weir.

Beyond the Drenthe plateau there are many examples of Mesolithic sites near river- or stream valleys. As a result it is not surprising that modern reconstruction paintings of the “Mesolithic landscape” differ very much from the paintings of TRB-Drenthe. An example of such a reconstructed “Mesolithic landscape” is shown in figure 6. This landscape is seen as a maritime-focused landscape and the chosen colours are brighter, with green and blue shades.

**Insights from the Swifterbant period**

In the period between 4900 and 3400 BC the people from the Swifterbant culture lived in the northern and western part of the Netherlands. In the northern Netherlands they were succeeded by the TRB-society around 3400 BC.

Especially the wetland sites Swifterbant and Schokland (both in the province of Flevoland) yielded a lot of information about the subsistence base of the Swifterbant culture. At these wetland sites however, people lived on creek banks, river dunes or boulder clay outcrops in a riverine landscape. It is assumed that this area was attractive because of its rich and varied ecological landscape with many and different food sources (a.o. Gehasse 1995; R. Bakker 2003). Therefore it is not surprising that hunting and gathering were important activities for the Swifterbant people. At the same time, there are indications that agriculture (livestock keeping and cereal cultivation) also played a small-scale role (Cappers and Raemaekers 2008).

We know that the creeks were of great importance in here; The excavations at Swifterbant yielded several paddles (transport), while at Emmeloord fish weirs were found (subsistence). The faunal spectra show that water animals (like fish, beaver and water birds) were hunted (subsistence; R. Bakker 2003).

The Swifterbant sites are very interesting for this study because they cover the period in which a more sedentary way of life developed and agriculture became increasingly important. This so-called Neolithic way of life seems to have been adapted fully in the TRB-period, but in my opinion there is a tendency to undervalue the role of hunting and gathering in TRB-Drenthe, perhaps due to the lack of preserved bone material from this period. Although we have a lot of information about the Swifterbant people in Flevoland, there are indications that they also lived on the Drenthe plateau (a.o. R. Bakker 2003). But what do we know about the activities of the people of the Swifterbant culture in this area?

From the Drenthe plateau the archaeological finds of the Swifterbant culture are scarce. Several researchers assumed that it is possible that agriculture played a more important role on the sandy soils, because wild resources (plant and animal) were less dense and diverse compared to the wetlands (a.o. Gehasse 1995). This notion may be questioned on two grounds. First, there are no botanical macroremains (cereal grains) that indicate that cereal cultivation took place in the Swifterbant period at the Drenthe plateau (R. Bakker 2003). Second, this notion might be an outcome of our terrestrial way of looking...
at prehistory. It seems that when we are thinking of the high sandy soils, we subsequently think that people were forced to exploit only these dry places, especially in the case of a society that has the ability to practice agriculture. Perhaps we tend to forget the important role of water streams in terms of subsistence.

In this context, I would like to mention an interesting find from the Swifterbant period on the Drenthe plateau. A site in the stream valley of the Voorste Diep in Bronneger yielded two red deer-antlers and a vessel of Swifterbant pottery (Kroezenga et al. 1991). According to Kroezenga et al. (1991), the animals did not die of natural causes and the finds can be seen as one deposition assemblage. Possibly, it was deliberately placed in this stream valley by the Swifterbant people. The find belongs to an early phase of the Swifterbant culture (c. 4850-4550 cal BC), and shows that the Swifterbant people possibly gave special meaning to water streams, also on the Drenthe plateau.

**Insights from TRB-Scandinavia**

From several studies we know that in southern Scandinavia water played an important role in the TRB-society (a.o. Davidsen 1978; Tilley 1996). Of course this has to do with the natural landscape: there are many more rivers and the sea has more influence than in land-locked TRB-Drenthe. Nevertheless, the people of the TRB Northgroup chose to live in this landscape. Despite the fact that they practiced agriculture, they also clearly exploited the watery environment.

By looking at the distribution pattern of settlements throughout the middle Neolithic TRB in Southern Scandinavia (contemporary to TRB-Drenthe), we see that a series of sites was located at a short distance from the Neolithic shoreline or rivers (Davidsen 1978; Tilley 1996). According to Tilley (1996, 167; 198) fishing and foraging were important subsistence activities at the end of the Middle Neolithic-A TRB sequence in Southern Sweden. In this case we are dealing with a society that was familiar with agriculture.

A more specific example is the TRB occupation of Bohuslän, an archipelago in Sweden (Tilley 196, 193). Here the spatial relation between megalithic tombs and the open sea seems to have been very important. Only small pieces of arable soil were available in the immediate vicinity of the tombs and the location of the tombs in relation to agricultural potential seems to have been of little importance. Although in this case we are not dealing with inland streams but with open sea, the example shows that the exploitation of water sources can be of great importance, also in societies that had the ability to practice agriculture.

In Skåne all megalithic graves are located either very close to the coast or along river courses (Tilley 1996, 198). It even seems to be the case that the orientation of the grave chambers has a relationship with the direction of the river (north-south or east-west). According to Tilley this suggests that a differentiation between a north-south and west-east axis defined by river channels in the landscape was of central symbolic significance.

These examples show that the water in Southern Scandinavia was not only of great importance for hunting and fishing, but possibly also had a symbolic significance. Moreover, Tilley (1996, 269) argues that we must
not undervalue the role of seas and rivers as communication routes. Also according to Davidsen (1978, 15) the association of settlements and water seems to reflect the need for trade and commerce along coasts and waterways.

**New insights from TRB-Drenthe**

From the studies of R. Bakker (2003) and Spek (2004) we know that the Drenthe plateau was densely forested in the Atlantic period. Nevertheless, there were some open areas where the TRB people located their settlements and used the fields for agricultural practices. Also, the forests in the stream valleys were less dense.

In this respect it is interesting that Spek (2004, 127) assumes that the megalithic graves as well as the settlements in the Drentse Aa-region were in many cases located near streams. In addition, a spatial analysis from Dresscher (2011) shows us that in this region more TRB-sites were located close to inland streams than she expected on the basis of an even distribution of sites in the landscape (based on zoning the landscape in 100 m wide buffers). There are two zones with more sites than expected: one zone with find spots located within a distance of 300 m from the streams, and another zone with find spots located between 2000 and 3000 m from the streams. Dresscher (2011, 55) postulates that the find spots close to the streams could have been located in a landscape type that would not be suitable for agriculture and would have had another specific function. To say something more about this, a comparison of find material of the two zones should be made.

Spek (2004, 27) argues that a location in an open space on a high flank of a stream valley strengthened the function of a megalithic grave as a territorial marker. People passing the stream would see the monument "at the top of the slope" at a glance. So in Spek's opinion it would have been possible to see the monuments from the location of the streams. This is an interesting hypothesis that also strengthens the idea that the streams would possibly have had a specific role in the landscape. Spek assumed that the streams functioned as natural borders of the territories. This is possible, but I think it should not necessarily be the case and this could have been just one of their roles. Spek's assumption could again be an outcome of a modern and terrestrial way of looking at prehistory. Instead of borders, the streams could also have functioned as the central elements in the landscape with a specific function or meaning.

The study of Wentink (2006) gives us more insight into the possible specific meaning of streams in TRB-Drenthe. Although his study is focused on the meaning of axe-depositions, in uplands as well as in bogs and streams, Wentink noticed that the role of streams could have been important in different ways and he even argues that we should not focus solely on the peat as being of prime importance for depositional practices (Wentink 2006, 67). Many axe depositions in TRB-Drenthe turned out to have been placed at the transition between upland and wetland along running water. Wentink (2006, 69) argues that these places possibly were experienced by the TRB people as being of liminal nature. On the one hand the stream valleys could have been perceived as natural boundaries between social groups as well as boundaries between people and supernatural entities (Wentink 2006, 69 quoting Fontijn 2002, 265). On the other hand, Wentink argues that because the higher grounds were densely forested, the stream valleys would have played an important role in transport. In Wentink's opinion it is likely that the streams were not solely visited for depositional practices. They could have formed important networks through the landscape, which were used for contact, transport and exchange (Wentink 2006, 69).

**Combining the data**

When we combine the insights from the Mesolithic period and the Swifterbant culture with the existing ideas about TRB-Drenthe, we can discern some important patterns. In the Mesolithic period as well as on the wetland sites of the Swifterbant culture, waterways clearly played a prominent role. Waterways seem to have been particularly important in 1) societies that were strongly oriented on hunting and gathering and 2) societies that lived in areas with a diverse ecological environment with many food sources (in most cases these would have been wetland areas). At the same time, it seems that when we think of the high sandy soils of TRB-Drenthe, we subsequently think that people were forced to exploit only these dry places, especially in the case of a society that had the ability to practice agriculture. So it seems to be the combination of two factors that created our terrestrial view on TRB-Drenthe: the high and dry natural environment, and their 'Neolithic capacity' to practice agriculture.

But the example of TRB-Scandinavia shows us that also in Neolithic TRB-societies waterways could play an important role for hunting and gathering as well as for transport and contact. There are also clues that the waterways had a specific symbolic meaning. In addition, the studies of Spek (2004), Wentink (2006) and Dresscher (2011) delivered us some new insights into the possible meaning of the water streams in TRB-Drenthe. Like in Scandinavia, it seems that the inland streams in TRB-Drenthe possibly had a more central role in the physical and cognitive landscape than was assumed for a long time. The location of find spots near streams, the location of megalithic monuments at high places which were possibly visible from the streams and the deposition location of axes underline this assumption.

**Conclusion: towards a new hypothesis**

With this information I would like to suggest a new, more maritime focused hypothesis on the TRB-landscape on
the Drenthe plateau. I think the “terrestrial worldview” of researchers could be the cause of the development of a picture of a TRB-Drenthe in which waterways would not have been of great importance. By interpreting the natural environment from our modern perspective, TRB-Drenthe is visualized as a dry sandy island which is particularly suitable for practicing agriculture. While I do not want to postulate that the TRB people in Drenthe were as focused on the river streams as their predecessors (they had adapted their lifestyles to a life on a sandy and dry environment including cultivation), I think we should be cautious to underestimate the relevance of river streams in TRB-Drenthe. It appears that this is happened in the research on TRB-Drenthe for many years. By focusing again and again on the dry sandy soils, the picture of a terrestrial environment was engraved in our discipline. Returning to the assumption of J.A. Bakker (1982, 88), who stated that the TRB culture would have restricted itself to the “sandy islands”, it would probably be better to state that “we restricted the TRB culture to the sandy islands.” In my opinion, TRB-Drenthe is probably not a terrestrial island, neither in a cultural, nor in a natural respect.

In short I would like to argue that it would be interesting to focus more to the inland streams in new research on TRB-Drenthe. The studies of Spek (2004), Wentink (2006) and Dresscher (2011) would be good starting points in this respect. New research could be carried out in different ways. As Dresscher (2011, 55) argued it might be interesting to compare the archaeological finds from the zone near the streams to that found further away. A different composition of materials would give us some insights into specific functions or meanings of the different landscape zones.

I think it could also be interesting to carry out research from a broader perspective. By focusing on TRB-Drenthe, the picture will remain narrow-minded. Making comparisons with other prehistoric societies could shed more light on the possible perception of inland streams. The use of ethnographic information could also be helpful in this respect. From modern hunter-gatherer-farmer societies we know that inland streams are important for subsistence, so it might be helpful to look at the perception of inland streams by societies that do not have a terrestrial worldview.

Finally I think that it would be useful to carry out more physical geographic research to gain more insight into the exact location of the streams in the TRB-period and into the extent of peat grow in the specific period. Perhaps it would be useful to undertake fieldwork to this end.

Notes
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The best witness to the Mediterranean's age-old past is the sea itself. This has to be said and said again; and the sea has to be seen and seen again. Simply looking at the Mediterranean cannot of course explain everything about a complicated past created by human agents, with varying doses of calculation, caprice and misadventure. But this is a sea that patiently recreates for us scenes from the past, breathing new life into them, locating them under a sky and in a landscape that we can see with our own eyes, a landscape and sky like those of long ago. A moment's concentration or daydreaming, and that past comes back to life.

Braudel 2001: 3

**Introduction**

For ages people have looked and lived at the sea. The sea could be a challenge, an opportunity, a threat, a barrier, a promise. The sea has as many faces as it has surfaces. In the heydays of the civil war in Northern Ireland the poet Dominic Behan wrote his famous poem about the relationship between the English and the Irish:

*The sea, oh the sea is the gradh geal mo croide,*  
*Long may it stay between England and me;*  
*It's a sure guarantee that some hour we'll be free,*  
*Thank God we're surrounded by water!*

The land separates, the sea connects. These are the two key environmental ingredients, especially in Mediterranean history: the topographical fragmentation and the connectivity provided by the sea (Malkin 2011: 12). The Mediterranean Sea's impact on human societies has had multiple and unpredictable consequences - and in return, the sea was socially constructed in different ways. The sea facilitated the movement of ideas and ideologies, of people, new technology and objects. It is in prehistory that we can see how autonomous regions wrestle and push for position and interact as the moment tells them, a pattern that is typical of the Mediterranean over its *longue durée,* consistent with the cultural and political plurality of the Mediterranean regions today (Knapp and Blake 2005: 12). But the specific character of this fragmented region is not given as much by the *longue durée* of Mediterranean landscapes but rather by people's perceptions of the constraints and the opportunities offered by the land and by the sea, and their decisions about how to react to them (Barker 2005: 46). The sea can be seen as playing the role of a bridge from a "mariners perspective", or the sea can from a "mainland viewpoint" suggest a sort of liquid barricade, tricky to cross (Beringhieri 2011: 117); it could be a barrier or a "corridor for movement" (Robb and Farr 2005: 26, see Phoca-Cosmetatou 2011: 18).

Increasingly the scholarly research with regard to island archaeology and seascapes is rightly carried out from a social point of view. A more integral archaeological approach is being used whereas the physical boundary of an island and the sea are not necessarily identical with the cultural and social boundary. Islands are ideas, inhabited metaphors with natural symbols of boundedness (Robb 2001: 177, 192). The concept of insularity must be revisited in the context of broader island-mainland or inter-island relations (see Broodbank 2000; Knapp and Blake 2005: 9). Insularity is not an absolute unchangeable state of being, but it is historically contingent and culturally constructed, like island identities themselves. We must attempt to understand islanders from their own perspective, which incorporates both the land and the sea: how did they experience the landscape and the seascape?

Maritime interaction involves communication between distant peoples, and social resources must be evaluated as closely as natural or mineral resources if we wish to gain a better understanding of prehistoric exchange (Knapp and Blake 2005: p. 10). Mediterranean archaeologists increasingly are concerned to examine the interplay between insularity, identity, human settlement, maritime interaction, agency, and the social construct of the seascape.

The Mediterranean Sea measures 2,500,000 square km, the world's largest inland sea. Actually, it is not just a sea but can be seen as a landscape and seascape with islandscapes (see e.g. Broodbank 2000: 21; also Phoca-Cosmetatou 2011: 18), and also as a climate, an identity, a way of life, and much more. For instance, as shaped by the biogeographical distribution of characteristic plant regimes, like the olive tree (Knapp and Blake 2005: 6).

In fact, neither in the Stone Age nor in the Bronze Age there existed "the" Mediterranean sea. "Mediterranean" and "Mediterranism" suggest an unjustified unity that does not reflect the diversity and the complexity of the Mediterranean world. One could look at this entity in two
principal ways in which Mediterranean unity is characterized: by reference either to ease communications (the interactionist approach) or to common physical features (the ecologizing approach). Within the interactionist approach one can speak about the seascape: a social (interactionist) view at the sea. The Mediterranean sea is created only after the Bronze Age, or, even more clearly, in Archaic times (Gosden 2011: 174); it is only by the beginning of the first millennium BC that the term "Great Sea" is widely diffused from the Levant, and so reached the Greeks (Horden and Purcell 2000: 10). Mutatis mutandis the same can be said about the Aegean Sea.

In this essay I will concentrate on the Aegean Sea which I define as a collection of microregions like the Cyclades and Crete. The Aegean Sea stretches out about 615 km long and 300 km wide, with a total area of some 215,000 square km. Once there was the initial occupation of the islands in the Aegean Sea, within the space of the Aegean circle: the coastal mainland of Greece in the west and north, the coastal areas of the Asia Minor in the east, and the island of Crete in the south. This occupation started in the early days of the Neolithic or even before that time, as we will see below. What was the perspective of those inhabitants of the microregions in and around the Aegean on "their" surrounding sea, and how did that perspective change over time, in changing seascapes?

How did those Aegeans cope with the Aegean seascape, how and why did they learn to use the sea to their advantage? Hereby I want to introduce a new term: seascape learning (next to landscape learning; coined by Meltzer 2003, Rockman 2003: see Phoca-Cosmetatou 2011: 20), which I will describe as: "The social response to situations concerning the sea where there is both a lack of knowledge on distance and a lack of knowledge on time (space and time)". The seascape is thus a social construct.

Seascape learning is a gradual process. One has to learn the possibilities and dangers of crossing the sea, and every phase adds new skills: nautical abilities, orientation, new technology, social cooperation and social skills as the use and knowledge of the sea are changing. It is "standing on the shoulders of giants": the crossing of a new part of the sea is done by importing and using existing knowledge of maritime travel and seascape. And people adapt new strategies to survive: economic and social innovations. Some rocky islets were above all beacons in the sea or stepping stones in maritime routes; they were important as a learning effect for Mesolithic and Neolithic navigation as well as the ritual and cultural understanding of the sea -- the "learning of the seascape".

The human perspectives on seascapes must then be analysed in relation to other spheres of activity in society: settlement, types and distributions of artefacts, networks, ship building, and so on, that is, in a contextual perspective. We have to read the data, interpret what data can tell us to get a fuller understanding of society, connectivity and changing seascapes. In this contextual approach we are depending on data as indicators.

The Stone Age: the foraging sea

Aegeans have been learning the seascape by accumulating the experience of applying the same patterns for the choice of sites, advancing little inland, and also practicing short-distance coastal navigation and cabotage trading (long-distance trading done via short hops and changing agents), while keeping in touch by means of lines of long-distance seafaring: lines that were growing longer due to further settlement. This Mediterranean movement in space, following a consistent pattern of learning seascapes and landscapes from ship to shore, not only created a 'Aegean' network but also filled in the pattern for further settlement (Malkin 2011: 44).

Mesolithic

Several parts of the Mediterranean had acted as refuges for human populations in the most extreme conditions of the Pleistocene (20,000 BP). Substantive seafaring activity in the Eastern Mediterranean and the Aegean is first dated in the Younger Dryas (12.700-11.500 BP), which formed the relatively short and the last part of the Weichselian glaciation. It then takes off from the Preboreal, the early Holocene onwards. Early traces of Mesolithic visits to the islands, in the form of isolated, sporadic and short lived sites but indicative of seafaring and knowledge of the islands, include the site of Akrotiri-Aetokremnos on Cyprus (but outside the scope of the Aegean), the cave of Cyclops on Yioura (an uninhabited Greek island in the Northern Sporades chain), and the open-air site of Maroulos on Kythnos (just south of Kea). The presence of Melian obsidian at Franchthi cave on mainland Greece an on the island of Lemnos indicates that also the isle of Melos was visited (Phoca-Cosmetatou 2011: 22-23).

The Cyclades were well known and navigation skills were quite developed since early Holocene, based on mutual visibility. In those days mutual visibility was the core of the navigational conception of the Mediterranean (Horden and Purcell 2000: 126). The Aegean microregions interacted along those lines of sight across the water. In fact, no zones exist within the Aegean circle where sailors found themselves out of sight of land in fine and clear weather (see Fig. 1).

What could be the reason for this seafaring activity, this first learning of the seascape?

The sea was seen by those Mesolithic people as an integrated part of their hunter-gatherers landscape. This has been denoted as "foraging seascapes" highlighting the role of the sea connecting people across
Changing Seascapes

the Aegean from the beginning of the Holocene. Apart from the fragments of Melian obsidian found in an early Holocene context in the Franchthi cave, this cave and other coastal cave sites fish yielded bones of deepwater species that only can have been fished using offshore watercraft, rather than with lines and nets cast from shore. There is also evidence of longer and more purposeful sea crossings (Barker 2005: 49). In the seventh millennium BC there are indications that the people of the Franchthi cave hunted tuna, practicing cooperative hunts using watercrafts and nets. Although still a minor part of the diet according to isotope studies, this increasing focus on marine foods in the later Mesolithic and early Neolithic may partly reflect the rising sea levels of the mid Holocene "climate optimum", bringing the food nearer to coastal caves (Barker 2005: 50-51).

It is thus likely that these Mesolithic people made use of seagoing craft capable of coping with Mediterranean currents and winds. There is a lack of direct evidence for sea transport during the Mesolithic (and the Neolithic) in terms of wooden structures or underwater wrecked bulks. The use of ethnographic analogies as a means to explaining prehistoric seafaring has provided better understanding and evaluation of the context, meaning and circulations of people and goods across the sea in prehistoric times. Through a few ethnographic examples Berlinghieri for instance demonstrates how even very simple shapes of floating items can provide a means for maritime transport within sight of land for people and goods. The relatively late appearance of wooden boats in the Aegean sea-transport records (the Bronze Age) can therefore be seen as an extension of a pre-existing system of mobility across the sea (Berlinghieri 2011: 117-118; see also Broodbank 2004: 102-106 for a reed-boat or papyrella voyage from Lavrion, Attica to Melos; see also figure 2).

Neolithic

Longer and often more permanent settlement on the Aegean islands dates to the Neolithic period and maritime activity becomes more widespread. This was part of the dissemination of Neolithic usages along the so-called Southern maritime route. The term "Neolithic" has in my opinion to be understood in the economical and social sense and not that much as a chronological boundary. The term is based, thus, on the principle of food production. In that way people could get a higher degree of control and manipulation of the environment. Moreover, according to Phoca-Cosmetatou a Neolithic economy is one consisting of rather small groups of people which travelled with or without their social network and without the support of any political unit (2011: 23). It is the time of various phases of island colonization: visitation, utilisation, exploration, settlement and establishment. 23 Aegean islands were colonized during the fifth millennium BC with a further ten during the next millennium.

This seemingly physical network took shape according to available seafaring technologies like rowing, paddling, sailing, which are however socially shaped. As Malinowski already said in 1922: "A canoe is an item of material culture, and as such it can be described, photographed and even bodily transported into a museum. But -- and this is a truth too often overlooked -- the
The ethnographic reality of the canoe would not be brought much nearer to a student at home, even by placing a perfect specimen right before him.” (Malinowski 1961: 105). One can imagine the investment needed (sheer energy in paddling or rowing) to sustain the Neolithic networks in the Aegean. This changed with the introduction of the sail technology in the Bronze Age, an invention which changed also the seascape for the Aegean. The foraging seascape, which provided humankind with subsistence, storage and tools for elementary life, transferred into a bridge to a more luxury existence. The seascape became a playground for the wealthy and the mighty.

The Bronze Age: the sea as bridge to social stratification

Sailing came in use in the Aegean during the Final Neolithic and the Early Bronze Age. Network connection across space and time bears some costs, whether that be in terms of capital, labour, or time investment. When sailing became customary those investments were less physically strenuous for individual sailors, but there is much more capital investment required as well as specialist boat building skills. Given the existence of costs, and the general tendency to offset costs with some benefit (assuming minimal optimization in human actions), what benefits might accrue from contacts that span physical distance? (Knappett 2011: 125). These are clear social contexts, like the need for exogamy to keep small island communities viable, and the prestige and power gained from knowledge of the distant and the exotic (Broodbank 2000, pp. 81–96).

At the end of the Middle Bronze Age in the Aegean the different microregions or clusters of activity (Crete, the Cyclades, the Greek mainland and the Dodecanese/coastal Asia Minor), which during Neolithic and Early Bronze Age have long been interacting among themselves and may be considered separate cultural identities, start to interact much more intensively than before (Knappett 2011: 130). The seascape apparently becomes more familiar, more open, less strenuous and less frightening. But why should there be long-distance interactions between those regions? It appears that there is not only an exchange of goods and materials, but also some level of acculturation: the process which Broodbank called "Minoanisation".

For discussing connectivity in the prehistoric Aegean network theory is increasingly used. Network methods are applied to explore research topics as the transmission of ideas, the movement of people and objects, interregional interaction and maritime connectivity. Relationships between entities like people, objects and ideas are important herein. Network applications study these entities in interaction that collectively form a complex structure.
According to Carl Knappett et al. (2008, p. 1009), the behaviour of a large collection of entities like island communities is best addressed stochastically (at random) rather than deterministically, with techniques derived from statistical physics and complex network analysis for tackling social questions. Knappett’s network model (“imperfect optimisation”: Knappett et al. 2008, p. 1012), focused on the Aegean Bronze Age, is an interesting one. Based on Broodbank’s proximal point analysis (PPA) his model is more sophisticated, altering the weighing of the costs and benefits of investing in local resources as opposed to investing in external connections: “trade”. The Aegean is patchy in terms of resources: there is an uneven distribution of metal resources (e.g., Crete has no silver, copper, tin). A social potential, or cost/benefit function, is assigned to each possible configuration of site and link variables in the Aegean. The parameters in this configuration are the costs of supporting local population, the benefits of exploiting local resources and the costs and benefits of maintaining links across the sea. By altering the constants tied with these parameters (constants denoting the relative importance of each parameter) we can see the kinds of processes underlying different network shapes. For example, in a wide range of changing constants, the link between the site of Akrotiri on Thera and a site on the north coast of Crete is important in keeping the Aegean network together; and it does not matter greater whether that site is Knossos or Malia (Knappett 2008: 1015–1016). It is the social potential across the sea that matters.

Until the late Middle Bronze Age Aegean there is interaction between regional clusters without much cultural transmission. That is, until the end of the period, 1700 BC, when Minoanisation starts. The change is essentially one from exchange to affiliation. This can be explained partly by the needs of the growing and more stratified Cretan elites, and partly by the desire of local communities across the Aegean to participate in exchange networks in a more intensive and competitive arena, on a level of individual agency and community (Knappett 2011: 144). The role of artefacts and the networks of objects are becoming important in enabling these affiliation networks; there is an emergence of new modes of objectification (ibid.: 145). A famous ethnographic example of this new mode of objectification and the role of artefacts therein is the so called Kula ring.

This exchange of “jewellery” around and in the island group in Melanesia by the tribe of the Trobiands was recorded by the anthropologist Malinowski in Argonauts of the Western Pacific: An Account of Native Enterprise and Adventure in the Archipelagoes of Melanesian New Guinea, dated 1922 (Malinowski 1961). The Kula system is an exchange system in which people rank themselves by exchanging two sets of shell valuables, counter clockwise circulating mwød (white shell armbands) and clockwise circulating bagi (red shell necklaces), through a circle of island cultures (see figure 3). This process could take four or five years. A mwød has to be returned by one or more bagi of the same or higher value.

The institution has been central in twentieth-century anthropological research and theories about society, “primitive” and “modern”, “non-Western” and “Western”,

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Fig. 3 The Kula ring (Barnard and Spencer 2010: 318)
The seascape was changing. This happened because the success of island occupation also depends upon networks, social obligations and reciprocity with other communities within and outside the region. Connectivity and interdependency between the communities of the islands are becoming more important and relevant, also because of access to resources. The High Commerce, the trade with mainly commercial purposes, came unto the Aegean market. The sea had become a bridge to social stratification. Aegean people learned to use the seascape as a road to wealth, power and status.

Sometimes man learned the awareness of the seascape the hard way. According to Colin Macdonald the maritime motifs on Cretan fine ware at the beginning of the Late Bronze Age appeared directly after the massive volcanic eruption on Thera, which caused a tsunami on the coastal areas of Crete. These motifs -- not so much fish but mostly moving and twirling octopuses (see figure 4) -- probably indicate a renewed respect for the sea.

**Discussion and conclusion**

In this "interactionist" area of the Aegean the seascapes were indeed changing from the Later Palaeolithic on. The Mesolithic people looked upon the sea as a foraging seascapes, providing them subsistence and tools as the landscape did. Their boats were probably made from light floating material and were moved through rowing and paddling, following the currents and winds, never letting intentionally the landscape out of sight. The Aegean seascapes changed lightly in the Neolithic through the gradual process of seascapes learning: by cabotage trade and longer maritime routes, and longer and often more permanent settlement on the Aegean islands.

Greater changes occurred in the Bronze Age, especially through the invention of the sail. Sailing needed more investment: more manpower, more technology, more specialism; and the cost which were made were offset with some benefit. The seascapes became a road for commercial trading, for High Commerce, and people looked upon the sea as an opportunity to acquire wealth, power and status. The seascapes became a means to social stratification.

**Notes**

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Changing Seascapes


Aegina Kolonna
A case study on resilience within changing networks during the Greek Bronze Age (c. 3000-1000 BC)

Iris Rom

Introduction

The importance of the sea for past societies is often underestimated by modern researchers. In modern society the sea plays only a marginal role in everyday life. Grasping the importance of the sea in a time before travel over land and air became the most accessible forms of transportation can be challenging. In Greece, the sea has always played a crucial role in the lives of its people. Its geographical distribution of mainland and many islands in and around the Aegean sea has made its people dependent on the sea for its subsistence, trade and even social structures, both in the past and for a large part still in the present.

During the Greek Bronze Age (ca. 3000-1000 BC), towns were often located on the shores of the mainland, the Peloponnesse, Crete, and many of the smaller islands. The sea played an important role in the subsistence of these towns, providing for instance a source of food for its inhabitants (Galik et al, 2010, p 750). However, the sea played an even more important role in the interconnectivity of the Aegean Bronze Age world. Most travel between sites within the Aegean took place over the sea.

In the course of the Greek Bronze Age the interconnectivity between towns fluctuated. Different trade networks prevailed at different times within the Aegean. These networks included different participating settlements and are recognized by specific assemblages. Short-distance connections led to distinct cultural zones, with shared cultural traits (Burns 2010, p. 293). Long distance trade played an important role in the acquisition of limited resources such as obsidian or metals. However, long-distance trade also was important in the transfer of new techniques, styles and social structures (Burns 2010, p. 294).

In Neolithic times the seas were first explored in canoes and longboats. This allowed people to travel between the Aegean Islands and have access to goods that were not originally available on the island itself. However, this way of traveling required a lot of manpower. At the start of the Bronze Age the sailing ship became available. The first depictions of ships with sails appear on Early Bronze Age Cycladic 'frying pans' (c. 2000 BC), but it is possible the ships themselves may have been around even longer (Maran 2007, p. 5). Wind-powered ships allowed for more cargo space and long distance travel. Trade between areas at far distances thus became possible and the first long distance trade networks came into being.

However, the development of trade networks in Greece was not a linear one (Maran 2007, p. 6). Different trade networks succeeded one another.

The responses to changing networks differ significantly between sites. The mainland, Crete and the Cyclades all see different developments in their trade connections over time, and even sites within these geographical units show many variations. Some towns grew to become powerful, well-connected centres for extended periods of time. Other sites collapsed or remained small and isolated. In this article I will focus on the changing trade connections of the, during the Bronze Age successful, centre of Aegina Kolonna.

Kolonna is located on the island of Aegina in the Saronic Gulf, south-west of Athens (fig. 1).

Fig. 1 The location of Aegina in the Saronic gulf. Kolonna is located at the red dot (sources: http://commons.wikimedia.org/wiki/File:Greece_map_modern.png; Wild et al 2009, p. 1014)
et al. 2009, p. 1013). Even though the site’s location is close to mainland Greece, its development was quite different. Kolonna continued to prosper at times during the Bronze Age, when other areas saw a general decline (see table 1 for an overview of the Bronze Age periods).

The site developed its own central structure comparable to a Minoan palace during the Middle Bronze Age (ca. 2000-1600 BC). This was something unseen on the mainland at this time where architecture mainly consisted of small apsidal huts. The fact that Kolonna’s development was so different from the nearby mainland makes it an interesting case study. By investigating its social organization and trade connections it may be possible to draw conclusions on why this site remained successful even when nearby sites were not. The main research questions discussed in this paper will be: What was trade in the Bronze Age Aegean like? What role did the sea play in Bronze Age trade? How did Aegina Kolonna react to changing seascapes during the Bronze Age? And finally: Why was Kolonna able to remain successful throughout the Bronze Age, what role did the sea play in this?

**Seascapes and Trade in the Bronze Age Aegean**

To understand trade in Bronze Age Greece first of all the term “trade” needs to be defined. Typically the definition of trade would be: the exchange of goods and services within a mercantile or economic framework that may or may not involve currency (Burns 2010, p. 291). In the study of ancient civilizations, however, not only economic motives play a role, but political and ideological dynamics are of equal importance. Trade in the Greek Bronze Age thus encompasses all these activities. Goods as well as technologies, crafts and artistic statements were

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**Table 1. Table of Aegean relative and absolute chronology (Shelmerdine 2008, p.4)**

<table>
<thead>
<tr>
<th>Chronology</th>
<th>Coene</th>
<th>Cyclades</th>
<th>Greece</th>
<th>Egypt</th>
</tr>
</thead>
<tbody>
<tr>
<td>3100</td>
<td>EM I</td>
<td>EC I</td>
<td>EHI</td>
<td>1st-2nd Dynasty 3100/3000-2700</td>
</tr>
<tr>
<td>3000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2900</td>
<td>EM II</td>
<td>EC II</td>
<td>EHI A</td>
<td>Old Kingdom (2700-2136)</td>
</tr>
<tr>
<td>2800</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2700</td>
<td>EM III</td>
<td>EC III</td>
<td>EHI I</td>
<td>1st Intermediate Period (2136-2023)</td>
</tr>
<tr>
<td>2600</td>
<td>MM IA</td>
<td>MC I</td>
<td>MHI</td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td>MM IB</td>
<td>MC II</td>
<td>MHI I</td>
<td>Middle Kingdom (2116-1795)</td>
</tr>
<tr>
<td>2400</td>
<td>MM II</td>
<td>MC III</td>
<td>MHI II</td>
<td></td>
</tr>
<tr>
<td>2300</td>
<td>MM III</td>
<td>MC IV</td>
<td>MHI III</td>
<td>2nd Intermediate Period (1795-1540)</td>
</tr>
<tr>
<td>2000</td>
<td>LM IA</td>
<td>LC I</td>
<td>LH I</td>
<td></td>
</tr>
<tr>
<td>1900</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1800</td>
<td>LM IB</td>
<td>LC II</td>
<td>LH II A</td>
<td>New Kingdom (1540-1070)</td>
</tr>
<tr>
<td>1700</td>
<td>LM II</td>
<td>LC III</td>
<td>LH II B</td>
<td></td>
</tr>
<tr>
<td>1600</td>
<td>LM III</td>
<td>Subminois</td>
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<td>1500</td>
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<td>1300</td>
<td>LM IA2</td>
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<td>1200</td>
<td>LM HB</td>
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<tr>
<td>1100</td>
<td>LM III</td>
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<td>1000</td>
<td>Submycesaran</td>
<td>Subminois</td>
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</tr>
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</table>
exchanged. The exchange of ideas could influence general ideas on political and social structures as well (Burns 2010, p. 291).

Throughout the Bronze Age, Greek societies stood in contact with large parts of Europe, Asia, the Near East and Africa. From these areas materials were imported that were not found in Greece. Examples of materials exchanged are copper from Cyprus, ivory from Egypt and the Levant, and amber from the Baltics (Burns 2010, p. 291). Alongside these raw materials, high-quality items were being exchanged. For instance Egyptian stone vessels appear on the mainland and many imported luxury goods are found in the palaces and the late Helladic shaft graves of Mycenae (Burns 2010, pp. 292-293). The role of elites within exchange networks seems therefore very important. Renfrew theorized about the role of elites in the increasing complexity of societies (Renfrew 1972). According to Renfrew, the rise of elites would be possible because of their role in the redistribution of goods. By collecting and redistributing agricultural goods, not everybody would have to spend time on farming. Craft specialization could develop. That the specialized craftsmen were attracted to the palaces is visible in traces of metal working, stone working and the production of higher quality goods at palace sites (Evely 2010, p. 391). Elites gained easy access to the specialized crafts and would use the products they produced in elite-life and elite-exchange. That elites controlled production and distribution is also visible in the development of administrative systems using seals and tablets at the palaces.

The movement of people and ideas is less visible in archaeology than the movement of goods, and is therefore a vivid topic of debate. Diffusion and invasion theories are often used to explain the spread of goods and ideas as well as the growing complexity of civilizations. It is true that in the Aegean the development of more complex forms of organization, such as the corridor houses during the Early Helladic period (EH IIb ca. 2400-2200 BC), and the Minoan and Mycenaean palaces, coincide with the arrival of goods and technologies from the more developed Near-East (Burns 2010, p. 292). The development of these more complex social organizations may not be merely the result of copying better developed “neighbours”, but can also result from internal changes, triggered by stress and opportunities the interactions offered. The importance of internal changes will become clearer when discussing Aegina further on. The island adapted to different networks in its own way even when nearby regions could or would not.

A society could thus benefit from trade. It provided access to non-local goods, technologies and developments in social and political structures. However, trading could also have merits on a more individual scale. Travel and the acquisition of foreign goods could for instance result in increased status which would have been the primary goal of establishing contacts in the first place (Helms 1988). Subsequently elites were able to rise when they established their previously discussed control of the social and economic benefits gained from long-distance trade.

The sea was thus more than a way of travel or a food source during the Bronze Age, it was a way to gain status. The sea offered an access to prestige for the groups who were able to exploit this. Through the sea trade networks, societies were able to become more complex in Greece. Without the focus of Bronze Age societies on the sea, the Bronze Age may have never seen the rise of the Minoan and Mycenaean palaces.

Aegina Kolonna

Aegina Kolonna has seen a long research history. Excavation works started in the late 19th century and have continued till today. The last fifteen years research on the site has been done by the Austrian Archaeological Institute. The Austrian research has focussed on establishing a relative chronological sequence of the site and synchronizing this chronology with sites on the Greek mainland (also using ^14C). Another important research focus has been the identification of imports at Kolonna and the distribution of Aeginetan pottery outside the island (OAI 2013). This recent research has led to a clear picture of the Kolonna’s interregional contacts.

Kolonna was located on the strategically placed island Aegina in the Saronic Gulf, directly on the maritime crossroads of central mainland Greece, the Northeast Peloponnese, Cyclades and Crete. The site has seen a continuous occupation from Neolithic till Late Bronze Age times (Gauss 2010, p. 636). This continuous habitation is
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very rare in Greece, and shows that a unique community developed at the site. After the Late Bronze age the site was abandoned for a short period and possibly reoccupied from the Geometric period onwards. In Classical times a temple for Apollo was built on top of the site (6th century BC), destroying some of the older Bronze Age remains. Despite some destruction, detailed settlement and pottery sequences could be made.

Fig. 2 gives an overview of the excavation plan. In the next section I will relate the different settlement phases and trade connections of Aegina Kolonna to the general changes in the Aegean during the major phases of the Greek Bronze Age. This way I want to find out in which way Kolonna responded to the major changes taking place in the wider context. Since Aegina is an island, all the influences resulting from changes occurring in the Aegean would have reached the island by sea travel. It is therefore an excellent case study to determine the role of the sea in changing communities and its importance in maintaining a sustainable society.

Final Neolithic (FN) - Early Helladic I (EH I), c. 3600-2700 BC

The earliest traces of habitation of Aegina Kolonna stem from the FN- EH I periods. However, much remains unclear about these periods. The early phases of the settlement have not yet been as extensively researched and publicised as the later periods; therefore one has to be very cautious when considering this period.

During the late Neolithic period a focus on the household becomes visible in mainland Greece. Household units become clearly partitioned and contain enclosed external spaces (Tomkins 2010, pp. 36-42). This distinction between household and community becomes even clearer during the Final Neolithic. Some sites expanded such as Dimini and Knossos, but new small settlements in marginal areas were established as well. These isolated hamlets relied on mixed farming but were also exploiting their specific environment. For instance, a farm could resort to herding goats on less fertile grounds if nearby (Tomkins 2010, p. 40). The isolation of sites shows a more flexible understanding of the community during FN than the communities centring within the village in the previous period. Communities
were now more widely distributed throughout the landscape (Tomkins 2010, p. 38). Other important changes during LN/FN and the early Bronze Age occur in technology, organization and ownership of production. An increasing efficiency, intensity and output of production become visible and are suggestive of the involvement of a possibly more specialized producing group (Tomkins 2010, p. 38). The fact that more specialized products were now available as well as the increased distance between interacting areas, paved the way for long-distance exchange relationships. That this was indeed the case shows in an increased amount of FN sites located on the coast and the presence of small amounts of imports from regions further away.

At Aegina Kolonna the few architectural remains from FN-EHI consist of postholes cut in the bedrock, and thin walls preserved in a fill-layer. This fill-layer was used to level the settlement for building activities in EH II. Not much of the settlement is known from this period, but the fact that a site arose on the shores of a strategically placed island may indicate a focus on the sea. Within the EH II fill-layer most of the pottery dating to FN and EH I has been found. This pottery is presumed to have been produced mostly locally. Interesting is a small table with crusted decoration, indicative of a connection with Thessaly (Gauss 2010, p. 739). Since this period is poorly investigated at Kolonna, it is interesting to see that Aeginetan exports have been found at several locations. Aeginetan pottery has been found at Athens, Franchti and Kitsos cave, and Lerna (Gauss and Kiriatzi 2011, p. 242). At Franchti cave (an important cave-site in the eastern Peloponnesus), Aeginetan andesite, a volcanic rock present at Aegina, was identified within the pottery. Saronic andesite millstones were found on the Athenian Agora and at Vayia in eastern Corinthia (Gauss 2010, p. 739; Gauss and Kiriatzi 2011, p. 242).

These finds indicate early networks of exchange with Aegina participating. The network took place on a relatively short-distance scale, with mainly mainland connections (Vitelli 1993, pp. 209–211).

**Early Helladic II (EHII), c. 2700-2200 BC**

During the Early Bronze Age, society became increasingly complex in Greece. Next to the already existing short-range trade connections, traces of a larger network connecting the larger Aegean towns appear during EH II. Although not completely understood, this network is called the Anatolian Trade network (ATN). The Anatolian trade network stretched from Anatolia to Syria to the south and Mainland Greece to the west. In fig. 3 an overview of a large part of the network is shown. The network was in use during EH II and EH III but its role in the lives of Bronze Age Greeks is unclear. The ATN may have played a significant role in the trade of metal and technologies. At the time of the ATN settlements appear throughout the Aegean with monumental structures, such as fortifications and the “corridor houses”. The corridor house is a large building which often contains administrative seals. These buildings indicate the introduction of a centralised political power as well as a new economic system in the Early Bronze Age communities. It is a possibility that this social structure was disseminated through the network (Sahoglu 2005, p. 341).

The ATN is also visible in pottery assemblages. Some sites on the mainland contain specific Anatolianizing pottery not previously present in Greece called the Lefkandi I-Kastri group. Pottery belonging to this group has been found at a few sites including Lerna, Lefkandi and Pefkakia on mainland Greece and Ayia Irini on Keos in the Cyclades (Sahoglu 2005, p. 340). Although the shapes are originally quite exotic, they are mainly locally produced. Aeginetan exports of EH II date are rare, but still export to nearby areas seems likely (Gauss and Kiriatzi 2011, p. 242).

Archaeological remains show that Kolonna must have participated within the Anatolian Trade Network. The site revealed the presence of both monumental structures...
and Anatolianizing pottery. Kolonna has its own corridor house, the “Haus am Felsrand”, later replaced by the even larger corridor house: the “Weisses haus” (fig. 4). Excavations of the corridor houses did not reveal seals. However, standardized weights of imported stones were found indicating participation in a network with standard measurement units. Lefkandi I-Kastri pottery has been found at Kolonna (Gauss 2010, p. 743) (fig. 5). The pottery is locally made but the shapes indicate an identification with the ATN. Aeginetans had a need for these wares alongside their traditionally made wares. This indicates the interest in new styles, introduction of new foods or new dining rituals which had a need for these wares, or even the immigration of Eastern people, who were used to their own wares.

Overall Kolonna shows a similar development as major sites on mainland Greece and Lerna on the Peloponnesus. It seems likely the areas belonged to a similar cultural group. The mainland groups stood in close contact with each other. Their close contacts allowed for the fast spread of new thoughts and ideas originating from the ATN. These thoughts and ideas led to an increasingly complex society to which Aegina adapted. It was not until EH III that Kolonna developed differently from the mainland.

Early Helladic III (EH III) and the Middle Helladic period (MH), c. 2200-1600 BC

The Middle Helladic period has been thoroughly investigated at Kolonna and shows some interesting developments of the site. EH III is generally seen as a period of social decline on mainland Greece. Many sites were abandoned and the corridor houses destroyed (Pullen 2008, pp. 36-38). The simple apsidal house became the prevailing domestic architectural form. Pottery fabric becomes coarser and new pottery shapes, of which the origin remains unclear, replace older forms (Pullen 2008, pp. 36-38). Because the changes seem rather abrupt, this period is often described as a time of crisis. Why these changes occurred remains doubtful. In the past, theories on climate change (Whitelaw 2000; Weiberg et al 2010; Weiss 2000), human impact on environment (Van Andel et al 1986; Van Andel et al 1990) and invasion (Maran 2007; Sahoglu 2005; Nicola 2005; Cazella 2007) have all been formulated. Somewhere during EH III-MH I the Anatolian trade network collapsed too. Anatolianizing pottery disappeared from the Aegean assemblages. Mainland Greece did not recover from this collapse till the end of the Middle Bronze Age. Society remained simple. No centralized power or stratified social hierarchy seems to have been in place. Life was focussed around the household indicating a renewed focus on the family (Pullen 2008, pp.36-38).

On Crete however, society recovered fast. Here the Minoan palaces developed during the Middle Bronze Age, signifying a central authority and centralized power over resources (Manning 2008, pp. 110-118). The Minoans rose to power in the rest of the Aegean as well. Although Crete did not participate very actively in the older Anatolian Trade Network, from MH times Minoan exports are found throughout the Aegean from early in the Middle Bronze Age. Minoan wares are over time often locally imitated (Knappett 2008 p. 130).

Aegina, although geographically close to the degenerated mainland, seems to have thrived during the MH period. Kolonna was heavily fortified during the EH III period continuing into the MH period. The defence works were continuously remodelled and strengthened indicating some form of threat to the town. On the location of the former corridor houses a metal furnace was found, indicating metallurgic activities.

At Kolonna the “Large Building Complex” was erected during early MH (fig. 6). This complex would stay in use throughout the period until a new building was erected in the Late Bronze Age (Gauss, Lindblom and Smetana 2011, p. 84). This building, covering an area somewhere between 230 and 680 m², was at least ten times larger than the average MH house (Gauss, 2010 p. 745). It is therefore thought it may have been Kolonna’s palatial centre. The finds of a seal and cylindrical clay objects suggest an administrative function of the building (Gauss 2010, p. 745).
Aeginetan pottery sees major changes during the MH. The locally produced matt-painted wares with geometric motives and potters marks are now produced and exported all over the Aegean. Within the before-mentioned Large Building Complex, high-quality pottery of local and imported pottery of Crete and the Cyclades was found (Gauss 2010, p. 745). Minoan imports arrive very early in the MH period. From MH II onwards they are also locally produced. Production technology of these wares is significantly different from traditional Aeginetan wares. The Minoan copies are wheel-made and may have been produced by Cretan settlers. Other Minoanizing finds (such as ritual stone hammers and double-axe mason’s marks) indicate a Minoanized elite at Kolonna (Gauss 2010, p. 745).

It seems Kolonna was able to adapt to the loss of the Anatolian Trade Network and the threats that halted the development of communities on the mainland. A new naval power now dominated the Aegean but Kolonna was able to adapt. Kolonna kept participating in the long distance trade networks. Kolonna imported Minoan wares, but also adapted its social, political and economic structure to resemble the Cretan palaces. By doing this, the town was able to sustain an elite and with that a complex social organization. This combination helped Kolonna to remain successful during the MH period.

**Late Helladic (LH), ca. 1600-1050 BC**

During the Late Helladic period Kolonna was still inhabited. Later Classical building activities however, have destroyed much of the LH architecture, making it difficult to comprehend what happened at Kolonna during this period.

In the Late Bronze Age the trade networks in the Aegean once again changed. On the mainland the Mycenaean gained in power and became the main players within the Aegean networks (Shelton 2010, p. 143). The mainland becomes very wealthy, which is especially visible in funerary contexts. Large tombs with lavish grave goods (including many imports) dating to this period have been found at many major sites. The Mycenaeans built their own palaces and fortified citadels (Shelton 2010, pp. 140-143). On Crete the old Minoan palaces suffer destructions and saw heavy Mycenaean influence from there on (Hallager 2010, pp. 153-157).

At Kolonna the Large Building Complex disappeared around LH I or II and a large potters kiln was constructed at its place. Kolonna seems to have become less important because of the growth of nearby palatial centres on the mainland. The site was still fortified and inhabited but was not a palatial centre (Gauss 2010, p. 746). Kolonna was still connected to the trade networks though. Mycenaean, Cypriote and south-east Aegean imports are present as well as clay seals. The bulk of pottery is however locally produced and fewer wares than during the MH period were imported. Export of Aegean wares flourishes in some areas, while it declines in others. At the start of the Late Bronze Age more Aegean wares are exported to Laconia and Lerna as well as it being exported further away to for instance Troy. In the Argolid, Corinthia and Cyclades the import of Aegean wares gradually declines, possibly
due to increased competition of mainland pottery production (Gauss and Kiriatzí 2011, pp. 243-247). LH III B & C pottery at Kolonna is scarce, and late and Sub-Mycenaean even rarer. Also exports seem to decline heavily during this period. Only cooking wares are exported from LH III A onwards, and it is unclear if export took place after LH III C. This may indicate that the site was abandoned at the end of the Bronze Age.

Kolonna seems to have been able to thrive during the Late Helladic period, but it must have clearly felt mainland influence. It now was forced to compete with the nearby mainland powers. Kolonna stopped being a palatial centre but the presence of rich graves in this period indicates it was still quite prosperous (Gauss 2010, p. 747). The site had to specialise in the exporting of cooking wares over time to be able to compete with the mainland. However, the general decline of the mainland at the end of the LH period, affected Kolonna likewise. Apparently, the site was at this time too involved with the mainland at the time to sustain itself during this “crisis”.

**Conclusion: Kolonna, the Sea and the Power**

The case study of Kolonna suggests that the success of a Bronze Age town was closely related to its success at sea. Sea trade allowed social differentiation and an increased settlement complexity. The people of Aegina show that by staying involved in interregional trade and adapting to changes in marine trade networks a community would thrive. Whether the successful adaptations were due to Aegina’s strategic location or perhaps the international spirit of its inhabitants, Kolonna adjusted to all the major societal changes in the Aegean.

Kolonna participated within the earliest networks, profiting from the benefits the Anatolian Trade Network brought. Besides the new pottery shapes that were introduced, Kolonna appropriated a new economic/ political system. This may have been copied from Eastern societies, but just as likely developed internally to success­fully participate within this huge network (Burns 2010, p. 291). When this network failed in EH III and large parts of the Aegean went in decline, Kolonna adjusted to the new successful Minoan trade networks. Minoan pottery was imported and copied. More importantly however, was that the Minoan power system was copied as well. Kolonna built its own version of a Minoan palace including its administrative function. The acquisition of status at Kolonna is comparable to the situation on Crete; elites controlled the access to prestige goods and probably specialized services such as metalworking as well. Religious beliefs may have even been copied, as Minoan ritual objects were also present at Kolonna (Gauss 2010, p. 747). Aegina at this point did not suffer much competition from the mainland and would have been the major power in the area till the Late Bronze Age. The first rich shaft grave on Aegina supports this idea; Aegina and its elite were able to acquire enormous wealth.

When Minoan civilization was finally replaced by the Mycenaeans, Kolonna adapted again. The town remained active within the trade networks, importing, exporting and administrating. However, due to the competition of nearby citadels in the Argolid, Attica, Corinthia and Troizenia, Aegina lost its unique position within the area. Aegina was no longer the independent palatial centre it once had been. Its exports decreased, being largely replaced by the more fashionable Mycenaean lustrous decorated pottery. When finally the Mycenaean societies collapsed, Aegina could no longer adjust as it did during previous changes. Kolonna was abandoned.

**Notes**

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**References**


Depiction of the sea in the Minoan frescoes from Knossos and Akrotiri (1700-1450 BC)

Paula Kalkman

Introduction
In the past few years the field of archaeology has witnessed a new way of studying landscapes: the focus is shifting from a terrestrial analysis towards seascapes and the influence of maritime elements. This new way of researching the landscapes has also reached the area of Mediterranean archaeology.

Greece is a well-researched region in archaeology, but until the concept of seascapes arose, the focus was mainly at the inlands and not the seas in-between. Berg mentions sixty-eight surface surveys in Greece since the seventies, of which practically all are focused towards the land, even when direct access to the sea was present (Berg 2010; 16). Considering the fact that Greece consists of numerous small islands of which the inhabitants interacted with each other, the need for an interpretation that reaches beyond the boundaries of the islands is apparent. The sea should not be considered as a barrier. Instead, it should be seen as an opportunity, as a means of interaction, a source of food, and so forth.

To be able to research the seascapes (a description of a landscape that also incorporates the sea) of the Greek islands, the dynamics between the islands and the mainland are important and should be explored within the context of maritime culture (Broodbank 2000; 1). This idea, the so-called island archaeology, thus aims for a method of research that incorporates the sea.

In order to apply the concept of island archaeology and seascapes, a comparison between the islands Crete and Thera is made in this paper. According to Cooney: “Seeing and thinking of the sea as seascape – contoured, alive, rich in ecological diversity and in cosmological and religious significance and ambiguity – provides a new perspective on how people in coastal areas actively create their identities, sense of place and histories” (Cooney 2010; 323). In this paper, the aim is to decode the meaning of the sea for the Minoans on Crete and Thera, and to interpret the way the sea is depicted.

In my opinion, art is an important medium that can offer insight in history. Depictions are impressions of what was important to the producer, the persons who decided what to depict and the ancient perceivers. Because it is impossible to depict everything, art is always a matter of selection. Thus, important elements must have been depicted. Sea fare is assumed to have been important to the Minoans; therefore my assumption is that it must have played a major role in art as well. For this paper, Minoan frescoes (1700-1450 BC) from the houses of Akrotiri (on Thera) and the palace of Knossos (Crete) will be discussed to research the perception during Minoan times.

This paper will adress the origins of the idea of the sea-faring Minoans. Thera is believed to be one of the areas in the Minoan network and to be influenced by the Minoans of Crete. A comparison between ‘the trader’ (Crete) and ‘the possible outpost’ (Thera) could inform us on the perception of the sea. After this, the focus will be at the interpretation of the frescoes: what is depicted on the frescoes, what are the main themes and what role is reserved for seaborne trade?

The archaeological context

“...And the first person known to us by tradition as having established a navy is Minos. He made himself master of what is now called the Hellenic sea, and ruled over the Cyclades, into most of which he sent the first colonies, expelling the Carians and appointing his own sons governors; and thus did his best to put down piracy in those waters, a necessary step to secure the revenues for his own use” (Thuc.1.4.1).

With these words, Thucydides described the origins of the Minoan empire in the fifth century BC. He was referring to the myth that is at the base of our ‘knowledge’ about the Minoans. According to this myth, Minos had a conflict with his two brothers about who should become the king of Crete. Minos prayed for a sign from the gods, and received that in the form of a bull rising from the sea. Instead of offering the bull to the sea-god, Minos decided to keep the bull to himself, a mistake that led to a punishment from the gods: his wife fell in love with the bull. Offspring in the form of a Minotaur was the result. Meanwhile, the son of Minos was killed in Greece, which was the reason for Minos to assemble his fleet and sail to Greece. The Athenians heard that their only hope was to regularly send seven young men and maidens to be eaten by the Minotaur who lived in the Labyrinth on Crete (Moormann & Uitterhoeve 2007; 281-283).

The excavator on Crete, Evans, named the archaeological culture on the island of Crete “the Minoans” (Papadopolous, 2005; 88). With this action, the assumption that the myth could be based on historical facts was made. In the scientific research there are two schools
Paula Kalkman

trying to explain the interrelations in the Aegean area (Niemeier 2004; 393). On the one hand there are scholars who believe that the Minoans had sovereignty over the Aegean seas ('the thalassocracy' as described in the myth of Minos) from the Prepalatial palace period onwards (2300-1450 BC). On the other hand there are scholars who believe that Crete did have cultural and economic influence across the Aegean, but the islands were autonomous from Crete.

Evidence for Cretan sovereignty on the Aegean seas is extensively discussed by Niemeier. Although the author states that Minoan predominance over the Cyclades is possible but cannot be proven, his arguments do point towards the military power of Knossos. The first argument is found in the fact that Knossos seems to have had centralized power over Crete, which is required for broader power. Knossos was the largest palace on Crete and other sites imitated Knossian architecture and frescoes. Seal stones with the sign of Knossos (a bull) have been found across Crete and even in Akrotiri (Thera), which could indicate centralized administrative power in Knossos (Niemeier 2004; 393-395).

A second, and maybe even more important, argument for the Cretan sovereignty over the seas is the existence of settlements with clear Minoan influence across the Aegean (see fig. 1). Niemeier mentions Kythera as Cretan foothold between Crete and the Peloponnesos (2300-1900 BC) and the 'Eastern String' to connect Crete with Asia Minor (1900-1700 BC). Akrotiri, Phylakopi and Ayia Irini seemed to have been rebuilt in Minoan style after they had been destructed (1600-1450 BC) (Niemeier 2004; 394).

In contrast, there are also several explanations in favour of the model of Cretan influence. According to Buck, no direct contact between the Cyclades and the Near East existed. Instead, Crete served as an intermediary between the Cyclades and the Near East, which means that Crete was in a monopoly position (Buck 1962; 133). Another explanation is that the Cretans did not have any fortifications, thus the fleet served as military force to gain protection against pirates and enemies. In this explanation, it was simply necessary for the Cretans to have power on the seas.

Starr and others state that the Minoan thalassocracy has never existed, but trade without sovereignty was present. Reasons to assume this are, amongst others, that no war or warships have been depicted. Starr proposes two options for trade without conquest (Starr 1955; 285):

![Fig. 1 Minoan influence across the Aegean according to Niemeier. Adapted map from http://www.santorini-eruption.org.uk/chapter2_2.htm](http://www.santorini-eruption.org.uk/chapter2_2.htm)
Depiction of the sea in the Minoan frescoes from Knossos and Akrotiri

- “Traders from the less-civilized areas were the intermediaries between islanders and mainlanders. Islanders and mainlanders may have been drawn by the riches of Crete.”
- “The Cretans set up trading footholds at various points on the islands and on the Greek mainland, but even this development need not have led to the process of conquest. Having established their factories, the Cretans would have been likely to wait for the natives to come to them.”

At this moment, we can not draw any definite conclusions about the Cretan thalassocracy, but it seems likely that something like a complicated trading network existed. In my opinion, the numerous cities with Minoan influences are an obvious argument to plead for major Cretan influence. Furthermore, the possible Knossian administrative power is a clear hint for great Cretan power in the Aegean. Starrs' arguments against the Thalassocracy are partly outdated since new evidence in the form of depictions of warships is present. In addition to that, his second model is maybe a bit credulous: one does not simply establish factories in land that is not his own property. Nevertheless, clear evidence for more than Minoan ships carrying the widely adopted Minoan cultural constructs is not present.

What seems to be clear is that Thera was under the influence of some kind of Cretan power. If this was established with or without military power is not important for now: Thera seems to have been an outpost or trading-place with Minoan influences. Not only the Minoan way of rebuilding Thera emphasizes this, but also the presence of a Knossian seal is an indication. There is no other conclusion to be made than that the sea was important to Crete. If we want to make a comparison between the role of the sea for Crete and Thera, knowing that Thera had a different role than Crete should be enough, because the model of ‘the trader’ (Crete) and ‘the outpost/trading-place’ (Thera) seems to be true. The Theran frescoes should show a combination of Cretan and indigenous influences.

**Discussion of the frescoes**

Now the context is clear, it is possible to start interpreting the frescoes from Akrotiri and Knossos, and to analyse how many references to the sea are present. To be able to quantify the references to the sea, the frescoes from Knossos and Akrotiri have been grouped. While grouping the frescoes, a few problems occurred. The main problem is that some of the frescoes are highly fragment-ed, and Evans' reconstructions are said to be based on his 'modern' view. To avoid this problem, a theoretical base is used. In my opinion, the Minoan frescoes are not simply art for the sake of art, but a high amount of symbology is present. The interpretation of the frescoes is based on an approach known as cognitive archaeology or post-processual archaeology. This approach aims for explanations based on contextualised ideas of the mind or society under study, with as little modern influences as possible. Therefore, archaeological data which may be combined with the original fragments have been used where possible. Still, it should not be forgotten that very little is known about the Minoan life, religion and ideology, and therefore the interpretations that are made in this paper are certainly debatable.

The first place to study is Crete. The sea is present in several kinds of art on found on this island. In pottery, a so-called Marine style (depicting sea-animals) was popular. Especially on clay seals, there seems to be a connection between goddesses and dolphins (Marinatos 1993; 156). This clearly indicates that the sea was present in religion. If the sea was present in religion on other forms of art on Crete, is it also visible in the religious frescoes from Knossos, and if so, how?

The frescoes from the Palace of Knossos are divided into six different categories for this paper: religious-toreador, religious-processions, religious-gatherings, religious-unknown, reference to the sea, and indeterminate. The subjects seem to be related to the place in the palace: therefore they are divided into a north, east, south and west area.

The west wing of the palace seems to have a focus on a goddess. An example is the Throne Room fresco, an image of a landscape with a griffin flanking both sides of a real, not painted chair. This is interpreted as a sign of religious power, because the griffin is an aggressor that usually is the companion of a goddess (Marinatos 1993; 54). Furthermore, Marinatos assumes that this room could be the place of ritual dining (Marinatos 1993; 102).

In other Minoan palaces, throne rooms have been found in combination with products and tools for bread making. On base of this comparison, Marinatos concludes that this throne room could function in agricultural festivals, in which small amounts of food are distributed by the elite. Nevertheless, there are no independent arguments for this assumption. No food tools have been found in the room, no utilities for cooking, and no clues for ritual dining at all.

Another fresco with connections to the harvest in this area of the palace is the corridor of the processions. This fresco was the decoration of the entrance of the palace. The depictions consist of a procession of persons carrying goods, persons with raised hands and a central figure. Again, Marinatos suggests that the ritual has a link with agricultural festivals, in this case because the entrance is leading the visitor right along the granaries (Marinatos 1993; 46). The other frescoes in this area are harder to explain: one is too small to be able to draw conclusions on (only a hand with a piece of a necklace), one has something to do with a toast or banquet of powerful persons (toasting persons sitting on campstools) and the last one consists of architectural facades, a bull and spectators, which might be similar to the frescoes in the east wing.

What we can conclude from this area of the palace is that...
there is no indication for an active role of the sea in rituals. Instead, agriculture might be more important.

The east wing is focused on bulls. The bulls are represented in the hall of frescoes, but the most famous bull-frescoes are found in the so-called ‘domestic quarters’. These frescoes show persons jumping over bulls. Castleden combines these images with possible sacrifices of bulls (Castleden 1990; 137). Could these images simply refer to the myth, in which Minos kept the Minotaur in the labyrinth? This is possible, especially considering the place where some of the bull-frescoes have been found: the house of the double axes. According to several scholars, double axe means labrys in Greek and labrys is etymologically connected to labyrinth (Savitz 1991; 467). The labyrinth was the place where Minos kept the Minotaur. Thus, the bulls could indirectly point towards the sea fare in the myth of Minos, but a broader adoration of Minos is more plausible. The connection to the sea is not impossible though, because the only indisputable connection to the sea is found here as well. This fresco depicts dolphins, which could refer to the maritime element in the religion (as pointed out before in this chapter: in Minoan clay seals seems to be a connection between goddesses and dolphins). The other two frescoes in this area have probably nothing to do with bulls or sea: the fragments show a part of a lady and a procession. Some other fragments have been found, but these are too small to draw any conclusions. What we can conclude about this side of the palace is that the bull-frescoes are dominant, and a connection to the maritime element in religion is possible, but not without doubt.

The north wing seems to be focused on public festivals. The two most important frescoes, the Grandstand fresco and the Sacred Grove fresco, show large groups of spectators. In both frescoes, the centre of the depiction is a separate group of performers taking part in an unknown ritual. The Grandstand fresco takes place near a shrine (which is elaborated with bull horns), the Sacred Grove is located between the olive trees. The bullhorns (probably the sign of Knossos and of course a reference to a bull or minotaur) lead to the idea that the ritual at the Grandstand fresco is either related to the power of Knossos or the myth of the seafaring Minos (see east wing), and that the ritual at the Sacred Grove fresco is related to agriculture (nature shrine between olive trees, but it could also indicate an unknown nature symbolism). The third fresco of this location is the Blue Monkey fresco. This fresco depicts a landscape with a blue monkey picking crocuses. It is interesting that that this kind of fresco is also present in Akrotiri. The blue monkeys seem, in most cases, to appear in connection to goddesses. In this case, the monkey is picking crocuses that are commercially used, and the goddess is watching over it or receiving the crocuses. The fact that a goddess is watching over the harvest is in my opinion to be interpreted as a plea to the goddess to ask for prosperous agriculture. For the sake of completeness, the fourth group of frescoes should also be mentioned. This group exists of small fragments that cannot be interpreted, and the exact origin is unknown. What we can conclude from this area is that public festivals were held, mainly revolting around agriculture. References to the sea may be present, but in a lesser extent than in the east wing.

Only two fragments remained in the south area. One probably depicts persons on campstools. As the campstool fresco in the west wing, this fresco probably relates to religious power. The other fresco shows similarities with the frescoes from Akrotiri. The depiction is a man, maybe a priest, who is standing with outstretched arms. He is surrounded by flowers and butterflies, which are also common in Akrotiri.

In Akrotiri, 45 frescoes from houses have been studied. These 45 frescoes are all depictions that were large enough to interpret; 7 small fragments have not been taken into account. These 7 fragments do not show references to the sea. Instead, trees, spirals, and birds were probably present. Within the 45 frescoes, 10 referred to interaction with the sea (boats/boat elements, sea as source of food), 8 can be interpreted as agricultural (rituals for fertility of the land/picking plants for trade, domesticated animals), and 28 are attested to another category (decorative, landscape, unknown ritual). Since it would be too much to discuss every single fresco, only the most significant ones (mainly the references to the sea and agriculture) will be discussed here.

Obviously, the most important frescoes are the ones that show interaction with the sea. It is interesting that all these frescoes are found in the same house: the Westhouse. In room 5, four frescoes related to the sea have been found, and room 4 contained six frescoes referring to the sea. Both rooms were further embellished with frescoes from the other groups, mainly decorative like marble imitations, but in room 5 a Nilotic landscape has been found as well. The sea-frescoes in room 5 can be split up in 2 groups, namely ‘the boys with fish’ and ‘seafaring’.

The depictions of the boys with fish are explained in different ways. Economidis explains the depiction of the boys simply as an illustration of gathering of food. The fishes are dolphin–fish, a species that is considered to be a delicacy (Economidis 2000; 555). Mylona gives three possible explanations: offerings of a fish to a sea god, showing the abilities of the boys to emphasize the rites of passage in growing up and a symbol for activities on the sea (Mylona 2000; 565). In my opinion, the options do not necessarily exclude each other: a rite of passage can easily be combined with offerings, and by offering fish, activities on the sea are impossible to exclude. In any of the options, we can deduce the next role of the sea: the sea as source of food.
The two other frescoes, both about sea faring, are more complicated to explain. The first one, the so-called Flotilla fresco (see fig. 2) depicts a city on the left. A building is shown with people looking at the sea. Above the city, we can see a hill with animals on it. Seven large ships and two smaller boats are departing from this city, heading to the right. The passengers on the ships are depicted in a formal way, and a cabin is present on the larger, decorated ships. Such cabins (called ‘ikria’) are also found on six separate frescoes in Akrotiri. The ships are on the sea, as indicated by the dolphins. Two boats are already in the harbour of the other city (with one building with bull-horns), where people are waiting for the fleet.

Numerous authors tried to explain the Flotilla scene. One explanation is that of a religious festival in which the ships were adorned (Shaw 2000; 270). The reason for this festival would be the remembrance of the fleet that served several purposes: for example trade, war and the start and maintaining of political contacts. Marinatos postulates that there is a high amount of symbolism on the ships. The iconography, consisting of birds, predators, stylistic representations of rocks and sea waves, are in her opinion indications for dominance on the sea as well as on land (Marinatos 2000; 908). Furthermore, Panagiotakopulu mentions references to the trade overseas: on the ships are signs like butterflies, which could be an indication for trade in silk (Panagiotakopulu 2000; 586). In fact, this interpretation is only based on one pop of a silk moth and a depiction of people who might be shaking trees. An addition to the idea of depiction of reality is that the city on the right looks like Akrotiri, and that the persons on the fleet might have been Myceneans (Warren 1979; 129). This is interesting, because it emphasizes the interconnections.

The Shipwreck fresco (fig. 3) shows a hill where a ritual is performed (which might be a reference to the peak sanctuaries that are known from Crete), next to this gathering is a parade of warriors, and above the warriors is a herd of goats. At the same time, there is a sinking ship on which people are drowning. Besides these images of religion, agriculture and war at sea, women are gathering water at a well. In my opinion, this might be what Minoan life was about. Every aspect is depicted: people

Fig. 2 Flotilla Fresco. The top one is the left part, the middle one is the middle part and the lower one is the right end. Doumas 1996; 68-70
staying at home doing normal chores, people dying when they are away on the seas, people making sure there is food, and above all: religion.

Besides the clear references to the sea, frescoes about agriculture are present as well, but these interpretations are mainly based on context and not on the depictions themselves. In house Xeste 3/3a, the two depictions deal with the gathering of crocuses, one with a blue monkey (also in seen in Knossos). These flowers are closely associated with goddesses, but were also commercially used. The fact that the goddess is supervising the picking, and flowers are offered by the monkey is a clear indication that these frescoes are about the request for a good harvest. The other group of frescoes possibly concerning agriculture is found in Delta 2. These depict a landscape with sea-lilies and birds. Marinatos stresses the fact that these frescoes are found in a room together with objects related to harvesting (sickles, dagger), and objects for making bread (barbeque grill, cooking pot, mill stone) and the consumption of food. Moreover, bulbs have been found, although these have been interpreted as onions during the excavation (Marinatos 1985; 221). According to Marinatos, it is not impossible that these bulbs actually were lilies. In any case, it seems plausible that the context in which the fresco is found is about fertility. What also is important is that sea-lilies could simply serve as nothing but an environmental element of the sea. The last reference to agriculture is in a fresco which depicts calves, which could indicate domesticated animals.

**Conclusion**

The analysis of the frescoes in combination with the archaeological contexts shows a clear discrepancy. Knossos, which is thought to be closely connected to sea fare, has hardly shown any direct evidence for sea fare, whereas in Akrotiri almost a quarter of the frescoes is related to sea fare or the sea. The main theme in the Knossian frescoes seems to be agriculture. Depictions of the sea seem to have been underrepresented in Knossos: all kinds of natural and mythical landscape are depicted, but there is not one single depiction of the sea. There may be indirect connections to the sea in the form of references to dolphins and the myth of Minos, but this does not necessarily mean that there is a link to the seafaring elements in particular. More likely is that the toreador frescoes are a reference to the myth of Minos in general.

Interesting is that there is a common ground in the frescoes from the two islands. The depictions from both sites showed blue monkeys, the same type of goddesses and persons, the ritual picking of flowers is present on both sites and even the bullhorns that are characteristic for Knossos are found in Akrotiri. Then why does one site show sea fare in religious depictions, and the other does not, especially considering the fact that Akrotiri is rebuilt in Minoan style?

It is impossible to simply conclude that sea fare was not important to Crete. There are several explanations for the incongruity. First of all, there is the archaeological bias of a false sample, misunderstandings and missing information. Furthermore, a possibility is the difference in social relations: for Knossos sea fare to outposts might have been normal, whereas to Thera, a visit from the Minoans was a memorable happening. Moreover, Akrotiri was rebuilt in Minoan style after the destruction. Could it be that the inhabitants wanted to remember the help from overseas? Nevertheless, a third option is more likely in my opinion. Considering the fact that a comparison is made between domestic space (Akrotiri) and public space (Knossos), one could expect differences in depictions. Maybe the palace was just not the place to ask for help in seafaring; rituals may have served to ask for primary needs (prosperous agriculture means access to food) that were accessible for all.
everybody. This idea is confirmed by the fact that the sea is depicted in other contexts outside the palace. One question still remains: why then, are no depictions of fishing found in Knossos? One could expect that such frescoes would follow the line of asking divine intervention to induce prosperous agriculture.

The fact that a person decides to show the sea in such an excessive way in his house in Akrotiri, indicates that ‘islander-identity’ existed. The next question is how the sea was seen by the islanders. The analysis of the frescoes leads to the next seven ways of interpreting the sea: as a source of food, as a trading place or means of transport, as an environmental element (sea-lilies), as a status-symbol (elite on ships; trade in luxury goods, source of elite food), as a place where one could find death (shipwreck), as a place for triumphs (adorning incoming fleet, defending land) and last but not least as a cosmological and mythical realm because the sea plays a role in religion and myths.

It is clear that the Minoans had an outward vision, and that the sea was more than just a barrier of the island. With this conclusion, a justification of the island-archaeology approach is apparent. In future research, the sea should be included. Not only should it be more integrated in interpretations, interrelations should receive more attention as well. Moreover, shipwrecks should receive more attention. The start of a search for Minoan shipwrecks is promising; hopefully more information will be available soon. Unfortunately, until the Minoan written language, Linear A, has not been deciphered, the only thing to do is continue comparing and interpreting finds.

Notes
1. Email: p.g.kalkman@student.rug.nl University of Groningen, The Netherlands
2. Because of limits in space in this paper, this is just a small element of an extensive discussion on the locations and the connection of the flotilla fresco and the shipwreck fresco. For more theories, see this article.

References

Rivers and Trade in Mainland Greece. A case study based on Corinthian Pottery (8th-6th centuries BC)

W. Jelmer Wubs

When discussing trade in the ancient Mediterranean, research mostly focuses on the Mediterranean Sea itself and the interrelationships between the different cultural spheres. Because of this focus, the role of rivers in trade seems understudied. One reason for this imbalance may be found in the notion that ‘we’, as in ‘Western society’, primarily have terrestrial worldview while a maritime worldview was predominant before the 20th century. Since nowadays rivers in the Mediterranean play only a small part in trade, it is hard for us to grasp the idea that this could have been different in the ancient world.

Focussing on mainland Greece, this is probably more true than anywhere else. Present-day factors like mountainous terrain, the building of dams, low annual rainfall and prolonged summer droughts (Foxhall, Jones & Forbes 2007, 93) make most of the rivers in Greece unfavourable for boats and ships. More often than not, it is assumed that the situation in Ancient Greece was the same: the rivers were unsuitable for trade, so all inland trade happened by land. The most common assumption is that if a particular inland settlement wanted to trade with another inland settlement, the goods would be transported via the nearest harbour on the coast (Westermann 1929, 494). This makes sense to some degree, as transport by sea is generally faster than transport by land.

Should we disregard the Greek rivers when discussing ancient trade? A priori I would argue against it. First of all, not all rivers were completely inaccessible. The larger rivers were not only navigable in their mouths, but also a significant distance inland (Morton 2001, 230). Trade by land can be very costly and time-consuming, especially in a landscape like that of Mainland Greece. Why then would they not have used the river, even if this was not possible all year through? Secondly, it should be recognized that the relationship between rivers and trade doesn’t necessarily have to do with the notion whether or not a river was traversable by ship. Because of the geophysical environment of Greece, some inland communities were quite isolated, especially in a, supposedly, sea-oriented society like Ancient Greece (Morton 2001, 237). As rivers flow out to the sea, they thus form a natural connection with the outside world, enabling trade.

Because of these two reasons, it is my hypothesis that inland sites that were located near a river had better trade relations compared to inland sites not located near a river. It is in this paper that I want to explore this hypothesis further. Did rivers have a positive influence on the trade relations in mainland Greece?

Material and methods

It was decided to look at the distribution of a particular export product. This product had to fulfil three criteria. Firstly, it must have been produced in a single city or region. Only this way it can be ascertained that, when found in other sites, the product isn’t local in origin. Secondly, the product must be recognizable by most archaeologists. The importance behind this is that one must be sure that the material has been found on a site or not. Thirdly, the distribution of the product must be widespread within mainland Greece. Otherwise the quantity of data won’t be enough to say anything significant about my hypothesis.

Not many archaeological materials in Greece fulfil these criteria. The exception to this is pottery. Arguably the best-known Greek pottery is Corinthian and Attic. It was decided to use Corinthian pottery, as the distribution of this product is more widespread within mainland Greece than Attic pottery (Risser 2001, 175). Corinthian pottery corresponds with the Geometric and Orientalising periods, which roughly dates it to the 8th to 6th centuries BC. The pottery was produced, as the name suggests, in Corinth (Coldstream 1968, 91). The research area’s are the regions to the north and south of Corinth: Central Greece and the Peloponnese. Attica, the region to the east, won’t be taken into consideration as it doesn’t contain any important rivers. Only the inland sites that are known to have existed in the period 800-600 BC are used here.

This paper is primarily concerned with the distribution and quantity of Corinthian pottery. In advance, four models have been made to represent four hypothetical outcomes (fig. 1). These models are made to clarify how the study of distribution patterns may help in the study of the relation between ancient trade and rivers. The percentages indicated are the proportions of Corinthian pottery in relation to the total number of pottery in a site. The use of proportions is proposed to allow comparisons between sites irrespective of the total number of archaeological sites. The first model is that of an equal distribution (fig. 1A), where both sites on or near a river and sites far from a river have the same proportion of Corinthian pottery. This model is based on the assumption that rivers had no impact on inland trade.
The second model (fig. 1B) visualises the hypothesis that inland sites located near a river had better trade relations opposed to inland sites not located near a river. In this model, the relative amount of Corinthian pottery in river sites is significantly higher than the amount of Corinthian pottery in non-river sites.

Another possible outcome is a random distribution, visualized in the third model (fig. 1C). ‘Random’ refers to the fact that the distribution has nothing to do with either river sites or non-river sites. It might, however, not be truly random. Factors not taken into account, like type and size of site, type of river, distances and dating, can all influence the distribution pattern of pottery. This is one of the reasons to quantify the pottery finds and use proportions.

The last model (fig. 1D) is in exact opposition of the hypothesis. In this scenario, the relative amount of Corinthian pottery is significantly higher in non-river sites than river sites. This would mean that a river actually had a negative influence on inland trade. While a priori unlikely, theoretically it is a possible outcome.

**Discussion**

Trying to quantify the distribution of Corinthian pottery proved to be a lot harder than originally thought. One of the biggest problem encountered is that most publications neglect to mention the number of pottery finds, both the Corinthian as the total. More common is the mentioning of ‘some’ Corinthian pottery, which is a rather vague description. The publications go on to describe this pottery, but it remains unclear whether this description refers to all the pottery found. Since these descriptions usually contain near-perfect examples of

![Fig. 1 Four theoretical distribution patterns of Corinthian pottery in sites on or near a river and sites not near rivers. A: Equal distribution, B: Distribution in favour of sites on or near a river, C: Random distribution, D: Distribution in favour of sites nor near a river.](image-url)
Rivers and Trade in Mainland Greece

Corinthian pottery, I strongly doubt it. It is worrying that out of all sites studied, only one produced a reliable result. This concerns Olympia, where at the most 258 Corinthian vessels have been found (Heiden 2000, 168). It is noted by Heiden that this number is remarkably low for a site of its size.

Due to the lack of quantitative data, it is impossible to create a distribution map similar to the models in figure 1. This limits the usability of the results of the analysis for testing the hypothesis. It is only possible to list the sites that had Corinthian pottery present. These sites and their approximate distance to the nearest body of water are shown in table 1. A choice has been made to use the term ‘body of water’ over ‘river’, since some inland sites are closer to the sea than a river (see: fig. 2). Inland sites for which I was unable to find the presence of Corinthian pottery have been omitted from the list. While it would be good for this study to add sites where no Corinthian pottery has been found, there is too much uncertainty surrounding the absence of this material. Examples for this are the incompleteness of the publications and/or the nature of the site that has been excavated (e.g. two graves or one house). The inland sites not mentioned in table 1, but that has been researched, are Argos, Thebes, Messene, Mantinea, Tegea, Thermon, Stratos and Elis.

Looking at table 1, it can at least be said that all inland sites where Corinthian pottery has been found are within 15 km of a body of water of importance. The issue that needs to be addressed here is when the proximity of a body of water to a site is still close enough to have any influence on trade. In other words: what is ‘near’? In our modern society, we don’t view 15 km as something particularly far away. This was certainly different in Ancient Greece, but it is hard to define the way distances were experienced in the past. When assuming that everything within 15 km is ‘near’, you could say that the presence of bodies of water, and thus also rivers, influenced the distribution of Corinthian pottery. However, when assuming that everything beyond 5 km is not ‘near’, a completely different picture emerges. Half of the sites are then beyond the influence of a body of water, which could suggest that the distribution of Corinthian pottery has nothing to do with rivers.

It is at this stage that proper quantitative data would have been useful. When sites within, for example, a 5 km radius of a river have significant more Corinthian pottery than sites further away, something more definitive might be said about the role of rivers in trade. Unfortunately this is impossible to do with the current data set.

Another thing to note is that most river sites in table 1 are located near the Phliasian Asopus river. This is probably no coincidence. The Phliasian Asopus is located in the north of the Peloponnesos and flows into the Corinthian Gulf, very near Corinth itself. It is not unthinkable that the proximity of this river to Corinth enabled trade between this city-state and the

### Table 1

<table>
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<tr>
<th>Site</th>
<th>Nearest body of water of importance:</th>
<th>Approximate distance:</th>
<th>Literature:</th>
</tr>
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<tr>
<td>Sparta</td>
<td>River: Eurotas</td>
<td>On the river</td>
<td>Woodard, Droop &amp; Lamb, 1927</td>
</tr>
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<td>River: Alfelos (on the confluence with the Kladeos)</td>
<td>On the river</td>
<td>Heiden, 2000</td>
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<td>Mycenae</td>
<td>Equal distance to River: Phliasian Asopus Sea: Argolic Gulf</td>
<td>15 km</td>
<td>Klein, 1997 Wace et al., 1980</td>
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<tr>
<td>Haliartos</td>
<td>River: Boeotian Cephissus (or Kifisos)</td>
<td>On the river</td>
<td>Austin, 1926 Austin, 1931</td>
</tr>
<tr>
<td>Nemea</td>
<td>River: Phliasian Asopus</td>
<td>4 km</td>
<td>Miller (Stephen), 1976 Miller (Stephen), 1981 Miller (Stella), 1982 Miller (Stephen), 1988</td>
</tr>
<tr>
<td>Delphi</td>
<td>Sea: Corinthian Gulf</td>
<td>8 km</td>
<td>Laistner, 1913</td>
</tr>
<tr>
<td>Aetos</td>
<td>Sea: Ionian Sea</td>
<td>14 km</td>
<td>Anderson &amp; Benton, 1953</td>
</tr>
<tr>
<td>Philius</td>
<td>River: Phliasian Asopus</td>
<td>On the river</td>
<td>Biers, 1971a Biers, 1971b</td>
</tr>
<tr>
<td>Zygouries</td>
<td>River: Phliasian Asopus</td>
<td>5 km</td>
<td>Coldstream, 1968</td>
</tr>
<tr>
<td>Athikia</td>
<td>Sea: Saronic Gulf</td>
<td>6 km</td>
<td>Coldstream, 1968</td>
</tr>
<tr>
<td>Clenia (or Cleonae)</td>
<td>River: Phliasian Asopus</td>
<td>5 km</td>
<td>Coldstream, 1968</td>
</tr>
</tbody>
</table>
other settlements. However, the fact that so many of these inland sites are in the vicinity of Corinth might also indicate that the distribution of Corinthian pottery wasn’t so widespread in mainland Greece as Coldstream (1968, 91) and Risser (2001, 175) have suggested.

Most of all, what this study has shown is that there is something inherently wrong with Greek archaeology. It shouldn’t have been this difficult to find data about the quantities of Corinthian pottery, and yet it was. Different factors contribute to this situation. While it is not in the scope of this study to fully explore these factors, something needs to be said about them. Firstly, there is a heavy emphasis in Greek archaeology on the (coastal) city-states and their colonies. The limited information about inland sites might be related to the so-called ‘empty countryside’. Until very recently, the countryside of Greece was “considered a blank zone, a mere empty space between the cities and sanctuaries that attracted the bulk of scholarly attention” (Alcock 2007, 120). While not all inland areas are considered ‘empty spaces’ (e.g. Argos and Mycenae), I would argue that there is a certain lack of interest in inland Greece between the 8th and 6th centuries BC. Tied in with this is another factor: many of the excavations of inland sites occurred before the Second World War. Over the years, many publications remain incomplete and data have been lost. Another factor of importance is that reports written in Greek have never been translated. This prevents them from being used by the archaeologists unable to read this language. Lastly, and most importantly, the use of ‘some’ (and variations thereupon) is insufficient when describing the material of a particular site. While it may serve the purpose of the original author, it heavily limits the usability of the data for other researchers.

It is unlikely that these problems will be solved overnight. As a result, quantifying Corinthian pottery for inland Greece remains impossible. This is unfortunate, since its relation to rivers and trade can’t be explored to satisfaction. Using another export product might be a solution to the problem, although I would expect one to encounter similar problems. Ideally, one would like the creation of an international database of all the archaeological finds of Greece. Considering the sheer amount of materials in Greece, this is no easy task and will require a lot of time, money and manpower. To work around this, the database could at first only contain information on quantitative data. This will already greatly improve Greek archaeology in the long run.

There are other (and less extensive) options to explore. First of all, archaeological data might exist that indicates the presence of river trade. Think about direct evidence like the remains of river ships and harbours or indirect evidence like warehouses located next to the river and city plans with an orientation on the river. The written records might also give some insight. Another way to research the relation between rivers and trade is the use of Geographical Information Systems (GIS). It was brought up at the beginning of the paper that even inland trade by foot happened along the rivers, because of the geophysical environment. As of yet, this is an assumption on my part, but the use of a GIS can go a long way to give
this idea more solid ground. For example, a cost-surface analysis can be made to determine if traversing the lands surrounding the rivers (or on the riverbed itself during a dry summer) costs significant less energy than other areas (Conolly & Lake 2006, 215-225). If this is the case, it is more likely that rivers have a positive influence on trade. It is important to remember that this type of research is more suitable on a more local scale. With the advance of GIS (Conolly & Lake 2006, 1) and the other possibilities mentions, there are still a lot of methods to use and explore to either prove or disprove a positive relation between rivers and trade.

**Conclusion**

At the start of this paper it was pointed out that one of the maritime aspects of Ancient Greece, the rivers, has been neglected by archaeologists. Most archaeologists just assumed that since rivers nowadays hardly play any role in trade this must have been the same in the past. Although I wouldn’t claim that river trade was of more importance than sea trade, I also think it is not wise to disregard rivers completely.

The attempt to map the distribution of Corinthian pottery of inland sites in mainland Greece has for the most part failed, since quantitative data of the material are rarely mentioned in publications. The hypothesis that the presence of rivers improved the trade relations with the outside world has neither been proved or disproved. It did expose some major problems within Greek archaeology, which limits the usability of archaeological data.

In conclusion, the hypothesis that rivers had an impact on Ancient Greek trade remains just that: a hypothesis. However, it remains worth exploring and some suggestions have been made to make this possible. Only by understanding local trade in a maritime world can we truly begin to understand trade on a greater scale.

**Notes**

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**References**


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A dead end road?
Investigating Iron Age (800-12 BC) routes of transport on the sandy soils of the Netherlands

Karen de Vries

Introduction
The Pleistocene sandy soils of the Netherlands have been a subject of research from the early days of archaeology as a scholarly discipline. At the end of the 19th century the landscape still bore the relics of prehistoric life with dozens of megaliths and barrows visible. From the beginning, a strong terrestrial focus has pervaded the research into the sandy soils. In the first decades prehistoric megaliths and barrows were the main topics of research only to be replaced in the 1960’s and 1970’s by research into settlement systems. A strong dichotomy exist in the research on the Pleistocene sandy soils: high and dry parts of the landscape were thought to be the only places suitable for habitation and erecting funerary monuments. The wet areas were always perceived as marginal areas with no use in daily life. Only once in a while the wet areas might have been used for ritual purposes.

With such a strong focus on the land, it is no great surprise that the little research done on routes of transport were always about roads of transport. It was implicitly assumed that the systems by which transport and communication took place were land-based (e.g. Harsema 1982, 145) and that prehistoric roads must have functioned much the same as medieval roads. These roads were known from historical sources and were sometimes still visible in the landscape (Jager 1985, 186). In investigating prehistoric roads historical-geographical research was combined with archaeology (Bakker 1976, 63–64; Jager 1985). Another persistent assumption was that funerary monuments – such as megaliths, barrows and urnfields – must had functioned as markers of prehistoric roads as they were laid out in linear patterns; within urnfields the existence of prehistoric roads was even emphasized by empty spaces and the orientation of the funerary monuments such as long beds (Kooi 1979, 152, 156, 159; Jager 1985). The landscape itself was divided by researchers in areas that were traffic-hostile, such as the peat-bogs and stream valleys, and areas that were traffic-friendly, such as the higher and dryer grounds (e.g. Jager 1985, 186). The possibility of transport by waterways has been completely ignored.

If we look at the distribution of sites dating from the Iron Age (ca. 800-12 BC) on the sandy soils, there was a clear preference to be located in the proximity of little streams (fig.1). This proximity to streaming water enabled on the one hand the inhabitants of the site to exploit all the different components of the landscape. On the other hand the streams would facilitate good drainage of the area (Harsema 1982; Harsema 2009, 543). The use of these little streams as waterways in Dutch prehistory is proven by the archaeological finds of canoes out of complete tree trunks (e.g. from Vlaardingen dated to the late Bronze Age/early Iron Age (Eijskoot & de Ridder 2004, 5)) and wooden oars (e.g. from Assendelft site Q found in an early Iron Age house (Van Heeringen 2009, 589, fig.26.12).

The Dutch Iron Age is within this discussion on routes of transport an interesting period because of the movement of products on a very large scale. Bronze and iron items – such as swords and ornaments – were imported from central Europe (Van den Broeke 2009, 605). Many of those metal items were found in special contexts, such as graves or ritual places (see e.g. descriptions of find contexts in Van den Broeke 2009, 620–624). Items belonging to daily life were as well imported over great distances. Querns for instance, used for grinding cereals to flour, were imported on a large scale from the Eifel to the Dutch sandy soils. They were found as far as the province of Drenthe (Harsema 1979).

Fig. 1 Distribution of sites on the sandy soils (after Vos 2011, 59).
So it is known that there was a preference for having water nearby, products were transported over vast distances and water was used for travelling. The strong emphasis in research on land roads and the neglect of other possibilities might thus be more a product of a modern view on the landscape and not a true reflection of the prehistoric situation. This paper aims to break away from this terrestrial view and aims to investigate the possibilities for the use of waterways as routes of transport. By this, a better understanding of Iron Age routes of transport can be developed. The question addressed in this paper is whether it is possible to prove that waterways were used as routes of transport during the Dutch Iron Age (800-12 BC).

**Tracing routes of transport**

Investigating waterways as routes of transport asks for a method of marking these routes. A person can go from one place to the other by canoe or ship for hundred times or more without ever leaving a - still visible - trace behind. Only when the traces of his travels can survive into the archaeological record, the travels can be reconstructed. The best chance of recovering these travels is when objects are systematically transported from one place to the other. And again not all objects are suitable for this, because small items such as metal objects do not oblige transportation via waterways. It is also necessary to have a reasonable amount of objects of a certain type if we want to reconstruct the use of waterways as routes of transport. For these reasons there is chosen to look at the distribution of querns in the Pleistocene sandy soil areas of the Netherlands.

For the Iron Age a total of 164 querns is known (fig. 2). Not all these querns were imported, as a part of the total is made from local materials: granite (20) and sandstone (22). Querns were used from the Neolithic period until the Middle Ages. The earliest querns were introduced by the people of the Linear Band ceramic culture in the 5th millennium BC. Not until the 4rd millennium BC the first farmers in the Northern-Netherlands started cultivating cereals and using querns to grind their cereals (Harsema 1979, 7). Querns were either made from local materials such as sandstone and granite or imported from the Eifel area where they were made from vesicular basalt lava.

Not all materials were used for making querns from the Neolithic period until the Middle Ages. During the Iron Age, though, all the materials were used for querns. From this it can be deduced that a choice had to be made between querns of different materials. Local materials were much more easily accessible, but the imported basalt lava querns were more durable. Basalt lava querns had the advantage that when a part broke off the querns kept their ability to grind cereals because of the vesicular or bubbly structure and did not need to be sharpened. Another advantage of basalt lava querns over the local granite and sandstone is that the basalt lava is so fine-grained that no small particles would chip off and contaminate the flour (fig.3). This is something that does happen with the other two types (Kars 1980, 401).

The locally produced querns were made of a big stone that was placed on the ground and a smaller, second stone. This smaller stone was used to rub the cereals on the lower part and make flour out of it. The imported basalt lava querns were made of two equally large stones that were rotated on each other. This made the imported basalt lava quern much larger that the locally produced sandstone or granite quern. Because of their size, the imported basalt lava querns were likely to be transported via water.

Within this study it is of importance to bring forward the hypothesis that the distribution of the querns is a
true reflection of the distribution of these querns during the Iron Age. The discarding or ritually depositing of objects can have influenced the distribution: the finding place is not the same as the primary place of use. Querns were first and foremost functional objects: the majority of querns show traces of (heavy) use (Hopman 2010, 15). Although chopping marks and fragmentation of querns can be seen as indications of ritual use of the querns, querns were found in most cases still within the context of a settlement (Hopman 2010, 21). Once a quern was brought into the settlement presumably it was not moved out again. By this, the present distribution of querns is a reliable representation of the distribution in the past.

Models of trade
This paper aims to reconstruct the use of waterways during the Iron Age, so a model of trade has to be applied, because of the distribution of imported basalt lava querns. Different models of trade can be used, but the fall-off model is used the most (Renfrew & Bahn 2008, 376). This model is based on the premise that closest to the source most items can be found and when going farther away the number of items will decrease exponentially. A true fall-off model is only valid through so called down-the-line trading systems: a village receives in this case a certain number of basalt lava querns, of which it retains some and trades the rest. The next villages will do the same and the farther away from the Eifel region, the fewer querns will be found (Renfrew & Bahn 2008, 374-376, 379). The distribution of basalt lava querns will not follow the model if the villages are not equally spread and not all villages are just as accessible. When a particular route is used for transport, either via land or via water, the distribution will change and the number of querns will not decrease exponentially. Querns can be transported to settlements quite far away from the source as long as those settlements are close to a connecting road or waterway.

Fig. 4 (Left) A idealised distribution of querns according to a fall-off model where closer to the source a higher density of finds is expected. (Right) The distribution of basalt lava querns from the Iron Age in the Netherlands.

Local distribution of querns
As concluded above the fall-off model does not hold on a supra-regional scale, because of the use of waterways. On a regional scale it is presumed that the fall-off model also will be not valid, since it is assumed that waterways were used also for a regional distribution. To investigate whether waterways were used on a regional scale a new model was made for this research.

On a local scale other factors as well have influence on the distribution of basalt lava querns. Basalt lava cannot
be naturally found in the Netherlands, but – as said – other materials suitable for making querns can be found. So next to the presence of waterways the assessment of material also plays a part in the regional distribution of querns. For the current research a model has been made in which it is assumed that, because of their higher durability, imported basalt lava querns will be preferred over local querns. But only if these imports can be easily accessed, they will actually be acquired. In the current model accessibility to waterways is expressed in distance to waterways: waterways that are within two kilometres from the settlement are considered to be directly accessible and waterways farther away than two kilometres are considered to be not directly accessible. If the model is valid, in settlements with direct access to water people would have chosen basalt lava querns; in settlement without direct access to water people would have chosen querns made from local materials.

We want to compare the three types of querns between the areas with direct access to waterways and areas without direct access to water. Before these comparisons can be made, we have to know where the settlements were located. This is important because we want to know where the settlements were in relation to the waterways. If in a certain region all settlements are within two kilometres from streams, no querns can be expected outside the area with easy access to water. On the contrary, if all settlements in another region lie at distances of at least two kilometres to a waterway no querns can be found in close proximity to the waterway. So a settlements distribution map is needed. However, the distribution of settlements from the Iron Age is not as self-evident as it seems. It is assumed that only a small percentage of the settlements has been found. If the data on these settlements was used for a distribution map, the map would become biased. For this reason urnfields were used in this research as a proxy for Iron Age settlements. Although the precise spatial relationship between urnfields and settlements is not known because of the above mentioned lack in data, from examples where this spatial relationship is known, the urnfields were located in the immediate vicinity of a settlement (Kooi 1979, 152). For this reason, urnfields are the best representatives of Iron Age settlements.

For this model, the sandy soils of the Netherlands were divided in three regions: the northern sandy soils of Drenthe, the eastern sandy soils of Overijssel below the Vecht together with the east of Gelderland and the southern sandy soils of Noord-Brabant and Limburg (fig.5). Although all areas belong to the Dutch Pleistocene sandy soils, differences exist between their morphology and geography. The landscapes in Drenthe and the Eastern-Netherlands owe their morphology to the second last ice age (Saalien) when the ice caps reached up to the line Utrecht-Nijmegen. With these ice caps boulder clay was deposited which contained granite (Berendsen 2008, 170-172). During the last ice age (Weichselien) no ice caps reached the Netherlands, but due to the cold and dry climate sand was deposited (Berendsen 2008, 190). The Saalien ice caps never reached Noord-Brabant and Limburg so no boulder clay was deposited, as a result of which no granite can be found locally. The south of Limburg is the only area in the Netherlands where sandstone is a substratum. These differences are of importance because they determine what local material could be used for making querns.

For the reconstruction of prehistoric waterways, different maps were used. The first map used is the palaeo-geographical map of the Netherlands of ca. 500 BC (Vos 2011, 59). The advantage of this map is that it is a reconstruction of the precise period concerned in this paper and takes into account the streams as they were in this period. Another advantage is that it covers all three study areas. As a result of the big scale of the palaeo-geographical map, it lacks the resolution that is needed when dealing with small streams on a regional scale.

To compensate this lack of resolution also regional maps were used. For Drenthe this research made use of the map of the stream valleys. The relative small scale of the map makes it suitable for a regional approach, but what is depicted is a result of long formation processes. Because of this it is not sure if it not depicts the modern day situation rather than the Iron Age situation. For the eastern sandy soils use was made of a physical-geographical map (Van Beek 2009, appendix 1). It shows the landscape as it is today, formed by different formation processes. It has the same advantage as the stream valley map of Drenthe in that it is detailed because of its small scale, but also has the drawback that it shows what the landscape looks like today. Because of this it might not be completely representative for the Iron Age landscape of the Eastern-Netherlands. For the southern sandy soils no other maps were used besides the palaeo-geographical
A dead end road?

[Image 65x530 to 291x785][Image 313x624 to 539x785]

map of Vos (2011). Although all maps have their disadvantages, they were used because for this research together they make the best reconstruction of Iron Age waterways. In ArcGIS 10 the maps were georeferenced on the Dutch national grid. With the use of the coordinates in Archis, the urnfields and three types of querns were plotted on the maps.

Northern sandy soils
For the province of Drenthe a stream valley map was used to reconstruct the location of streams and rivers in prehistoric times. According to the model imported basalt lava querns are expected in a two km buffer zone around the stream valleys as the waterways were easy accessible. Outside this area granite – the local material in Drenthe – querns are expected. No sandstone can be found in Drenthe and no sandstone querns are expected to be found. Fig.6 (above) shows what the ideal distribution should look like: only imported basalt lava querns within the dark grey areas and only granite querns in the light grey areas. As shown by the distribution of the urnfields (black dots on the map), habitation during the Iron Age can be expected in the areas close to streams as well as in the areas farther away from the streams.

A comparison of the ideal distribution with the real distribution of querns (fig.6 below) shows that the real distribution does match the model. The expectation was that all imported basalt lava querns (red stars on the map) had to be found within the areas close to waterways (dark grey areas on the map). The granite querns (blue asterixes on the map) were all expected in the areas farther away from waterways (light grey areas on the map). In reality both the imported basalt lava querns and the granite querns were found in the areas with direct access to water and in the areas without direct access to water. What is perhaps as striking as the divergence of the model is the relative small number of querns in relation to the number of urnfields. By far too few querns were found in Drenthe to facilitate every settlement there.

Southern sandy soils
Only in the south of Limburg sandstone is a natural resource and only in this area the model can be applied (fig.7 left). It is expected that in the south of Limburg imported basalt lava querns can be found if within a two kilometre radius of the river Meuse and its branches. Locally made sandstone querns can be expected when waterways are more than two kilometre away. Because no sandstone can be found in the rest of Limburg, only basalt lava querns can be expected. The sandy soils of Noord-Brabant do not facilitate sandstone or granite and all querns found in this area must be imported. In Noord-Brabant according to the model only basalt lava querns can be found, as there is no convenience of availability of local materials and basalt lava querns are the most durable.

Again the distribution of querns deviates from the model. As expected, querns were found close to waterways. This holds true for both Noord-Brabant and Limburg, but against expectations all three types of querns were found in Noord-Brabant. In Limburg only sandstone querns and basalt lava querns were found, but both types close to waterways. It seems very likely that on the southern sandy soils querns were distributed by water, but that there was no preference to the imported basalt lava querns. The different types of querns have been distributed along the same waterways. From this we might conclude that the river Meuse was already known as a route of transport. This assumption is supported by the distribution of sandstone querns from earlier periods (Neolithic and Bronze Age, ca. 6000-800 BC). Fig.7(right) shows the

Fig. 6 (above) Expected areas of the northern sandy soils with basalt lava querns (dark grey) and local granite querns (light grey). (Below) The known querns plotted against the expected distribution.

Fig. 7 (Left) The distribution of querns during Iron Age. (Right) The distribution of sandstone querns older than Iron Age.

from waterways (light grey areas on the map). In reality both the imported basalt lava querns and the granite querns were found in the areas with direct access to water and in the areas without direct access to water. What is perhaps as striking as the divergence of the model is the relative small number of querns in relation to the number of urnfields. By far too few querns were found in Drenthe to facilitate every settlement there.
distribution of the sandstone querns from the Neolithic and Bronze Age. Sandstone querns are found in areas without any natural sandstone available, furthermore the sandstone querns were found close to the river Meuse and its branches. From this distribution map it becomes clear that sandstone querns were already transported via waterways before the Iron Age.

It also holds for the southern sandy soils that far too few querns were found in relation to the number of urnfields. Also some querns were found without any urnfields nearby. The location of those isolated querns is difficult to explain.

**Eastern sandy soils**

For the last region only the area covered by the physical-geographical map of Van Beek (2009, appendix 1) was analysed. The same area was analysed on the palaeo-geographical map of Vos (2011). The model for regional distribution of querns was also applied on this area. It was expected that close to waterways (blue on the palaeo-geographical map and green on the physical-geographical map) imported basalt lava querns were found and in the hinterlands the local made granite querns.

The distribution of querns on the palaeo-geographical map (fig.8-above) is as expected according to the model. All imported basalt lava querns (red stars) are located close to waterways. On the contrary, all granite querns (blue asterixes) are located farther away. If we compare the distribution on the palaeo-geographical map with the distribution on the physical-geographical map (fig.8-below), the difference in scale and resolution becomes clear. Although the shift of the waterways only seems small, it represents 2.8 kilometres. This means that querns that were considered to be in an area without easy access to a waterway, now lie in an area with easy access to a waterway. Although the distribution of querns on the palaeo-geographical map seemed to support the model, the distribution of querns on the physical-geographical maps shows that the model again failed to predict the distribution.

More deviations of the model can be seen on the complete physical-geographical map (fig.9). In the northern part of the maps, along the river Vecht, imported and locally produced querns are found close together. Both those querns were at the same distance from this waterway. Another particularity is again the total number of querns in relation to the number of urnfields.

**A dead end road?**

Concluding from the supra-regional distribution of imported basalt lava querns, transportation via waterways seems very likely. The most imported basalt lava querns were found in the areas where the rivers Rhine and Meuse enter the Netherlands. Although these observations seemed very promising for reconstructing local routes of transport via waterways, the same was not true for the different regions. For this research a model was made in which was presumed that a preference existed...
for basalt lava querns because of their durability, but only if there was an easy access to a waterway (< 2 km). This model did not hold. Apparently imported basalt lava querns were used at some great distances from waterways. Also locally produced querns were used even when the model assumed that – because of the close proximity to water – imported basalt lava querns were accessible. With making a model there is always the risk of generalizing the real situation as not all aspects that are involved in a process are taken into account. The model for regional distribution of querns only made use of two assumptions: the quality of the materials used and the proximity to a waterway. In this proximity and accessibility were seen as the same. Many other factors were not taken into account. On the divergence of the local model several remarks can be made to explain why perhaps the appliance of the model did not work.

First of all, the model has a strong functionalist-economical base. The model assumed that the choice between different types of querns was always based only on practical arguments. The most durable and sturdy querns (i.e. basalt lava querns) will be chosen if the efforts to acquire such a quern will not outweigh the benefits of the material. The model did not take into account that other considerations could be made. Tradition for example can be of influence. The oldest basalt lava querns in the Netherlands date from the Late Bronze Age (1100–800 BC)\(^6\), but sandstone querns were still used in the Middle Roman period (70–270 AD)\(^7\). The same holds for granite querns that were still used during the Late Iron Age (250–12 BC)\(^8\). Although a new and better material was available it took quite a time for people to adapt to it.

Secondly, the model assumed that an access to water must also mean an access to imported querns. This might not be true for all settlements in all areas. Not every settlement might have someone to travel to the Eifel area. If there was also no connection to a trading network, a settlement had no opportunity to obtain a basalt lava quern. Also the availability of local materials might not be even spread within a region: granite might have outcroppings in the stream valleys.

Thirdly, an either/or model was used. Basalt lava querns had to be transported by waterways, otherwise the model failed. In this, there is no option for a system in which part of the transport took place via waterways and – probably the last – part of the transport via road systems.

Finally, a remarkable outcome of this research was the number of querns found in relation to the number of urnfields. This could mean that the urnfields might not be the ideal proxy for Iron Age settlements. Another possibility is that too little querns were properly dated. Querns are sometimes found as stray finds, because they are easy recognizable by their size and material. When those querns are found without a context they cannot be dated to a specific period, because they were used for a very long time. It is also possible that querns were found in settlement context, but were not datable to a specific phase. In both cases the querns have a very broad date in Archis. These undatable querns were not used in this research. In this, the research shows us to be careful in what data we use to reconstruct the past.

**Future research**

To prove that waterways were used as routes of transport with the distribution of querns, a better understanding is needed of the mechanisms that lay behind the trade of basalt lava querns. We need to know where the querns exactly came from and how they were transported to the Netherlands. When looking at the distribution of querns in the south of the Netherlands, it seems likely that over there the querns were distributed along an already existing transport route: the river Meuse. A better understanding of these old routes of distribution will lead to better understanding of Iron Age routes of transport.

**Notes**

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   University of Groningen, The Netherlands.
2. Megaliths can only be found on the sandy soils of the northern Netherlands. They are dated in the Dutch middle Neolithic-B, between 3400-3000 BC (Bakker 2009, 307).
3. Barrows can be found on all the sandy soils of the Netherlands. They are dated from the Dutch late Neolithic until the middle Iron Age, between 2900-250 BC (Drenth & Lohof 2009, 433; Hessing & Kooi 2009).
4. As reported in the Dutch national archaeological database (Archis2), situation 13 January 2013.
5. For the convenience of comparison only distance is taken into account. The author is well aware that factors such as relief and land cover have influence on the accessibility of water features.
6. This underrepresentation of settlements is implied by the way demographical reconstructions for the Iron Age are made. For these demographical reconstructions often numbers on urnfields are used (see e.g. Gerritsen 2001, 220-224; Harserma 2009, 553-554).
7. The northern sandy soils also encompass parts of Friesland, Groningen and Overijssel north of the Vecht. Because of the available maps only Drenthe was used in the model.
8. Digitally available on geoportaal.drenthe.nl [accessed 6 February 2013]
9. Rijksdriehoekstelsel. In ArcGIS RD_new
10. E.g. Archis2: Wng nr 15178
11. E.g. Archis2: Wng nr 15895
12. E.g. Archis2: Wng nr 32262
References


the mainland. As might be expected he found an enormous variety in the configurations, leading him to the conclusion that despite similarities “... there is no such thing as a typical island that represents the Cyclades as a whole” (Broodbank, 2000; 74).

Nevertheless, islands share certain features that make them different from the mainland, some of them very obvious but not equally decisive for the islands development. An island is clearly defined by the sea around it. Whether a group of islands is geographically seen as an archipelago is defined by distance and geological unity. If islands may be called an archipelago or if they are to be treated as individual islands is not easily defined and certainly the geography alone will not relate to unity or diversity of cultures. An example is Indonesia, which is geographically a single archipelago but hardly a cultural unity.

In general, small islands lack resources to meet with all subsistence needs. Therefore Mediterranean island dwellers usually engage and engaged in trade. Polybius noted “Nobody sails the seas just to get across them”. (Horden, 2000; 342). Numerous research projects on the spread of pottery proved this beyond doubt. The possibility of growing sufficient crops to feed everyone, as we shall see later, can be a determining factor for the destiny of an island. The same is true for the presence or absence of valued natural resources in antiquity as well as today.

Throughout history, there is a strong connection between the mobility and exchange of people and goods, primarily connected to the uneven spread of resources, be it food, other commodities or skills and knowledge. Islands are topographically and by size influenced by this since their environment is delimited (Horden, 2000; 342-344).

In the modern Mediterranean, Malta has a unique position. It is the only fully sovereign state today and it formed a distinct identity that can be traced back to probably its first habitation. This paper will explore some aspects of Maltese identity. Although dynamic, it is still built on elements originating from the megalithic temple period (3500 BC) or even since first inhabitation around 5000 BC (Trump, 2002; 9). Later elements of culture added to the build-up of modern Maltese identity, without losing all ancient elements. To compare this, I will discuss the impact of Greek colonization on Sicily, where the first known indigenous identity is lost and seems to have been replaced by an identity rooted predominantly in its later Greek and Roman history.

Island cultures

To define what an island culture is, we should look at similarities and differences between island and mainland and between islands. Broodbank studied the Cycladic islands in antiquity, taking into account variables like geological features, size, inter-island distance and distance to the mainland. As might be expected he found an enormous variety in the configurations, leading him to the conclusion that despite similarities “... there is no such thing as a typical island that represents the Cyclades as a whole” (Broodbank, 2000; 74).

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Some islanders may have had warships at their disposal. For the Maltese, piracy has been an important activity for a long time. That made the island less easy to conquer but it was also a good reason to do just that in order to end piracy or to control it and use it for your own purposes. To enter piracy successfully, the community would need skilled shipbuilders, skilled sailors and good harbours (Dalli, 2011; 73-76).

When looking at a contemporary map of the Mediterranean, almost all islands are ruled by mainland states, large and small islands alike. In the Mediterranean, only Malta and Cyprus are the exceptions, although the northern part of Cyprus is in fact controlled by Turkey.
On first impression, an island may seem to be an isolated place. In the Mediterranean, this never was the case. All islands were visible from mainland or from the next island (Lätsch, 2013). The Braudelian paradigm tells us that the sea is at the same time an agent of connectivity and separation (Bonanno, 2011; 37). The separating element was especially true in antiquity when seafaring in the Mediterranean was limited to the safe months, April - September (Bonanno, 2011; 38, Morton, 2001; 255-263). Historic sources like Thucydides (5th CBC) also described islands as places of exile. The physical separation of an island created a cultural development related to this isolation, lasting at least six months a year. An island language, beliefs and social customs were formed in the community, much less influenced by neighbouring cultures then in mainland cultures.

Colonizing and Trading in the Mediterranean
Trading across the Mediterranean dates back long before colonization. For this essay I will concentrate on the later phenomenon of colonization and the establishment of trading posts, starting around the 7th century BC for Malta and Sicily. The developments for both islands will be described. To understand the differences between Malta and Sicily, it is important to evaluate some historic developments. Although every era is of influence on cultural identity, the colonization period was in my opinion decisive for as well Sicily as Malta. For Sicily this led to a full change to a Greek-based identity and for Malta the period moulded Maltese identity by gradually mixing indigenous culture with foreign influences without annihilating the past.

Sicily
Greek colonies at Sicily were established, starting around 700 BC. The aim of colonizing the island was partly to take over the arable land. Ancient writers usually tell us that colonization was the solution to subsistence problems and overpopulation in the home land, although Strabo (64 BC - 19 AD) also notes socio-political circumstances to pack your things and go found a colony somewhere. Combining archaeology and geography tells us that trade was the starting point in choosing locations. Or as Boardman put it “trade preceded the flag” (Boardman 1999, p. 162-163). Phoenician and Greek trade posts were established long before colonization in the Mediterranean started.

The indigenous Sicilian tribes distinguished by the Greeks were the Elymnians (western Sicily), Sicans (central Sicily), and Sicels (eastern Sicily) (Boardman, 1999; 43). Thucydides assumed that the Sicans were the first people of Sicily and that later the Elymnians and Sicels arrived from the Iberian peninsula and Southern Italy. The Greek historian Hellanicus calculated the presence of the Sicels to the 13th century BC (Boardman, 1999; 41).

At Sicily, Greek colonies were at first founded along the coastline. The local tribes were forced into the inland and found themselves surrounded and outnumbered by Greek settlers from various city states. Later, inland settlements were built. Over time, this was the only influence on their culture. All three gradually lost territory and were besieged and probably assimilated by the Greeks (Von Matt, 1959; 7-8). The relation of the indigenous people to the Greek settlers may have varied from cohabitation with equal rights to being subjected to slavery. According to Albanese Procelli there were several options of contact based on Greek literary sources. She differentiates between expulsion of the indigenous population by the incoming settlers, formal alliances and concessions and attempts at cohabitation. (Nijboer 2011; 5).

Some alliances were recorded, like with the Sicel King Hyblon who is said to have given the Megarans the land to build Megara Hyblaea (Marconi, 2007; 33). In the end the Sicels of Hyblon were forced to leave Sicily and try their luck in mainland Italy. The Greek colonization was a period of conflict. The immigrants however, had more to fear from competing Greek settlers and Carthaginian expansion then from the Sicels, Sicans and Elymnians. (Boardman, 199; 43). For the shaping of identity, the period of Greek (and Carthaginian) colonization may well have been a decisive turning point in Sicilian history. Sicily was attractive to colonize since it had what Greece was lacking: arable land. This advantage for the first settlers turned into a disadvantage when the outsiders took over and turned the island into an array of Greek based colonies, imposing Greek religion and symbols and a Greek identity on it.

Malta
Unlike Sicily Malta, was not colonized. It was not a place of interest for the Greeks. The first outsiders to settle on the island were Phoenician traders and their families, arriving from the 7th century BC onwards, based on two inscribed cippi (Bonanno, 2005; 42). The obvious reason that Malta was not colonized while Sicily was, is that Sicily is a large island with good arable land whereas
Malta and Gozo are small and lack resources. The largest Maltese Island measures less than 30 km from east to west and both are basically large chunks of limestone. These islands will not feed a lot of people. It is estimated that the population in prehistory was around 10,000 (Boardman, 1999; 17 and Trump, 2002; 17). The advantage of Malta is found in the natural harbours which made it suitable for founding a trading post, refuge or port of call (Aubet, 2001; 234). In the course of at least a century, the Phoenician trading post slowly turned into a Punic community. The archaeological evidence for this is found in some Phoenician tombs, built around 700 BC, and after this a growing number of Punic tombs, found across the islands dating to ± 500 BC and later (Bonanno, 2005; 56, 115, Aubet, 2001; 234-235). This shows a slow integration or cohabitation of indigenous people and immigrants. Although Aubet designates Malta as a Phoenician colony, there is no evidence for the “act” of colonization. There is also no evidence of conflicts between the newcomers and the indigenous people. On the contrary; the Final Bronze Age sanctuary of Tas Silg was used jointly by the Phoenicians and the indigenous communities (Aubet, 2001; 235). The temple was built, incorporating an earlier Neolithic temple-like structure (Trump, 2002; 138-139). Continuity is unclear but the location may still have been meaningful. Constructions are found starting 3000 BC and occupation of the location is suggested up to 700 BC, when the first Phoenician constructions were built. Later phases incorporate Punic, Roman and Byzantine periods (Bonanno, 2005; 284-285).

The Maltese landscape is quite barren. On a limited scale, agriculture is possible on terraces and water supply had to be secured from rainfall in large cisterns. Traded products were small-scale goods like honey. Melita is “Island of honey”. Another product is fine linen and wool clothing, for which the Maltese were famous in ancient times. Malta was, when its population grew, not capable of properly feeding its people from local resources which then made it largely dependent on trade, for the most part with its neighbour Sicily. A long tradition of trade contacts between Malta and Sicily is shown by Stentinello style pottery, encountered first in 6\textsuperscript{th} millennium BC in the Uzzo cave at Sicily with a parallel at Malta in the Skorba temple site (Ross Holloway, 1991; 7-16). Which items exactly were traded remains in the dark.

Both Malta and Gozo were known to the Greek. According to the Maltese, Gozo holds the Calypso’s Cave where Odysseus was held captive by Calypso for seven years. Gozo would then be the island Homer called Ogygia mentioned in Odyssey V en Odyssey VI 169-210 (Homer, 1956; 461).

Identity

Identity is based on cultural inheritance, from which ethnicity (or even perceived ethnicity) is one of the parts. It is clear that the identity of a people is not static. Ethnicity is closely connected to culture but as we have seen, ethnicity is not a continuous factor in the history of a landscape. Identity is based on identification with a certain group but, however strong it may be felt, in the long term there is no one-on-one relationship between culture and ethnicity (Jones 2010; 305). In fact, I would like to add, the landscape is much more the stable factor in any culture. Although changing too, it usually does so in a very slow pace.

Nationalism, one of the forces shaping identity, makes use of symbols of the past. This is as much true for Malta and Sicily as it is for Egypt or Greece where the ancient past is used to form present identity. The same use of symbols can lead to modern day conflicts as it did between Greece and the new Republic of Macedonia where different moments in history are used to claim or deny the “ownership” of symbols or territorial rights by different parties (Renfrew and Bahn, 2008; 548).

According to Bourdieu, ethnicity is formed through consciousness of factors like morality, habits and practices, division of labour. These factors form a social environment Bourdieu calls a habitus. This is the structure that is formed, maintained and constantly reshaped by the shared beliefs and social practice of a people. Indeed a structure, restructuring itself (Jones, 2010; 301-310). The landscape is an important factor in the structure as it holds the natural environment, territorial markers like rivers, mountain rangers or the sea, as well as many cultural important structures. In this case these are the megalithic temples of Malta and the Greek temples of Sicily. An island culture is different from mainland cultures through its clear borders.

Historical interpretations and meanings are individually learned. Together with the environment, they shape a culture in which human behaviour is an adaptation to the world as individuals imagine it to be, rather than as it really is (Trigger, 2003; 653). The following paragraphs should be read with this in mind.

Language as an identity marker

Regarding the modern Mediterranean there are some notable differences and similarities in language. On almost all eastern islands, Greek is the primary language, with the exception of northern Cyprus. Along the North African coast, Arabic is standard. The central and western islands are all part of mainland states: Spain, France and Italy. The islands along the eastern Adriatic coast are also part of a mainland state; Croatia. Malta is the only undivided sovereign state and is also the only European island where a Semitic language is the primary language. Furthermore on all larger western islands a local language
is still alive to different levels but it is never the official language. The official language is that of the ruling mainland culture. In this respect, Sicily is the exception: there is a local dialect but the primary language is Italian. The antique island languages no longer exist on Sicily.

Mabry states that in any country language serves as an immediate and obvious marker of identity. Other markers are e.g. social customs, phenotypical differences and religion. These identity markers become rallying points in times of conflict. From this follows that in competition between cultures, the triumphant culture has its own preferred language which is then protected in its state formation processes. (Mabry, 2011; 191). Language is a binding factor. In ancient Greece, the Panhellenic games at Olympia were exclusively held for Greek speakers, binding the Greek city-states into a greater Hellenic unity (Renfrew and Bahn, 2008; 193).

According to Dalli Maltese is an Arabic language that can be linked to the Sicilian Siculo Arabic which was spoken there until all Muslims were expelled by the 11th century AD by Christian rulers (Dalli, 2011; personal communication). This language survives as Maltese up to the present day. According to Fellman, Maltese is a North African dialect which in its linguistic morphology was Europeanized after the Arab rulers of Malta were expelled around the 11th century AD. Maltese language was also Semitic before Arab rule. This was in the period ca. 800 B.C.E. - 218 B.C.E., when the Phoenicians and later the Carthaginians ruled the islands and imposed Phoenician and later Punic. Modern language includes a script using Latin characters. Fellman states that “the Maltese are Catholics and disavow the Arabic connection, viewing themselves and their culture as European and not Islamic in any sense” (Fellman 1982; 896).

Sicily, as said before, did not maintain the ancient Sicilian languages. There is no trace from Sicel or Elymnian language. The later Arabic dialect, brought to the island by Punic settlers, was removed by force when the last Islamic inhabitants were removed from the island. The language of the Greek settlers also disappeared after the island came into Roman control.

Other identity markers
Besides language, religion is often an identity marker. It can exist as a unifying element in a group and, in many cases, as a dividing element or a source of bitter conflict within a nation or a population. Island cultures are no different from mainland cultures in this aspect. Symbols are a second marker that cultures use to express what they see as their identity.

At Malta, an important identity marker is the early temple culture, which returns in the modern day coinage. The obverse shows images of the Mnajdra temple (3500 BC), the Maltese coat of arms and the Maltese Cross. They represent the temple period, the connection to the Knights of St. John and the Christian identity of the island. The temple period is archaeologically well documented and the megalithic temple sites, some of them very well maintained, are an important tourist attraction.

Sicily’s symbol is the Triskele. The Triskele represents the triangular form of the Island in the three legs and reflects a Greek past in using a Medusa image in the centre. Trinakria (three cornered island) is also the ancient Greek name of Sicily. Tourist information on Sicily never fails to include the temples and other structures built by the Greek immigrants. When we turn to archaeology, the vast majority of research and literature deals with the Greek, Roman and later periods of Sicilian history and not with its pre-Greek prehistoric ‘native’ past.

The difference between the two islands is clear. Malta moulds its identity around ancient symbols, early Christianity and a language that can be traced back to at least 870 AD, if not at least partly to the Phoenician and Punic periods. It is in this sense an identity based on many elements of human inhabitation during some 7000 years. Sicily finds its identity markers in a Greek past. This can be traced back to ± 700 BC but it lacks a connection to the first indigenous people and is therefore in general the culture of immigrants. Christianity is also the primary religion on Sicily but is much less used to express Sicilian identity than on Malta. The reason for this may
be the earlier mentioned Maltese wish to profile themselves as being a part of the Christian-European world as opposed to the North African Islamic world. Grabbing back to specific symbols connected to an islands (pre)history is used to confirm the islanders' special identity as they see it.

Malta is convinced of a continuous history of the islanders down to the very first settlers. The following was published on May 7 2013: “Heritage Malta launched a 3D virtual reconstruction of facial features based on one of the prehistoric skulls (over 5,000 years old) found at the Xagħra Stone Circle in Gozo. It revealed, for the very first time, what one of the earliest Maltese actually looked like. It was a face which was much closer to what one would expect from a woman of our day and age rather than that of a person who lived on the islands over 5,000 years ago.” (Times of Malta, 2013). The reconstruction conveniently fits into the Maltese perception of an unbroken descent from the first inhabitants. Nevertheless, it is still for a large part an artist’s impression and less solid than proof from DNA testing.

Archaeological and historical problems and later developments

Both islands share a long history of outside influence and rule, during and following the colonization period. Romans, Arabs, Normans and many others ruled the islands to form them to their present state.

Archaeological literature on Sicily tends to concentrate on the Greek and later periods. The indigenous people are largely neglected or at most mentioned briefly. This is partly a result of a lack of archaeological material but may well also be a lack of archaeological interest. For the case of Sicily, I believe this is a problem in understanding the process of colonization of the island: it largely deals with only one of the people involved: the colonizing Greeks. Further research to compensate this would be advisable. This is equally true for Malta where historical texts as well as archaeological research tells us much concerning the incoming peoples but much less on the Maltese themselves.

Archaeological bias and identity

Early Maltese archaeology showed a lack of interest in Medieval and Arab times. Remains from these periods were quickly removed to reach the ‘interesting’ Roman and earlier layers (Dalli, 2001; personal communication).

The Maltese regard and profile themselves as an early Christian society that survived Islamic rule. Today nearly all Maltese regard themselves Roman Catholic. The shipwreck of St. Paul, on his way to Rome, is regarded as one of the most influential happenings on the island, delivering the first roots of Christianity to the Maltese in 60 AD, despite uncertainty if it really happened. The Maltese however have no doubts in this. In this debate we may state that “mythology makes history irrelevant” (Dalli, 2001; personal communication). The same shipwreck adventure is claimed by the Croatian island of Mljet, or Milete Adriaticum and the Greek island Kefallonia, although these routes for a journey from Alexandria to Rome are unlikely (Bonanno, 2005; 199-200).

An important question is: who are the indigenous and is descent, actual or assumed, connected to identity? People moved all over the world during millennia. Are the indigenous people the first people we know of or is this a modern construct? The western world considers itself as built on the ancient Greek culture and ideas of democracy. Influences from the Levant and farther east have been left out in the creation of this identity. Pinpointing identity to a single source is a denial of cultures influencing and moulding one another. This will result in an incomplete picture of history, not in understanding it.

Conclusion

This study suggests that identity is a dynamic mixture of fact and fiction, formed by history, by interpretation of history and by choices made in the agency of symbols and religion. The landscape and location of an island have a clear impact on this process. Important features in the landscape are the physical remains of early cultures which are used to shape identity, regardless of an actual ethnic connection to the builders. Malta builds identity partly on the early megalithic temples constructed by the first inhabitants while Sicily’s identity is partly based on the Greek temples and symbols, constructed and used by immigrant groups. Together, natural and cultural features are important to create the islanders’ identity.

Before the industrial revolution the only means of contact from islands to the surrounding world was through shipping. The islander’s world was tightly bound to the maritime setting of the island. Modern, shipping, communication and aviation brought islands closer to the mainland. Socio-political developments determine the identity of all people everywhere. This also determines what parts of history and material and spiritual culture are completely lost and which are kept until this day to make us out the identity of a people.

In all these respects, the history of Malta produced an identity slowly moulded since the islands were first inhabited. Nearly all aspects which influenced Malta over time are still part of the islander’s identity. The islands size and landscape, lacking natural resources, made it a place to visit, to rule over, to trade with etc. but apparently not as a place to colonize. Sicily did have these natural resources, mainly thanks to its size and its arable land. As a result of colonization by Carthaginian and Greek immigrants, the cultural history from Neolithic until ± 700 BC seems to be a lost part of modern day Sicilian identity.
Why parts of history are rejected and other parts are held on to is a matter of choice in time and can never be explained by a single issue. Important is that an island culture appears to build its identity on its “islandness”, using language, social behaviour, religion, historical symbols and cultural heritage. Which elements of history are held high, which are not and which elements change, is a question of economic and demographic developments, or in the Braudelian paradigm, a time-concept of Moyenne durée.

So in the end: a people’s identity will change through politics, power, trade, economics, cultural encounters, immigration/colonization and aspects of the physical and cultural landscape. Identity may keep parts of ancient history in daily life or remember them at the level of archaeological information, showed in a museum. If this is for the better or not, is open to debate. The mission for archaeology as a science is to carefully review its spread of attention to archaeological material and data. The question if in colonization processes the early people are removed from the collective memory or, on the contrary, are still incorporated in a peoples identity system deserves a better answer. Archaeology still has some work to do on the topic. Transferred to modern day life, this may help us better understand and review ethnic, social and religious encounters and conflicts.

Notes
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References

The Samothracian cult and the maritime world (4th century BC – 2nd century AD)

Dies van der Linde

“The isolated location of Tainaron is well known and has in fact played a major part during the entire history of the region. The area is (very) rocky and mountainous and access to the sanctuary was difficult, at least overland.” (Schumacher 1993, 80; my emphasis)

In this treatise Three related sanctuaries of Poseidon: Geraistos, Kalauria and Tainaron Schumacher (1993) aims to explain the relation between three sanctuaries of Poseidon by way of their common function as place of refuge. According to Schumacher (1993, 80-81) this function is expressed, most clearly, by their peripheral and isolated location: a suitable place thus for refugees, far from society. For his purposes, this perspective from society, i.e. the city in Schumacher’s eyes, might be fruitful, but as is clear from the quote above, this isolated and peripheral location is not at all isolated and peripheral from a maritime perspective. Sailors and merchants travelling along the coastline would frequently encounter a sanctuary of Poseidon at locations that were very prominent when approaching them from the sea: these sanctuaries rose high above sea level on promontories and islands, where worshippers could offer to the God of the Sea before continuing their journey (fig 1; Schumacher 1993, 72, 77-78). This change of perspective, thus, opens up a whole new world, a maritime world, and creates new views on these sanctuaries and their significance.

In the western world of today people in general have a worldview that is mainly focused on the land. We travel less by boat and much more by airplane and car. Not that long ago, however, many people saw the world from a maritime perspective and the boat was the dominant means for travelling and transportation. Turning to the Mediterranean world during the heyday of the Greek poleis and the Hellenistic monarchies the Mediterranean Sea was a very important aspect of people’s lives. We only have to look at the distribution of Greek colonies across the Mediterranean to note that the bulk of these colonies can be classified as coastal cities. Next to that, the Aegean Sea in between Greece and Asia Minor is dominated by hundreds of islands that were linked to each other and to the coastal cities on the mainland by means of maritime connections. Naturally, the totality of all these connections might be called a maritime network (Malkin 2011, 3, 15-16). While historians and archaeologists from the 1970s onwards focused their attention increasingly on the hinterland of cities, that is the countryside, it has recently been recognized that in a lot of cases the sea and the neighbouring islands constituted a more important and more influential hinterland, if not the central playground of these Greek cities (Horden & Purcell 2000, 133-136; Malkin 2011, 48-50). Related to the increasing attention paid to networks and network theory by historians and archaeologists (Malkin a.o. 2007; Malkin 2011), maritime aspects and perspectives have begun to form an important field of interest in studies of the Classical and Mediterranean world.

The importance of the maritime world was not confined, however, to interaction between cities. Cult places were connected in a similar way: pilgrims travelled by boat to famous sanctuaries like the one of Apollo at Delos and during the early period of existence of this sanctuary the people that showed interest in the sanctuary mainly originated from neighbouring islands in the Aegean Sea. In this way, the sanctuary of Apollo constituted a central node in a religious network of islands (Constantakopoulou 2007, 38-58). However, not only famous sanctuaries were involved, cult places were erected on numerous small and seemingly isolated islands or islands off the coast that were attended by sea travellers passing by. On the island of Syros, for example, several rock-cut inscriptions have been found dedicated to the goddess of fair sailing, Aphrodite Euploia (Horden & Purcell 2000, 440). So cult places, whether they were large and famous sanctuaries or just a certain rock, were strongly connected within a maritime network. Based on these insights this paper focuses on another famous cult and sanctuary, particularly popular during the Hellenistic and Roman period: the cult and sanctuary of the Great Gods of Samothrace. Although several studies have been devoted to this famous cult, they have mainly dealt with the identification of the Great Gods, with the nature of the mysteries that took place inside the sanctuary, with a comparison of the Samothracian cult with other mystery cults and, of course, with the famous Nikê of Samothrace that is nowadays displayed in the Louvre at Paris (Bowden 2010, 49-67; Burkert 1993; Cole 1984; Lehmann 1973). This is not to say that earlier scholars have not acknowledged some of the most obvious maritime aspects of the Samothracian cult, but they have never stressed the significance of these aspects. In accordance with recent
views considering the Classical and Mediterranean world as a very maritime world this paper aims to argue that these maritime aspects did indeed constitute significant and central elements of the Samothracian cult.

The Samothracian gods: protectors of seafarers

Research on the Great Gods of Samothrace for a long time has been preoccupied with the identification of the gods. Who were they? And how many were they? Using literary and epigraphic sources scholars have connected the Great Gods to other known gods, mainly to the Kabeiroi and the Dioscuri (Bowden 2010, 53, 63-64; Burkert 1993, 181, 186-187; Cole 1984, 1-2). This preoccupation with the identity of the Great Gods is not that remarkable, since the ancient sources give a good reason for it. These sources are often contradictory and the gods have been identified with a variety of Olympian and Anatolian gods based on supposed similarities. In the Roman period other identities were proposed, for example by Varro, who stated that the Great Gods were similar to the Penates and Jupiter, Juno and Minerva (Cole 1984, 100-103). The difficulty of identifying the gods is made very clear by an inscription from Delos referring to “priests of the Great Gods of Samothrace, the Dioscuri, the Kabeiroi” (Bowden 2010, 65-66; Cole 1984, 78-79). Bowden (2010, 66) sees this inscription as evidence that people were reluctant and ignorant as regards the identity of the gods,
The Samothracian cult and the maritime world

while Cole (1984, 79) argued that the Samothracian gods here were assimilated to the Dioscuri and the Kabeiroi. Either way, the inscription displays the difficulty people in ancient times could have with the identification of the Great Gods, just like modern scholars have and have had. It has been suggested that this secrecy regarding the identity of the gods probably constituted an important element of the mysteries of the Samothracian cult (Bowden 2010, 67; Cole 1984, 1). The Great Gods were anonymous gods and were only venerated as a group.

Regarding the question why these nameless deities were venerated, the ancient sources display much less confusion and contradiction. Ancient authors are unambiguous concerning the ability of the gods: they protected people at sea and saved them from storms and other dangerous situations (Bowden 2010, 66 n.31; Cole 1984, 6). Several inscriptions found scattered over the Greek world support this ability. They show the gratitude of people when they had survived severe weather at sea (Cole 1984, 61). One good example is the dedication found at Koptos in Egypt, in which Appolonios of Thera thanks the ‘Theoi Megaloi Samothrakes’ for saving him when in danger on the Red Sea (Cole 1984, 64; for another example: 65–66; fig 2). This main characteristic of the Great Gods has been acknowledged by scholars, but has never received the attention it deserves (Bowden 2010, 66; Burkert 1993, 183; Cole 1984, 6). There is something to say, then, that scholars have put too much

Fig. 2 Map displaying the provenance of theoroi and mystai as mentioned in the inscribed lists found at Samothrace. Slightly modified version of figure 1 and 2 in Dimitrova 2008.
emphasis on the identification of the gods, the mysteries and their potential meaning in order to understand the Samothracian cult and its worshippers, while there is abundant and less contradictory evidence supporting the view that the main reason for people worshiping these gods was their power to protect and save people who were travelling the seas. So, it is primarily this particular ability of the Great Gods that made people worship these gods and attracted them to Samothrace or other cult places of the Samothracian gods.

**Samothrace and the sanctuary of the Great Gods**

The sanctuary of the Great Gods was situated on the island of Samothrace. This island, located in the northern part of the Aegean Sea (figs 1 and 2), was and is dominated by a circa 1600m high mountain. Since this mountain is one of the highest in the region, the island was visible from afar and very recognizable, whether you approached it from the Thracian mainland to the north or from neighbouring islands like Lemnos, Imbros and Thasos. Due to the strong winds coming from the north and those that rush down from the mountain, approaching the sanctuary and the city of Samothrace both located on the northern side of the island was a rather dangerous business. The fact that the island did not have any natural harbours as has been attested already by Pliny the Elder (*Nat. Hist.* 4,12,73), contributed as well to the difficulty of reaching the island and anchoring at it (Ehrhardt 1985, 11-16; Horden & Purcell 2000, 442). These qualities of the island had a great impact on the primary reason of worshipping the Great Gods (Cole 1984, 5-6).

The origins of the cult of the Great Gods at Samothrace are quite obscure, but the heydays of the cult in the Hellenistic and Roman period are well known. Especially in the fourth and third century BC Hellenistic kings showed great interest in the sanctuary of Samothrace and it is from this time on that monumental buildings started to be erected (Ehrhardt 1985, 74-80; Wescoat 2010). For my purposes, two particular structures in the sanctuary are of interest: the so-called *Neorion* and the Nikè-monument (fig 3).

The *Neorion* was constructed in the first half of the third century BC as is indicated by pottery finds from the construction fill. It was placed on a terrace overlooking the central area of the sanctuary and providing a good view at the sea to the north. The building was divided in two parts, one of which served to house a whole ship dedicated to the Great Gods. Some of the marble supports for this ship were found in situ, while others were reused as building material for later structures (Wescoat 2005, 158, 163-165; Wescoat 2010, 22). The direct motive remains uncertain, although a naval victory for the Hellenistic kings is the most likely occasion to think of (Wescoat 2005, 170-172). However, whether commissioned by one of the Hellenistic kings, queen Arsinoe or the Samothracians themselves, the very act of constructing an edifice, set at a prominent location within the confines of a sacred space, and placing in it an entire ship as a dedication to the Great Gods, does already display “a deeply felt need to acknowledge the centrality of the cult in success at sea” (Wescoat 2005, 171). Only one other building housing a whole votive ship is known in the Greek world, indicating its extraordinary nature (on Delos: see Wescoat 2005; Wescoat 2010, 22).

The other structure of interest here is the Nikè-monument that is most famous due to the statue known as the Nikè of Samothrace that originated from this monument and is now displayed in the Louvre in Paris. It was located at the top of the theatre complex in the vicinity of several other statue monuments (fig 3). Its date, its commissioner and its purpose have been debated several times, most recently by Palagia (2010; Lehmann 1973, 179-198), who attributes the monument to the Romans who commemorated the capture of Perseus in 167 BC which put an end to the kingdom of Macedonia. However, she provides just an additional possibility very much based on probable scenarios. Therefore it is impossible to say what was the specific relation between this monument, the sanctuary and the Great Gods. Although the significance of the Nikè-monument in relation to the cult of the Great Gods is hard to establish, the significance of the monument itself is reflected by its prominent location, its large dimensions and its materials (Lartian and Parian marble) and therefore the Nikè-monument comprises another significant maritime aspect of the Samothracian sanctuary, no matter by whom it was commissioned or for what purpose it had been constructed.

**Worshippers of the Great Gods at Samothrace**

Apart from the several monumental structures the Samothracian sanctuary was also characterized by numerous stones inscribed with lists of names dating mainly from the second century BC to the early third century AD (Cole 1984, 38). These names belonged to people who were initiated in the Samothracian Mysteries (*mystai*) or to representatives of other cities or sanctuaries (*theoroi*) that came to Samothrace to attend religious festivals, to set up dedications to the Great Gods or to become initiated as well (Cole 1984, 38-56; Dimitrova 2008, 4, 9-14). The initiates are represented by almost every class of society, including slaves, freedmen, citizens, officials and royalty. The initiates included both men and women (Dimitrova 2008, 245). Important to note is that people coming to Samothrace more often than not travelled in a group, indicated by the fact that initiates placed in one list originated from the same city. Sometimes the captains or sailors of the ship who brought the initiates to Samothrace were mentioned as
well and some inscriptions identify the initiates as soldiers, sailors or family groups (Cole 1984, 44-45, 93, 99). In this way, then, travelling to Samothrace and attending the festivals, rituals or initiations was often a collective act strengthening bonds between the people involved.

Another kind of information provided by these lists consists of the ethnicity and the city of origin of the mystai or the theoroi (Cole 1984, 42-46, 48-52; Dimitrova 2008, 71-72, 243-244). Most of the people who inscribed their names originated from the western coast of Asia Minor, the Aegean islands or the Thracian coast (fig 2). Although less underrepresented than previously thought (Cole 1984, 43; versus Dimitrova 2008, 5, 71-72), people of the Greek mainland are rather infrequently attested on the lists. The distribution map, then, shows clearly that the bulk of the represented cities comprises coastal cities or islands connected with the Aegean Sea. Although this distribution map is based on the epigraphic studies of Cole (1984) and Dimitrova (2008), they both failed to see what was the characteristic common to most of the mystai and theoroi travelling to Samothrace: they originated from coastal cities or islands and had a strong relation with the sea.

An aspect related to this distribution map that has rather been neglected, is the journey to Samothrace itself. To be able to participate in the initiations or celebrations on Samothrace, people traversed the seas for hundreds of kilometers (or in rare instances even a much greater

Fig. 3 Plan of the sanctuary of the Great Gods of Samothrace in the first century AD. Red circles indicate the Neorion (29 and the Niké-monument (12). From: Wescoat 2010, fig 3.3.
The spread of the Samothracian cult

The Samothracian cult of the Great Gods did not limit itself to the island of Samothrace, but spread over the Greek world from the Hellenistic period onwards. While on Samothrace the Samothracian deities were always referred to as ‘Great Gods’ (except for one occasion), outside of Samothrace the same gods were called ‘Samothracian gods’ or ‘Great Gods of Samothrace’. The evidence for the spread of the Samothracian cult consists of personal dedications or inscriptions mentioning priests, temples or associations dedicated to the Samothracian gods (Cole 1984, 57-86). While the first category might reveal quite isolated instances of worship, the second category of evidence shows that throughout the Greek world people gathered and organized themselves to venerate the Samothracian Gods in their own city. Figure 1 clearly indicates that the places where these gods were worshipped are concentrated along the coast of the Black Sea, the western coast of Asia Minor and the Aegean islands. Again, Cole (1984, 58) only mentions this geographical distribution and notes the relative absence of places in mainland Greece. However, important is the fact that coastal cities and islands are best represented, indicating a special interest of the inhabitants of these cities in the cult of the Samothracian gods. Especially on the island of Rhodes the worship of the Samothracian gods appears to have been rather popular, since personal dedications and inscriptions referring to priests, temples as well as private associations called Samothrakiatai have been found there (Cole 1984, 65, 74, 84-85). Two cities are clearly situated land inwards: Seuthopolis in Thrace and Apameia in Asia Minor (fig 1). The temple of the Samothracian gods at Seuthopolis might probably be connected to the special interest of the Macedonian kings during the fourth and third century BC. The inscription is indeed dated to the end of the fourth century BC and is the earliest known example of an inscription mentioning the Great Gods outside Samothrace (Cole 1984, 59-60). The personal dedication at Apameia clearly states that the dedicator had been saved from dangers at sea. So, while the dedication was placed far inland, the reason for the dedication originated in a maritime context. In the case of personal dedications, then, we should be aware that they could be placed at any place, meaning that their location not always constitutes a decisive factor when looking for maritime aspects (the same holds for the provenance of the mystai). In contrast, organized and established cult practices are much more bound to their location. Seuthopolis, then, should be regarded as an exception and in general it appears that the worship of the Samothracian gods was concentrated in coastal cities and on the Aegean islands.

Some of the inscriptions tell us more about the identity of the worshippers and the reasons for dedications to the Great Gods of Samothrace. When a reason is included in a personal dedication, this reason was always the dedicator’s urge to express his gratitude to the gods for rescuing him from dangers at sea (Cole 1984, 61, 69; see earlier for the dedications found at Koptos and Apameia). The members of private associations of the Samothracian cult, especially on Rhodes, were called ‘Samothrakiatai’ and in one instance they refer to themselves as ‘Rowers’ when honouring a naval commander, indicating their affiliation with maritime activities (Cole 1984, 85). At Ephesos an inscription mentioning a Samothrakion, a temple or shrine dedicated to the Samothracian gods, was found near the harbour. According to the inscription, this edifice was located near or within a Fishery Customs House. Although the evidence is not conclusive, Cole (1984, 80) assumes that this ‘Samothrakion’ was primarily frequented by the fishermen paying their taxes in the Customs House. Lastly, I should mention the Samothrakion on Delos that has been attested archaeologically as well. Although originally called a Kabeiron, from the middle of the second century BC the building was referred to as a Samothrakion (see above for references to the priests on Delos). Within this building inventories have been found mentioning dedicated statues and, more importantly, several votive objects including two iron anchors, three wooden anchors and a trident (Cole 1984, 80). Whether these objects were dedicated due to the nature of the Samothracian gods or due to the nature of the dedicators cannot be determined, but as is true for the other examples mentioned here, the relation between the Samothracian gods and its worshippers clearly is a maritime one.

Conclusion: the Samothracian cult in a maritime world

The Samothracian cult and its sanctuary has interested scholars for decades. The presence of several maritime
aspects of the cult has been noted, but has never been put into the spotlights. This is not surprising since the value and importance of a maritime perspective for the Classical and Mediterranean world has only recently been acknowledged. So, in the light of these scholarly developments, this paper has explicitly dealt with aspects of the Samothracian cult that have a clear maritime connotation. In the paper it has at first been highlighted that the main reason for people to worship the Great Gods of Samothrace was their capacity to protect and save people when in danger at sea. Secondly, the sanctuary of these gods was situated on an island that required quite some sailing skills to reach. Thirdly, the importance of the sea for this cult has impressively been expressed by the Neorion housing the dedication of an entire ship and by the monument that supported a statue of Nikê standing on a prow of a ship. A fourth aspect entails the worshippers, who originated from coastal places, who were often connected to the sea in daily life as well and who were, as pilgrims, willing to make a journey overseas for hundreds of miles to come to the center of the Samothracian cult. The fifth aspect contains the spread of the Samothracian cult to coastal places, where people involved with the sea organized themselves to collectively worship the Samothracian gods. While these aspects individually would not make a strong case when stressing the significance of their maritime character, together they do. Maritime elements were incorporated in central aspects of the Samothracian cult ranging from the Great Gods themselves, the location and monuments of the sanctuary to the worshippers and spread of the cult. The maritime world, then, was part and parcel of the Samothracian cult.

Of course the Great Gods of Samothrace were not the only deities involved with maritime matters. As mentioned in the introduction, sanctuaries of Poseidon were often located on prominent promontories extending into the sea. Next to such monumental cult places, smaller cult places were to be found scattered over the numerous islands of the Aegean and along the coastlines of Greece, Thrace and Asia Minor. All these cult places, large and small, together form a network of cult places that had a special meaning for people involved with the sea. Whereas this paper has shown that the maritime world constituted an intrinsic part of the Samothracian cult, further research should concentrate on the Samothracian cult as part of the maritime world by placing the cult within the wider maritime network of cult places.

Notes
1 Email: diesvanderlinde@gmail.com
2 Stadiumweg 26, 1077 SM Amsterdam, The Netherlands.
3 For figure 2 I have excluded some of the places mentioned by Cole (1984), because the evidence merely consisted of an inscription which only named the Samothracian gods (Gökçöreön, Bizone and Kythnos: Cole 1984, 68). The only certain thing that can be extracted from these inscriptions is the fact that the Samothracian gods were known at these places. Two other places are also omitted from the distribution map, because it is doubtful whether in these instances the Samothracian gods constitute the actual subject of worship (Fasilar and Kyrene: Cole 1984, 66-67).

References


On terpen from Flanders up to Frisia
Two maritime regions from the last centuries BC until the Late Middle Ages compared

Sophie Thasing

Introduction
The Dunkerque transgression model held archaeological research of maritime regions in its grasps for decennia. It was believed that fundamental changes occurring in the coastal areas during the Holocene could be connected to shifting periods of rapid sea level rise (transgressions) and to slower sea level rise or even a drop in sea level (regressions), both driven by climate change. During transgressions clay and sand would have been deposited and during regressions vegetation could develop in the coastal area, which could be recognized by peat layers and vegetation horizons. These periods of varying sea activity were believed to influence habitation of the coastal area as well. During regressions, characterized by a relatively low sea level, the highest parts of the salt marshes became suitable for habitation. Transgressions, on the contrary, made settlements in the coastal area unfit for habitation. Archaeological, earth scientific and historian studies on maritime regions were influenced by the Dunkerque Transgression model until well in the 90ties of the twentieth century (Vos & Knol 2005, 120-121).

In Belgium the Dunkerque Transgression model led to an overall belief that the coastal area was not suitable for habitation during the 3rd until the 8th century and because literary sources from before the 8th century are lacking, finds were misinterpreted. It was thought that the Dunkerque transgression-phase 2 took place between the end of the 3rd century and the beginning of the 8th century (Tys 2003b, 258). When the Dunkerque transgression model was dismissed at the end of the 20th century, the image about habitation in this area gradually started to change. The archaeological finds collected from the Belgian coastal area during the time of the Dunkerque Transgression model has now been reviewed. Several field surveys and a some excavations provide evidence for habitation starting in the late Merovingian period (o.a. Tys 2003b, 263; Deckers 2011; Pype 2002). Amongst different settlement types that have been observed are so-called terpen (Dutch-language term for man-made dwelling mounds, singular: terp), well known and quite elaborately studied in the northern coastal area (or the terp area) of the Netherlands. It might thus not be surprising that researchers of the Belgian coastal area modelled their interpretations after the Dutch terp area. By taking habitation models on the terp area of the Netherlands as an example, albeit implicit, it is assumed that these areas show some resemblance. Although they are both former maritime environments, the question is raised here to what extent these two different areas can be compared to each other. By taking into account the natural landscape, culture development and the research history, what can we learn of different or similar approaches and the reconstruction of both maritime cultures? In this contribution I will outline the history of research in both areas, the two regional landscapes and the livelihood illustrated by food supplies and exchange. By doing so I will discuss some of the theories that originate from the Groningen-Frisian terp area used by Belgian researchers to explain patterns in their coastal area. By becoming aware of the differences and similarities in the aspects mentioned above, we gain a better understanding of maritime development in both areas, particularly in the Belgian coastal area. It will enlarge the awareness of research possibilities in the Belgian coastal area, which will be helpful to improve theories and future research questions. Furthermore, it will make us aware of the fact that we, as scientists, are influenced by ideas that cause us to think differently about similar patterns we detect.

Environmental situation and habitation history
The terp area of the Netherlands lies some 250 km from the Belgian coastal plain. While the latter lays directly on the North Sea, the northern coastal area of the Netherlands lies on the Wadden Sea, an inland sea with indirect influence of the North Sea. These two locations were exposed to different coastal developments until the moment of embankment (in both regions in later medieval times (Tys in press.; Mol 1992)).

The ground of the northern Netherlands settles faster than the coastal areas of the western Netherlands and Belgium. The strong descending basin of the northern coastal area of the Netherlands needs more sediment to fill it up than the slower descending basin of the Dutch west coast and the Belgian coastal area. A predominant western wind provided a bigger transport of sand to the Belgian coast - which caused dunes to form, than to the northern coastal area of the Netherlands. As a result, the latter remained an open coastline during the Holocene.
Sophie Thasing

The coastal area of the northern Netherlands became suitable for habitation and the end of the Early Iron Age (around 7th–6th BC) (Vos & Knol 2005, 123-124; Bazelmans et al. 2009, 24). Although it has frequently been assumed that some of the first settlements on the higher areas of the salt marshes were situated on ground level of higher terrains in the area – like tidal channel ridges or salt marsh embankments – more recent insights show that the evidence of settlements on a ground level is very scanty and obscure. It seems that by far most settlements on salt marshes arose on at least a small artificial dwelling mound (Varwijk 2013, 13-19).

The peat area in the northern coastal area of the Netherlands was larger during the period of terpen-residence than in the Belgian coastal area (compare fig. 1 and 2). Peat formed a boundary to the sandy soils but offered also opportunities for habitation. The wet and warm climate of the Holocene caused peat to form between the coastline and the Pleistocene higher sandy soils. In the northern Netherlands people did not only build terpen as a protection to direct influence of the sea, but also to make habitation in the water rich environment of the peat area possible (Bazelmans et al. 2009, 19).

Belgium

The Belgian coastline extends over 65 km. Like other coastal areas in north-western Europe, the basis of the Belgian coastal area is formed by an old Pleistocene estuarine valley. In this case it turned into a mud flat area during the course of the 3rd millennium BC, which it continued to be until approximately the 5th century AD (Tys 2003a, 71). When the Dunkerque transgression model was abandoned, it became clear that the Merovingian period was actually a period with less tidal activity than the preceding Roman period (of which also archaeological remains have been found) (Ervynck et al. 1999, 102-106). It is now clear that the first tidal gullies were already formed during the Late Iron Age. Many tidal gullies silted up in the Late Roman period. Between the second half of the 6th century and the second half of the 8th century most tidal gullies were fully silted up. This increased the possibilities for habitation in the coastal area (Tys in press).

The former Belgian salt marshes are nowadays almost totally confined by a dune belt. Although these dunes formed during the Middle Ages, they were already suitable for human occupation during the process of formation in the Early Middle Ages, and parts of the old dunes even earlier (traces of settlements have been found from the Roman period) (Ervynck et al. 1999, 109-110). It is concluded that the coastline was always a short distance from dry sandy soils, and also the Pleistocene higher grounds were nearby. Through erosion of the underlying peat layer the higher Pleistocene sandy grounds, now bordering the tidal deposits, became more accessible from the coastal area and vice versa (Ervynck et al. 1999, 99, 103-106) (fig. 2).

Archaeological research showed that habitation of the coastal area already started in the Roman period and, with no traces of occupation dated directly after the Roman period so far, possibly started again in the 7th century (Tys 2003b, 261). Silted up tidal channels were particularly favourable for habitation, where habitation seemingly occurred on a ground level. Inversion of the relief happened when the tidal gullies were silted up, making them as higher spots in the flat tidal landscape particularly favourable for habitation. But habitation also took place on small artificially made dwelling mounds: terp-like structures (Tys in press; Demey et al. in press).

History of research

It is due to the evident appearance of terpen in the Northern Netherlands that the terp region has a relative long history of research. The northern coastal area of the Netherlands in Friesland and Groningen is characterised
by many terpen that form a marked feature in the landscape (fig. 3). Their marked appearance made people aware of their existence (although they were not always associated with settlements) and scientific attention started already at the end of the 19th century. Scientific excavations began with the excavations of Van Giffen at the beginning of the 20th century (Jensma & Knol 2005, 37-38).

Unlike terpen in the northern Netherlands, terpen in the Belgian coastal area can hardly be distinguished in the landscape (compare fig. 3 and 4). This is partly a result of the large tidal influence until the end of the Early Middle Ages, causing former settlements not only to be flooded but also to be buried below sediments. However, from the few systematically excavations in the Belgian coastal area that have been done recently (o.a. at Stene (Demey et al. in press) and Leffinge-Oude Werf (Deckers 2011)); it seems that dwelling mounds were quite small in comparison to Dutch terpen. Therefore they are at present, after levelling of the surface during the course of time, easier to overlook (Tys 2003b, 268-270). The supposed presence of terpen in the Belgian coastal area was at first only inferred from typical terpen-toponyms like werf, wal and wierde (Tys 2003b). However, archaeological research on sites with a wal-toponym, made clear that these were artificial elevations from the Late Medieval period surrounded by a moat and mainly functioned as status symbols (Verhaeghe 1980, 54-55). As a consequence it was thought that terpen did not exist in the Belgian coastal area at all. After the Dunkerque transgression model was abandoned, archaeological material already available now was regarded as proof of habitation in the coastal area during the late Merovingian period. This marked also a renewed interest in terpen. Besides indications by place-names, analysis of cadastral maps as pioneered by Tys (2003a, 195-231; 2003b) proved to be helpful tracing terp-structures. On excavations and small prospective field surveys that followed, it became clear that terpen were indeed present in this area, and were already built in the Roman period (o.a. Demey et al. in press; Deckers 2011).

Livelihood
Livestock

Despite some regional differences and variation through time, the major livestock in the Dutch terp area is cattle. The high proportion of cattle in the Dutch terp area is not associated with specialisation, leading to exchange or trade, but rather to self-sufficiency. Presumably there was a need for much cattle because manure could be used as a fuel having little other fuels available. Additionally, manure layers are often found in terpen, especially in Groningen, which demonstrates the use of manure to elevate terpen (Bazelmans et al. 2009, 31-32). However, to my opinion this does not exclude the possibility that a surplus of cattle was exported, all be it on a small scale.

In the Belgian coastal area livestock breeding seems to have focussed on sheep. This focus is connected to wool...
production and implies a certain amount of specialization in the coastal societies of Belgium. The animal remains of the site Leffinge-Oude Werf for example showed a dominance of sheep (74% of the main domestic animals) in the late Early Middle ages (Ervinck et al. 2012). Even though systematic archaeozoological research has until now only been carried out on few sites, notably terpen-like structures, the dominance of sheep is also supported by the results from all sites and by historical sources from the 8th century onwards as well. The recently excavated site in Stene for example, a terp-like structure of the Roman period, also revealed a high proportion of sheep bones (Demey et al. in press). Remarkably similar high percentages of sheep are yielded from other sites in the coastal area, compromising animal remains from different periods, and are therefore interpreted to be typical for the Belgian coastal area (Ervynck et al. 2012, 158; Demey et al. in press; Tys 2003b, 270-271).

This distinction between a self-sufficient society in the Northern coastal area of the Netherlands and a more specialised society in the Belgium coastal area, might not be that strong in every period, and related to every site. While it seems that at Leffinge-Oude Werf sheep were mainly held for meat consumption, sheep breeding for wool production might have been of secondary consideration here (Ervynck et al. 2012, 157). Interesting is also the difference between the small importance of sheep held in Groningen and higher proportions of sheep in most parts of Friesland. It has been assumed this might be related to the occurrence of dwarf pond snail (Galba truncatula), which cannot survive on salt rich tidal marshes. The importance of sheep seems to increase after the Roman period, also in Groningen (Bazelmans et al. 2009, 32). Regarding exchange in the Early Medieval period, often associated with the central place of Wijnaldum in the Merovingian period, the high proportion of sheep found in Wijnaldum-Tjitsma stands out (Prummel et al. 2013). Also the dominantly advanced age at which sheep must have been slaughtered seems to point not only to meat production (Prummel et al. 2013, 90), but also to keeping sheep longer in order to produce more wool. In many parts of Friesland (particularly Westergo) sheep farming took a rather important role, more or less equal to cattle breeding. It might be possible that especially in Westergo during the Early Middle ages wool production was related to export.

**Cultivation**

While archaeobotanical research received little attention in research of the Belgian coastal area, it has a long history in the research of the Dutch terp area. Nevertheless, researchers of the Belgian coastal area did bring forward theories on cultivation. It is proposed that most cereals and other crops were imported from the inland (Tys in press). This notion corresponds to the traditional view on the limited potential for cultivation in the terp area of the Netherlands (o.a. Van Zeist 1988, 136-138). Research from the past few years in the northern coastal area of the Netherlands has shown that this was not necessarily the case. By means of a small dike to protect crops, it was possible to bring (small strokes of) land into cultivation, on but also outside of the terp (a.o. Cappers & Prummel 2005, 143).

Intriguingly, one of the first results in archaeobotanical research of the Belgian coastal area is linked to this sort of dike, protecting the terp itself. On this site, in the village of Stene, a large quantity (pollen as well as seeds/fruit) of turnips/turnips rapa (Brassica rapa subsp. campestris/rapa) and broad beans (Vicia faba) were found. Despite these results Demey et al. (in press) hesitate to interpret these high amounts of turnips/turnips rapa and broad beans as an indication for arable farming.

**Trade and exchange**

In this section I will restrict myself to the model of so-called trade terpen. This model was developed in the Dutch and northern-German terp area after the excavation of elongated terpen which were thought to have been created specifically as landing places for ships and boats (for example: Haarnagel 1955, and in the Netherlands: Halbertsma 1956, 50-51. Important critical comments
were given by Miedema 1983, 340–341). This hypothesis has recently been abandoned (Bazelmans et al. 2009, 36). In the terp area of the Netherlands there seems to have been no permanent trade centres until the middle of the 9th century, or at least they do not seem to have been indispensable (Bazelmans et al. 2009, 36). With one exception (Wijnaldum-Tjitsma), there are no large amounts of imported pottery found and we lack evidence for significant industry. Furthermore, terpen in the Early Middle Ages lack this elongated structure that is required for the trade terpen theory.

The model of trade terpen is nowadays still used in the Belgian terp research. The Belgian view on this can at best be explained by the example of Leffinge village. A central function is ascribed to the village of Leffinge, from at least the 10th century onwards. This is deduced from the fact that it served as a centre of the main parish with one of the earliest parish-churches in the coastal area. This position might date back even earlier, and the question that follows is what that signified for the Early Medieval settlement structure in this area and if these kinds of settlements had a specific social or even elitist significance. In search of an analogy, the function of a trade terp was considered a possibility (Tys 2003b, 272). However, Leffinge clearly also does not have this prescribed elongated structure. Its radial subdivision points to a circular terp-structure (Tys 2003b), which can rather be interrelated to the importance of agriculture in society (see below).

**Land subdivisions and recognition of terpen**

In this paragraph I will discuss the use of subdivisions in the Belgian coastal area and as was initiated in research of the Dutch terp area. I will take the situation in the Netherlands as a starting point.

In the Dutch terp area, there seem two types of subdivisions: radial subdivided and block subdivided terpen (respectively fig. 5 and 6). A radial subdivision is in Groningen and Friesland found on terpen situated on the salt marsh itself, specifically not on natural elevations in the landscape like a tidal channel ridge. The radial subdivision made it possible to spread the higher and lower parts of the terp evenly, which is mainly an advantage for an agrarian oriented society (De Langen 1992, 170–172). The study of land subdivisions forms an important tool in the search for terpen in the Belgian coastal area. To recognize terpen in the Belgian coastal area a proper aid seems to be the use of cadastral maps. Researchers on the Belgian coastal area took the subdivision-model on the Dutch terp area as a basis. Unlike block subdivisions, radial subdivided terpen are easily recognizable without any visible signs of an artificial dwelling mound above the ground surface level. This was proven by the village of Leffinge, where during a small excavation elevation layers were discovered (Tys 2003b, 268). The village of Leffinge forms an excellent example of a radial subdivided terp in the Belgian coastal area (fig. 7), and makes it comparable to for example Foudgum (Friesland, The Netherlands) (fig. 5).

**Discussion and conclusion**

By the comparison of both maritime regions it seems that, despite showing similarities in being situated near the sea and the presence of comparable terpen or terpen-like structures, a difference in landscape caused many major differences between those two regions. By this we can detect differences in settlement structures, livelihood and even the way the coastal area of Belgium has been interpreted for a long time (overlooking of settlements), as opposed to the long research history of the Dutch terp area, caused by differences in landscape.

A greater variety of landscapes suitable for habitation within a relatively short distance, including dunes, tidal deposits and inland sandy soils, resulted in a less isolated position of settlements in the Belgian coastal area than in the northern Netherlands. The terp area of the Netherlands was separated from the sandy soils in the hinterland by a large peat area. As a result, terpen also developed in the peat area. If terpen ever arose in the former peat area of Belgium will probably never be known due to the erosion of this landscape.

The less-isolated position of settlements in the Belgian coastal area may have resulted in another kind of relationship between settlements outside and inside the coastal area. Where it is assumed that terpen in the northern Netherlands were largely self-supporting, settlements in the Belgian coastal area might not have been. The on-going discussion about permanent or seasonal habitation in the Belgian coastal area might contribute to this issue. A possible scenario is that inhabitants of the inland used some of the coastal settlements for sheep farming on a seasonal base, although evidence of a dike (in Stene) seems more likely to be pointing in the direction of permanent occupation. Further research on the function of settlements in the coastal area and their relations within and outside the area, and excavations will have to shed more light on that.

This brings us to the role of trade and livelihood. Surely, on the basis of the little evidence we have from the Belgian terpen, it seems that trade terpen are lacking, just as they are not clearly indicated in the terp area of the Netherlands. Furthermore, the role of exchange or trade itself in the Belgian coastal area is until now not really clear. Sheep farming connected to wool production might also lead to production on a larger scale, meant for export, but if and when this extra step occurred is not in the least certain. The evidence of Stene illustrates that arable farming occurred, similar to the Dutch terpen area. On what scale it occurred is unclear, and relates also to the character of the habitation (seasonal or permanent).
Due to a lack of extensive archaeobotanical research an answer to this question is still open. The evidence of radial land subdivision, however, leads to the probability that arable farming was a rather important part on the economic basis. Moreover, that makes self-supporting settlements more probable.

In respect to the subdivision of terpen - a block subdivision, which is more often to be found on natural elevations (De Langen 1992, 170-172), will be difficult, if not hardly impossible, to identify in the Belgian coastal area. Investigation and making an inventory of previously collected findings in the coastal area will help to map supposedly terp-like sites. And also excavations will help to obtain more knowledge on settlement structures in general.

Of a totally different order is the approach of scientists in both areas, encountering archaeological problems and facing new questions. By turning to terpen research in the northern Netherlands in search for theories, implicitly the Belgian researchers did not only expect similar events, but more specifically they adopted a view upon a situation. These views may alter, and this is also what happened on the trade terpen-theory and the theory on agriculture. The reason why researchers of the Belgian terpen area took abandoned theories to explain aspects they encounter in their area of research, can partly been explained by the fact that new insights on the terp area of the Netherlands have not been published yet. On the other hand, over the last few years small updates appeared in for example Professor van Giffen en het geheim van de wierden (2005) and De late prehistorie en protohistorie van holocene Noord-Nederland, versie 2.0 (in the Dutch national research agenda, 2009), which apparently did not gain much international attention, explaining why Belgian researchers were unaware that these aspects are now being looked at differently.

For inspiration on habitation models of the coastal area Belgian researchers were certainly at first more inclined to focus on the northern part of the Netherlands (which becomes clear in Tys 2003a, 212-265 and Tys 2003b ). In terms of the environment, the Belgian coastal region shows more similarities to the most northern part of the coastline in France, and parts of the coastline in Zeeland (the Netherlands). It might be that cultural development in these regions also show more resemblance to the Belgian coastal area, than to the northern terp area of the Netherlands.

The comparison of phenomena that we encounter in both coastal regions and the way they are approached does not only contribute information to the Belgian part of the story, but makes us aware that we have to be always critical of our interpretations. Because the Dutch terp area is embedded in a long research history (many theories which are held for quite a long time), it is probably harder to be receptive for new interpretations. An example might be that the high percentages of cattle in terpen is chiefly linked to self-sufficiency, while it might just as well have been related to exchange or trade to some extent. Also Wijnaldum-Tjitsma is one of the
first examples in archaeozoological research of the terp area where the high number of sheep (which were already, although in a somewhat lower number, known from Friesland) is associated with exchange (Bazelmans et al. 2009, 32; Prummel 2013, 97). The Belgian literary sources underline specialization in sheep farming, which might have been more extensive than in the Dutch terp area. However, because the Dutch terp area lacks this kind of supportive evidence on exchange or trade during Early Medieval times, of course it does not mean it did not happen. We must try to prevent misinterpretation of archaeological sources as occurred in Belgium on the research of terpen, where historical sources from the late Merovingian period are missing; *argumentum ex nihilo* must always be treated with the greatest caution.

**Notes**

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2 In Englum (Groningen) the proportion of cattle runs up to 76% in the Late Iron Age. Also in early Medieval times (contemporary to the sites in the Belgian coastal area) this category outnumbers other domestic animals (Prummel 2008, 122-123).

3 This excludes animal remains that were collected mostly during field surveys, by means of poor sampling and recovery methods. These remains are also severely biased towards larger animals (cattle) (Envynck et al. 1999, 109).

4 In most remains a distinction between sheep and goat cannot be made, but since no goat bones were identified it is supposed that no goats were kept (Prummel et al. 2013, 89-90).

5 Although it seems that concerning animal husbandry cattle was more preferred in the coastal area of Zeeland, stressing the rather unique role of sheep farming in the Belgian coastal area (Demey et al. in press; Van Dijk et al. 2011, 113).

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Beyond a terrestrial view on the Roman period obelisk transport
The social implications of the shipping

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Introduction
It is evident that research perspectives are often largely the result of our current worldview. This worldview is not a given constant at all but has changed greatly over time. As an example, it is clear that the role and meaning of the river Nile has changed dramatically over time. During the Predynastic period in Upper Egypt, the river Nile was an important part of the Egyptian daily life. The fertility of the Nile not only formed the economic basis of Upper Egypt but the river influenced its religion and other aspect of daily life as well (Brown, 2001: 288). Nowadays the dependence on and use of the Nile as a waterway has dropped dramatically. This shift might be interpreted as a change to a dominantly terrestrial worldview.

This paper will analyse how our current worldview has influenced our understanding of the Roman obelisk transport. From 10 BC onwards, obelisks were transported from Egypt to Rome. Nowadays there are thirteen ancient obelisks of which eight are Egyptian and five Roman obelisks (Todini, 1995: 10-13). With this number, Rome harbours most of the obelisks in the world. At least five of these obelisks were manufactured in Egypt during the Roman period at the request of wealthy Romans, or were made in Rome as copies of ancient Egyptian originals. Although the obelisks were visually made up of two parts, a long shaft and the pyramidion at the top of it, they were actually true monoliths.

Besides, this paper will address the way in which the physical and social act of the transport of these obelisks was emphasized and made part of Rome's history. To this end, a description of the transport vessels is necessary to see if these obelisk ships were evidently different from other ships and therefore noticeable, not only for a Roman specialist but also for all citizens of ancient Rome. Moreover, if the obelisk ships clearly differed from other transport vessels, e.g. grain carriers, it is crucial to see how these obelisk ships were treated after use. Were they abandoned, demolished, re-used or treated in some other way and what does this mean? And if they were treated in some special way, what was the function of this? Was the sea only regarded as a barrier or did it enable the Romans to give a new meaning to the obelisks?

The obelisks of Rome
According to the Roman writer Pliny the Elder (29 – 73 AD), the obelisks were meant to resemble the rays of the sun (Eichholz, 1962: 36; 14). The construction of the precursors of these monumental structures had already begun in the Predynastic period, but it is only during the twelfth dynasty that the oldest obelisk, that of Sesostris I (1971-1928 BC) is constructed (Sorek, 2010: 13). Although the erection of obelisks in Egypt becomes less frequent after the twelfth century BC, the tradition continues until the time of Ptolemy IX (116-107 BC). The Romans came into contact with the obelisks after 30 BC when Egypt became a province of Rome (called Aegyptus). These standing monuments must somehow have greatly impressed the Romans as is shown by the transport of a number of obelisks to Rome by Augustus (13-10 BC), Caligula (37 AD) and their successors (Budge, 2003: 23). The reasons for this transport must be sought in the complicated way in which especially Augustus is trying to create a new and strong Roman identity (Versluys, 2010: 27).

The transport of these ancient monoliths from Egypt to Rome was a true challenge to the engineering skills of the Romans. Their remarkable engineering accomplishments are not only evidenced by the transport of these obelisks but also by the 1,000 metric ton block employed in the temple of Jupiter at Baalbek (Heizer, 1966: 823). Both examples show that the Romans were capable of transporting large-sized stone blocks. In the case of the obelisks, their engineering skills are most clearly shown by the largest of the eight obelisks that were brought to Rome, the Lateran obelisk. It had an original height of 36 metres, nowadays it has a length of 32 metres, and an estimated weight of 455 tons (Habachi, 1977: 112). The best suitable and fastest way to transport these obelisks is by sea. Of course this implies that the obelisk first should be transported to a suitable waterway. It is quite ironical that, although the distance covered on land is only a minimal part of the total distance covered on sea, the transport by land is well-investigated compared to the minimal attention paid to the transport by sea. Besides, the transport has always been seen as a purely functional act while, in my opinion, the symbolic value of both the physical and social aspects were equally important.

According to Grant Parker (2007: 209-211), an obelisk is a collection of five aspects: transport, measuring, inscribing, describing and imitating. Although Parker does not place these aspects in a hierarchical order, the majority of the research has focussed on the last four
aspects that are mainly focusing on the current location or on the former standing place of an obelisk. However, the physical act of moving is strongly connected to the metaphorical displacement of an obelisk, i.e. the change in audience and hence a change of meaning. In other words, the transport of an obelisk made it possible to give a new meaning to the structure. This might be a first clue that the transport not only comprised of the purely practical act of moving, but also of a symbolical, social and perhaps political act.

Roman transport: making use of Egyptian knowhow
Before Egypt became a province of Rome in 30 BC, the Roman knowledge of shipping obelisks was absent. Yet they managed to transport some of Egypt’s largest obelisks to Rome some twenty years after the annexation of Egypt. To achieve this, the Romans must have used Egyptian knowhow as there was no development in Roman ship construction that made such a major achievement possible (Wirsching, 2000: 276). The Egyptians did indeed already transport obelisks. This is illustrated by the fact that Cleopatra brought an obelisk to Alexandria and by the presence of the depictions of an obelisk ship now known as Hatshepsut’s barge (see fig. 1). There was one significant difference between the Egyptian and Roman obelisk transport. While the Egyptian transport only took place on the river Nile, the Roman transport occurred mainly by sea. Therefore the Roman engineers had to adapt the river ships, which could drift with the current to sea, to vessels that could cut through the waves. It seems nearly impossible to construct a suitable seafaring ship with a capacity of 1000 metric tons in the brief span of several years, but with the use of Egyptian knowhow they managed to do this. The shipping of the obelisks was thus accomplished on the basis of the combination of Egyptian technology and Roman ships adapted to this purpose (Wirsching, 2000: 276-277).

An example of the enormous ships used by the Egyptians is the barge of Hatshepsut, the fifth pharaoh of the eighteenth dynasty (1508-1458 BC). Our knowledge of this ship comes from a depiction on her memorial temple which is accompanied by several inscriptions. The complete scene shows a group of soldiers ready to unload the two obelisks that were carried by the barge and a group of priests celebrating the arrival with prayers of thanks. It might be that the day of this event was declared a public holiday so that all the residents could come and witness this marvellous event (Thomas, 2003: 69). This depiction clearly shows that the transport might have been a highly important act for a society. Whether this is the case for the Roman society, will be discussed below.

Descriptions and excavations: the special position of the obelisk transport
Unfortunately, there are no direct descriptions of the obelisk transport in the Roman world during the beginning of the Imperial period. There are later descriptions of for instance Pliny and a report of Ammianus Marcellinus on the transport of the Lateran Obelisk from Alexandria to Rome in 357 AD during the reign of Constantius II. Pliny gives us some important clues about the way these obelisks vessels were seen. In his Natural History, he writes:

Above all, there came also the difficult task of transporting obelisks to Rome by sea. The ships used attracted much attention from sightseers. That which carried the first (of two obelisks) was solemnly laid up by Augustus of Revered Memory in a permanent dock at Puteoli to celebrate the remarkable achievement; but later it was destroyed by fire. The ship used by the Emperor Gaius for bringing an obelisk (the third) was carefully preserved for several years by Claudius of Revered Memory, for it was the most amazing thing that had ever been seen at sea. Then towers of earth were erected in its hull at Puteoli, whereupon it was towed to Ostia and sunk there

Fig. 1 The obelisk ship of Hatshepsut with a detail of the obelisk (Wirsching, 1999: 401).
by order of the Emperor, so as to contribute to his harbour works. (Eichholz, 1962: 36; 14, 70)

Highly important for our understanding of the position of the obelisk transport in the Roman society is that one of these ships "was solemnly laid up (…) in a permanent dock at Puteoli to celebrate the remarkable achievement" (emphasis added). In other words, the process of shipping, which was temporal at first, has now been monumentalized by Augustus himself, the one that also ordered to bring the first obelisks to Rome. A second ship, used by Gaius (Caligula) was preserved as Pliny tells us. It thus seems that these ships were not simply docked in a harbour because they became useless, but were conserved to maintain the memory of the transport. It seems unlikely that these ships were maintained for later use as the shipping of obelisks was a process that occurred only once every couple of decades. Nevertheless, the harbours of Ostia and Puteoli must have been the final destinations of the obelisks ships, as it was impossible to sail up the narrow Tiber (Blackman, 1982: 187). According to Casson (1965: 32), the ships indeed could not have gotten up the river as these ships were only designed for sea transport. Pliny’s words *alia ex hoc cura navium quae Tiberi subvehant* imply that the obelisks were taken up the Tiber by special barges. Only the Lateran obelisk was carried right up to a point three miles south of Rome, but this was only made possible because it was transported on a specially built ship, able to sail up the Tiber, according to the fourth century writer Ammianus Marcellinus (Rolfe, 1935: 17; 4; 13–14).

A second comment of Pliny from his Natural History strengthens the idea of the peculiarity of these ships. In his comments, he again emphasizes that Caligula’s ship was the most wonderful thing that had ever been seen on the sea. Ostia was a major and large harbour (Meiggs, 1973: 149). Therefore, when Pliny writes that the obelisk ship took up a large part of the left side of the harbour, it indicates that this ship must have had quite a length. These obelisk ships can thus by no means be compared to other large vessels, such as the large grain carriers that were also sailing from Egypt to Rome. Although these vessels also could have an enormous size, there are not any ancient reports that glorify these ships as for instance Pliny does to the obelisk ships.

*An especially wonderful fir was seen on the ship which brought from Egypt, at the order of the Emperor Gaius, the obelisk erected in the Vatican Circus and four shafts of the same stone to serve as its base. It is certain that nothing more wonderful than this ship has ever been seen on the sea. It carried 120,000 modii of lentils for ballast, and its length took up a large part of the left side of the harbour of Ostia, for under the Emperor Claudius it was sunk there with three moles as high as towers erected upon it, that had been made of Puteoli earth for the purpose, and conveyed to the place. It took four men to span the girth of this tree with their arms . . .* (Eichholz, 1962: 36; 14, 70).

Pliny gives us the idea that the obelisk ships were true masterpieces of the Roman engineers. Unfortunately, the lay-out of these ships is poorly understood. There are many contradicting hypotheses due to the scarce information. In fact, of only one obelisk ship some remains have been excavated in the harbour of Ostia. This harbour nowadays lays some km inland due to the regressing coastline and therefore the ancient harbour zone could be excavated. From 1959 onwards, imprints of planks, beams and holes were found which were identified by Testaguzza as the remains of the obelisk ship of Caligula. According to Testaguzza (1970: 105), the ship had a maximum length of 104 metres, 90 metres at the waterline, a beam of over 20 metres and a total height of 12.5 metres. This must be the ship that is mentioned by Pliny and the one that was later made part of the harbour. If Testaguzza’s measurements and reconstructions are correct, then it is not surprising that Pliny describes this ship as “the most amazing thing that had ever been seen at sea”. Compared to the size of the ship, the obelisk is quite small: most of them are less than 25 metres in length and have sides of 1.5 to 2.0 metres. This explains why the vessels still attracted much attention after use as the obelisk themselves would not have made these ships much more noticeable, especially because the obelisks were laying horizontal and therefore were not as impressive while standing.

Although their enormous size seems to be their most attractive factor, there might have been different characteristics that made these ships true attractions. According to Wirsching (2000: 275–276), the dimensions given by Testaguzza are incorrect. Wirsching argues that the obelisks were transported by a double-ship with a long and slender form, which also had a necessary hydrodynamic form adapted to seafaring (see fig. 2). In his view, three ships were necessary to transport one obelisk. There were two aft ships, both of rectangular shape, of circa 37 metres in length and 5 metres in width. These two vessels were connected by longitudinal beams, while the obelisk itself was in between these two ships and was completely below the waterline. In front of the third ship was a larger trireme to help steer the two aft ships and to sail the ship across the Mediterranean (Wirsching, 1999: 396–406). The scarce and often ambiguous information about the ships makes it impossible to choose between one of the interpretations.

In my opinion it is quite important that Pliny seems to be writing about one ship instead of a whole construction made up of three ships. The harbours around Rome, such as Portus and Ostia, were among the most frequent used of the Roman world (Oleson, 1988: 148). Thus, to
be regarded as “the most amazing thing that had ever been seen at sea”, taking into account the wide variety of ships that visited these harbours, it truly must have been an amazing structure, regardless the different interpretations of the scholars.

The construction of memory and meaning

One might wonder where Pliny found his information as his Natural History was published more than three decades after the rule of Caligula. Although there are no indications which sources Pliny used for this part of his work, it might be that the story was still known within the Roman society at that time. In other words, Augustus and Caligula both managed to not only monumentalize the transport for the period when the ships were still intact, but it is possible that they also made this transport part of the Roman communal memory. Communal memories were constructed in a wide variety of ways, for instance by portraits and imperial propaganda (Marincola, 2007: 71). In my opinion, the monumentalizing of the transport must be seen as an example of the latter. The greatness of the Roman Empire and the skills of the Roman engineers were emphasized by this great engineering challenge.

The influence of the emperors on the obelisks was minimal as they were imported as completed structures which were as a rule not altered by the Romans. However, the base piece was added to the structure to increase its height and thus its visibility.

The inscriptions on this base do not relate strongly with the transport from Egypt to Rome. At first glance this lack of reference might be remarkable, especially when one takes the monumentalizing of the transport in mind. Nevertheless, the importance of these inscriptions should not be overestimated. As already stated above, the majority of the Roman society was illiterate. The connotation with Egypt must have been clear, thanks to the distinctive shape, used materials, colours and in a number of cases also the hieroglyphs present (see fig. 3). Although these obelisks were distinctively Egyptian in origin, in Rome they were incorporated in the indigenous style. The obelisks are not the only example of this and the list of buildings and artefacts in Rome which show Egyptianizing elements is almost inexhaustive (Roullet, 1972; Versluys, 2001). All these Egyptian characteristics are also found in Roman copies of the Egyptian obelisks, where especially the used materials in combination with its colour must have been important. Apparently, the link to Egypt was strong and obvious without emphasizing the connotation with the transport. Again, it is still possible that the memory was communicated, the oral tradition, without materializing it (Ong, 1982: 16-20).

Parker’s statement that the physical act of moving is strongly connected to the metaphorical displacement of an obelisk implies that the transport can also comprise a
change in worldview. This seems to be the case when one compares the treatment of the obelisks in the Egyptian and the Roman world. In the first area the obelisks were often placed near a temple dedicated to the sun god Ra. These temples and its accompanying obelisks could be oriented to the Nile or the sun, while in Rome the orientation was much more variable (Magli, 2005: 80; Meyboom, 1995: 246). Here the connotation between an obelisk and a particular building was absent. Obelisks were used in grave monuments (e.g. the Mausoleum of Augustus), sundials (Solarium Augusti), on the spina of a Roman circus and in a wide variety of other contexts. Besides, there is a major difference in the visibility of these obelisks in both areas. As stated above, the obelisks in Egypt often had a relation with the Nile, while in Rome they stood in a land-locked context. Only the obelisk used in the Solarium Augusti seems to have been an exception, which was used in a sun-related context. However, in my opinion this obelisk had a purely architectural function (as the gnomon) instead of symbolical one (with an orientation towards the sun).

During the transport, the obelisk was thus removed from its original context and accompanying worldview and placed into a new one. Although this seems to be nothing more than a direct effect of the transport, it has some consequences. First of all, if the Romans had replaced an obelisk in Egypt in a typical Roman setting, the Egyptians would still have interpreted it within their own worldview. However, once they removed it from its original context, they could give it a new meaning. Moreover, these objects were unknown in Rome, which made it possible that the Roman emperor gave the obelisks the meaning he desired. The movement of the obelisk is thus also a change from a society where the Nile was the major river, to one where the Tiber was the main watercourse. This contrast between the Nile and Tiber was often emphasized in Roman culture (Hornung, 2001: 67).

**Conclusion**

The shipping of the obelisks must not be regarded as a purely practical act that only served the purpose of the transporting of obelisks from Egypt to Rome. Of course, the transport was in first place physical and practical, but it enabled the Romans to give a new meaning to these monuments. Therefore, obelisks must not be regarded as static, architectural objects, but rather as artefacts which could be removed from their original context and placed in a new one. The sea thus not only functioned as a barrier, but also as an area where the original meaning was deconstructed and where the obelisk was removed from a particular worldview and hence could be placed in a completely new one. In this new environment, it was an unparalleled object which must have been distinctive, regarding its notable characteristics like colour and shape.

Great emphasis was laid upon the transport itself, as is demonstrated by Pliny’s comments on the obelisk ships. These ships were purposefully docked in the harbours of Ostia and Puteoli and not simply, as one could argue, because they became useless. Instead, these ships were carefully preserved. This prolonged the temporal act of transport and monumentalized it until these ships were either destroyed by fire or reused in the harbour itself. The monumentalizing of this transport might have made this event part of the communal memory of the Roman society. According to Pliny, large numbers of people came to the harbours to witness this transport. In the largely illiterate Roman society these stories must have dispersed quickly, whereby, even after the vessels themselves had disappeared, the story of the transport was still widely known.

Unfortunately, there is little knowledge about the shape and appearance of these ships. The obelisk ships would have been much more recognizable if the obelisks were on top of them instead of below the waterline. Nevertheless we can state that the presence of the obelisks was not the only factor that made these ships important as these vessels still received much attention after they completed their primary duty. Even if they were less than 50 metres in length (according to Wirsching) rather than approximately 100 metres (according to Testaguzza), they were still different from other vessels that visited the harbours around Rome. Without discussion, the actual
moving was an unparalleled masterpiece of engineering where Roman and Egyptians skills had to be combined to make this possible.

We too often tend to consider activities such as transport as a purely functional act while it can create new opportunities for creating meaning. In my opinion, this is clearly the case in the research of obelisk transport. In this case study, the sea does not simply function as a barrier which had to be overcome, but rather as a liminal area where meanings were removed and recharged.

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References
The Roman Rhine
Trade along and across the border river

Susanne Manuel

Introduction
Before the arrival of modern transport facilities like cars, trains and planes, transport by river was the most important way of transport. These modern inventions seem to have changed our view of the world, in which almost everything revolved around a maritime existence. In classical and medieval times the river Rhine, which is the largest river in north-western Europe, was vital to trade and exploration. As a frontier of the Roman Empire and main transport corridor between the Mediterranean and the North Sea, it played an important role in shaping the history of the ancient world.

While a great deal of archaeological evidence along with numerous written historical sources show the importance of the transport function of the river, many are stuck with their association of the Rhine with the limes: the border defence or delimiting system the Romans used to mark the boundaries of their empire. The basic principle of this defence system was deterrence: wherever the enemy attacked, they would always find a professional, heavily armed Roman force on the other side of the border that often outnumbered them. The limes usually consisted of a clear line where the enemy had to stay away from; in this case this line was the river Rhine. It is often assumed that Roman culture, which spread over almost the whole of Europe, came to an end in the north at the limes, which followed the lower course of the Rhine and part of the Danube, thus excluding most of present-day Germany.

This paper will focus on the Dutch section of the Roman Rhine. This part of the Rhine is commonly known as the Niederrhein or the Lower Rhine and it used to flow from Bonn, Germany, to the North Sea at Katwijk, Netherlands (fig. 1). The main purpose of this paper is to discuss the archaeological evidence and the different trading directions in order to prove the importance of trade along and across the Rhine. This evidence ranges from archaeological finds to ancient written sources. Furthermore, the function of the Rhine as a territorial border will be discussed. These combined sources will help to answer the following questions: How and why did the Romans use the river Rhine? How did the Romans perceive the river Rhine and its function: as a trading route, or as a territorial border? And more importantly, how come we see the Roman Rhine as a defence line, rather than functioning as a trade route?

The Rhine as a frontier
The Romans hardly knew about the existence of this river until Julius Caesar reached it in 58 BC. He declared it to be the boundary between the Gallic (or Celtic) nations in the west and the Germanic tribes in the east. This is simply untrue: along the Upper Rhine, the Celtic culture continued along the Danube to Bohemia, and further north, the Germanic language had already advanced west of the Rhine into what is now Belgium. Yet, Caesar needed a clear demarcation of the war zone, and this is why it is still commonly believed that the Rhine divided two peoples. Caesar had crossed the Rhine in 55 and 53 BC. A quote from Caesar makes clear that he meant the river to function as deterrence:

“Several reasons prompted me [to cross the Rhine]. The strongest was that I could see the Germans were all too ready to cross into Gaul, and I wanted them to have reasons of their own for anxiety when they realized that an army of the Roman people could and would cross the Rhine.” (Caesar’s War in Gaul 4.16-18)

At this point, the Romans had not yet given up their conquest to conquer the region to the north of the Rhine. After the defeat of Varus and his army in the Teutoburger Forest in 9 AD, the Romans finally gave in. As a consequence, the Rhine was considered the final frontier between the Roman Empire and the free Germanic tribes in 16 AD (Hansen, 1987: 165). At regular intervals along the Rhine, there were forts for the auxiliary troops, and on some places the legions had their fortresses (fig. 1).

Limes to secure the Rhine
At De Meern the limes road has been traced over a distance of c. 3 km (Graafstal, 2002 cited in Kooistra et al., 2013: 5). It does not follow the contemporary bank of the main stream of the Rhine, but the strongly winding gully of a smaller southward branch joining the main course before the next auxiliary fort, at Woerden (fig. 1). Along this section of the road several watchtowers have been discovered: a rare phenomenon in this section of the limes until now. One tower was built of stone and may be dated to the beginning of the 2nd century; two others are timber structures and seem to have been erected around the middle of the 1st century. Interestingly, the positions of the towers seem to be related to the course of the Rhine rather than to the limes road (Kooistra et al., 2013: 5).
This fits in with the location of the auxiliary forts in the western Netherlands. They were laid out immediately adjacent to the river, prone to flooding, even when less vulnerable locations were at hand nearby. For this reason, one might ask whether the military alignment in the Rhine delta was primarily and/or initially related to the river, instead of being related to the territory across. Questions arise if this even was a limes at the time. At present it is considered to be a short-term investment related to securing the Rhine delta, with an eye on the conquest of Britain or to control the Germanic pirates or perhaps both (Polak, 2009: 948-9). After this period, it was probably also a way to mark the north-western border of the Roman province (Graafstal in press; Polak et al. 2004: 249-250 cited in Kooistra et al. 2013: 5).

This evidence of the watchtowers at De Meern shows that the limes, instead of being just a border, could also have served as a way to control and defend trade along the Rhine. After all, according to the Price Edict of Diocletian from 301 AD, transport and trade over land was more expensive and less efficient than transport by river (Teigelake, 2008: 497).

Policies of trade near the Rhine
While classical Latin texts describe the Rhine as the outermost limits of civilization and the area beyond as wilderness inhabited by primitive tribes, the archaeological evidence tells us otherwise. Corbulo’s operations across the Rhine demonstrate that the river was not a definite end to Rome’s territorial ambition towards northern expansion at that time (Polak 2009: 949). Moreover, tribes like the Batavians had allied themselves to the Romans and had known a certain degree of Romanization. So, while historians, who interpreted these ancient texts, once thought the river was mainly used as a border, it has become recognized that the river was not only a political limit but the outer limit of logistical support for the empire.

The river was the avenue by which needed supplies were sent to support the Roman army and to trade with the “barbarians”. That way the Rhine was the place in which the greatest amount of commerce between the Romans and barbarians occurred. Rome believed trade and gift-exchange were ways to civilize the barbarians. The Romans hoped that the barbarians would come to rely on and value Roman goods to the extent that any disruption in trade, such as raids or war would end. These Roman policies of trading and gift-exchange were followed with three underlying goals, according to Gordon (1949: 67-8): “to buy alliance and active military help against more formidable enemies; to buy immunity from attack; and to create division among the enemies of the empire so as to maintain the frontiers intact.” Gordon (1949: 67-8) also noted:

“Of considerable interest are the effects which this policy had on external trade and the internal economy of the Empire, and on the barbarians who received the subsidies. Recent history has many examples of trade agreements.
by which one government has lent or given large sums to another government for purposes that will benefit both. The Canadian and American credits and loans to Europe have not been made in a spirit of pure philanthropy, but with the idea, among others, of stimulating the home industries by providing purchasing power for local products in foreign countries. Without imagining that Rome ever paid subsidies with this in mind, we can see that the sending of Roman money to foreigners must have helped the Roman export trade, especially to the barbarian north which had so great a need for Roman manufactures."

In accomplishing these goals the Roman policy was, at least initially, successful for both sides. The trade had the desirable economic effects on the Germanic people. The people living near the Roman borders became accustomed to the quality of Roman goods and they also converted to a money economy. Cassius Dio, governor on the Danube in the early third century AD remarked (O’Donnell, 2011: 79):

“The barbarians were adapting themselves to the Roman world. They were setting up markets and peaceful meetings, although they had not forgotten their ancestral habits, their tribal customs, their independent life, and the freedom that came from weapons. As long as they learned these different habits gradually and under some sort of supervision, they did not find it difficult to change their life, and they were becoming different without realizing it.”

As a result, the Germanic people brought this new style of trade with them deeper into free Germania. The result was a slow cultural “equalizing” between the Germanic peoples along the limes and those in the interior. However, equalizing did not mean stabilizing. The political situation and repeated clashes between the Romans and the Germanic tribes who settled along the Rhine seem to show that this area lacked internal stability (Hansen, 1987: 166).

The frontier was thus a zone where two or more polities met, and the rivers, roads and mountains commonly associated with fixed borders were avenues of communication and control (Whittaker, 1997: 62, 79). On one side, Rome exercised direct control and on the other side that control was exercised indirectly (Whittaker, 1997: 222). The imperial frontiers were regions of economic development that allowed Rome to expand its area of direct control. In turn competing polities, of Germanic and other tribes, arose that also put pressure on the limes.

Trade routes along and over the Rhine
The evidence for trade discussed here, is divided into the following trading directions: following the Rhine (east-west), as well as across the Rhine (north-south). The sources will range from pottery sherds to epigraphic evidence. It would appear that these goods generally changed hands at the frontier, where strict watch was kept and customs dues were levied, but there does not seem to be a reason why some of the sailors of the Lower Rhine, largely Germanic themselves, should not have ventured far along the coast, despite the early rise of Germanic piracy (Brogan, 1936: 196).

According to Fulford (1978: 59), pottery is certainly the best suited artefact to demonstrate trade and marketing patterns because it is virtually indestructible and excavation produces large amounts of it. Furthermore, the various fabrics of pottery can be recognized and characterized with comparative ease, which makes it possible to reveal its place of origin.

From north and south
A sustainable frontier requires a well-organized food supply (Groenman-van Waateringe, 1989 cited in Kooistra et al., 2013: 6) and limitless supplies of building materials. It is however, precisely these two important aspects that are relatively little known. The accepted opinion is that both a large part of the food as well as that of the wood and stone for construction was imported. This opinion is based on a supposed insufficient carrying capacity of the landscape, while the local population was not used to producing a substantial surplus (Bloemers, 1983; Van Es, 1981: 166–173; Whittaker, 1994 cited in Kooistra et al., 2013: 6). There are also a number of historical and archaeological arguments for the import of food. Tacitus (Hist. IV, 26) described how in the first century, forts had to be supplied by cereal ships along the river Rhine. In Nijmegen, an inscription from the second or third century was found referring to a Nervian grain trader (Driessen, 2007 cited in Kooistra et al., 2013: 6) and a ship filled with cereals was found near the fort of Woerden; the ship dates to the second century, and the cereals probably came from the loess area (Pals & Hakbijl, 1992 cited in Kooistra et al., 2013: 6).

Building materials were transported from quarries from the south in the area of the Middle Rhine. Wood was transported from the area around the Middle and Upper Rhine as well as all kinds of products from Gaul. From the more southern areas of the Roman Empire pottery, glass, wine, oil, olives, fish sauce, dates among other products were transported along the Rhine. Since a lot of these products were transported in amphorae, their areas of origin could be deduced (Teigelake, 2008: 502).

Recent research has demonstrated that the local population around the northwest frontier was fully integrated into the Roman world (Derks & Roymans, 2002; Heeren, 2009; Vos, 2009 cited in Kooistra et al., 2013: 6) and that they were involved in supplying the army with food (Groot, 2008; Groot et al., 2009; Kooistra, 1996; 2012; Vos, 2009 cited in Kooistra et al., 2013: 6). This region had indeed already been subjected to the Romans since Drusus’ invasion in 12 BC.

It has often been considered that the areas north of the Rhine provided the Roman Empire with cattle. This
idea could quite possibly have been influenced by written sources describing the revolt of the Frisians in AD 28. One of the reasons of this uprising was the size of cattle hides that was demanded by the Romans (Tacitus: Annales IV, 72-73). An indirect deduction that has been made from this is that not only the hide but the entire animal was supplied. This is why the model introduced by Bloemers (1983 cited in Kooistra et al., 2013: 6) has been followed for a long time: the Roman army in the Rhine delta was supplied by cereals from the loess zone (northern France, Belgium, Dutch South Limburg and the German Rhineland) and meat from the terpen region (the northern Netherlands and northern Germany).

According to Teigelake (2008: 498), fish, oysters and later also fish sauce were imported from coastal areas of the Rhine delta into the rest of the Roman Empire. Later on these goods, as well as cereals, would have probably been imported from Britannia (see below).

**From east and west**
The ships on the Roman Rhine heading east and west mainly came from or went to Britain with their goods. The group of inscriptions from Domburg and Colijnsplaat at the Rhine mouth, discussed by Hassall (1978: 41-8), is potentially the most fruitful source of information about negotiatores, merchants trading between Britain and the Rhineland (Wild 1978: 80). These inscriptions were found on altars along with the remains of temple complexes dedicated to Nehalennia. She was probably the indigenous goddess and safe keeper of merchants, sailors and ship owners. Once the merchants had made a safe passage to or from Britannia with their goods, they honoured their vow by setting up an altar dedicated to the goddess. Some of these altars dedicated to Nehalennia display the names of merchants of salt (negotiatores salarii) and fish sauce (negotiatores allecari) (Kuipers et al. 2005: 26) (fig. 2).

Although we cannot be sure that the circle of devotees to Nehalennia was a genuine cross-section of commercial society on the Lower Rhine, Van Dierendonck (2009) sees this as part of the evidence for the supposed salt industry that resided in Zeeland. While this has not yet been scientifically proven, a part of a wooden construction has been found near Kapelle, which was probably used in the evaporation of water; this way salt must have been extracted from seawater. Van Dierendonck believes Zeeland was in great need of salt. The Roman army stationed in modern Aardenburg (Zeeland) would need salt to conserve meat and fish. Previously, it was believed salt was mainly imported from Britain because of the Roman salters found here, especially in the East Anglian fens (Trimble, 2001: 99).

Four Nehalennia altars, found near Colijnsplaat, display texts pointing towards the trade in fish sauce, specifically Allec. Fish sauce used to be imported from southern-France, Spain and Morocco until around 70 AD. Afterwards, it was believed fish sauce found its origin in Breataine, but evidence for this place of origin has never been found. However, remains of North Sea fish have been found in Vlaanderen near Zeeland. When considering this evidence in combination with the inscriptions from Colijnsplaat, it seems likely that after this period, the fish sauce was produced locally in the coast areas and then traded. Van Dierendonck considers this evidence for the fact that Domburg and Colijnsplaat were harbours, from which regional products were traded with the rest of the Roman Empire. The sauce must have found its way into the rest of the Roman Empire through the Rhine, as well as the salt.

It is well known that quantities of Mediterranean amphorae are found in Roman Britain. It is quite possible that they found their way into Britannia via the Rhine. Peacock (1978: 49) however, questions different routes by which they could be shipped. It appears that amphorae and other Mediterranean goods could have arrived in Britain in a number of ways, begging the question not only of route, but also of the economic or political factors determining the choice. Clearly, cost must have been an important parameter, though one that is difficult to assess. To examine this, Peacock made use of a cost surface analysis. Of the routes he examined, it appeared that the

![Fig. 2 An altar dedicated to Nehalennia by a negotiator salarii, found in Colijnsplaat (Rijksmuseum van Oudheden).](image)
route from Narbonne to Bordeaux was rated cheapest and thus this is the one we might expect to be used in supplying the British market. The Rhine is theoretically twice as expensive, even though a distribution map of Dressel 30 amphorae shows a striking concentration of sherds along the river. So, why ship goods to Britain via the Rhine, rather than the cheaper Narbonne – Bordeaux route? The answer must surely be that Britain was not the primary commercial objective, but that the goods were destined in the first instance for the Rhineland, where a large civilian and, above all, military population provided a lucrative market. Perhaps Britain merely received the surplus when this market had been satisfied. However, it is more probable that the answer lies in the mechanism of transportation: in the complex organization and synchronization required to load and unload goods for different sectors of the journey. Having established a system to meet prolific Rhenish requirements it would be logical to use the North Sea link to carry goods to Britain (Peacock 1978: 51).

Some pottery forms made in Britain were exported into the Roman mainland. The fine Oxfordshire ware (Young, 1973, cited in Fulford, 1978: 59) and the course black-burnished ware manufactured in south-east Dorset (Farrar, 1973; Williams, 1977 cited in Fulford, 1978: 59) are the two most important exports to Europe. According to Fulford (1978: 59-61), a part of these pottery forms must have transported via the Rhine.

Besides pottery, it seems fairly certain that we can recognize other artefacts which crossed the Channel to and from Britain via the Rhine. There is a Late Roman source that mentions grain imports from Britannia, destined for the Roman army along the Rhine (Mattingly 2006: 491, 505, cited in Kooistra et al., 2013: 6). Coal (Smith, 1997: 322), pewter and jet were undoubtedly exported from Britain, while metal objects like silver plate, glass (Price, 1978) and silk (Wild, 1978) found their way into Britain. Wool and other textiles would have been exported as well. Although epigraphic sources contain no explicit reference to negotiatoriis engaged in the textile trade between Britain and the Rhineland, we do have some references of merchants who worked with textiles and who might have had textiles among their wares. One example is an inscription from Colijnsplaat by Placidus, the negotiator Britannicus, for his tribe, the Veliocasses, who might have had some connection with flax growing and linen. Another example is a tombstone from Stockum near Düsseldorf (CIL. XIII. 8568; Weisgerber, 1968: 134 cited in Wild 1978: 80) which commemorates L. Priminius Ingenuus, a negotiator vestiarius importator. His name is of Rhenish origin and it would have passed unremarked among the Rhinelanders at Dumburg or Colijnsplaat. His main business was probably the sale of textiles to the garrison of the fort at Neuss and nearby military sites along the Rhine (von Petrikovits, 1960: 124 cited in Wild 1978: 80). He may well have received his goods by sea and river from Britain – or perhaps from the wool-producing areas of Gallia Belgica. However, with the exception of coins, these objects mentioned above do not survive in quantity, and characterization of sources and recognition of manufacturing centres are also fraught with difficulties (Fulford 1978: 59).

Conclusions

If the evidence for trade over and along the Rhine is so clear, then how come the Roman Rhine is seen as a defence line, rather than a trading route?

The fact that the Roman Rhine is usually associated with the limes is not strange. In the north-western part of the Roman Empire, the limes followed a great part of the river. Natural borders were usually easier to maintain and were selected to serve as boundaries for this reason. This view of the Rhine as the limes, and the limes as the outer border of the Roman Empire seems to be created by ancient written texts and their interpretations by historians. Historians, living in the modern age, seem to have focussed on the ancient written sources that describe the limes as the border of the civilized world. However, most of the ancient authors of these texts have never been to the outskirts of their world, which makes their contributions second handed or even irrelevant. This created our
one-sided image of the Rhine as the limes and only as a border. Archaeological evidence, as described above, could help complete and correct this view and pull it out of its biased context.

Looking closer while considering the archaeological evidence, one might notice that a river would also make a great way of transport and quite possibly, trade. After all, the limes with its stationed legions and forts would need the necessary supplies. Recent research and discoveries of for example the limes road near De Meern, shows us the limes as a way to control the Rhine as a trade route. The river was not the end of the world, and most of the Romans knew this. It was a possibility of trade over water with the barbarians and other Roman provinces. Trade was very important for the Romans (fig. 3), especially since they saw it as way to Romanize the barbarians that lived on the other side of the river. Their main goal was to get the free population of Germany depending on their goods, but the Romans needed their supplies as well. Using the Rhine as just a defence border would have been a missed chance for the Romans. Besides, using the waterways was a lot cheaper than travelling and trading over land.

Since we nowadays have quicker and less expensive ways to trade, rivers as a trade route have become indispensable. Perhaps this is because the modern world has become a terrestrial world. We don't think of the Rhine as water anymore, because we don't need to worry about ways to cross it. Seeing the Roman Rhine as a defence line is from our perspective more likely than a route of trade, because we now have endless other possibilities of trade, even though the Rhine nowadays is still used as a trade route.

Notes
1 Email: s.c.j.manuel@student.rug.nl
2 The edict describes the prices of goods, but also the prices of transport. When we compare the given prices for the transport of goods along established routes, it shows that transport over land costs five times as much as transport by river.

References


Maritime opportunities and their exploitation in antiquity

Pieter Swart¹

No one in the village had ever seen the sea – except for the Dutch people, the mayor and Jósef Puszka, who had been there during the war. (Geert Mak, In Europe)

Introduction
This essay investigates one of man’s interactions with the matter that covers some seventy percent of the surface of the earth: water, in the form of oceans, seas, rivers, lakes etc. This interaction involves the hunting of water fauna in order to use them for consumption, better known as fishing. This activity not only took place in Antiquity but is still in vogue and we can roughly distinguish three different approaches. There is the recreational approach, a somewhat individual activity that you can watch on a drizzly Saturday morning driving along the Hoornse Diep (canal in the North of the Netherlands) when an amazing number of men sit under their umbrellas staring at their float. Then there is the highly industrialized alternative of high sea fishing with fishing fleets accompanied by a factory ship. The third version is a kind of maritime pastoralism also called fish farming that is performed in open water (for instance salmon) or on inundated land (shrimps). The sea is not only a source of food but also plays a role as a supplier in the non food sector. Among these products are for instance salt, corral blocks as building material and shells, used as jewellery or, in some areas of the world, as money. The last aspect will not be discussed here.

There are indications that all three above mentioned variations on a theme were practiced in Antiquity although the emphasis was different. I seriously doubt that fishing as a sport or recreation played a large role in Antiquity. Since fishing as a sport involves hooks, the general distribution of this equipment is too small to invalidate my doubts. Many people who practice fishing as a sport (perhaps in reality it is a kind of mental yoga or zazen) always put the caught fish back in the water, a practise that cannot have had a lot of followers in Antiquity. Whether fish farming existed is doubtful, there are indications that fish was kept alive in large basins on land but there is no proof of breeding. The question is now if in Antiquity a version of our fish catching industry existed, if fish was an important part of the diet and if the combination of these two factors made for an important economic component. An altogether different, in the sense of eccentric or exotic, additional flavour in the relation with fish and the consumption of fish should not be neglected or excluded.

The sea as a context
Many people in this world have never seen the sea and will never see it but to many others it is an important factor that influences their lives in one way or another. This influence can have many appearances. The sea can be an important provider of food and in certain extreme environments it occupies a near monopolistic position e.g. with certain groups of subarctic hunter-gatherers (Bekker-Nielsen, 2007: 187). In less extreme habitats the significance of the sea as a food provider may vary. In our efforts to appreciate the importance of fishing as an economic factor or as part of the diet in Antiquity we may be biased by our terrestrial orientation. This orientation has taken over the more maritime orientated worldview from before 1900. Our analysis of the maritime activities concerning fish and fishing in Antiquity could well be judged as the effort of an outsider with all its consequences.

Fishing in archaeological and proto-historical sources
From archaeological and protohistorical sources one might gain the impression that fishing (or harvesting from the sea) in ancient times in the Mediterranean was a somewhat neglected source of food or income. There could be several reasons for this evaluation:
1. In reality, fishing did not play a large role in the food supply.
2. Archaeology influenced by the pre-20th century prevailing maritime worldview considered fishing an almost natural human activity and took it for granted.
3. Archaeology preoccupied by the terrestrial worldview that gained momentum in the 20th century was more interested in other human activities concerning food supply and neglected the subject.
4. The research for evidence of fishing activities was not a priority among archaeologists and could have been considered a waste of time and money. In order to get a more profound idea about the economic and social status of fishing in Antiquity I will now discuss the evidence of fish and fishing by means of looking at the written sources, the iconography and the archaeological data.
Fishing in more or less contemporary written sources

Fish and fishing are not frequently discussed items in the contemporary written sources and in Homer’s (±1000 BC) *Odyssey*, where a saga of ten years unfolds on or around the sea the subjects are conspicuously absent, except for the occasional sea monster.

The New testament of the *Bible* (written between the second half of the first century AD and the beginning of the second century) forms quite a contrast because here fishing is a major item. However, we have to consider a number of things: 1) Fishing takes place mainly on lakes and not on the high seas 2) Fishing is used as a metaphor for the winning of souls. In the Bible we can detect strong clues for the social environment of fishing and its practitioners. It is emphasized that Jesus mingles with outcasts such as lepers and prostitutes. Contemporary Jews would try to avoid this since it would make them impure, a status that had to be corrected by time-consuming rituals. That Jesus is in close contact to fishermen does not only have a metaphorical meaning but says also something about the social status of fishermen. It puts them in a group of social losers among lepers and prostitutes.

In the *Geographica* of Strabo (64 BC – 24 AD) we find the following sentence: “At any rate, they are compelled, on account of the poverty of their soil, to busy themselves mostly with the sea and to establish factories for the salting of fish, and other such industries” (Strabo, Geographica, 6.1.1). He talks about the people of Velia (Hyele) a Greek colony south of present day Salerno who stood apparently with their backs to the wall in making a living to such a degree, that they had to fall back on fishing.

The *Historia Naturalis* written by ancient know-it-all Pliny the Elder (23 AD – August 25, 79 AD) has a chapter with the title: “The decay of morality is caused by the produce of the sea”. In this chapter he continues ranting: “Indeed, of the whole realm of Nature the sea is in many ways the most harmful to the stomach, with its great variety of dishes and tasteful fish” (Pliny the Elder, Naturalis Historia, 104).

The *Halieutica* of Oppian (± 200 AD) or Ovid (43 BC – 17 AD) according to some describes the life of fishermen in a 3500 stanza epic poem but the fishing seems to be operated from the beach and you could suspect that Oppian has never been on a boat (Bekker-Nielsen, 2005: 94).

In *De Re Coquinaria*, a cookbook or rather gourmet guide by Marcus Gavius Apicius (25 BC–47 AD) the consumption of fish is depicted as an upper class privilege that has a rather decadent touch. Apicius confirms here the above cited suspicions of Pliny about “decay of morality”.

Nowhere in the written sources is any evidence of fish as a sacrifice to the gods. Every animal fit for human consumption: pigs, cows, goats even the pigeon has this function (Katchadourian, no date: 82). It looks like the gods had a collective aversion against fish and this again comments on the status of the product. More logical seems that sacrifices are performed with animals that are still alive: a pig or cow is slaughtered on or in front of the altar. With fish this ritual is not an option and this might disqualify the species for this role.

Overall one can conclude that fishing is not a hot item in ancient literature. When it is mentioned then rather negatively, as a last resort or a sign of decadence. From the written sources we do not gain the impression that fishing is an important economic factor or a well-organized industry that involves the investment of capital on a big scale and the employment of a considerable number of people.

Iconography

On the colourful frescos from Akrotiri (±1500 BC) we see men carrying fish hanging on a string. From the 5th century onwards red figured plates with depictions of fish appeared in Greece and Southern Italy. More than one thousand are known (Katchadourian, no date: 81) and they are generally considered to have been used as plates to eat fish from. The argument used is a small round recession in many of the plates that was supposed to hold the *garum* (fish sauce) or the Greek equivalent of this ancient *Maggi*. I am sceptical about this. Ceramics carry all kinds of depictions, battle scenes, domestic scenes, erotic scenes and depictions of fish. There are no or very few depictions of other types of food like for instance pork chops or fruit so why was fish the only food that was depicted?

There are quite a lot of mosaics around on which fish are depicted that give us information on the types of fish that were known to the artists and to the clients who ordered the decorations. The mosaics hardly give any information on the consumption of fish or about the methods used to catch them. Maybe the fish mosaics had the same interior decoration function as nowadays an aquarium in a living room or an office, to furnish a quiet and relaxing atmosphere. In Japan you can even encounter screens showing aquarium endless movies in many hotel elevators. One mosaic from Hadramatum (Tunesia) depicts some catching methods and I will discuss this below with the archaeological evidence.

Conspicuous by their absence are inscriptions and grave monuments that indicate a relation to fish or fishing. This may again point towards a low status of the profession and its products. Iconography provides us with a lot of beautiful pictures of fish but says very little about the importance of fishing and fish consumption. The frequent depiction of fishes on plates and mosaics could also be linked to the slightly decadent touch that Pliny identifies in the motive on which I will elaborate below.

Archaeological evidence

Fishing with hooks made from bone is known since the Mesolithic, an even older method may be harpooning but there is no direct evidence of this. A mosaic dating
Maritime opportunities and their exploitation in antiquity

from the 3rd century AD from Sousse (Hadramatum) in Tunisia offers us a glimpse of several fishing methods (Fig. 1). On the mosaic we see two men fishing with a rod and hook and going clockwise we then observe two men operating a seine (drag net) from a boat. Technically seen this is a rather hopeless enterprise since it is very difficult to keep the net outstretched from one boat but this may be attributed to the artist’s interpretation or his unfamiliarity with the procedure. At the bottom we discern a man in a boat who is possibly handling a casting net (Bekker-Nielsen, 2007: 191). According to the Archaeological Museum of Sousse it is a representation of a man fishing with a trained sparrow hawk. This technique is well-known as being performed with cormorants for instance in China, Japan and Macedonia. I cannot eliminate the possibility of fishing with a trained hawk but I have found no further evidence of this method. The last technique shows a man holding a creel (fish trap). This technique can only be used in the shallow waters of a creek or a lake (a boat is not really necessary) and the yield is not overwhelming. I would conclude that all shown methods indicate that fishing was a rather small-scale operation that did not provide big catches. The depiction of the drag net and fish trap method provoke the idea that neither the artist nor his principal was very familiar with fishing activities.

In 1959, while work on the new airport of Rome was in progress, the wreck of a boat was discovered (Fig. 2). This boat has a reservoir with openings to let in seawater and so fish could be kept alive and fresh until the catch could be brought on land. This vessel has a length of approximately seven meters, was built in the 2nd century AD and can be admired in the Museum of Roman Ships near the Fiumicino airport. This is up till now the only vessel from Antiquity that can be qualified as a fishing boat. It is not a very large, it could only be operated near the shore or on inland waters (Beltrame, 2007: 230). The boat shows no evidence of being propelled by sail and the crew would have been limited to two or three men. The amount of fish that could have been caught and handled with this vessel cannot have been copious. In 1986 a vessel with a similar but bigger reservoir was found at Grado near Venice. The reservoir that was equipped with lead pipes that suggest machinery to exchange the water, had a volume of about four m² and could have held 200 kilograms of live fish. The sixteen meters long boat also contained hundreds of amphorae in which garum and salted fish residue was detected (Marchant, 2011). This was certainly not a fishing boat but a freighter and it is interesting to see that fish was obviously not only transported after it had been processed.

In the coastal regions of Spain, France and Italy, archaeology has brought to light large production sites for the maggi of Antiquity garum, an evil smelling condiment that enjoyed great popularity. As important as it is today to supply American armed forces with Coca-Cola when on mission abroad as important was it to provide a sufficient stock of garum for the Roman legions. The concoction is made by letting fish or fish innards, mixed with a lot of salt, ferment in stone basins in the open air preferably at a high temperature. Although the exact recipe is unknown the final product might have had some similarity with trassi (fermented shrimp paste) from the Indonesian kitchen or nam plah (fish sauce) from the Thai cuisine. If we consider the large production sites of garum, there must have been
an enormous supply of fish (innards). Archaeology however has so far failed to come up with satisfactory evidence of how this supply came about.

The problem with the remains of fish consumption and fishing is that they do not withstand time very well and so it is not remarkable that hardly any fishing boats, nets, creels (wicker fish traps) etc. have been found. At excavations the soil has to be sieved meticulously in a time consuming (thus expensive) activity otherwise the fish bones will elude our attention.

After World War II and the development of the aqualung by Cousteau and his colleagues, maritime archaeology (and the depredation of maritime sites) took advantage of the improved conditions for working under water. The number of shipwrecks that was discovered and analysed rose dramatically (Muckelroy, 1978: 13-14). It is remarkable that this development has not led to the discovery of more fishing ships or even to the discovery of remains of activities in connection with fishing. It is also striking that books on maritime archaeology like the one cited above written by Keith Muckelroy do not pay any attention what so ever to fishing. This points towards a kind of *contradictio in terminis* that maritime archaeologists also start leaning towards a more terrestrial world-view nowadays. Because they worked in an environment with limited access and possessed very specialized skills, maritime archaeologists started to view themselves as a kind of archaeological elite. The more terrestrial world-view of maritime archaeologists can be detected by their increasing interest in sites that are not per definition under water but near the water or connected to shipping like for instance harbour installations, warehouses and sanctuaries with special ties to sailors. Dr. Gamin of the University of Malta underlined this evolvement as he started his lectures on Maritime Archaeology as follows: “You don’t have to bring your diving goggles for this course” (Gamin, 2011: personal communication).

**Malta, a fishy case study**

The relatively small Maltese archipelago (316 km²) located south of Sicily had an estimated population of eight to ten thousand people in 218 BC, at the time of the annexation by the Romans (Gamin, 2004: 172). Malta has a rather problematic agricultural situation since it seldom rains between May and October (Wilson, 2010: 160- 161), in other words Malta had a problem to supply enough food to its population. From the Middle Ages when the population numbers were about the same or in decline there are frequent reports of badly needed imports of grain from Sicily or their failure to materialize (Dalli, 2011: & Dalli, 2011: personal communication). It would be logical when the Maltese had turned to the sea for a supplement in their diet, however evidence of fishing in Antiquity on Malta is nonexistent. Traces of *garum* production like in Southern Spain, France or Italy are also not visible. This is in contrast to the large area with Roman salt pans. Modern archaeological publications concerning Malta e.g. by Atauz, Bruno, Gamin and others do not dwell on the subject.

In contrast “*the other economy of the sea based on the violent extraction of wealth*” (Dalli, 2011: 75), also known as piracy was an explicit part of the Maltese economy in Antiquity (Cicero, In Verrem, 2.4.46). So here we have the controversy of people who needed a supplement of their diet, who had ships at their disposal and were good sailors by consequence but did not practice fishing. If we take Strabo at his word the Maltese were obviously not that desperate in their efforts to provide sufficient food. There is of course the possibility that Maltese archaeology that in now bygone days strongly focussed on the Neolithic temples completely missed or ignored traces of fishing.

**Evaluation and conclusion**

The overall evidence of fish consumption and fishery in the contemporary written sources is not abundant. One does not get the impression that fishing was an important economic factor and it is indeed being denounced as an occupation of people who are either desperate or of a low social stratum. As an opposite there is the placement of fish consumption in a slightly decadent ambiance (Pliny and Apicius). In order to appreciate this last phenomenon it might be adequate to compare the social merit of fish consumption in Antiquity with the social merit of boxing nowadays. Boxing always had the characteristic of being at home among the lower strata of society (in the USA among the African Americans) but boxing matches nowadays enjoy the attention of crowds of well-heeled and high educated people who are attracted by the supposedly decadent atmosphere.
In the iconography, fish has a high profile as in mosaics, frescoes and on plates but besides having the value of nice decorations, it gives us only very limited information on fishing. If fish in reality had a connection with a type of decadent atmosphere then the high illustrative presence makes sense. An interesting comparison could be drawn with the tales about mermaids, they survive in our fairy tales and a closer look discloses quite often a slight erotic undertone. Depictions of fish could also have been a kind of ancient mania, comparable to the situation that not long ago in Japan or China one could not buy a plate, a stamp or a pair of socks without Dick Bruna’s Nijntje (rabbit) on it (fig. 3). Research directed at inscriptions concerning fishing on monuments or graves is a dead end and this could again give an indication about the (non) respectability of the subject.

Archaeology offers us large sites with production installations for garum and innumerable amphorae with residue that discloses the contents as garum or salted fish. Archaeology, in particular the maritime branch, has however failed to come up with large-scale evidence of the industries’ supply side. Only one vessel has been identified as a fishing boat and if something compared to present day high sea fishing was in operation can be doubted. Recent research by way of isotope studies of human bones gives evidence that fish formed only a very small part of the diet (Bekker-Nielsen, 2007: 199).

Still the quantities of fish required for the garum production and the moderate consumption had to be caught. Our approach towards fishing is heavily influenced by the image that we have of commercial fishing nowadays. This image can be split up in two separate images: A fleet of fishing boats accompanied by a kind of factory ship that processes the catch while at sea and keeps it from going bad, an industrial operation that in particular the Chinese, the Koreans and the Japanese have developed to perfection. The other image is the holiday picture of fishermen working during the night (you can see the lights of their boats from the beach) and in the morning returning with their catch, a sight well known from the Mediterranean and South East Asia. We should not jump to the conclusion that one of these images can be applied to fishing in the past because there is no evidence that shows that this has something in common with the reality of fishing in Antiquity.

We can assume that rivers and lakes in Antiquity were hardly polluted the way they are nowadays and that these waters did have a far larger fish population as compared to the present. Putting fish traps or stationary nets in rivers and lakes is a small time operation that not obligatory involves the use of boats and requires only a small investment in equipment, manpower and time. This could mean that without huge investments both in equipment and time a considerable quantity of fish could be caught. The quantity of fish caught in lakes, rivers and close to the coast (either from small boats or with dragnets operated from the beach) must have presented the raw material for the garum and salting industry and for the rather limited consumption of fresh seafood. We must also take into consideration that the coastal area of the Mediterranean in Antiquity boasted some 6,500 km² of marshy lagoons. This form of maritime landscape is far more productive then the open sea with a possible yield of more than 100 kg/ha p.a. (Horden and Purcell, 2000: 192).

Gallant (1985), as he writes in his book “A Fisherman’s Tale” considered fishing in Antiquity a low profile operation that took place on the shore without boats (Bekker-Nielsen, 2005: 93, Beltrame, 2007: 229 & Gallant, 1985). The evidence supplied by contemporary written sources, iconography, archaeology and modern archaeological publications for fishing in Antiquity and in particular for high sea fishing is poor to nonexistent and so supports this view. The problems that seem to deny fishing and fish consumption an important economic role are the fact that fish spoils within 24 hours, that it is tainted by a low social status (on the other hand by a kind of decadence), that the activity is seen as a last resort and that even the palate of the gods was not tempted by a good seafood meal. Without visible high sea fishing operations, the quantity of fish, required for the large scale garum industries must have been caught in streams, lakes, lagoons and close to the shore. The absence of pollution and over-fishing in Antiquity made that fish was still abundant there.

Notes
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The economic growth of terp-settlements related to their accessibility through waterways

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Introduction

This paper is written in the context of the course ‘Approaches to and interpretations of landscape’. Central theme of this course is the decoding of the meaning of maritime aspects in art history, landscape history and archaeology. The general premise related to this is that we, people of the 21th century, are inclined to look at the world through a primary ‘terrestrial’ view, whereas people in the past (at least before approximately 1900) had assumedly a more maritime worldview. Because of this different view the wrong scientific questions might be asked, and some research questions which are essential to be asked in order to understand the behaviour of people in the past, might never be asked.

Problem definition

In this paper the maritime worldview of the inhabitants of the Dutch terpen area will be questioned. Terpen are artificial dwelling mounds, created by people during the period from the Iron Age till the Middle Ages, in order to protect them from high water levels. They are a common phenomenon in the Dutch provinces Friesland, Drenthe and Groningen. The study of terp-settlements has a long history, but although the importance of waterways in this area is acknowledged, surprisingly little archaeological attention is given to them.

When discussing the archaeology of the terpen area, Heidinga stated that Dutch archaeology has not included the role of water in the identification and interpretation of the cultural landscape (1997, 50). Water is generally taken to be a natural demarcation of the study area and this might lead to wrong conclusions (Heidinga 1997, 50). Instead the author pleaded for a research method in which the researcher should alternate his point of view from land to water and from water to land. Heidinga (1997, 49-53) suggested to consider the by waterways fragmented coast of the Northern Netherlands as a maritime landscape in which the network of gullies, creeks and rivers offered perfect opportunities for water transport and participation in (inter)regional exchange networks.

Terp settlements are often located in the vicinity of a gully, creek or river. It is assumed that these places had a geographical advantage, being located in a landscape in which travelling and transport are considered to go mainly via water (Gerrets 2010, 64). This assumption is however hardly questioned. Although waterways sometimes play a prominent role in paleogeographic reconstructions, and are often still visible on cadastral- and height maps, most archaeological research to date hasn’t gone beyond the observation that terp-settlements are often located near a waterway. In few cases an incomplete distribution map is made to visualize this. Waterways also have a low value in archaeological prediction maps, while study on the meaning, course and navigability of waterways in the past can provide important information about transport opportunities in different periods, and could also partly explain why the (economic) growth of some settlements is larger than others (Bazelmans et al, 2009,83).

One aspect to have received attention is that regional and local differences can be observed in the quantity and luxury of import goods found in terp-settlements (Bazelmans, 2009 referring to Volkers & Galestin 1992 (Roman period) and Knol 1993 (Middle Ages)). Their research leads to several questions. What do these differences mean and how did they develop through time? Are they an indication of status differences and the rise of local or regional centres? Do they reflect a different degree of accessibility through waterways or are the observed patterns the result of post-depositional processes (cf. Bazelmans 2009, 86)? A possible hierarchy in terp-settlements was observed in archaeological excavations near Cornjum (Exaltus 2001, 107-111). The larger terpen in this area were situated near open water and the smaller ones were situated more inland, near gullies at a distance of 200 to 500 m from the larger terpen (Exaltus 2001, 109-111).

The area between the larger and the smaller sites seems to have been uninhabited. According to Exaltus (2001, 110) the larger terpen, economically ideally situated near open water, maintained contacts with the Romans (import goods were found at these larger settlements), and the smaller ones concentrated on breeding cattle. Because of the larger economic possibilities along the open waters, part of the inhabitants of the larger settlements might have formed a rich elite (Exaltus 2001, 111).

It will be interesting to research whether this pattern of large wealthy settlements located near open water and small settlements near smaller gullies creeks is also visible in other parts of the terpen area. Only recently palaeographic maps have been made including the locations of all known terpen. These maps however lack a differentiation in size and nature of the settlements, like Miedema (1983) has incorporated in here distribution maps of the...
The objective of this paper is to study whether the accessibility of a terp through waterways is of influence on its economic growth. The numbers of import finds on terpen and the size of terpen are taken as indicators of economical growth. The limited scope of this paper implies that only general patterns have been analysed within a relatively small area and specific period. The chosen area and time period is Westergo in the Roman period, because for this area and period the relatively best data is available in terms of maps, finds quality and documentation.

Conceptual models
This section discusses three models on the spatial relation between terpen, waterways and their economic importance. For each of these models a schematic figure of the expected distribution pattern is made (the figure does not represent the way the landscape looked like in the Roman time). It is assumed for each of these models that the imported goods were brought to Westergo over sea and not through the inland peat area.

Model.1: Large and wealthy settlements located near the sea
In this model the terpen with the largest number of imported goods are located near the sea (that is within approximately one km of the coast (fig. 1). The model is based on the idea that the import-goods are delivered to those settlements which are the easiest accessible from the sea. These settlements are possibly located along trade routes from the Roman area to for instance Scandinavia and Germany. Moreover, these trading settlements are located on water deep enough for large ships. These settlements might trade with neighbouring settlements inland via smaller waterways. As a result, the number of imports is expected to decrease as we move further inland.

Model.2: Large and wealthy settlements are centrally positioned along waterways
According to this model the import goods are brought to central positioned settlements located along the main waterways (fig. 2). These settlements are well accessible by large ships. From here, imported goods could be distributed with smaller ships to neighbouring settlements through smaller waterways.

Model.3: No relationship between the location of settlements and water
This model is based on the alternative hypothesis that there is no relationship between the accessibility of a terp through waterways and the number of imported goods. This could mean that the importance of waterways as ways of transport is overrated, or that other locational factors are more important. Such factors might be that...
settlements with many import goods produce a specific sought-after product or obtain a sought-after good product from the local landscape. On the basis of this model we expect the terpen with many import goods to be randomly distributed over the whole area (fig. 3).

**Methods and Source criticism**

Above, three models concerning the relationship between the abundance of imported goods on terpen and their accessibility through waterways were presented. In order to test these models all terp-settlements located in Westergo are assigned to classes on the basis of their size and the imported goods. For this last aspect, both the type and number of imported goods is taken into account. Then for each class a distribution map of the terpen is made. The x- and y-coordinates of all settlements within a class are imported in ArcGis10 and visualized in a layer. Each class has its own layer. These distribution maps are plotted on a paleogeographic map with waterways. A settlement is described as located along a major waterway when it is positioned within one km from one of the waterways indicated on the paleogeographic map. Since there is no information about the distance between a harbour and its settlement, this is an estimation based on the idea that people in the past would not transport their goods a very long way over (wet)land.

**Paleogeographic maps**

There are several recent paleogeographic maps made by Peter Vos (figs 4-6).

Although all three maps are supposed to reflect the landscape of Westergo in more or less the same period, small differences in the course of the waterways can be identified. This observation is intriguing while for all maps the same data is used to reconstruct the landscape. The differences may be the result of the difference in scale of the maps while on a smaller scale the course of the waterways might be more detailed. On the detailed scale used in this paper the choice of map might affect the visibility of patterns. The distributions maps used here are made on the bases of the paleogeographic map from Vos et al (2011, 63) shown in figure 5. This map is chosen because, out of the available three, it was the only one suitable for our purpose. The resolution of the image of the local maps of Westergo was not sufficient, and the map on which the terpen were already indicated distorted the visibility of any patterns.

Another problem which we have to take into account is that these paleogeographic maps are not intended for very detailed studies. Apart from a matter of scale and precision, this means that not all waterways are on the map. Because only the major waterways are shown on the map, only general patterns will be visible.

**Size of terpen**

Because the number of excavated terpen is slight compared to the total amount of terp-settlements (the total number of settlements occupied in the Roman period is estimated at more than 1000) it is difficult to understand the settlement pattern in Westergo. A frequently used method to create a hierarchy between terp-settlements is to measure the size of the settlements and classify them accordingly (e.g., Miedema 1983). The used measurements for this paper are adopted from Gerretsen (2010). The terp-settlements are divided into six separate classes, or in three groups. The first group is that of the supposed
single farm-terpen. This group comprises class 1 (<0.5 ha), class 2 (0.5-1.0 ha) and class 3 (1.0-2.5 ha). The second group is that of small village-terpen and comprises class 4 (2.5-5.0 ha) and class 5 (5.0-10.0 ha). The third group comprises the large village-terpen and consist of class 6 sized settlements (>10.0 ha).

A major problem with this classification is that the size is based on the current (or recent past) extent of these settlements and therefore it is not certain whether this size is firmly related to the size during the Roman period. It can be argued that at least for part of the settlements the current size is representative for that in the Roman era. It is known that the relatively large settlements in the northern part of Westergo have been founded in the Roman period and that their biggest expansion took place in the middle ages (Gerretsen 2010, 91). On the contrary, the biggest expansion of the settlements in central Westergo had already occurred by then (Gerretsen 2010, 91). It will be clear that the presented hierarchy of terp-settlements in Westergo based on their current size must be seen as indicative.

Import as an indicator of wealth

Import is often seen as an indicator of wealth (Bazelmans, 2009). Imported products were often luxury goods meant for rich people e.g. *terra sigillata*, coins and other metal objects. But how did these imported goods reach Westergo? If we assume the inhabitants of Westergo required them by trade these settlements must have had a stable economy. Wells (1999, 244) argues that Germanic settlements even changed their economy in order to produce goods for trade. Edrich (2001) however argues that there was no sustainable, through time growing, trade-import of Roman goods. According to Edrich Roman goods reached the west-German area only during relatively short periods and in particular through military and diplomatic contacts (Erdrich, 2001). There was no intensive trade with a strong influence on the economy of Germanic tribes. This still means that elite people must have been present at the settlements were import goods were found. Galestin discusses both viewpoints in her article *Roman artefact beyond the Northern frontier* (2008). She concludes that there are strong indications for trade but she also offers two other possibilities. Galestin suggests that veterans brought Roman artefacts with them upon returning from service abroad or that they were looted. Both options are unlikely to be the case for all objects because there are simply too many of them (Galestin 2008).
The economic growth of terp-settlements related to their accessibility through waterways

Post-deposition processes can cause severe problems when we consider settlements as rich and poor on the basis of the amount of import pieces discovered. Most of the imported goods were found in the course of the commercial levelling of terpen during the nineteenth and early twentieth centuries for the sake of their fertile soil (Galestin, 2008). Just a small number comes from scientific excavations. During the commercial diggings, only the more visible and valuable objects such as coins, metal items, and *terra sigillata* received attention. This makes it uncertain if all encountered Roman artefacts were preserved. It is not known, for instance, if the lack of Roman plain wheel thrown pottery means that it was absent, or that it simply went unnoticed (Galestin 2008). Another problem is that not all terpen are excavated, so possibly large amounts of imported goods are not found. Other factors that differ per region and produce problems in our analysis are the soil characteristics and conservation related to that, activities of amateur archaeologists and the use of metal detectors (Bazelmans 2009).

Despite these problems the number of import goods is used as an indicator of wealth, not only because better options are absent, but also because general patterns will still be visible.

The terpen are classified in the following four classes, based on the number of *terra sigillata*, bronze artefacts and any other valuable imports. Class 1 are sites without import goods. Class 2 produced 1-9 sherds of *terra sigillata* or other import goods. Class 3 provided 10-50 sherds of *terra sigillata* or 1-9 sherds of *terra sigillata* plus other imported goods. The class 4 sites provided more than 50 sherds of *terra sigillata*. The data about the Roman imports per terp are obtained from Galestin and Volkers (1992), Edrich (2001), Boeles (1951) and Bivanck (1931-1947). Especially in the older publications from before 1990 it was not always clear from which specific terp the finds were obtained. These import goods are not taken into account.

Fig. 7 Distribution of large village-terpen related to waterways.

Fig. 8 Distribution of small village-terpen related to waterways.

Fig. 9 Distribution of house-terpen related to waterways.
It was difficult to establish the relevance of bronze artefact and especially bronze statuettes. Galestin (2008, 77) explains this by stating: “The lack of a reliable context for the Frisian statuettes makes it difficult to come up with an adequate explanation for their presence in the terpen”. It was decided to reclass class 1 sites in class 2 and class 2 sites in class 3 if a bronze statuette was found.

Analysis

Distribution of sites based on their size (figs 7-9)
The ‘near the sea’ model seems not applicable to the distribution pattern of terpen based on their size. None of the three largest settlements, Achlum (A in fig. 7), Tzum (B in fig. 7) and Berlikum village-terp (C in fig. 7) is located near the sea (the closest is located eight km from sea). The terpen with a size between 5 and 10 ha lie 4-20 km from sea. The smaller settlements seem randomly distributed regarding distance to sea. However, it is noticeable that the smaller settlements occupy a larger area, extending further inland to the peat area.

The pattern better fits the second model whereby the growth of settlements is related to major waterways. Two of the three largest settlements (Achlum and Berlikum) are located within 500 m of a waterway. The terp Berlikum, which lies closest to a waterway, is situated in the northern part of Westergo and was probably not grown to its present day size in the Roman period. The terp at Tzum is located at approximately 1 km from a major waterway. Some of the smaller village terpen and some house terpen lie closer to the water than these large terpen. If we then look at the other large village terpen (5-10ha) it becomes clear that although half of them are located further than a km away from a waterway they are still concentrated around them. The areas in between the visible streams on the map remain empty. Looking at the smaller village terpen this pattern of closeness to waterways becomes less clear (fig. 8). The majority of the terpen is however still concentrated around the two central main waterways. According to these findings there seems to be no particular relationship between the location of house terpen and the major waterways (fig. 9).

The third model that there is no relationship between the accessibility of a terp through waterways and its growth can be rejected. As described above the larger settlements are closely connected to waterways. One might argue that large parts of Westergo were nearby waterways, and that therefore this relationship is not significant. However, the areas furthest away from waterways remain empty except for the smaller settlements. A random distribution of the larger settlements which would be expected on the basis of this model is not present.

Distribution of sites based on the amount of import (figs 10-11)
There are six terpen of class 4 (fig. 10). Striking is that the three wealthiest of them are situated in the east of Westergo while the others are located in the west. Also noticeable is that two terpen on the Westside, Voorijp III (B in fig. 10) and Wijnaldum-dorpsterp (A in fig. 10), lie within one km from each other. The same goes for the terpen Hatzum I (D in fig. 10) en Hatzem II (E in fig. 10) on the Eastside of Westergo. The four groups thus created lie approximately seven kilometres from the nearest other group.

The ‘near to the sea’ model again seems to play no primary role. The terpen at Wijnaldum and Voorijp are closest to sea but still at a distance of over 4.5 km. However via the main waterway at which they are located they have fast access to the sea. The other four all lay at approximately 14 km from sea. There are a lot of terpen with no import located closer to sea (fig. 11). Apparently closeness to sea is not related to the number of import goods. Nevertheless, it can be noted that settlements with import are mostly located in the northern and central part of Westergo and not further inland. Maybe distance to the sea was of some importance although it was certainly not the primary criterium.

Model 2 again fits the data better. Three of the six terpen in class 4 (Wijnaldum, Voorijp, and Ritzemaburen (F in fig. 10)) are closely connected to main waterways. On the distribution map the distance to the nearest waterway of the terpen at Wijnaldum is approximately
The economic growth of terp-settlements related to their accessibility through waterways

one km but the excavation reports (Besteman 1999) and other literature (Gerritsen 2005) show a location almost directly at an important waterway called Ried. The *terpen* at Hatzum we could also consider to be related to water. On the distribution map they are located at approximately 1.5 km from a main waterway but if we look at the more detailed paleogeographic map of Westergo (Gerritsen 2005, 21) it might have been closer in reality. *Terp* Groot Tolsum (C in fig. 10) is the only one which can not directly be related to a known waterway. Of the six class 4 sites it is the one with the lowest number of *terra sigillata*, but it is quite a large *terp* and some special other Roman import goods are found.

From the *terpen* in class 3 special attention must be given to the *terp* Winsum–Bruggeburen (G in fig. 10). Only one sherd of *terra sigillata* was found here, but the *terp* is rich in imported metal objects from iron, bronze and silver. This *terp* is often considered to have had a central position in Westergo (Galestin 1992, Gerrits 2010). Indeed it is located almost exactly in the centre of Westergo, and it is located directly on a major waterway. The detailed maps of Westergo (fig. 6) reveal that the *terp* is situated at a waterway (2 in fig. 10) which crosses Westergo completely from Northwest to Southeast and joins the northern waterway (1 in fig. 10). The connection between these two waterways is of importance with respect to accessibility and contact between the *terpen* close to them. Out of the eleven *terpen* in class 3 eight are located within one km from a waterway, three of them near a main branch (fig. 10). Three are located at some distance. There seems to be no specific relation between the *terpen* with relatively few Roman imports (class 2) and waterways (fig. 10). Some are located close to waterways while others lie at a distance of 3-5 km. This applies even to stronger extent on the *terpen* with no import (class 1; fig. 11).

Size and number of import goods compared

There is no ‘one to one’ relationship in the sense that all *terpen* with the largest number of import are also the largest *terpen*. However, in general the *terpen* with Roman import are also quite large. So if we compare both distribution patterns it becomes clear that large settlements with many import goods are often located along major waterways.

Conclusion

This paper addresses the question whether the variation in size and number of import goods in Roman period settlements of Westergo is related to a maritime infrastructure. To this end three maritime models were proposed. The first model proposes that direct access to the sea was a major influence on the growth (size) and wealth (import goods) of settlements. The GIS analysis suggests that this is not the case. The second model, in which the major rivers are included in the analysis, seems more relevant and will be discussed in more detail below.

The third model supposes that there is no relationship between the growth and wealth of a *terp* and its accessibility via waterways at all and can be rejected. There is a pattern that large and wealthy sites are often located near a major waterway.

The first part of the second model, stating that the largest *terpen* are centrally positioned along the major waterways therefore seems to be correct. Because not only large settlements, but also quite a number of small settlements are located near major waterways, it is concluded that other factors may also influence the growth potential of settlements. Some of the larger settlements with many import goods, such as Groot Tolsum don’t seem to fit the general pattern, because they appear to be at some distance from the nearest waterway. An explanation could be that not all waterways are on the map used.

In the second part of model 2, it is proposed that import goods were transported down-the-line from the large settlements with a large number of import goods to neighbouring settlements via smaller waterways. This part of the model cannot yet be demonstrated due to the lack of appropriately detailed maps. Future research should therefore pay more attention to the course of gullies, creeks and rivers. These waterways can be reconstructed by means of a map study including data from heights, cadastral data and geomorphology, but additional drilling in the field is needed to date the waterways. These drillings can also provide information about waterways on a more local scale, including the navigability of these waterways.
Another problem in the analysis of terpen-patterns is that the knowledge of central places in the Roman period is very limited. Large scale research is needed to elaborate on the potential for terpen in the coastal area to have had a central function. Ideally a comparative study should be done on a couple of representative and simultaneous settlements in the same region, such as done by Richard Exaltus on Cornjum. To this date investigation has mostly concentrated on the terp-mounts, while research of the immediate environment might be very valuable as well. Especially the (unknown) location of the harbours could provide us with information on the distance of the terpen to the harbour and on which settlements might have had a central function. Consequently we can characterize settlements with respect to the location near a waterway.

It has become clear that studies from a more maritime perspective can provide a valuable addition to the traditional way of archaeological research with a ‘terrestrial’ view. New questions can be asked and may lead to better understanding of the way the people in the past exploited and experienced the landscape they lived in.

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Transformations in Worldviews along the Mainland Coast of the Dutch Wadden Sea Area (9th and 10th centuries AD)

Merit Henriët Snoeijer

Introduction
The meaning of maritime aspects in (art) history, landscape history and archaeology is a recurring topic in international scientific conferences (e.g. Conference on International Maritime History; Annual Maritime History Symposium; Annual Conference on Historical and Underwater Archaeology). With regard to the meaning of maritime aspects in the discipline of history, one could question when these aspects were of the greatest importance in history. For nowadays a maritime worldview seems absent in the Netherlands and a mainly terrestrial worldview is of importance. When did this shift occur and what does this shift signify for the communities concerned?

The general hypothesis in this volume is that the worldview was primarily a maritime one before c. 1900, for the 19th century is the time when significant changes occurred in landscape structure and society. It is clear that the 19th century was an era of industrialization, urbanization, modernization and population growth (Knottnerus, 2001: 57). Due to the population growth, the market for agricultural products boomed, and agriculture modernized, increasing in scale and output production. In order to facilitate this growth, investments in hydrology, infrastructure and machinery were made, making fields drained better so they could be used more extensively (Knottnerus, 2001: 59). Paved roads and railroads were introduced, making the use of sea, rivers and canals less important for transport and commerce (Knottnerus, 2001: 47). The roads resulted in a reversal of the coastal infrastructure, making the cities became of increased importance as they provided more work. These changes can be seen as indicators of a shift from a more maritime-focused world to a more terrestrial, inland-focused world.

In the light of this 19th century transformation, it is interesting to note that despite the 19th century changes, already in the 9th and 10th century significant changes occurred in terms of worldview. This study shows that already in the Carolingian time (early Middle Ages, 750 – 1000 AD) fundamental transformations took place in the shift from a maritime viewpoint to a terrestrial viewpoint.

To present this transformation, this paper focuses on a case study-area: the mainland coast of the Dutch Wadden Sea area. It covers (parts of) the provinces of Groningen, Friesland and Noord-Holland. The focus of this paper will be on human settlements, agriculture and fishery, for there, the shift is most evident. In this paper, worldview is seen as the overall perspective from which the society saw, used and interpreted the world. When society is more focussed on and influenced by the sea and other waters, a maritime worldview exists. When society is more focussed on land, a terrestrial worldview is observed. Since these are abstract concepts, the shift will be interpreted according to six themes, described below.

Natural Background
The mainland coast of the Dutch Wadden Sea area consists of tidal mud flats, shoals, and fertile marshlands, nowadays mostly lying behind the dikes. It is a shallow coastal area with extensive tidal flats (Schoorl, 1999). During the last ice age (Weichsel, 110.000-10.000 BP), land ice did not reach the Netherlands, but wind erosion shaped the landscape by depositing a layer of sand (Janssen-Stelder, 2000). Since this last Ice Age, the sea has risen by a 100-120 meters (Lotze, 2005; Rippon, 2000). As a consequence of the sea level rise the ground water rose as well. This rise in groundwater level subsequently resulted in the growth of a broad belt of marshes, now visible as peat layers. The peat growth continued up to the early Middle Ages, covering large parts of the land (Waterbolk, 1988; Knottnerus, 2001, p.28; Lotze, 2005). Later, the continuing sea level rise resulted in the deposition of clay over most of the peat areas (Waterbolk, 1988; Knottnerus, 2001).

The physical geography had its repercussion on the social-historical geography of the region. Since the Late Neolithic, men inhabited the Wadden Sea region, mainly located on natural elevations (e.g. ridges and sand heights) and, from the Iron Age onwards, on artificial dwelling mounds (Knottnerus, 2001, p.12). For many centuries, permanent settlement was only possible at the edges of the coastal area, for the risk of flooding was too high. Only when a broad belt of salt marshes rose in the landscape, safe habitation was possible and settlements were formed. The coastal marshes of Groningen and Friesland were habited permanently from the 6th and 5th century BC onwards, when the wetlands were exploited and farmers began to modify their immediate surroundings (2005; Rippon, 2000; Knol, 1993). During the Roman times (0-400 AD), the riverbanks were densely populated. Trade became an important aspect of economy and the region bloomed (Knottnerus, 2001, p.33; 2005).
Transformation during the Carolingian time

The landscape of a coastal region is bound to nature, as the natural background of the area shows. Men had to deal with the dynamic landscape and nature of the area, making it a challenge to inhabit the region and adapting to the circumstances. At the dawn of the Carolingian times (750 AD), the landscape consisted of clay areas, peat bogs, marshes and more scarce, sand grounds in the south and east of the region (Waterbolk, 1988). Until the Carolingian times, the region can therefore be distinguished as a region with a mainly maritime worldview, where the sea and many rivers and creeks provided not only means of transport and communication, but also nutrients for the soil and the thread of flooding. During the 9th and 10th century, several shifts can be observed, namely: 1) changes in landscape use in the early Middle Ages, 2) decreased marine influence: the construction of dikes, 3) a new balance between agriculture and fishery, 4) new settlement locations, 5) reclamations, 6) changes in commercial networks. In combination these shifts resulted in the Carolingian worldview shift.

Shift (1): changes in landscape use in the early Middle Ages (750 - 900 AD)

Permanent settlers adapted to living in tidal areas, as they built cattle farms on mounds. There were ditches dug for drainage and farms were located side by side along the slopes of the mounds or the riverbanks (Knottnerus, 2001). Throughout the occupation period of these (artificial) mounds, archaeological finds show a rich and diverse material culture, characterized by extensive maritime contacts and a considerable degree of specialization (Schmid 1991; Knol 1993; Heidinga 1997). Especially the production of salt can be seen as a function of this maritime society. Salt production was introduced in the Roman times and became of greater importance in the early Middle Ages. As a result, most tidal bogs were dug away for fuel and their salt content (Knottnerus, 2005). The sea and rivers were used for trading, and trading villages came into existence along tidal creeks (Kossack et al. 1984; Knottnerus, 2005).

Shift (2): decreased marine influence: the construction of dikes

While permanent settlers who were adapted to living in tidal areas by building their farms on mounds and digging ditches for drainage are known from the Iron Age onwards (Knottnerus, 2001, p.31), at the end of the Carolingian times, the settlers started to construct dikes along the mainland coast of the Wadden Sea (Schoorl, 1999). By doing this, the sea decreased to be the determining factor in the daily life of the settlers. Human activity became less influenced by natural forces.

Shift (3): a new balance between agriculture and fishery

Despite the clear maritime aspects of the Carolingian society, most of the coastal villages were largely agricultural (Knottnerus, 2005; Knol, 1993). The habitation on the dwelling mounds continued during the Carolingian time, and most of the dwelling mounds consisted of infelos and a natural well, surrounded by ditches and hedgerows. Outfields were parcelled out and privately owned, leaving only wasteland and peat moors undivided (Knottnerus, 2005). From an agricultural perspective the sea does not play a central role, although it certainly delimited the potential of agriculture. But even though there is a mainly terrestrial worldview supposed here, agriculture is unavoidable dependent on nature, as Fischer and Hasse explain. They state that “agriculture finds expression in a) the tides, b) the storms and c) in the (always threatened) area immediately behind the coast” (Fischer & Hasse, 2001: 78). Moreover, the coastal economy was still largely seasonal, dependent on the seasonal influence of the sea (Knottnerus, 2005; Knol, 1993). So even though the focus became more towards agriculture and agriculture expanded, the influence of water was still present.

According to Brinkhuizen (1988), fishery was well developed from the 8th until 10th century. He states that “the fish remains found [during archaeological excavations] are whiting (wijting), cod (kabeljauw) and haddock (schelvis), and these show that the fisherman fished in sea inlets and maybe even on open sea” (Brinkhuizen, 1988: 232). It is also known that inhabitants of the region also fished in the Wadden Sea with a fine fishnet and/or with a combination of a fyke and fishtrap for the smaller fish (Brinkhuizen, 1988). In a study on medieval European nutrition, it became clear that during the Middle Ages, fish was consumed regularly, making the importance of fishing more plausible (Hoffman, 2004). But even though fishery was well developed during the Carolingian times, and the sea was still of influence on agriculture, it can be society was more focussed on the (use of) arable land, while the influence of the sea decreased as a result of the construction of dikes.

Shift (4): new settlement locations

During the Carolingian period the settlement pattern is largely a continuation of the traditional pattern. Habitation was mainly concentrated on the artificial dwelling mounds and along riverbanks and tidal creeks, locations important for commerce and transport (Knottnerus, 2001: 34). This period holds important changes as well; occupation started to expand during the 9th and 10th century. The salt marshes were parcelled out in blocks and occupation was concentrated in hamlets at the border of the marshland zone (Knottnerus,
2001: 35). These findings suggest that a shift in worldviews based on settlements was initiated during the Carolingian times, for settlements started to use the land and expand quickly.

**Shift (5): reclamations**
The first colonisation of any meaning occurred during the Carolingian period. The colonists dug ditches for draining of the peat and cultivated grain and other crops on the reclaimed peat moors (Wolff, 1982; Knottnerus, 2005). Due to these reclamations and the more intensive use of the land, the peat surface oxidized. In its turn, this resulted in a lowering of the surface. This process was further increased when the top layer was burnt for the fertilisation of the land (Wolff, 1982). These combined effects resulted in a rapid lowering of peat moors to groundwater level. This process coincided with the mining of the salt marshes, extensively done along certain areas in the mainland coast of the Wadden Sea area (Borger, 1992, Wolff, 1982).

Because of the reclamations and its effects on the landscape, the land became again more vulnerable to the sea, resulting in large storm floods that increased in range and volume. A consequence of this was the deepening of access channels into the land (Wolff, 1982; Borger, 1992; Van der Ven, 2004; Knottnerus, 2005). Because of the vulnerability of the land, inhabitants needed to stay on the higher grounds. Therefore on the one hand, with reclaiming the land, man created land and used land more extensively, but on the other hand, reclamations made the land vulnerable.

**Shift (6): changes in commercial networks**
Ever since their occupation, the inhabited areas along the mainland coast of the North Sea had been in contact with each other by means of the sea and waterways. These contacts included trade (Waterbolk, 1988; Knottnerus, 2001: 33). In early Carolingian times, a new type of settlement came into existence in the Wadden Sea region: mercantile dwelling mounds. These villages were populated by merchants and situated along tidal creeks and rivers (Knottnerus, 2001: 34). This suggests that the region was commercially focussed on water. From the late 9th and 10th century onwards, maritime commerce gradually declined, while regional markets came to rise and export to the inland was of lesser importance. Also competition from Flanders rose during that time (Knottnerus, 2001: 35). Subsequently, during the summer and later all year round, the region became accessible through the higher dry areas of the peat moors (Waterbolk, 1988). Therefore, the waterways were no longer required for commerce, although until the 19th century, they were used for this purpose.

**Conclusions**
This study was set out to construct an analysis on the shift of a maritime worldview to a terrestrial worldview along the mainland coast of the Dutch Wadden Sea area. It is seen from the introduction that the assumption existed that this shift mainly took place in the 19th century, for the 19th century is symbol for change and modernization. But, it is seen that when following several themes from the 9th and 10th century, a variety of indicators on transformations can already be observed. It became clear that already in the Carolingian time, transformations on worldviews took place.

Based on these findings, the following conclusions can be stated, following the six shifts discussed. Firstly, the change in landscape use during the early Middle Ages shows that salt became of major importance for the region, and society became less influenced by the sea. Secondly, the marine influence decreased even more by the construction of dikes at the end of the Carolingian times. Thirdly, a shift from fishery to agriculture has been observed, but also a coexistence of both has been seen. It can be considered as a more nuanced shift or as the indication of the start of the shift. Fourthly, settlements were relocated, but kept on following the traditional pattern, with habitation mainly concentrated on the (artificial) dwelling mounds. Fifthly, extensive reclamations created more land, but also made the land more vulnerable. Last, the commerce turned more terrestrial since waterways were no longer required for commerce, confirming the transformation in worldviews.

These changes indicate that the maritime organisation of pre-Carolingian society shifted to a more land-based societal organisation. At the same time, it is clear that many maritime aspects continue to be of importance, and also a coexistence of worldviews can be observed. On the basis of these observations, it is clear that Carolingian society cannot be typified as either maritime or terrestrial. But even though worldviews can coexist, and the Carolingian society cannot be typified, the main finding of this research is that already in the Carolingian time indicators of a shift from a maritime worldview to a more terrestrial worldview can be observed, refuting the general idea that this would only have happened in the 19th century.

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References
Introduction

“The Free Hanseatic city of Bremen- in reality two towns in one: Bremen and Bremen-Nord. Bremen-Nord… This is where the maritime heart of Bremen beats.” Ulf Buschmann (2006:5) uses these words to introduce the city of Vegesack. A city that is located in the north of Bremen, about twenty km from the city centre, directly at the river Weser (Fig.1). Although it belongs to the city of Bremen, Vegesack has its own story to tell.

This paper presents the historical development of Vegesack and its modern day appearance. I am going to relate the formation history and the modern day visibility of the maritime past to the hypothesis that until c. 1900, the world looked very different from what we are used to. Communication and transport, mainly took place on water and traffic and trade by water made the world turn. The world view was a maritime one. The fact that our modern world view is land-based and until c.1900 it was water-based makes the analysis of the past difficult. It makes it the analysis of an outsider.

The history of Vegesack

The beginning (15th – 18th century)

Vegesack was first mentioned in the 15th century. The city can be traced back in the historical sources until 1470. It is not certain where the rather unusual name Vegesack comes from. There are two explanations. The first is that only a few houses were located along both sides of the river Weser during the earliest time of the settlement. One of those houses was supposed to be a pub or an inn that was called Thom Fegesacke. The part of the city that nowadays is considered to be Vegesack was therefore called Thom Vegesacke or Zum Vegesacke, as the several drinking locations along the river offered seafarers plenty of opportunities to empty their sacks before going on sea. Another suggestion is that the northern part of Bremen, Bremen-Nord, that today belongs to Grohn was called Wegesacke, as roads slipped away towards the side of the river. Both interpretations are not considered to be wrong, but it still offers room for discussion (Vege.net, 2012-2013c).

In the 17th century the city of Vegesack was already associated with ship building and seafaring. The history of Vegesack really begins when constructions in 1619 started in order to build the first artificial harbour in Germany, and according to some authors even in the north of Europe. The senate of Bremen decided to do so, because the river Weser had to deal with siltation which made it impossible for sailing ships to reach the former harbour in the city centre. Vegesack was chosen as a suitable location for a new harbour because the Weser was still deep enough for larger ships to sail on. Furthermore, the natural circumstances of the river bay of the Lesum were already functioning as a harbour before the artificial harbour was built. The construction was completed in 1622/23. Bigger ships could now land in Vegesack to offload their carriage, which was further transported to the city centre of Bremen by land or by smaller ships that could still reach the city harbour. Later in the 17th century (1645-48) the Havenhaus was built, which controlled the shipping traffic in Vegesack. The completion of the harbour in Vegesack resulted in a shipbuilding boom along the Weser and the parallel running river Lesum (Vegesack Marketing e.V., 2013a).

The rulership over the region of northern Bremen and the historical development of Vegesack during the 17th until the 19th century can be described as constantly changing. In 1653, after the constructions of the harbour were completed, Sweden conquered Vegesack and other parts in the north of Bremen. In 1707 the Danish ruled over Vegesack, which was the case until the kingdom of Hannover bought Bremen in 1715. In 1803/1804 Vegesack became part of Bremen again (Vegesack Marketing e.V., 2013a).

In the 17th century whale hunters started to depart from Vegesack to Greenland under the Bremen flag. This new economic development reached its peak in 1723-1725,
Ludwig Franzius first published a plan for deepening and correction of the Weser. Although high costs were connected to the changing of Weser, work started in 1884 due to the fact that it became a political and economic necessity. The change of the flow of Weser was supposed to be influenced in a way that the river could clean itself from the extra sand that is causing the siltation. This could only be achieved if the speed of the flowing water became faster. This was made possible by altering the intersection of the river into a funnel shaped appearance and the removal of small islands. In 1892 after a long period of time a big ship with a depth reaching up to five meters draught could again reach the harbour of Bremen in the city centre. The correction of the river also had a positive effect on Vegesack. As the river changed its flow new, fertile land was created which the city of Vegesack could use. Nowadays it is used as a park with exotic trees and flowers. The shipyards alongside the Weser benefited as well from this correction (Vegesack Marketing e.V., 2013d). When Bremerhaven was founded in 1827/30 the trade for goods shifted eventually from Vegesack to the new harbour of Bremerhaven, but Vegesack did not lose its importance yet.

The end (20th century)

At the end of the 19th and beginning of the 20th century Vegesack was the home harbour of the largest float of German Herring logger. The special type of ship which was explicitly used for fishing of herring offloaded the barrels filled with herring in Vegesack, where the fish was further processed. With 68 ships and 1200 men crew, the Bremen-Vegesacker Fischerei-Gesellschaft (Bremen-Vegesack Fishing association) was one of the biggest in Europe, during its time. Due to the constant fishing without reproduction time for the fish stock the number of herring constantly decreased, which finally led to the end of fishing herring in Vegesack in 1969 (Vegesack Marketing e.V., 2013b).

When the herring fleet was abandoned, Vegesack slowly lost its importance. In explaining why this happened, the fact that long distance trade had shifted to Bremerhaven and the natural circumstances that originally led to the construction of the first artificially build harbour in Germany finally also were main reasons to understand its slow loss of significance.

The Bremer Vulkan shipyard still managed to survive many years of crisis. In the beginning of the 20th century the shipyard released the 500th ship that was built since Johann Lange founded the company into the Weser. In 1910 the Bremer Vulkan was the biggest shipyard in Germany (Vege.net GmbH, 2012-2013b). The shipyard was extensively used by the German marine during the First and the Second World War. The Bremer Vulkan was ordered to build ships for searching mines as well as U-boats. On the 18th of May 1943, the Bremer Vulkan

when up to 25 ships left from Vegesack to the artic sea. Although not much literature can be found on this topic, this part of its maritime history is still visible in many monuments and art objects that can be found in Bremen today. The first that is to be seen when crossing the river Weser with a ferry in order to reach Vegesack is a monumental, iron, mandible of a whale (Fig.2). At other places in Vegesack as well, monuments were built in order to remember this period (Vegesack Marketing e.V., 2013b).

From the completion of the harbour onwards, the development of Vegesack went fast. Bremen had good trade relations with the United States of America which resulted in a higher demand for ships. In the 18th century the shipyards in Vegesack mainly produced wooden sailing ships with two to three masts. Vegesack really became a centre for fishing, whale hunting and ship building (Vegesack Marketing e.V., 2013b).

The peak (19th – early 20th century)

When the shipbuilding industry flourished, the Johann Lange shipyard achieved a mile stone in German maritime history. The Johann Lange shipyard was ahead of its time when building the first functional steamboat in Germany. The vessel called Die Weser was completed in 1816. In the middle of the 19th century the demand for wooden sailing boats changed into shipbuilding out of iron and steel. This change initiated the first crisis the shipbuilding industry had to face. During this period, the Johann Lange shipyard was changed into the Bremer Vulkan which was to become the most important shipyard and employer for the region of northern Bremen. The first ship that was built in the Bremer Vulkan shipyard, the Vegesack, a logger, was released into water on the 28th of April 1895 (Vege.net, 2012-2013e).

The on-going siltation of the river Weser, which had led to the construction of the harbour of Vegesack, was still a problem in the 19th century. It also led to the construction of Bremerhaven, which became the new harbour of Bremen in 1827/30. The new harbour was directly located at the point where the Weser entered the North Sea, which is a point of strategic importance. In 1878
was first attacked by American bombs, which killed more than a hundred workers. Towards the end of the Second World War, Vegesack was occupied by American soldiers. The Americans visited the Bremer Vulkan shipyard and planned to use it for repairing their own ships. Due to this factor the shipyard was able to survive the years of destruction caused by the war. It took several years before the shipyard was able to build civil ships again. In 1950 the first two post-war ships were completed and released into water. The Bremer Vulkan was able to spread its business during the years that followed. New companies became part of the Bremer Vulkan Verbund AG and in 1993 the number of workers was 25,181 people in total. Though only three years later, the most important shipyard and employer could not meet the expected numbers and finally went bankrupt causing 22,500 people lost their job. The last container ship that was built at the Bremer Vulkan shipyard was completed in May 1997 (Vege.net GmbH, 2012-2013b).

Visibility of the maritime history today

Although the most important shipyard of its time, the Bremer Vulkan went bankrupt, there are still shipyards located at the shore of Vegesack and at the other side of the Weser, Lemwerder. The Lürssen as well as Abeking & Rasmussen shipyard, both founded in the early 20th century, are still located in Vegesack until this day (Bremer Vulkan Marketing e.V., 2013b). The independence that Vegesack had achieved by its economy was lost when the most important employer, the Bremer Vulkan, had to close its doors forever.

The fact that Vegesack developed from a small village along the Weser towards one of the most significant maritime locations in Germany and subsequently was almost completely forgotten, is intriguing. The natural circumstances that pushed the city of Bremen towards the decision of constructing the first artificially built harbour in Germany triggered the historical development of Vegesack. In 1812 Vegesack had 1,379 inhabitants; in 1905 the number rose to 4,133 and 55 years later, in 1960, the city of Vegesack numbered 35,193 inhabitants (Bremer Vulkan Marketing e.V., 2013a). These numbers speak for themselves. The increase in inhabitants must on the one hand be related to the success of the harbour. It created employment and an economic income for the region. Bremen, on the other hand, also grew steadily. The city expanded more and more, which also had an impact on the north of Bremen. The developments in the 20th century that took place in Vegesack were not only radical in terms of shipbuilding and fishing. When reflecting the summarised history of Vegesack, discussed above, it becomes clear that the maritime world was a central theme in the North of Bremen and it is without doubt, that the maritime world was of great significance in the development of the city.

One element of the past is still very important nowadays. In 1860 Adolph Bermpohl, who was a navigation teacher in Vegesack and the advocate C. Kuhlmay, started an initiative to build rescue stations along the North Sea. The Deutsche Gesellschaft zur Rettung Schiffbrüchiger (DGzRS), the German association for the rescue of the shipwrecked, was founded in 1865. Bermpohl is therefore known as being one of the founder members of the DGzRS and the German sea rescue. The DGzRS still has its head quarter in Bremen (Bremer Vulkan Marketing e.V., 2013a).

Although the harbour of Vegesack lost its importance, much of the maritime history of the city is still present and visible today. The harbour itself is used as a museum-harbour since 2006. Nowadays 23 traditional and historical ships are located in Vegesack. Many other elements that were of importance in the past, such as the magazine of the harbour of the original Johann Lange shipyard, are still preserved today. The magazine is kept as such but is also used nowadays as a museum of the maritime past of the region. The Spicarium opened in 2011 (Bremer Vulkan Marketing e.V., 2013e). The marketing of Vegesack is trying hard to preserve the maritime past, as well as to incorporate it into modern day life. As mentioned above, the period of whale hunting is made visible through several artistic monuments, such as shown in fig.4. In order to cross the Weser, one still has to use a ferry. A bridge from Vegesack to the other side has never been built, so that the water traffic on the river was not disturbed. Although many monuments are used to remind us of the once flourishing maritime past, the modern day life forms a contrast to this former prosperous situation. The city centre of Vegesack is characterised by empty streets and empty shops. Vegesack is still losing parts of its importance. Nowadays, there are still ca. 35,000 inhabitants living in Vegesack and the surrounding region. This is the same number as in 1960. Here no progress can be seen.
Conclusion
The central topic of this paper is the historical development of the city of Vegesack. The history was divided into three stages, of which the beginning dates back as early as the 15th century. By covering the period from the 15th century until modern day, one can get a good overview of how the city changed and developed through time.

Vegesack was built due to the siltation of the Weser. Large ships were not able to reach the city harbour any more. In order to solve this problem the senate of Bremen decided to build a new, artificially made harbour further in the north. In Vegesack, larger ships could then unload their cargo, which was transported to the city centre by smaller boats. The harbour was completed in 1622/23. Until the 20th century, the shipbuilding industry in Vegesack was of great importance. The harbour though, started to lose its importance in long distance trade after the construction of Bremerhaven was finished in 1827-1830.

The hypothesis, stated in the introduction, assumes that the world until ca. 1900 was mainly a maritime one, while in modern times everyday life is characterised by a terrestrial worldview. This assumption is partly true for the case study of Vegesack. Everyday life in the northern Bremen city was strongly influenced by seafaring and shipping until the 20th century. The world did change though, after the Bremer Vulkan shipyard went bankrupt. The natural circumstances of the river Weser which men had to cope with were and are still not ideal. The reason for the construction of the harbour of Vegesack, the siltation of the Weser, also became one of the most important factors why it eventually lost its importance, although a mayor alteration of the flow and depth of the Weser was accomplished in the 19th century. Due to the fact that the maritime past of Vegesack is still very young and preserved makes an analysis easier, and not completely the analysis of an outsider.

The case study of Vegesack is therefore a good example of a slightly different view on the hypothesis, mentioned in the introduction. The case of Vegesack shows that the development from a maritime worldview towards a more terrestrial one might not always have been a free choice. Nevertheless, the maritime past of the city Vegesack is still very visible in many corners of the region. Artistic monuments are reminders of different periods of the past, such as the whale hunting. There are also some developments, such as the German association of the shipwrecked and the German sea rescue organisation, part of the heritage of Vegesack. In many parts of the city the past is celebrated in contrast with other aspects of the modern day life in Vegesack and Bremen Nord.

Vegesack is a city that nobody knows, except when you were born or lived there. The historical development of Vegesack was in many ways important in the maritime world. The first artificially built harbour of Germany was constructed in Vegesack, as was the first functional steamboat. These developments were of mayor importance for the shipbuilding and seafaring industry in Bremen and Germany. But why does nobody know Vegesack? The answer might be hidden in the fate the harbour and the shipbuilding industry had to face. The harbour of Vegesack lost its importance in the 19th century when the on-going siltation of the Weser forced the city of Bremen to build another harbour, closer to the North Sea, Bremerhaven. The shipbuilding industry in Vegesack was a solid economic income for the north of Bremen, until the most important employer went bankrupt and no other shipyard was able to replace it. One of the most important heritages is the German sea rescue organisation and the DGzRS, which are still located in Bremen.

Although the city and its forgotten harbour might not be known to many people, the inhabitants of Vegesack still preserve its history and the maritime influence is part of the identity.

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References
The port portrayed
Depictions of Naples from the 15th and 16th centuries

Lotte van ter Toolen

Introduction

"With the exception of love, there is perhaps nothing else by which people of all kinds are more united than by their pleasure in a good view", wrote the art historian sir Kenneth Clark in his book on landscape painting (Clark, 1956: 86). When looking at depictions of Naples from the 15th and 16th centuries, a good view seems to be the only feature the images have in common – one might at first glance easily overlook the fact that it is indeed the very same city that is depicted in each image. Not one of these works of art looks at the city of Naples from the same point of view, for example, and the significance of the port differs in each and every one.

This paper will investigate the different ways in which Naples was depicted in the 15th and 16th centuries and, most importantly, what possible reasons could be behind these differences. For this purpose, five of the best-known depictions of Naples from this period will be discussed. In this kind of research questions such as who made the work of art, who gave the commission and what was its function are of great importance, but sadly cannot always be answered. Most of the time it is unknown for whom the works of art were made. Therefore, it is important to try to interpret other aspects of these images, such as the faithfulness of the portrayal of Naples, as certain elements might be left out or enlarged, or whether or not a specific moment is depicted. Examining these and other aspects of the works of art will hopefully provide insights so as to explain the different images of the port of Naples that were created and its role in these works of art.

Although in the 18th century travelling to Italy would be considered a crucial part of one's education, in the 15th and 16th centuries this was not yet the case. There were, however, many artists who already undertook the journey to Italy. Rome and Florence were high on the agenda, whereas Naples was a less important and attractive place for artists to visit. Naples simply was not as important from an artistic point of view. Furthermore, this city was more difficult to reach: it was a dangerous journey, whether one travelled over land or over sea, as there were brigands and pirates one could encounter along the way (Lettis, 1918: 176). When in Rome, however, a trip to Naples was indeed on the list of places to visit. In this period this was mostly due to the many antique remains and the classical history of the area, but later the Vesuvius would draw many travellers as well. Most of the artists who visited and subsequently painted Naples were Flemish (De Seta, 1988: 113). As a result, the examples chosen for this paper are mostly by artists from the Low Countries. The most important part of the history of depictions of Naples starts, however, with a mysterious painting from Italian origin.

The ‘Tavola Strozzi’

The earliest depiction of Naples stems from the second half of the 15th century and is known as the ‘Tavola Strozzi’ (fig. 1). Unfortunately, the artist and the commissioner of this work of art are unknown, as is the exact date it was made. This means that very important information is missing. What is known about this painting, however, is that it originally functioned as a headboard on a ‘let-tuccio’, a typically Tuscan piece of furniture used as both a bed and a couch, and that it was probably meant as a gift (Beyer, 2000: 64). Possibly, the ‘Tavola Strozzi’ was commissioned by the Florentine banker Filippo Strozzi, hence the name given to the painting. This is, however, uncertain. As to the artist, some art historians suggest that the painting might be attributed to Francesco Rosselli, but many disagree (De Seta, 1988: 109). Although the ‘Tavola Strozzi’ cannot be dated precisely, the subject of the painting helps to determine a ‘terminus post quem’. The procession of ships in the foreground has been identified as the triumphal return of the Aragonese fleet to the port of Naples after defeating Jean of Anjou at Ischia, 7 July 1465 (De Seta, 1988: 105). The known date of the triumph establishes the date after which this painting must have been made.

The port that is depicted in the ‘Tavola Strozzi’ is unmistakably the port of Naples, with its L-shaped jetty and recognizable buildings such as the Castel dell’Ovo, the ‘Lanterna’, the Castel Nuovo and on the hill in the background the Castel Sant’Elmo. In this way, the chosen point of view draws attention to Naples‘ excellent location as a port and its many impressive buildings, its churches, castles and ‘palazzi’. Furthermore, by depicting the triumphal return of the fleet, the naval power of Naples is emphasized as well. But how topographically correct is this depiction of the city? According to some experts this is a very faithful representation of Naples, according to others not at all (De Seta, 1988: 105-106). The disagreement concerns mostly the right half of the painting. There are, for example, many red rooftops to be
seen in this part of the painting – but apparently, these are typically Tuscan. Naples, on the other hand, was known for its roof covering a ‘terrazzo’. Therefore, the pale colour of ‘terrazzo’ should dominate the view, not the red rooftops. The experts who pointed this out used this as an argument for the unfaithful representation of the city. An interesting counter-argument, however, is that when one looks more closely at the painting, one notices more and more light-coloured roof coverings. As ‘terrazzo’ is not red but of a colour closer to white, this material simply does not stand out as much as the red coloured rooftops. However, the presence of the red rooftops can also be explained, as these were frequently used on certain types of buildings, for instance on convents and hospitals – not just in Tuscany, but in Naples as well (De Seta, 1988: 106). Still, some aspects of the ‘Tavola Strozzi’ indicate that this painting is not entirely correct from a topographical point of view. Although Naples’ key buildings are represented faithfully, in some areas of the city the perspective is manipulated. Furthermore, the entire city and its buildings are slightly raised compared to the sea level, in order to enhance its visibility. Although the provenance of this painting is somewhat sketchy, the image created of Naples is quite clear. The ‘Tavola Strozzi’ depicts a triumphal return, an important moment in the history of this city, and therefore Naples is represented at its best. This means that all the key buildings are depicted impressively and recognizably; the artist even manipulated the perspective to emphasise the city’s characteristics. The foreground of the painting is dedicated to the impressive triumphal procession, indicating Naples’ maritime power. The importance of the harbour is further emphasized by depicting it in its entirety. In short, the port of Naples is portrayed in such a way that it is easily recognizable and at the same time accentuates the importance of the city and its harbour.

Pieter Bruegel the Elder’s ‘View of Naples’
In 1551 the Flemish painter Pieter Bruegel the Elder travelled to Italy together with the geographer Abraham Ortelius. Among other cities they visited Rome, Messina and Naples and during these travels Bruegel made many sketches, as many artists did, which he could refer to once he was back home. Some of these drawings were of a topographical nature, perhaps inspired by the company of Ortelius, but possibly out of Bruegel’s own interest. Almost ten years after his journey to Italy Bruegel made a painting with a view of Naples (fig. 2), the provenance of which is uncertain. It is known, however, that unlike other landscape painters such as Joachim Patinir or Henri met de Bles, Bruegel did not have a large workshop (Ten Brink Goldsmith, 1992: 218). His landscape paintings were not mass produced or meant for a large and open market, but explicitly made for private clients. Therefore, it is safe to assume that his ‘View of Naples’ is not a standardized scene that was produced several times. In comparison to the ‘Tavola Strozzi’ this painting presents a very different image of the port of Naples. It might not even be recognised if one does not know what to look for. This is partly due to the fact that the jetty is depicted as being rounded, instead of L-shaped. That this is indeed the port of Naples is proven by the presence of the Castel Nuovo and the Castel Sant’Elmo, among other recognizable Neapolitan buildings. The incorrect portrayal of the jetty is not easily explained. Pieter Bruegel visited Naples, so he must have seen the jetty himself – he might even have made some sketches of it. In any case, it seems highly unlikely that he simply forgot what it looked like. The unfaithful depiction appears to be a deliberate choice. According to some experts Bruegel found a round harbour more attractive. Moreover, as the art historian Jane ten Brink Goldsmith suggests, the rounded shape of the jetty might possibly even be connected to Vitruvius, who recommended that ports be rounded (Ten Brink Goldsmith, 1992: 222).

The subject of the painting is puzzling as well. Although this painting is most commonly titled a ‘view of Naples’, it is sometimes referred to as a ‘naval battle’ due to the fact that some of the ships in the foreground are firing cannons. In another work inspired by his journey to Italy Bruegel depicted a somewhat similar scene: his ‘Battle in the Strait of Messina’ represents a naval
The port portrayed: depictions of Naples from the 15th and 16th centuries

In Bruegel’s view of Naples, however, the ships are undamaged and do not seem to be positioned as if they are in battle. Furthermore, there is no historical event to which this battle in the port of Naples might be connected. This suggests that this is either a non-existent battle or not a naval battle after all – perhaps it is even possible that the ships are firing cannons as a salute.

Another possibility, though this requires further research, is that Bruegel wanted to give an allegorical meaning to this painting. The unfaithful reproduction of the jetty and the unknown naval battle might be an indication of this. An example of another work by Bruegel in which an allegorical meaning is hidden is his ‘Storm in the river Scheldt with a view of Antwerp’ (fig. 3). At first, one might think this is simply a drawing of the river near Antwerp, as the skyline of the city is depicted exactly as it could be seen in those days. There is, however, one element out of place: a strange little island with a gallows. From a topographical point of view this tiny island, enclosed by the high waves of the river Scheldt, cannot be explained. Instead, this detail should be interpreted as an indication of the allegorical message Bruegel wished to communicate. Possibly, he meant that the city of Antwerp was being threatened (Bakker, 2004: 205). Although this drawing is quite different from his ‘View of Naples’, both works of art depict a seemingly faithful view of a city. Moreover, both depictions contain topographically unexplainable elements. As it is quite probable that these elements in Bruegel’s drawing of Antwerp indicate the presence of a moral lesson, possibly those in his depiction of Naples should be viewed in just the same way.

It is difficult to determine how to interpret the unfaithful representation of the port of Naples. Perhaps Bruegel simply wanted to portray ‘a’ port, which he adjusted to his own conventions. In fact, it is known that he was quite fond of depicting wild seascapes, detailed ships and battles. It is therefore possible that there is no complex explanation at all. Still, a few things can be said about the image created of the port of Naples. It is clear that unlike the artist of the ‘Tavola Strozzi’, Pieter Bruegel did not intend to glorify Naples. He depicted the port in the background, where the city’s recognizable buildings can barely be identified. The fact that Naples was a port, however, seems to have inspired him. Two-thirds of the painting are dedicated to the sea and the minute depiction of several kinds of ships. In this case, Naples, as a port, seems to function as a stage for the seascapes Bruegel loved to depict.

Joris Hoefnagel’s approach

The print by the Flemish Joris Hoefnagel represents Naples as seen from the ‘Grotto di Posillipo’ (fig. 4). This depiction appeared in the ‘Civitates Orbis Terrarum’ (1572-1618), a book by Georg Braun and Franz Hogenberg containing maps and bird’s-eye views of cities from all over the world. The informative quality of the drawing is indicated by the legend in the bottom right corner, identifying the depicted buildings and sites. The ‘Grotto di Posillipo’ stems from classical antiquity and is nowadays an archaeological site. In the 16th century,
however, the tunnel was used by travellers who came from Pozzuoli and wished to reach Naples without travelling through the hills. The ‘Grotto’ and the travellers are depicted in the foreground, behind which the city of Naples appears. On top of the mountain the Castel Sant’Elmo can be recognized and closer to the sea the area known as ‘Pizzofalcone’. The Castel dell’Ovo is depicted as well, but other characteristics of the port of Naples cannot be discerned – the jetty, for instance, is not visible. Looming large in the distance, but immediately catching the eye of the beholder, is the Vesuvius.

The chosen point of view is quite unusual in depictions of Naples from this period (De Seta, 1988: 114). But in addition to being original, this choice might also seem strange: the drawing was meant to show the beholder what Naples looked like, but depicted the city as seen from a distance and from such an angle that it was not even entirely visible. Instead, it is the Vesuvius that dominates the view. However, Hoefnagel’s intention was not to draw a map but to typify, and he adjusted the point of view accordingly. By placing the city between the ‘Grotto’ and the volcano, Hoefnagel portrayed Naples in the company of its important neighbouring sites. In this way, the beholder is able to visualize Naples and its key buildings in its surroundings. This is in keeping with the other depictions in the ‘Civitates Orbis Terrarum’, which characterized cities: “capturing their significance for armchair travellers”, as the historian Sean Cocco put it (2013: 34). Therefore, Hoefnagel depicted Naples as a beautifully located port, close to the impressive Vesuvius, and paid more attention to its surroundings than to the city and the harbour itself.

Jan van Stinemolen’s view of Naples

The Flemish Jan van Stinemolen, an artist about whom very little is known, depicted Naples in 1582 (fig. 5). He chose a unique point of view as well, depicting the entire city of Naples not as seen from the sea, but as seen from the land. This is a strikingly different perspective than was traditionally used when depicting this city. This point of view provides an all-encompassing panorama of Naples, beautifully illustrating how the port was situated. Furthermore, Stinemolen’s drawing is highly detailed, all the buildings and sites are depicted with great precision. As this drawing presents a bird’s-eye view of the city, it is very important and useful when ‘reading’ the urban landscape of Naples from this period. Furthermore, this might even be called the first topographically faithful depiction of Naples – that is, the first not being a map (De Seta, 1988: 113). Although the exact use of this drawing is uncertain, it is known that Stinemolen’s minutely drawn topographical works were much sought-after by 16th-century collectors. Supposedly, Joris Hoefnagel even congratulated the geographer Abraham Ortelius on his possession of several drawings made by Stinemolen (Stefes, 2013). Considering the delicate way in which the artist executed his view of Naples, this is not surprising. Even though this drawing cannot be called a map, it certainly was highly valued because of its topographical precision. His possession of several of Stinemolen’s drawings might indicate that Ortelius commissioned them himself and stresses the scholarly importance of these drawings (Van Regteren Altena, 1932: 96).

The beholder Stinemolen had in mind when creating this work of art might not be as well-defined as Hoefnagel’s, but there are a few things that can be said about the artist’s approach. In this drawing Naples was not used as a backdrop to a story or event, nor did the artist draw special attention to its harbour as he was not interested in highlighting any aspects of this city. Instead, Stinemolen depicted Naples faithfully and meticulously, as it could be seen from the mountain, to show what the urban structure of the city looked like.
Jan Bruegel the Elder and the Castel dell’Ovo

At the end of the 16th century Pieter Bruegel’s son, Jan Bruegel, went to Italy. Jan is mostly known as a painter of fruit, flowers and birds – and therefore is sometimes referred to as “Flower Bruegel”. The exact date of his journey is unknown, but it is certain that he was there around 1593 (De Seta, 1988: 114). During his stay in Italy he visited Naples, just like his father, and made many drawings of everything he saw. By 1597 he was back home in Antwerp and used these sketches when working on his paintings. It is obvious that he used the drawings he had made in Italy when working on his ‘Large Fish Market’ (fig. 6). For those who are familiar with Naples, the Castel dell’Ovo and the Castel Sant’Elmo can easily be recognised and one might expect this to be yet another depiction of the port of Naples. Even the drawing of the Castel dell’Ovo probably used by Bruegel when working on this painting is known. Moreover, he used this very same castle in several of his other paintings as well, for example in ‘Christ in the Storm on the Sea of Galilee’, which he made in 1595 (Bedoni, 1983: 21). This underlines that Bruegel made many sketches in Italy and did indeed refer to them once he was back in his hometown.

His painting of the fish market is, however, not a depiction of the port of Naples. It simply depicts some elements of it – and not just elements from Naples, but from other cities as well. The dome visible in the distance, for instance, is the dome of the St. Peter in Rome – of which another drawing made by Bruegel is known. Finally, Jan Bruegel was not only inspired by Italy, but he depicted his hometown as well. When looking closely at the ‘Large Fish Market’, one can discern the typically northern stepped-roofed house that could be found in cities like Antwerp and Amsterdam. This painting is also quite interesting as it is a landscape without either biblical or historical content, which is unusual in Bruegel’s oeuvre. Unlike his other landscapes, this painting is a genre scene that depicts everyday life in a worldly landscape. Moreover, what makes the ‘Large Fish Market’ even more exceptional is that Bruegel possibly depicted himself together with his wife and children in the foreground (Ertz, 2008: 100). As there are, to my knowledge, no other suggestions as to how this elegantly dressed group in the foreground might be explained I will assume, albeit tentatively, that this is a portrait of Bruegel and his family.

Together with Bruegel’s possible self-portrait, the motifs referring to Antwerp, such as the step-roofed houses and the fish market, might be seen as a reference to the fact that Jan Bruegel had become established in his native city (Ertz, 2008: 100). Especially his self-portrait attests to his self-consciousness. The elements regarding Rome and Naples might be interpreted along the same lines: it proves that Bruegel has travelled to Italy and should be seen as a worldly and established artist. By depicting a genre scene set against such a complex architectural backdrop consisting of several important cities, Bruegel emphasised his knowledge of Netherlandish as well as Italian art and culture (Kolb, 2005: 22). Naples merely functions as part of the ideal landscape in the background of this painting. Although it is known that Jan Bruegel used the Castel dell’Ovo in other paintings as well, it is the combination of elements of other cities that makes this painting special. Whereas in his ‘Christ in the Storm on the Sea of Galilee’ the castle seems merely to be functioning as a backdrop to the depicted biblical scene, in the ‘Large Fish Market’ it contributes to the image Bruegel wanted to create of himself. In other words, in this painting it is not so much Naples or any other city that is portrayed, but the artist. By using elements of Naples, Rome and Antwerp, Jan Bruegel formed an ideal landscape in which to create an image of himself – literally, as he quite possibly portrayed himself in the foreground.

Conclusion

As the strikingly different images of the port of Naples discussed in this paper illustrated, there is not just one way to depict a port: there are many, and for many reasons. Not only did the artists use several points of view from which they looked at Naples, they also appointed very different roles for this port to play in their works. Naples could be used to mark an important historical event, as seen in the ‘Tavola Strozzi’. In this painting the...
city is represented at its best. To achieve this glorifying image the artist had to manipulate the point of view, as he meant to highlight the impressive buildings as well as Naples' maritime importance as a port. In Pieter Bruegel's 'View of Naples', however, the city can hardly be recognised and seems to be functioning as a background to an unknown naval battle. Clearly, glorifying Naples was not on this artist's mind. The fact that it was a port, however, was of great value to him, as he was very interested in the depiction of seascapes. Therefore, the function of Naples in this painting is reduced to figuring as a maritime background for one of Pieter Bruegel's seascapes.

When fulfilling an entirely different role, Naples could also be quite faithfully depicted out of topographical interests. In that case a faithful and detailed overview of the area with all the landmarks was given – as seen in Stinemolen's drawing – or special sites were singled out, such as the antique tunnel and the volcano in the drawing made by Joris Hoefnagel. In this particular drawing characterizing Naples and its surroundings was all-important. Therefore, the harbour of the city is barely depicted, as the city's function as a port was here of lesser value, and more attention is drawn to the impressive Vesuvius. Finally, Jan Bruegel's 'Large Fish Market' can serve as an example of the way in which an artist might use elements of a city in terms of self-fashioning. Although the port of Naples is not depicted in its entirety, it does contribute to the worldly image Bruegel wanted to present of himself. In conclusion, the many different ways in which the port of Naples was portrayed is caused by the many different functions it fulfilled in these artworks. In spite of these differences the maritime character of Naples seems to have inspired almost every depiction, though this is expressed in several different ways. The depiction of the harbour could be a sign of pride, the setting for a seascape, an important part of the urban structure of the city, or could belong to an impressive worldly landscape.

Notes
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3 In the discussion concerning the topographical correctness of the 'Tavola Strozzi' the results of radiographic research play an important part as well, as it sheds light on the way the artist (or perhaps even several artists) worked (De Seta, 1988: 107).
4 A thorough discussion of the complexity of the topographical correctness of the 'Tavola Strozzi' can be found in De Seta, 1988.
5 F. Grossmann (1973: 93) states that Bruegel "certainly did so for compositional reasons", without mentioning what those reasons might have been. R.L. Bonn (2006: 81) writes confidently: "The circular shape of the jetty is Bruegel's reinterpretation of a much less attractive rectangular one that existed in his day, and still exists in ours".
6 For Vitruvius, see chapter XII 'Harbours, breakwaters, and shipyards', in Morgan, 1960: 162.
8 The art historian F. Smekens (1961: 29) suggests this might be a depiction of a battle against the Turks, as this is the case in Bruegel's 'Battle in the Strait of Messina'. Unfortunately, this statement is not well-founded because the battle cannot be identified. Perhaps a study of the flags and their colours could reveal information about the parties involved in the skirmish.
9 This is suggested briefly by the art historian Boudewijn Bakker in a footnote, but remains unspecified (Bakker, 2004: 417, n. 513).
10 A thorough account of Pieter Bruegel and his depictions of ships can be found in Smekens, 1961.
12 (After) Jan Bruegel the Elder, 'View of the Castel dell'Ovo off Naples', c. 1593, Rotterdam, Museum Boijmans van Beuningen.
13 Jan Brueghel the Elder, 'View of the City of Rome with the Tiber, Castel Sant'Angelo and St. Peter's', 1594, Hessisches Landesmuseum, Darmstadt.

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The port portrayed: depictions of Naples from the 15th and 16th centuries


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The meaning and significance of ‘water’ in the Antwerp cityscapes (c. 1550-1650 AD)

Julia Dijkstra

Scholars have often described the sixteenth century as the ‘golden age’ of Antwerp. From the last decades of the fifteenth century onwards, Antwerp became one of the leading cities in Europe in terms of wealth and cultural activity, comparable to Florence, Rome and Venice. The rising importance of the Antwerp harbour made the city a major centre of trade. Foreign tradesmen played an essential role in the rise of Antwerp as metropolis (Van der Stock, 1993: 16). This period of great prosperity, however, came to a sudden end with the commencement of the political and economic turmoil caused by the Eighty Years’ War (1568 – 1648). In 1585, the Fall of Antwerp even led to the so-called ‘blocking’ of the Scheldt, the most important route from Antwerp to the sea (Groenveld, 2008: 32–34; Van der Stock, 1993: 16-17). This blockade, forced upon Antwerp by the Beggars (Dutch: Watergeuzen), was not a physical barrier between Antwerp and the sea, but it was a barricade in the form of taxes. Nevertheless, it became expensive and thus difficult to sail from the sea to the Antwerp harbour. Since the Scheldt was the main stimulus of Antwerp’s trade, this event ended the economical blossoming of the city by the end of the sixteenth century. Although the harbour kept some of its importance during the following century, the city lost its privileged position to Amsterdam in the northern part of the Low Countries.

It is generally believed that the city, once open to the world, gradually closed in upon itself after the Fall in 1585. In this view, Antwerp became excluded from the outside world during this ‘dark period’, both economically and culturally. Focussing on the meaning and significance of maritime landscape in the cityscapes of Antwerp, in which the Scheldt plays an important role, this essay will examine to what extent this conventional view on the rise and fall of Antwerp corresponds to the visually rendered perceptions of the city. Can this presumed period of decline also be noticed in the portrayal of the city, or does this maritime approach shed different light on the matter? This essay has been inspired by the internationalization project 'Trading Values: Cultural Translation in Early Modern Antwerp'. This NWO-funded project started in 2011. It was initiated by the Faculty of Arts of the University of Groningen and supported by the Courtauld Institute of Art (University of London) and the Institute of Art History (University of Bern).

This essay starts with a short history of the rise of cityscapes in the fine arts. It will show the emergence of maritime landscape as an independent motif in the sixteenth century. Set against this theoretical framework, a selection of Antwerp cityscapes will be discussed. Both prints and paintings will be analysed according to viewpoint, the ratio of water, sky and city elements in the picture plane, type of ships and other significant maritime details. The primary aim is to see if and how the cityscape of Antwerp changed in the sixteenth and seventeenth century, in particular between 1550 and 1650. The case studies represent Antwerp cityscapes from different periods within this time frame, in order to examine whether a certain development can be determined. Since it is impossible within the scope of this essay to identify all different ship-types, this study will only limit itself to simple remarks about the size of the ships, number of masts or sails and the amount of ships sailing on the Scheldt or in the Antwerp harbour. It should be noted that the period in question shows a lot of artistic activity and diversity. In relation to the subject of this essay, it is a rather complex story. For that matter, this aspect will not be discussed in the present study.

The rise of cityscapes in the art of the Low Countries

Cityscapes are difficult to define in terms of genre. Strictly speaking, a ‘cityscape’ is a representation of or a view on a particular city. Authors are divided about the genesis of the cityscape (Stapel, 2000: 9). According to some, representations of the city originated in landscape painting. In this approach, city views should be interpreted as artistic renderings of urban motives. Topographical accuracy was of secondary interest to the makers of these representations (Lakerveeld, 1977: 18). Others, however, have associated cityscapes with the rise of the portrait-genre, since the city obtained the same status as the individual in artistic sense (Van der Stock, 1993: p. 69). Also it has been suggested that developments in cartography and topographical prints gave rise to the emergence of the genre (Stapel, 2000: 9).

Regardless of the origin in painting, the rise of cityscapes is closely linked to the emergence of maritime landscape. In the fifteenth century, a new-found enthusiasm for optical realism initiated the incorporation of maritime elements in traditional religious paintings.
(Russell, 1983: 3). In doing so, North European painters preceded their Italian Renaissance colleagues, who were generally known for their ‘realistic’ renderings of nature. It is assumed that the Flemish painter Joachim Patinir (ca. 1480–1524) was the originator of the pure landscape and river-scape (Preston, 1937: 2). In his compositions, Patinir reduced the size of figures so much in proportion to the landscape that they were little more than a bright colour contrast. This is especially clear in his paintings on the theme of St. Jerome. It is significant that although landscape is featured more prominently within these paintings, the traditional religious themes still remained prevalent during this period.

Another significant painter was Pieter Breughel the Elder (ca. 1525–1569). It is said that he influenced true maritime painting with his open seascapes, such as *The fall of Icarus* (ca. 1558) (Preston, 1937: 2). Since the late Middle Ages the motive of water thus entered into the representation of landscape. Yet maritime painting can certainly not be considered as an autonomous genre before the end of the sixteenth century (Prud’homme van Reine, 2009: 30).

Once water became a subject in the representation of landscape in painting, the first cityscapes also began to appear (Koeman, 1985: 113). In print the independent cityscape or ‘city profile’ already started to evolve during the last decades of the fifteenth century. These cityscapes were closely related to cartography and topography, for in the sixteenth century, map making and landscape painting were often done by the same artists. The main problem they had to deal with were the choices of what and how to represent landscapes on a plane surface. Accordingly, the Renaissance maps were often used as decorative art. Therefore these maps can both be considered as works of art and as scientific products (Unger, 2010: 2). By contrast, in painting, the cityscape only started to develop as an autonomous genre during the seventeenth century (Lakerveld, 1977: 18). Until then the view on the city was always part of a larger landscape. The case studies dealt with in this essay are in compliance with the development of cityscapes within these genres.

### The iconography of Antwerp

One of the earliest traceable cityscapes of Antwerp is in a topographical map of the Scheldt, made in 1468 (Van der Stock, 1993: 151). This map (measuring 351 by 521cm) was commissioned by the Great Council of the Netherlands in Mechelen in order to chart the many places at which toll had to be paid. There is a clear emphasis on waterways. The map shows the course of the Scheldt from Rupelmonde to the sea. The Scheldt gave passage far inland. Even sea ships were able to sail upstream, as can be seen on the map. This was one of the reasons for the blossoming of Antwerp in the first half of the sixteenth century. Different ships prominently feature on the map. The size of the ships, however, does not correspond to the different cities depicted on the map. Since the map was used to chart the toll processes, it is not surprising that the ships are prominently depicted. Focussing on the cityscape of Antwerp, it is rendered in great detail. Because of its low bird’s-eye perspective, only a few specific buildings can be identified. The viewer gets the impression of an abstracted façade, with only the tower of the Cathedral of Our Lady rising above it. The Scheldt clearly dominates, whereas the cityscape is pushed backwards on the map. It is not yet a panoramic view, but it may be considered as a predecessor of the monumental view on Antwerp on the roadstead or harbour of the city. This specific image on Antwerp originates in the end of the fifteenth and the beginning of the sixteenth century and is predominant in the representations of the city during the whole sixteenth century.

While in print and maps the cityscape emerged as a genre, in painting it was still used as a background. A good example is the painting of *Flora* (1559) by Jan Massys, with a view on Antwerp (fig.1). An elegant woman is painted in the foreground dominating the painting. She is the representation of Flora, the Roman goddess of flowers. The red and white flowers she holds allude to the colours of the city. Typical for paintings in this time, the cityscape of Antwerp is portrayed in the background. Nevertheless, looking at the overall painting, the cityscape is prominently featuring, for the view on Antwerp is framed by the

![Fig. 1 Jan Massys, Detail of *Flora*, 1559, oil on panel, 113.2 x 112.9 cm, Kunsthalle, Hamburg (Copyright Kunsthalle, Hamburg).](image)
The meaning and significance of ‘water’ in the Antwerp cityscapes

Since the sky breaks up behind the city, the city stands out. Also the posture of Flora’s arm, with the flowers in her hand, directs the spectator to the cityscape in the background. Different iconographic elements of Antwerp can be traced, for example the tower of the cathedral and the abbey of St. Michael (Van der Stock, 1993: 73).

In this iconography of Antwerp, the Scheldt plays an essential role. This may be inferred from the width of the Scheldt, which is comparable to the width of the city in the picture. A closer examination shows that the river is filled with ships, ranging from seagoing ships to smaller vessels. Yet the painting does not suggest an abundance of activity on the river. On the left three or four ships are sailing towards the harbour. This is only a small part of the cityscape, which is hardly visible because the boats almost disappear behind a tree. The harbour is filled with mooring ships. Another four or five boats are sailing along the cityscape. The picture of Massys may be an allegory of the prosperity of Antwerp. It shows the city at its economic and artistic peak, just before the political and religious turmoil of the next decades. The focus on the Scheldt is important for the expression of this specific image of Antwerp.

City portraits remained largely a matter of print makers and publishers until the beginning of the seventeenth century (Van Suchtelen & Wheelock, 2008: 36). In 1572, Georg Braun and Frans Hogenberg were breaking new ground with their bird’s-eye view of Antwerp in their Civitates orbis terrarium. Nowadays this decorative map is considered as an iconic view on Antwerp, but in fact it was rather unconventional at the time of production. Braun and Hogenberg actually depicted the city twice. Firstly, they used the conventional orientation with the Scheldt at the top, but secondly they rotated this configuration to create a new perspective (fig. 2) (Pollak, 2010: 20). This second view on Antwerp shows the city in its full glory. The citadel, which was built between 1567 and 1571, is emphasized (Groenveld, 2008: 33), and the Scheldt plays an equally important role in this view. It occupies one-fourth of the picture plane and it is seen from a bird’s-eye perspective from the south side of the city. The second approach creates a more detailed image, compared to the previously discussed map. Waves of the water can be distinguished, which makes it a more lively representation. The grandeur of water is also underscored by the canals surrounding Antwerp. Consequently, the river’s dominance is visually emphasized. The map shows industrious port activities, which is an indication for the
economic wealth of the city (Van der Stock, 1993: 72). The image could be seen as the self-representation or promotion of Antwerp as a major city of trade. Here the individual ships are actually identifiable. There is a wide variety of different types, from small boats to sea ships. Two one-mast ships and two two-mast ships sail from land inward towards the harbour. The two bigger ships do not have their sails unrolled. The ships coming from sea have white bulging sails. Most of these ships also sail towards the harbour. A large sea ship with bulging sails and surrounding clouds of dust attracts the viewer’s attention. Perhaps this is a warship, the dust referring to the presence of cannons on board. The map has a decorative character. It was printed in a series of other cityscapes. The identity of the city is largely determined by the activity on the Scheldt. It presents Antwerp as a flourishing, universal metropolis.

**New times, new views?**

Antwerp lost much of its significance as a cultural capital after the 1585 siege. Caused by the political circumstances, Antwerp’s cartography school collapsed and many skilled Protestants fled to Amsterdam. There the exiles stimulated the rise of Amsterdam as a cultural capital (Pollak, 2010: 19). The political events of 1585 left a deep impression on Antwerp. This is reflected in a painting by Hans Vredeman de Vries, made only one year after the Fall of the city (fig. 3). The setting is curious. In the foreground the arrival of Alexander Farnese is celebrated with a variety of activities, whereas in the background a lot of activity on the Scheldt is shown. Numerous ships of different types sail towards the harbour. On the quay of the river merchants meet and bring their merchandise. These activities allude to the prosperous times, when the city’s harbour flourished and wealth was derived from it. The picture gives an abstract vision of the meandering river. As a result of the view from the east, the city is visually directly connected to the sea. It emphasizes Antwerp’s relation with the sea and thus presents the city as open to the world. In this image ships not only sail to the harbour from land inwards, also on the route between Antwerp and the sea a large number of ships are featured. Interestingly, in reality the Scheldt was still blocked in 1586 by the Beggars. Therefore it seems unlikely that there was so much activity going on. So why does the painter give this idealised impression of the river? The answer is that an allegory on the revival of Antwerp after the victory of Alexander Farnese in 1585 is represented. For the Catholic inhabitants of Antwerp the Spanish victory meant hope for the revival of Antwerp to its former glory.

**Fig. 3** Hans Vredeman de Vries, *Allegory on the revival of Antwerp after the victory of Alexander Farnese in 1585*, 1586, oil on canvas, 155 x 216 cm, Stadsarchief, Antwerp. (Copyright MAS, Antwerp – photo: Bart Huysmans).
Almost fifteen years later, in 1600, Abel Grimmer and Hendrik van Balen painted another interesting cityscape of Antwerp (fig. 4). Like the first case study, this picture shows the harbour of Antwerp from a conventional point of view. Artists often depicted Antwerp from the opposite side of the river Scheldt, the so-called ‘Vlaamse Hoofd’, thus combining a view from the waterfront with the inland landscape. The cityscape, including this left bank and the Scheldt, takes in one-third of the painting. The viewer looks down on the city and the river. The characteristic iconographic features of the cityscape are rendered. Furthermore God, the Holy Spirit, Christ and Mary are floating on a cloud. They are flanked by flying angels and take up almost two third of the picture. The divine characters painted above the city were rather unconventional. Usually Antwerp was represented with figures like Mercury (Roman god of trade), Vertumnus (Roman god of the seasons) and Fama (Roman goddess of rumour, slander and gossip) (Van der Stock, 1993: 285). In this picture the presence of Christian figures may be interpreted as an expression of the Catholic Church regaining power in Antwerp. The Scheldt represented suggests that Antwerp still enjoys prosperous times. The river is even more prominent than the city itself. The size of the ships, however, differs from the previous case studies. A lot of small ships having only one mast sail on the river. Some ships don’t have a mast at all. On the right side of the picture, which is the route from land inwards, only one ‘big’ ship is shown. Bigger ships are depicted on the left side. Here, three two-mast ships sail towards the harbour, only one with bulging sails. Another ship displays a total of four masts. Apart from some ships mooring, however, there is little activity in the harbour itself. The city is still represented as prosperous, and the Scheldt still plays an essential part in creating Antwerp’s identity as thus. Since the Scheldt was still blocked by the Beggars, it seems likely to suggest that fewer sea-ships were able to sail towards the Antwerp harbour. In this sense Grimmer and Van Balen’s image presents us with a more realistic view of the situation, since smaller ships are shown on the Scheldt.

With the beginning of the seventeenth century and under the influence of the emerging maritime painting

Fig. 4 Abel Grimmer and Hendrik van Balen, *View on the harbour of Antwerp*, 1600, oil on panel, 37.7 x 44.4 cm, Koninklijk Museum voor Schone Kunsten, Antwerp (Copyright Lukas - Art in Flanders VZW – photo: Hugo Maertens).
in Holland, the cityscapes of Antwerp again underwent a drastic change in appearance. By then painting was favoured at the expense of prints and maps, for paintings were considered to be more prestigious by patrons (Van der Stock, 1998: 76). Up until then it was more or less conventional in all mediums to present the city from a bird’s-eye view. During the seventeenth century, however, the pictures acquire a more naturalistic and atmospheric approach (Preston, 1937: 38). The Antwerp cityscapes of painters like Bonaventura Peeters (1614 – 1652), Jan Wildens (1585/6 – 1653) and Jean Baptist (1618 – 1676) present a more personal and realistic view. This can also be seen in the cityscape of Antwerp of the Dutch Jan van Goyen (fig. 5). The viewer is on the same level as the presented picture and therefore the viewer is addressed on a more personal basis. The important buildings are still visible, but are not emphasized any more. Only the silhouette of the city as a whole is presented. The sky dominates the image and overshadows the river. The low perspective provides a cramped image of the river, rather than an open and spacious one. The emphasis on Antwerp as universal metropolis is left behind. Furthermore the tonality gives the city a gloomy look. Only a few small ships sail across the harbour. On the foreground people are hauling fishnets. The image shows aspects of a locally bound economy rather than a flourishing global capital. Comparing it to the previous case studies, it is clear that the nature of activity stimulated by the Scheldt has changed.

Conclusions and discussion
The Early Modern period (c. 1500 – 1800 AD) marked successful but also precarious times for the city of Antwerp. Focussing on the Scheldt and its activity, it can be argued that the view of Antwerp represented by artists in the cityscapes did not always reflect the historical situation. At the same time, the importance of the Scheldt for the blossoming of the city is reflected in the cityscapes of the time. City portraits remained largely a matter of print makers and publishers until the beginning of the seventeenth century. Typically Antwerp was portrayed from the south-side of the city, where the river prominently featured in the picture plane. Large ships sail towards the city and the harbours are filled. Antwerp is presented as a universal metropolis, vibrant and above all prosperous.

Due to the blockade of the river after 1585, fewer ships could sail from the sea towards the city. However, the number of ships only decreases in the representations of Antwerp in the course of the seventeenth century, whereas the types of ships represented change into smaller examples. Hence, this paper proposes that, although the harbour became less significant in international trade, the city kept trying to present itself as open to the outside world far into the seventeenth century. The rise of the cityscape as a genre presented the perfect model for the self-representation of the city. It enabled Antwerp to suggest continuity in politically and economically turbulent times. The iconographic

![Image](image.png)

Fig. 5 Jan van Goyen, Grand view on Antwerp, 1648, oil on panel, 74.5 x 118.5 cm, private collection. (Picture from the catalogue: Wurfbain M.L., 1981, Jan van Goyen, 1596-1656: conquest of space : paintings from museums and private collections, Amsterdam, Watermann; Bremen, Schunemann, p. 121).
features of Antwerp suggest the representation of the Scheldt to be essential for the identity of the city. It symbolizes Antwerp in its best shape and therefore reminded of the prosperous times of the city. In this sense, these cityscapes are not only portraits of the city, they are also an expression of Antwerp's continued claim of being a centre of trade and prosperity, even after the Fall in 1585.

Only half a century later, around the mid-seventeenth century, the view on Antwerp started to change under the influence of Dutch maritime painting. Jan van Goyen's View on Antwerp for example, approaches the city in a more rustic manner. It does not show the economic vigour on the Scheldt as presented in all the previous case studies. However, this essay does not propose that the image Van Goyen presents is directly related to his aim to represent a more realistic image of the river and Antwerp. There may be more causes for his perception and representation.

All in all, this paper shows that a maritime approach does shed different light on the traditional story of the rise and fall of Antwerp. Although the harbour became less significant in the international trade after the Fall of Antwerp in 1585, images of the city kept trying to present it as open to the outside world far into the seventeenth century. To gain more insight in the meanings of the Antwerp cityscapes, the Antwerp case studies need to be compared with cityscapes of other cities. Furthermore, artistic activity and changes in style should be taken into account in order to give a clearer vision on the development of the imagery of Antwerp during this period. In addition, more research on patrons and commissioners might give new insights into the purpose and significance of the cityscapes.

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References
A maritime worldview in Jan van Goyen’s ‘View of The Hague from the south east’

Noortje Knol

In 1651 Jan van Goyen painted a ‘View of The Hague from the south east’ (fig. 1), commissioned by the magistrate of that town. The commission resulted in an enormous panorama painting that depicted the profile of the city with fields and a canal on the foreground. In order to investigate whether it is possible to speak of a maritime worldview before 1900, this 17th century cityscape will be used as a case study. A first reason for choosing this case study becomes clear after a short discussion of an article about the depiction of inroads in 17th century landscapes by Julie Berger Hochstrasser (1997). Based on the book ‘Barges and capitalism’ of the historian Jan de Vries, Berger Hochstrasser states that barge travelling was by far the most important way of travelling in the 17th century. It was much more important than transport by roads. The question has been raised why inroads in these landscape paintings play a much bigger role than they actually had and why barges and their waterways (Dutch: trekvaarten) were hardly ever depicted. According to the writer, the roads were not just part of a pictorial convention. They also symbolized an escape to the countryside in an age that was orderly and efficient and they invited the viewer into contemplation (Berger Hochstrasser, 1997: pp. 193-221). If these inroads in landscape paintings were meant to symbolize an escape from the busy life in the city, what is the meaning of the water in Van Goyen’s painting in which the trekvaart and barges are prominently depicted? Another reason why the canal in Van Goyen’s painting is quite striking is the fact that, until 1650, the Hofvijver near the Binnenhof was the most depicted part of The Hague in paintings and engravings (Dumas & Van der Meer Mohr, 1991: pp. 12-56). What was the reason to depict the city from the south east this time and why was the canal, which was called the ‘Trekvliet’ or ‘Delftse Vaart’, placed so prominently on the foreground?

Consequently, the water in the painting raises some interesting questions considering the maritime worldview. The main point of this paper will be to question the function of the water in this painting and to query whether the water was an expression of a maritime worldview. It is crucial first to state when it is justified to consider a painting as an expression of a maritime worldview. In this paper, paintings showing the significance of water for the daily live, will be considered as ‘expressing a maritime worldview’. The function of the water will be studied from different approaches and therefore historical as well as art historical literature will be used in order to come to a conclusion.

Fig. 1 Jan van Goyen, View of The Hague from the south east, 1650/51, 460 x 174 cm, oil on canvas, Haags Historisch Museum, The Hague.
Historical context
To place the view of The Hague in a context, it is necessary to start with an introduction about cityscapes in the Dutch Republic. Although this kind of painting is often associated with the 'Golden Age' of the Dutch Republic, cities had already been depicted for many years. They often served as backgrounds to religious scenes, but from the 17th century onwards they became the subject themselves. It is not clear whether cityscapes can be considered truly a 'genre' since the term cityscape only arose in the 18th century and cityscape paintings never gained the popularity of the leading genres. Still, the fact remains that during the 17th century cities became an often depicted subject. This phenomenon is generally explained by art historians as a manifestation of the rising importance of cities in the Dutch Republic (Van Suchtelen & Wheelock, 2009: pp. 14-33). This growing importance resulted from the political situation in the Republic of Seven United Netherlands. Although the Republic had a central government, the seven provinces kept their autonomy. Each province was represented in the States-General, the federal government and within each province, the cities were represented in the provincial states. Because of this remarkable political situation cities had much power within the provinces and, indirectly, within the Republic. Especially the ones located in the province of Holland were extremely powerful, since this was by far the richest and, consequently the most influential province of the Republic (Price, 1998: pp. 1-16).

The Hague, situated in Holland, was officially a village and was therefore not represented in the States of Holland. As a result, the town was less influential in national politics than neighbouring cities. In spite of this absence of political influence, it became a prestigious and cosmopolitan town and a centre of political institutions during the 17th century. The meetings of the States of Holland and the States-General took place in The Hague from 1585 onwards and also the Stadtholder Maurits decided to settle in the town (Smit & Beukers, 2005: pp. 18-22). In 1651, the magistrate of The Hague considered the town to be important enough to commission a cityscape by Jan van Goyen, one of the leading landscape painters of his day. He was born in Leiden in 1596 and he moved to The Hague in 1632, where he became leader of the guild. The painter was acknowledged for his river landscapes, his monochrome colours and his rapid work speed. Besides his profession as a painter, he was also a real estate keeper. Although Van Goyen was always looking for ways to raise his income, he died in 1656 leaving debts. He did however leave an impressive oeuvre of 1200 paintings and 800 drawings (Vogelaar, 1996: pp. 38-59).

Fig. 2 Anonymus, Joan Blaeu (ed.) Map of The Hague, 1649, Atlas van Loon
**Topographical situation**

In order to research the function of the water in Jan van Goyen's 'view of The Hague', it is necessary first to study a map of The Hague around 1650 (fig. 2). Were the town and the landscape painted according to reality? Van Goyen painted the town from the south east and from a considerable distance, so he was able to fill the foreground with fields and a canal. Some scholars suggested he made his sketches from a little castle in the area because of the high point of view, but he probably just applied a bird's-eye view, which was common practice for landscape painters (Dumas & Van der Meer Mohr, 1991: pp. 510). By applying this viewpoint, a large part of the town could be depicted. The Hague on the horizon has been depicted detailed and truthfully. Although a few buildings have been slightly modified to represent them better, the largest part of the town has been painted accurately and almost every building can be identified, something that has already been done by several scholars (Dumas & Van der Meer Mohr, 1991: pp. 509-512; Rosenberg, 2010: pp. 75-81).

The landscape on the foreground has been depicted according to the real situation as well. The abrupt transition from town to countryside that might seem like a painterly interference was actually an accurate representation of reality, since The Hague was officially not a city and did not have city walls or fortifications. On the map of Blaeu, a part of the canal has been depicted flowing into the centre of the town. Although 17th century maps cannot always be considered as reliable, the canal was depicted in the same way on other maps of the town. The existence of the 'Trekvliet' was also confirmed by historic sources. (De Vries, 1981). So a first reason for depicting the Trekvaart was that the painter apparently chose to— or the commissioner ordered him to— give a realistic image of The Hague from the south east around 1650. However, this does not explain why the town has been depicted from this particular direction. Moreover, as mentioned before, the town had almost never been painted from this side before. (Duma & Van der Meer Mohr, 1991: pp. 12-56, 511). Who chose this point of view and, more important, was the canal that flowed into the town from the south east, a reason for doing so?

Since the painting was a commission, it is necessary to take into consideration the possible influence of the magistrate by studying the original contract of 1651. “Johan van Goyen earns 650 pounds after selling a large painting which depicts The Hague, according to reality, decorated with many of the most important buildings, landscapes and images, and with the necessary additions.” (Dumas & Van der Meer Mohr, 1991: pp. 515). This contract tells nothing about the direction from where the city had to be viewed. The choice for this position was therefore probably made by the painter himself. Choosing the south east as a point of view does not necessarily mean it was chosen because of the water, but still it is remarkable that the water is depicted prominently on the foreground. One author even suggested that the Trekvliet was depicted more curved than it actually was, in order to give it a more central position in the painting (Rosenberg, 2010: pp. 62-63). Does this prominence of the water points to a self-representational function for the town?

**Self-representation**

As stated above, art historians generally consider cityscapes as references to the power and prosperity of the cities. From 1585 onwards, engravings of Amsterdam were made in which the importance of water for the economy the city was clearly reflected. In an engraving of Johannes Rem (fig. 3). This becomes clear in the prominence of the river on the foreground and by more symbolic references such as Mercurius and Neptunus, representing trade and shipping industry (Frijhoff & Prak, 2004: pp. 64-67). Did the water in paintings have a similar function and can this be detected in the 'view of The Hague'?

The fact that the cityscape was commissioned by the magistrate strongly indicates that the artwork was supposed to represent the city. Additionally there are more motifs in this painting that clearly point to civic pride. The coach with the six horses at the road along the canal possibly refers to the States-General, which was settled in The Hague. The clothes of the passengers of the barge on the left side (a Staatsieterkschuit) suggests aristocratic

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Fig. 3 Johannes Rem, *View of Amsterdam from the IJ in 1606*, 1606, 30 x 214,5 cm, engraving on four pages, Collectie Rijksprentenkabinet, Rijksmuseum, Amsterdam
persons, while the stork right in the middle of the painting is the symbol of the town (Dumas & Van der Meer Mohr, 1991: pp. 510). Considering these clear references to the town, it is most likely that the painting served as a way of self-representation but the function of ‘water’ within this representation remains unclear. Therefore it is necessary to give an impression of the economic importance of water for the town.

The Hague certainly was a rising town from 1575 onwards and the population grew from about 6,900 in 1585 to 18,000 in 1650. This enormous growth was mainly caused by the settling of the Stadtholder, the States-General and other political institutions in the town. Its function as a governmental centre attracted not only functionaries, but also merchants, and it caused a growing services sector. Since transport by the water forms a part of this services sector, its importance rose after 1575, but the presence of many governmental organisations was the driving force behind the economic growth (Smit & Beukers, 2005: pp. 57-89). The development of The Hague differs strongly from that of Amsterdam, with a seaport that offered jobs to many of its citizens and where the harbour and shipping industry formed a substantial part of the economy. While compared to Amsterdam the economic role of the Trekvliet might have been marginal, the canal remained essential for trade as well as for public transport and the accessibility of The Hague (Frijhoff & Prak, 2004: pp. 103-188). The Trekvliet formed a part of the trekvaart network; a substantial transport network in the Netherlands in a time when travelling by roads was uncomfortable and time consuming. In 1638 The Hague was connected to the trekvaart between Delft and Leiden and it became the most important connection with the surrounding areas (De Vries, 1981: pp. 26-41). The canal was therefore of great importance for the accessibility of the town and this might have been reflected in this painting.

Aside from its function within the composition, the canal fulfils an important role as part of the composition. Thus, the rays of sun that shine upon them that give them a more intense colour than the brownish colours on the left side. Furthermore, the canal leads the eye into the city, the subject after all. The fields on the right side are another substantial element in the composition that balances the foreground, mainly by the scenic function of the water. The profile of the city has been placed as a horizontal line on the horizon. The landscape on the foreground takes about 1/3 of the painting and although the city is intended to be the subject the surrounding countryside takes a considerable part of the composition. The canal forms a diagonal line in the, predominantly horizontal, composition which makes the painting dynamic. Furthermore, the canal leads the eye of the viewer into the city, the subject after all. The fields on the right side are another substantial element in the composition that balances the foreground, mainly by the rays of sun that shine upon them that give them a more intense colour than the brownish colours on the left side. The elements in the landscape that towards the background decline in size render most of the space and especially the river contributes to this effect. Thus, the canal fulfils an important role as part of the composition and as a means of creating space.

The city is shown in profile and although there are a lot of overlapping elements, it does not create a very spacious view. The elements in the landscape that towards the background decline in size render most of the space and especially the river contributes to this effect. Thus, the canal fulfils an important role as part of the composition and as a means of creating space.
This aesthetic function of the water may be part of a newly found pictorial convention. Even though the painting is one of the first to depict a town in profile with a canal running diagonal on the foreground, the painter probably had some sources of influence. One edition of Jacob Cats’ widespread emblem book ‘Houwelick’ from 1625, included an engraving of The Hague from the south east (fig. 4) (Anonymous, View of The Hague from the south east, 1625, municipal archive of The Hague.). It is not unlikely that the painter was acquainted with this image since Cats’ emblem books were immensely popular during the 17th century. Even though the engraving shows the city from a slightly different angle than the painting, the similarities between painting and engraving are striking. Just like the painting, the engraving shows a coach on the road along the canal and again some barges can be seen on the water. Another possible source of influence might have been the contemporary Dutch landscape painter Hendrick Vroom (1562-1640). Considered the founder of seascape painting, he also painted several cityscapes. One of them, a view of Delft from the north west (fig. 5), shows many resemblances with Van Goyens view of The Hague. Again, a canal is running diagonally into the city and there is a lot of activity in and around the canal (Dumas & Van der Meer Mohr, 1991: pp. 512-513).

Van Goyen’s choice to depict the canal was not only based on predecessors, but probably also on his own specialism. According to Boudewijn Bakker the background of cityscape painters could often be detected. The fact that Van Goyen was originally a landscape painter may therefore have been of importance in making the decision to pay so much attention to the landscape and the canal (Bakker, 2009: pp.34-59). When painting cities, he often chose locations near the water. It is well-known that he travelled through the Republic by boat and depicted landscapes or cities he ran across during these excursions. His favourite subjects were cities surrounded by water, like Dordrecht, Nijmegen, Rhenen and Arnhem (Vogelaar, 2009: pp. 10-21). Therefore, his professional background and his manner of painting may be another explanation for depicting the Trekvliet. The Hague never became as popular a subject for the painter as the cities near the rivers, but since this was the subject he was commissioned to paint, he might well have done this in a manner that emphasized his qualities as a landscape painter.

Nevertheless the ‘View of The Hague’ has been considered by several art historians as one of Van Goyen’s weaker paintings. The composition has been called unbalanced and the technical quality was criticized. This criticism has mainly to do with the extraordinary detailed painting technique that Van Goyen applied here, which differs from his usually quick and sketchy working method that is appreciated so much (Dumas & Van der Meer Mohr, 1991: pp. 512). Although the details might distract the attention of the viewer and contribute to the ‘imbalance’ of the painting, the canal is an important element that was necessary to create a sense of unity in his composition. The detailed and neat working method was probably applied here because it was a paid commission. Because of this for Van Goyen remarkable working method, several scholars have suggested that he wanted to depict as many professions as possible, by painting little figures working in the fields and in or nearby the canal (Van Suchtelen & Wheelock, 2009: pp.116; Dumas & Van der Meer Mohr: pp. 510). Indeed, it is striking that so many working people are depicted(fig. 1): a barge and some little boats are sailing in the canal, fishing nets are being thrown in the water and farmers are ploughing the fields and are resting in the shadow of a haystack. To

Fig. 5 Hendrick Cornelisz.Vroom, View of Delft from the north, 1615, 71 x 162 cm, oil on canvas, Museum Het Prinsenhof, Delft.
what extent these details serve to symbolise the various professions of the citizens of The Hague is hard to say but they certainly add to the expression of a lively, dynamic town. Explaining the neat working method in this way, the aesthetical value of the water actually comes together with the self-representational function of the Trekvliet. The precisely depicted canal, together with the fields, gives an impression of the liveliness of the town and this must have been appreciated by the magistrate.

**Conclusion**

Why was the canal depicted in Van Goyen’s ‘View of The Hague'? First of all, the painting had to give a realistic image of The Hague and its surroundings and depicting the canal was a part of this truthful representation. The painter certainly achieved this goal and he apparently chose to give this view from the south east, which might be explained by the representational function of this commissioned work. Although the water was of importance for the economy and accessibility of the town, The Hague was especially associated with its function as political centre and court residence. However, that is not to say that the water in Van Goyen’s view did not have any function in representing the city. As stated above, formal aspects and especially the details in the foreground result in the image of a lively city and in that way the water can be considered as a way of self-representation. Still, this liveliness cannot only be attributed to the canal: the fields are at least as important in creating this dynamic image. The aesthetic function of the water must also be taken into consideration. The Trekvliet plays a considerable role in the composition and depicting the canal this way was probably inspired by predecessors. Moreover, the painter was specialised in painting landscapes and water. Consequently, after studying three possible motifs for depicting the canal, the water seems to have had several functions. Nevertheless, in my opinion the aesthetic function was the most important, since the painting can be placed convincingly within a pictorial convention.

What does this conclusion mean for the water as an expression of a maritime worldview? Just the fact that the canal was a part of this truthful representation. The painter certainly achieved this goal and he apparently chose to give this view from the south east, which might be explained by the representational function of this commissioned work. Although the water was of importance for the economy and accessibility of the town, The Hague was especially associated with its function as political centre and court residence. However, that is not to say that the water in Van Goyen’s view did not have any function in representing the city. As stated above, formal aspects and especially the details in the foreground result in the image of a lively city and in that way the water can be considered as a way of self-representation. Still, this liveliness cannot only be attributed to the canal: the fields are at least as important in creating this dynamic image. The aesthetic function of the water must also be taken into consideration. The Trekvliet plays a considerable role in the composition and depicting the canal this way was probably inspired by predecessors. Moreover, the painter was specialised in painting landscapes and water. Consequently, after studying three possible motifs for depicting the canal, the water seems to have had several functions. Nevertheless, in my opinion the aesthetic function was the most important, since the painting can be placed convincingly within a pictorial convention.

More study is needed however, to give a general impression of a maritime worldview in the 17th century art. It would be interesting to investigate in what manner other paintings may, or may not, have referred to a maritime worldview. In the Johannes Rem’s engraving of Amsterdam, the water has been used very consciously as a representation of a city or the republic. Is this an expression of a maritime worldview or is a possible propaganda function of this kind of engraving troubling the view on reality? The importance of the water might have been overstated and therefore misleading when one uses it to prove the existence of a maritime worldview.

Another interesting question can be raised concerning the inroads in landscape paintings that have been mentioned in the introduction: were these landscape painters actually confirming a maritime worldview by consciously leaving the canals and trekvaarten out of their artworks? They did not depict them, but they consciously ignored them, because of their importance on daily life (Berger Hochstrasser, 1997: pp. 193-221). Consequently, a maritime worldview was definitely present in the Dutch Republic of the 17th century, but a standard manner of expressing itself through painting does not seem to have existed. The ‘View of The Hague’ serves as a case study to state a connection between this worldview and the visual arts. In order to give a more general view of this connection, more artworks, from different genres, should be studied together with the historical circumstances in which they were made.

**Notes**

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University of Groningen, The Netherlands
2 GAG Oud Archief, Tresosiersrekeningen, inv. nr. 1248, fol. 241/341v.: ‘Johan van Goyen de sommme van seshondert vijftich ponden over coop van een schil- derijie vervatende den haech int groot soo die leijt met vele van de principaalste gebouwen, Landschappen ende beelden verciert, met de appendentien ende dependentien van dien. In the same archive, the contract can be found again with the date: August 7, 1651.
References
Frijhoff W. & M. Prak, 2004, Geschiedenis van Amsterdam, centrum van de wereld, 1578-1650, Amsterdam, SUN.
Hier onder Rust het Lijk van dien Vermaarden Heer, Welke, op BATAVIA, STAATS luister hielp Bewaren.
Ten Op-gang van BRAZIL, versterkte een Man van Eer;
En onze MAGT, focht met KASTILIES te Evenaren.
Die met een Rijke-Vloot, 
vol MAATSCHAPPYE Schat,
Als HOOFD- en ADMIRAAL
van Thien- en Negen Schepen,
Door Stuur-Man- en Peylloot, al ‘t geen de Kiel bevat,
Met Flukse en Rappe-Maats onze Havens in deed slepen.
Die ‘t BURGERMEESTERS ambt tot 
Drie-maal heeft Bekleed;
En in de Vierde Beurt,
Ons THURENDRECHT Ont-vallen,
De Schrikkelijke Dood, heel Magtig, Sterk en Wreed;
Heeft ons die Zuil ontrukt en W agter Onzer W allen.
Wat baat gestaag Geween, met Tranen of de W ang?
Hier helpt geen Silte vogt, te Perssen uit onze Oogen:
Dien Scherm-Heer zijn Kwijt,
al zienwe noch zoo Bang,
Geen Naar en Droef geklag, zijn Wederkomst Vermogen.
GOD leide Hem in zijn Rijk en Onwaardeerbre Zalen;
Om daar, in Wit-Gewaad, Altoos te Zegen-pralen."

MATTHYS BALEN (Balen, 1685: a4)

Introduction
This occasional poem was written in 1685 by Matthys Balen, the Dordrecht city chronicler. It was part of a Lykstai, a description of a funeral and a collection of poems and eulogies written in memory of the deceased. Matthys Balen wrote this panegyric for Mattheus van den Broucke, an important figure in the elite of the city of Dordrecht, a well known city in Holland. During the span of nine years Mattheus was thrice burgomaster of Dordrecht and he died when serving his fourth term. He was buried in the Grote Kerk in Dordrecht, where his tombstone is still visible today, praising the acts of Mattheus. During his life Mattheus was portrayed at least three times. The painter Samuel van Hoogstraten portrayed Mattheus twice in the seventies of the 17th century. One portrait is in the collection of the Rijksmuseum (Figure 1), the other is owned by the Dordrechts Museum (Figure 2). Godfried Schalcken painted Mattheus van den Broucke too. This portrait belongs to the collection of museum Huis van Gijn in Dordrecht (Figure 3). The background in the two portraits made by Van Hoogstraten depicts elements of water. The Rijksmuseum painting shows a wild sea with more than fifteen three-masters sailing under the Dutch flag. The picture in Dordrecht shows a calm river, the Old Maas and the tower of the Grote Kerk, the church in which Mattheus was buried. In every portrait (Figures 1-3) Mattheus is clearly recognizable but he has been depicted differently every time. One could say that every portrait shows a distinct identity of the person portrayed. These different identities form the subject of this paper.

Which identities of Mattheus van den Broucke are portrayed in each portrait and what is the significance of the water in the backgrounds? All three paintings will be discussed. However, the portrait of Schalcken does not depict elements of water and will therefore play a smaller role.

To be able to answer the above given questions and to understand the significance of the water in the life of Mattheus van den Broucke, this paper will deal with the following subjects. First of all, a small introduction on 17th century portraiture will be given. Then, the biography of Mattheus and the chronology of the portraits will be discussed. This is important, because only one of the portraits is dated. Lastly, before turning to the separate identities in each portrait, I will look at the provenance of the pictures to be able to say something about the contemporary viewers of the portraits.

17th century portraiture
After the abjuration of Catholicism and the start of the Eighty Years’ War, the Dutch painters in the Republic were deprived of an important patron: the Catholic Church. Luckily, there was a fast growing upper and middle class in the Republic that wanted to show its newly acquired wealth by decorating their houses with all kinds of genre paintings. Portraiture was one of them.

Estimations made of the production of paintings in the 17th century vary from five to ten million paintings in the Netherlands (Van der Woude, 1991: 315). Many of those paintings were of low quality and were lost in the course of the centuries (Van der Woude, 1991: 294-295).

In the hierarchy of genre painting portraiture was considered one of the lowest genres, due to the fact that the painter had to paint from life. Far less creativity was needed than when making, for example, a historical piece, the
most admired genre. Even so, almost every painter in the 17th century produced portraits. Inventories showed that in every house of an upper or middle class family several portraits were present, not only of deceased family members or ancestors, but also of living residents (Loughman, 1992: 58-64, Adams, 2009: 11). Therefore, portrait painters were assured of a certain income. Research showed that at least half of the residents in urban areas, mostly from the upper and middle class, had the means to buy a portrait (Adams, 2009: 9).

Methodology

When studying 17th century Dutch portraiture there are several methodological and theoretical tools at hand. One can empirically describe features like dress, pose and other objects, or one can try to find the iconographic meaning of those features. The researcher can use material from archives and contemporary books and treatises to learn more about the person portrayed and the culture in which he or she lived. In this paper I will go one step further and follow, amongst others, a contextual approach (Adams, 2009: 54). To investigate which identity is portrayed of Mattheus van den Broucke in the three different portraits, we need to go further than looking empirically or at an iconographical level. Knowledge has to be gained about the biography of the person portrayed, the patron who commissioned the portraits and the contemporary viewers of the portraits. When researching the audience, the original location of the portraits becomes important. Were the portraits commissioned to hang in the house of Mattheus van den Broucke, or were they commissioned to be placed in the city hall of Dordrecht or in the chamber of the Dutch East Indies Company in Amsterdam? This matters because every location has its own audience. The identity that was created by painter, patron, and person portrayed was created for a specific audience. In what way did Mattheus want to present himself? How did he want to be remembered?

We have to keep in mind that 17th century portraits were no forerunners of the photograph or mirror images of the person portrayed. They were created images. Every feature, pose and facial expression was painted for a reason. Mattheus van den Broucke maybe had a globe at home, but he definitely did not lean on it the whole day while pointing at himself, like he does in the picture in the Dordrechts Museum (Figure 2). He certainly did not wear the golden chain which he shows in the Rijksmuseum portrait when he went out for a walk (Figure 1). Not only did the chain weigh more than 50 ounces (almost one and a half kilogram), but it was also made of pure gold and therefore a dangerous item to wear (Balen, 1677: 888). The pictures were painted to create and show a particular identity of the person portrayed. Therefore, I will not only use the contextual approach to investigate the identity of Mattheus, but also compare his portraits with contemporary ones. This helps answering questions about the commonness or uncommonness of clothing, pose and items with which Mattheus is depicted and therefore about the portrayed identity.

In an ideal situation enough evidence has survived to prove the provenance of the pictures from commission to present. Unfortunately, this is rarely the case in art history. The researcher is lucky to find a contract concerning the commission, a proof of payment to the painter, or a contemporary inventory which names the portrait. Furthermore, many 17th century portraits disappeared during the 18th century, to show up again in the 19th century when museums were opened and art collections were made. It has to be remembered that portraits like the ones under discussion were not valued, like nowadays, for the painter who made the pictures but for the memory of the family member it evoked (Adams, 2009: 20). Eventually, after several generations, the family ties with the person portrayed were stretched too far to have any sentimental value. Therefore, most portraits were lost. With the formation of museum collections these portraits gained value again, but only when they were painted by well-known painters. By then a lot of important information about the person portrayed, original location and painter was lost. Of the portraits under discussion no evidence has come down to us concerning the original locations of the paintings, the patrons who commissioned them.

Fig. 1 Samuel van Hoogstraten, Mattheus van den Broucke (1620-1685), 1671-1678, 142 x 111 cm., Amsterdam, Rijksmuseum (Photo: Rijksmuseum, Amsterdam).
Through research in the archives of Dordrecht it will be shown here for the first time that the portrait now in the Rijksmuseum remained in the family from commission until the middle of the 19th century when it was acquired by the former director of the Dordrecht Museum, who bequeathed it to the Rijksmuseum in 1870 (De Bruyn Kops, 1984: 253).

Mattheus Mzn. was most successful in pursuing a career abroad. In 1636, when he was sixteen, Mattheus Mzn. left Dordrecht for Brazil to work for the Dutch West Indies Company. “[D]en Opgang, en Luyster van dezen Staat”, in Brazil helpen bevorderen (Balen, 1677: 887) is what Mattheus Mzn. did, according to Balen. In 1648 Mattheus Mzn. went to the East Indies as a merchant for the Dutch East Indies Company, representing the chamber of Rotterdam (Wijnaendts van Resandt, 1944: 27). He was sent to Bengal (nowadays Bangladesh) as a senior merchant in 1652 to inspect the possible Dutch profits in the area. The following year he was appointed as chief senior merchant of Casimbesar, an important trading post in Bengal. In 1655 he was second in command in Houghly, the capital, and three years later he became director of Bengal. Known now in the upper echelons of the Dutch East Indies Company, he became a member of the extra-ordinary council of the Indies (Raad extra-ordinair) in 1660, and in 1662 he was chosen to be a member of the general council (Raad Ordinaris), the government of the Dutch Indies. After a period of seven years in the general council, he decided to repatriate (Wijnaendts van Resandt, 1944: 27).

In November and December 1669 a fleet of nineteen ships filled with valuable cargo left the harbour of Batavia with Mattheus Mzn. as its admiral (Balen, 1677: 887). On the first of July 1670 the fleet arrived in the Netherlands. The ships were carrying a “Rijker Ladinge, als oyt bevorens in eenig Jaar was overgekomen, ende welkers Verkoop wel op Vijftien Miljoenen guldens geschat wezende, daar op ook een ongemeene groote Uytdeelinge van tzestig ten honderd is gevolgd” (Balen, 1677: 887-888). The Lords Seventeen (Heren seventien) of the Dutch East Indies Company honoured Mattheus Mzn. for this act with a commemorative gold medal and a gold chain. These medals were given only on special occasions (Sanders, 1994: 13-15). The front side of Mattheus Mzn.’s medal shows a Dutch East Indies Company three master. The back was engraved with the following inscription: “De Bewindhebbers van de Generale Geoctroyeerde Oost-Indische Compagnie, ter Vergaderinghe van de Seventienen, geconfidereert, en in achtingh genomen, de goede Diensten, door den Heere Mattheus van den Brouck, jonghst geweest zijnde Raad-Ordinaris in de Hooge Regeeringe van India, aan de gemelte Compagnie gedaan, en gepresteerd; hebben in erkentenisse van dien, mitsgaders tot betuyginge, dat de selve hare aangenaam zijn, en besonderlijck mede, dat fijn E. de Retour-Vloot, den eersten July 1670. In deze landen gearrierveert, in goede, en welgeschickte Orde,
Sanne Roefs

als Commandeur over de selve, heeft overgebracht, fijn deze Medaille, en Goude Kettingh, om tot een gedenkteecken te dienen, Vereert (Balen, 1677: 888).

Because of the writings of Balen we know the chain weighed at least 50 ounces of pure gold. The Lords Seventeen asked Mattheus Mzn. to continue his activities for the Company, but he kindly declined. After being employed there for over 30 years, Mattheus Mzn. decided it was time to pursue a career in Dordrecht. He did, however, stay involved with the company. Because of his services rendered he was appointed governor in the chamber in Amsterdam in 1671.

Mattheus Mzn. climbed up the social ladder of Dordrecht quickly. He was appointed sheriff (Schepen) and aldermen (Oud-Raad) in 1672. Five years later he was elected mayor for the first time (Balen, 1677: 888). In 1681, 1684 and 1685 he was chosen as mayor again. Mattheus Mzn. died during his fourth term in January 1685 (Balen, 1685: a4). Nowhere in the book of Balen or in the archival documents in Dordrecht is any proof that Mattheus Mzn. was married or had any children, therefore I assume that he died unmarried and without any direct heirs.

Chronology of the portraits

The two portraits painted by Van Hooogstraten were made when Mattheus Mzn. was living in Dordrecht. Samuel van Hooogstraten painted his initials 'S.v.H' on both portraits. The Rijksmuseum portrait shows the monogram on the balustrade in the right background (Figure 1) and in the Dordrecht portrait the monogram is painted on the pedestal of the column (Figure 2). Van Hooogstraten only dated the portrait in Dordrecht (1676). The other picture shows Mattheus Mzn. with the gold medal he received in 1670. This portrait was probably meant to be a commemorative painting, remembering his return home and the golden medal he received for it. Therefore, it was most likely painted just after his return. We know that Van Hooogstraten returned to Dordrecht in 1671 and died there seven years later (De Bruyn Kops, 1984: 253). Therefore, the painting in the Rijksmuseum can securely be dated between 1671 and 1678.

Less is known about the picture in the collection of Huis van Gijn (Figure 3). During a restoration in 1973 the signature of Schalcken popped up from under the varnish. The painter also added the word "Dordrecht" in the upper right corner which suggests the portrait was made in that city. Schalcken was born in Made, near Dordrecht, in 1643 and studied in the workshop of Van Hooogstraten. He also worked in Leiden for a while. In 1665 Schalcken returned to Dordrecht to work as a painter. He left the city in 1691 and never returned (Beherman, 1988: 25-27). It is thus safe to assume that the portrait was made between 1670 and 1691. Features in the picture point to a possible specification of the dating. In the right background, Schalcken painted the arm of a figure holding an object, which can be identified as a halberd. In 1502 a priest attacked a mayor of Dordrecht. Since that moment the two mayors (since 1574 four, see note 3) and the bailiff (Schout) were protected by three halberdiers, who accompanied them wherever they went (Van Balen, 1677: 805). The halberd became a symbol of mayoral dignity. The halberd in the portrait of Schalcken identifies Mattheus Mzn. as a mayor and the picture is therefore made after 1677. There is a possibility that the portrait made by Schalcken was painted posthumously, given the fact that Mattheus Mzn. died in 1685 and Schalcken left the city six years later. Too little information is known about the provenance of the painting to make an educated guess.

With the information given above the following chronology in the production of the portraits is suggested: Van Hooogstraten painted the portrait in the Rijksmuseum first (Figure 1), followed by the one in the Dordrechts Museum (Figure 2). After Mattheus Mzn. became mayor in 1677, Schalcken painted the last known portrait (Figure 3). This chronology corresponds with the features in the pictures and the biography of the person portrayed. I will return to this later.

Provenance and beholders of the portraits

Now we know more about the person portrayed and the dating of the portraits, we can turn to the provenance and the possible audience of the pictures. Little
The identities of Mattheus Mzn. van den Broucke portrayed

The Rijksmuseum Portrait

For reasons of convenience the features will be discussed per portrait. After discussing them, some remarks will be made on the identity the portrait creates of Mattheus Mzn.

The Rijksmuseum portrait (Figure 1) shows Mattheus Mzn. at three quarter length, his left arm akimbo and his right hand resting on a cane. Behind Mattheus Van Hoogstraten painted a classically inspired architectural setting with a red silk curtain. In the distance ships of the Dutch East Indies Company sail on a wild sea lighted by rays of sun, shining through a thick blanket of clouds. Mattheus Mzn. is dressed in the colourful clothing worn by admirals and other highly ranked military men. The feature standing out in this portrait is the golden chain Mattheus proudly presents to the spectator. This is the medal he was given by the Dutch East Indies Company. Because of the depiction of the chain other features, commonly present in portraits of admirals, are less visible; the bandolier and sword which give evidence of the rank of admiral (Dickey, 1994: 233). This shows that the golden chain was of the utmost importance for Mattheus Mzn. The rattan cane is a reference to his stay abroad, since rattan did not grow in the Netherlands. The feature missing in this portrait is the commodore’s staff. Many (vice) admirals, like Michiel de Ruyter and Aert van Nes, were depicted with the staff to attest to their rank as (vice) admiral. There is no logical explanation for this omission, since it could have easily been placed in Mattheus’ left hand. Maybe Mattheus wanted to show the beholder that he, as an admiral, had everything under control and did not need a commodore’s staff.

In portraits of highly ranked military men involved with either trade in the Indies or warfare at sea, the background was usually filled with a view of the sea and ships to create a naval context (Dickey, 1994: 227). This is also the case in the portrait of Mattheus Mzn. Unusual however, is the number of ships painted. In pictures showing highly ranked naval men usually a couple of ships were depicted. Van Hoogstraten painted at least fifteen ships.

Another noticeable aspect is the open architectural setting. Mattheus Mzn. is standing in front of a flight of stairs leading to the beach. When our eyes follow the steps down to the shore we end up seeing a little rowboat transporting passengers to the ships. Other (vice) admirals are portrayed in a closed architectural setting and the ships in the background merely testify to the naval career of the person portrayed. In the picture of Mattheus Mzn. it tells a more important part of the story. In my opinion, Mattheus Mzn. has been portrayed just before he left Batavia to sail home in 1670. During this voyage he was admiral of nineteen ships filled with valuable cargo. That is probably the reason why Van Hoogstraten

is known about the provenance of the pictures and therefore only hypotheses can be given concerning the possible viewers. The portrait in the Dordrechts Museum was bought with mediation of the art historian and collector Abraham Bredius at an auction of Preyer & Co in Amsterdam in 1890 (Figure 2). The picture of Schalken is on loan from the municipality of Dordrecht, to which Beelaerts, a rich citizen of Dordrecht and important art collector, bequeathed it in 1891-1893 (Figure 3). The Rijksmuseum portrait was part of the bequest of Leendert Dupper, former director of the Dordrechts Museum, in 1870 (De Bruyn Kops, 1984: 253) (Figure 1). An anonymous note describing the sale of this painting survives in the Dordrecht archives. The portrait was sold to Dupper in Dordrecht in 1857. Further research done in the build-up of the exhibition ‘Prijz de Lijst’ in the Rijksmuseum in 1987 showed that the picture was originally part of the collection of the family Hoeufft (De Bruyn Kops, 1984: 253). The author of the entry knew that the families Hoeufft and Van den Broucke were related through the marriage of Pieter Hoeufft and Adriana van den Broucke, the daughter of Mattheus Ezn. van den Broucke, who, as the author wrote, was possibly the nephew of the Mattheus portrayed (De Bruyn Kops, 1984: 253).

Through research in the archives of Dordrecht the genealogy from Mattheus Mzn. to Adriana Hoeufft - van den Broucke is presented here for the first time (see appendices I and II). Furthermore, surviving wills of the different family members make a case for the transference of the portrait to Adriana or her daughter Sophia Adriana. This hypothesis is still based on certain assumptions. Because the portrait ended up in the collection of Adriana or her daughter, I assume the portrait was commissioned by Mattheus Mzn. If the portrait would have been made, for example, for the chamber of the Dutch East Indies Company in Amsterdam, it would not have ended up in the collection Hoeufft, but in the collection of the Rijksmuseum straightaway. To my knowledge – after extensive research in the archives - there are no contemporary inventories mentioning the portrait. This can be explained by looking at the surviving wills (see appendix I and II). In my opinion, the Rijksmuseum portrait stayed in the family until it was sold to Dupper. Therefore, the painting was made to be hung in the house of Van den Broucke. The provenance of the other two portraits is less clear. No information concerning the portrait in the Dordrechts Museum (Figure 2) survives from before the auction at Preyer & Co and how Beelaerts obtained the portrait now in Huis van Gijn is a mystery as well (Figure 3). In the following section I will argue that the other two portraits were commissioned for private use too. Therefore, I propose that the beholders of the portraits consisted out of family members, Mattheus Mzn. himself, and the guests they entertained.
Mattheus Mzn. to the city. Van Hoogstraten painted a
the beholder to remember his important actions in ser
knows whose story is depicted. Mattheus Mzn. wants
actions for the Dutch East Indies Company. The point
scholar. The globe thus functions as a keepsake for his
cause Mattheus Mzn. is not depicted as an admiral or a
Mzn. the globe bears neither of the two meanings, be
used as a metaphor for worldly knowledge and wander
(vice) admirals were portrayed in the vicinity of one to
be made to hang in the house of the person portrayed and
would thus have been inherited by Mattheus Mzn.

The Portrait in the Dordrechts Museum
A couple of years later, Van Hoogstraten portrayed
Mattheus Mzn. a second time (figure 2). This time he
depicted him as a Dordrecht regent. The black clothing
Mattheus Mzn. is wearing is not a sign of Calvinistic
austerity: the garment is clearly made of silk and pre-
sents Mattheus Mzn. as an important figure in the
administrative elite (Groeneweg, 1995: 231-233). Mattheus
Mzn. had by now been made sheriff and al-
derman and was a member of the chamber of the Dutch
East Indies Company in Amsterdam. He is not repre-
sented as a mayor of Dordrecht, because he would only
become one the following year, in 1677. Also in this
portrait, Mattheus Mzn. is depicted in front of an archi-
tectural setting with a silk curtain. Three features stand
out and are worth discussing: the globe, the pose and
the cityscape of Dordrecht. Mattheus Mzn.’s left arm
is leaning on a globe. Van Hoogstraten has painted the
globe in detail and probably deliberately turned the part
showing the Dutch East Indies to the spectator. The
globe was a feature not uncommon in portraits. Many
(vice) admirals were portrayed in the vicinity of one to
attest to the voyages on the sea.28 The globe was also
used as a metaphor for worldly knowledge and wander-
lust in portraits of scholars. In the portrait of Mattheus
Mzn. the globe bears neither of the two meanings, be-
cause Mattheus Mzn. is not depicted as an admiral or a
scholar. The globe thus functions as a keepsake for his
actions for the Dutch East Indies Company. The point-
ing of Mattheus Mzn.’s finger makes sure the spectator
knows whose story is depicted. Mattheus Mzn. wants
the beholder to remember his important actions in ser-
vice of the Company. The cityscape of Dordrecht links
Mattheus Mzn. to the city. Van Hoogstraten painted a
cityscape of Dordrecht with its recognizable tower of
the Grote Kerk and a calm river with ships.

The identity of Mattheus Mzn. created by this portrait
is one of an important administrator of Dordrecht. The
person portrayed asks the beholder to put faith in his ad-
ministrative capacities. He tells the spectator that he will
be as valuable for the city as he had been for the company.
That is probably why Van Hoogstraten painted a calm
river. With Mattheus in the administration of Dordrecht
proverbially there would not be a cloud in the sky or a
ripple in the river. As I have mentioned above, nothing
is known about the provenance of this picture from be-
fore the sale in 1890. But due to the fact that Mattheus
Mzn. is not clearly identifiable as an admiral, sheriff or
other public figure, I cannot believe this portrait was or-
dered for a public building. Therefore, this picture could
be made to hang in the house of the person portrayed and
would thus have been inherited by Mattheus Mzn.

The Portrait in Huis van Gijn
In 1677 Mattheus Mzn. was elected mayor for the first
time. Godfried Schalcken painted his portrait some-
where after that (Figure 3). The portrait is relatively small
and dark; hardly any features can be identified. Mattheus
Mzn. is depicted in the same kind of garment as in the
second portrait of Van Hoogstraten. The halberd in the
background identifies him as one of the four mayors of
Dordrecht. The content of the picture with the golden
frame in the background is not visible. The person por-
trayed is placed in a frame shaped with a curtain on the
left and some kind of balustrade on which his left arm
is leaning. Balen, in his Beschryvinge, described the vari-
ous chambers of the city hall of Dordrecht (Balen, 1677:
233-234). He also listed the paintings that hung there.
Nowhere has he mentioned a hall of fame with portraits of
former mayors. Therefore, I presume that this portrait
was made for private purposes as well. Due to its small
size it was a perfect piece to be hung for example in the
library or chamber of the master of the house. It remind-
ed the viewer that Mattheus Mzn. had been mayor of
Dordrecht.

Conclusion
The questions concerning the portrayed identities men-
tioned in the introduction of this article can be answered
satisfactorily now. Mattheus Mzn. created a hall of fame
for himself. In the three portraits discussed memorable
events in the life of the person portrayed were depicted.
He was one of the few admirals in the Dutch East Indies
Company who earned a medal and he proudly presents it
in the first portrait of Van Hoogstraten (Figure 1). When
he lost his sea legs after being employed by the Company
for more than thirty years, he pursued a political career
in Dordrecht. The second portrait of Van Hoogstraten
attests to the rising political star of Mattheus Mzn. when
he had made alderman and sheriff (Figure 2). Maybe it was even a statement that he was ready to become a mayor. Under his guidance the city would prosper and be without disorder, just as the river Old Maas, visible in the background of the portrait. The last portrait shows Mattheus Mzn. as a mayor of Dordrecht (Figure 3). It is the only picture not clearly showing an element of water. Water played an important role in Mattheus’ life. Not only did he sail the oceans for the Dutch East (and West) Indies Company, but he became an administrator of a city that owned its fortune to trade over waterways. And that is why the elements of water in the background play a significant role.

Endnotes
1 Email: s.roefs@student.rug.nl
University of Groningen, The Netherlands.
2 See appendix III for a translation.
3 The mayors of Dordrecht served a term of one year. Since 1574 Dordrecht had four burgomasters at the same time (Balen, 1677: 260), two for dealings with the city and two for dealings with the surrounding villages and polders under the rule of Dordrecht. See Balen 1677: 560 for the procedure of appointment.
4 SAD (City Archives of Dordrecht), ONA (Notaries’ Archives), inv. 580, 1730. The very extensive inventory of Elisabeth Francken, who died in 1728, forms a nice example for studying the possession of paintings by the upper class of Dordrecht. Not only was she one of the first residents of Dordrecht who owned a ‘Schilderij Kamer’, but her inventory shows that families in the 17th century owned multiple portraits of ancestors, family portraits and residents. In his particular inventory there are at least two pairs of portraits of the main residents of the house: Mattheus Ezn. van den Broucke and Elisabeth Francken.
5 The costs of portraits varied from ten guilders for a modest but fine portrait to over 140 guilders for a large well made family portrait (Adams, 2009: 14). Loughman shows that the daily wage of a trained labourer was approximately one guilder. A foreman could earn twice as much (Loughman, 1992: 53). The administrative elite and successful merchants earned, of course, much more.
6 This was not the case with portraits of important national leaders or kings like William of Orange. Those pictures evoked patriotic feelings and were always appreciated.
7 It has to be noticed that in some cases the person portrayed did not order the portrait him- or herself. In this case it would have made perfect sense when the Rijksmuseum picture was ordered by the chamber of de Dutch East Indies Company in Amsterdam because it shows Mattheus van den Broucke as a commander admiral of the company. However, it will be argued here that this portrait was made for family purposes.
8 Mattheus Ezn. also became mayor of Dordrecht. A youthful portrait painted by Jacobus Leveck is in the collection of the Dordrechts Museum. Another portrait painted by Pieter van der Werff shows Mattheus Ezn., as a member of the chamber of the Dutch East Indies Company in Rotterdam, to which he was elected in 1685, and is now in the Historisch Museum in Rotterdam.
9 SAD, ONA, inv. 685, dated 17-11-1720. In every document in the archives of Dordrecht which concern Mattheus Ezn. van den Broucke it is stated that he worked for the Dutch East Indies Company. The document cited is just an example.
10 The Republic of the Netherlands.
11 See appendix III for a translation.
12 Most of the literature on the return voyage of Mattheus Mzn. speaks of a total of fifteen ships. Balen, however, writes that the fleet consisted of nineteen ships. Because Balen was a contemporary of Van den Broucke and probably knew the admiral, his report is more convincing. See for an account of fifteen ships Wijnandaerts van Resandt 1944: 28 and Zandvliet 2002: 188–189.
13 This means that 60% dividend of the profits made by the sale of the cargo were handed out to the share holders of the Dutch East Indies Company. See appendix III for a translation.
14 See appendix III for a translation.
15 Information kindly provided by Mr. De Bruyn, curator applied arts at Huis van Gijn, Dordrecht.
16 I owe this very important insight to Mr. De Bruyn.
17 Information kindly provided by Ms. Rakuzyn, librarian at the Dordrechts Museum, Dordrecht.
18 Information kindly provided by Mr. De Bruyn. SAD, 398 association for external and internal sending, inv. 31.
19 SAD, 150 Collection of Handwritings, inv. 1657.
20 It is also possible that this portrait was commissioned by his brother Elias or his nephew Mattheus Ezn. but this is less likely. Due to the fact that the portrait shows the person portrayed with features that were worth to be remembered – the golden chain and medal – it is most likely that Mattheus Mzn. ordered the picture himself to remember this special occasion.
21 SAD, 150 Collection of Handwritings, inv. 1657.
22 See for a comparison the portrait of Vice admiral Aert van Nes painted by Bartholomeus van der Helst and Ludolf Bakhuizen in 1668 (Rijksmuseum, Amsterdam) or the portrait of Admiral Michiel de Ruyter, made by Ferdinand Bol and Willem van de Velde in 1667 (Mauritshuis, Den Haag).
23 The picture *A senior merchant of the Dutch East Indies Company* painted by Aelbert Cuyp in the collection of the Rijksmuseum serves as another example.

24 It has to be noticed, however, that the painter Godfried Schalcken used this portrait of Van Hoogstraten to make an etching of the portrait of Mattheus. In this etching Schalcken adjusted several features. One of them is the substitution of the rattan cane with a commodore’s staff. This was probably necessary because of the medium used. Mattheus could not wear colourful clothing that would identify him as an admiral. The Rijksmuseum in Amsterdam has several copies of this etching in its possession.

25 See the portraits of Aert van Nes and Michiel de Ruyter and the portrait of Cornelis de Witt painted by Jan de Baen and his studio (Dordrechts Museum, Dordrecht).

26 Big ships were not able to moor at beaches and therefore little rowboats were used to transport the passengers.

27 See for another contemporary example of black garments Van Hoogstraten’s *The Mint masters and Inspectors of the Mint of Holland in Dordrecht* (Dordrechts Museum, Dordrecht).

28 See for example the portraits of Michiel de Ruyter and Aert van Nes, which I have mentioned before.

29 It is not incontestable that this portrait does not show an element of water. The picture is too dark to see what was painted in the golden frame. But the small size of the picture leads me to believe that nothing identifiable was painted in the frame. It is of course not that strange that this portrait does not contain an element of water. In this portrait Mattheus Mzn. is identified as a mayor of Dordrecht and no element of water is needed for that.

References


Appendix I

Genealogy of family Van den Broucke

In the *Lykstasi* Balen described the funeral procession of the funeral of Mattheus Mzn van den Broucke. Balen only mentions the brother of Mattheus Mzn. Elias and his nephew Mattheus Ezn. as direct family members (Balen, 1685: a3). Therefore we know that Mattheus Mzn. did not have a surviving wife or children. Furthermore, it seems that Mattheus Ezn. was an only child. It is most likely that the belongings of Mattheus Mzn. passed on to his brother Elias. Elias died three years later in 1688, and because Mattheus Ezn. was his only heir, he received the belongings of his father. The portrait made by Van Hoogstraten (Figure 1) would be in the collection of Mattheus Ezn. by now. The fact that the picture is not mentioned in any inventory makes sense because there was no need to draw up one. Mattheus Mzn., without wife and children, left everything to his brother who left, on his part, everything to his only son.

Mattheus Ezn. married twice. In 1679 or 1680 he married Johanetta van den Burg, the daughter of former mayor Johan van den Burg. They had five children, but only Johan and Maria reached on old age. We know that Johanetta died before she was forty because Mattheus Ezn. married a second time, in 1703 with Elisabeth Francken, widow of Matthijs van den Burg, brother of Johanetta van den Burg. This shows that the elite of Dordrecht was being kept small by marriages. Mattheus Ezn. and Elisabeth Francken had one daughter called Adriana. She was born in 1705. Elisabeth Francken married both Matthijs van den Burg and Mattheus Ezn. van den Broucke with a prenuptial agreement stipulating that the properties of bride and groom were not to be combined and that the inheritance would only be shared with the children emanated from the marriage. This meant that Johan and Maria van den Broucke would not get a share in the wealth of the Franckens.

In 1720 Mattheus Ezn. died. In the same year he made up his will leaving all his belongings to Maria and Johan. Strangely enough, he did not leave anything to his daughter Adriana. In the same year Maria and Johan signed an agreement at the notary, stipulating that their worldly goods would pass to the person living longest and after that to their sister Adriana. In 1735 Johan drew up another will stipulating the same. Adriana married Pieter Hoeufft in 1743 and they had one daughter, Sophia Adriana. She married Hendrik Onderwater. After the death of Mattheus Ezn. the portrait either went to Johan or Maria who after their passing demised it to Adriana Hoeufft – van den Broucke. Either way, the portrait would have ended up by Adriana and in the collection Hoeufft from which Leendert Dupper bought the portrait in 1857.

Endnotes appendix I

1 The notarial archives of Dordrecht are far from opened up. The will of Mattheus Mzn. probably survived but has yet to be found. There were more than thirty notaries active in Dordrecht in the period Mattheus Mzn. was living in that city, so from 1670 until 1685. We do not know in which year he made up his will and therefore it can be in one of the yearbooks of one of the more than thirty active notaries in the period from 1670 until 1685, a true needle in a haystack.

2 Also the will of Elias van den Broucke has not been found yet due to circumstances given above. See note 1.

3 Maria, the first child of the couple, was baptized in April 1681 and therefore it is likely the couple married in 1679 or 1680. Johanetta was born in 1663 so an earlier date seems not logical. Johanetta would have been too young.

4 That means, not with children from earlier marriages.

5 Mattheus Mzn. van den Broucke and Elisabeth Francken.

6 Only mentions the brother of Mattheus Mzn. Elias and his nephew Mattheus Ezn. as direct family members (Balen, 1685: a3).

7 Mattheus Ezn. by now. The fact that the picture is not mentioned in any inventory makes sense because there was no need to draw up one. Mattheus Mzn., without wife and children, left everything to his brother who left, on his part, everything to his only son.

8 Two Maria’s van den Broucke were baptized, one in 1681 and one in 1688. Therefore it is safe to assume that the first Maria died before 1688. Mattheus Mzn. made up his will in 1720. He leaves his belongings to Maria and Johan and it is likely that Margareta and Johanna Margareta already died.

9 That means, not with children from earlier marriages.

10 Mattheus Mzn. van den Broucke and Elisabeth Francken.

11 Mattheus Ezn. married twice. In 1679 or 1680 he married Johanetta van den Burg, the daughter of former mayor Johan van den Burg. They had five children, but only Johan and Maria reached on old age. We know that Johanetta died before she was forty because Mattheus Ezn. married a second time, in 1703 with Elisabeth Francken, widow of Matthijs van den Burg, brother of Johanetta van den Burg. This shows that the elite of Dordrecht was being kept small by marriages. Mattheus Ezn. and Elisabeth Francken had one daughter called Adriana. She was born in 1705. Elisabeth Francken married both Matthijs van den Burg and Mattheus Ezn. van den Broucke with a prenuptial agreement stipulating that the properties of bride and groom were not to be combined and that the inheritance would only be shared with the children emanated from the marriage. This meant that Johan and Maria van den Broucke would not get a share in the wealth of the Franckens.

12 Mattheus Ezn. married twice. In 1679 or 1680 he married Johanetta van den Burg, the daughter of former mayor Johan van den Burg. They had five children, but only Johan and Maria reached on old age. We know that Johanetta died before she was forty because Mattheus Ezn. married a second time, in 1703 with Elisabeth Francken, widow of Matthijs van den Burg, brother of Johanetta van den Burg. This shows that the elite of Dordrecht was being kept small by marriages. Mattheus Ezn. and Elisabeth Francken had one daughter called Adriana. She was born in 1705. Elisabeth Francken married both Matthijs van den Burg and Mattheus Ezn. van den Broucke with a prenuptial agreement stipulating that the properties of bride and groom were not to be combined and that the inheritance would only be shared with the children emanated from the marriage. This meant that Johan and Maria van den Broucke would not get a share in the wealth of the Franckens.
Mattheus van den Broucke x Katarina Cruidenier

Elias Mzn. van den Broucke
(7 – 1688) x Maria Sautijn

Mattheus Mzn. van den Broucke (1620-1685)

Sofia van den Brocke
Died at an early age

Huybert van den Broucke
Died at an early age

Mattheus Ezn. van den Broucke (1652 – 1720)
x (1680) Johanetta van den Burg (1663 – before 1703)
x (1703) Elisabeth Franken (? – 1728)

Maria van den Broucke (1681 – before 1688)
Died at an early age

Margareta van den Broucke (1682 – before 1720)

Johanna Margareta van den Broucke (1686 – before 1720)

Maria van den Broucke (1688 – after 1737)

Janus/Johan van den Broucke (1693 – 1737)

Adriana van den Broucke (1705 – 1747) x (1743)
Pieter Hoeuff (1707 – 1778)

Sophia Adriana Hoeuff (1745 – 1822) x Hendrik Onderwater (? – 1822)

Underneath rests the corpse of that renowned gentleman, Who, on Batavia, maintained the lustre of the state, For the rise in Brazil, fortified a man with honour; And our power, fought with Castile to equal [Spanish power overseas]. Who, with a rich cargo, full of communal treasure, As Commodore of ten and nine ships, By first mate and pilot, everything the keel contains, With quick and swift shipmates dragged into our harbours. Who held the office of burgomaster three times; And during the fourth term was lost by Thurendrecht [Dordrecht] The terrible death, very powerful, strong and cruel; Has snatched away that pillar from us, the watchman of our walls. To what avail is steady weeping, with tears on the cheek? It does not help to press out salty liquid of our eyes; That protector we have lost, however frightened we look, No ghastly and sad lamenting is able to bring him back. May God lead him to his noble and invaluable halls To triumph forever in white garments. [D]en Opgang, en Luyster van dezen Staat, in Brazil helpen bevorderen (Balcn, 1677: 887).

He [Mattheus] helped to promote the rise and lustre of this state [Dutch Republic], in Brazil.

Rijker Ladinge, als oyt bevorens in eenig Jaar was overgekomen, ende welkers Verkoop wel op Vijftien Miljoenen guldens geschat wezende, daar op ook een ongemoene groote Uytdeelinge van t zestig ten honderd is gevolgd (Balcn, 1677: 887-888).

A richer cargo, than had ever came over [from the Indies] in one year, and its sale was estimated at fifteen million guilders, because of this also an extraordinarily large dividend distribution of 60% has followed.

De Bewindhebbers van de Generale Geoctroyeerde Oost-Indische Compagnie, ter Vergaderinghe van de Seventhienen, geconfidereert, en in achtingh genomen, de goede Diensten, door den Heere Mattheus van den Brouck, jonghst geweest zijnde Raad-Ordinaris in de Hooge Regeeringe van India, aan de gemelte Compagnie gedaan, en gepreesteed; hebben in erkentenisse van dien, mitsgaders tot betuyginge, dat de selve hare aangenaam zijn, en besonderlijck mede, dat fijn E. de Retour-Vloot, den eersten July 1670. In deze landen gearriveert, in goede, en welgeschickte Orde, als Commandeur over de selve, heeft overgebracht, fijn deze Medaille, en Goude Kettingh, om tot een gedenckteecken te dienen, Vereert (Balcn, 1677: 888).

The directors of the General Authorized Dutch East Indies Company, assembled in the council of the Lords Seventeen, having regard to and considering the good services rendered and done to the named Company by the gentlemen Mattheus van den Brouck, who most recently has been member in the general council in the government of the Indies; have honoured his Lordship, in recognition of those services, and also as a proof that those services are agreeable to the Company, and especially that his Lordship as Commander of the returning fleet has brought back this fleet, which has arrived in these countries on the first of July 1670 in good and properly order, this fine Medal and golden chain to serve as a memorial.

* I thank Mr. Verlaan for his kind assistance in translating these texts.
Introduction: the hidden maritime landscape

The bottom of the sea around the Netherlands, a country with a rich maritime history, is covered with shipwrecks. This maritime landscape is hidden, mostly by sand, but also by meters of seawater. The sand keeps the shipwrecks preserved. When tidal movements lay bare a shipwreck, it often decays soon (www.waddenvereniging.nl). This hidden landscape is an important archaeological and maritime heritage. The Wadden Islands form an archipelago, stretching from the north-west of the Netherlands through Germany to the west of Denmark. The Dutch Wadden Islands consist of five inhabited islands (Fig. 1). Around the Dutch Wadden Islands, shipping disasters were often caused by stranding, because the sea around the Wadden Islands is not very deep. This stranding usually occurred north of the islands, not in the Wadden Sea area. Storm or a strong north-western wind could cause stranding, where the ships where blown against the sandbanks on the north side of the Wadden Islands. But most shipping disasters around the Wadden Islands were caused by stranding during calm weather (Statistiek der Zeescheepvaart, 1884-1920). Due to the fact that the maritime cartography and navigation techniques were not as accurate in the past as they are nowadays, stranding occurred in the dynamic Waddensea-area where sandbanks and islands are constantly moving.

This maritime landscape is a hidden one. We can not see or visit the landscape, and it is unknown exactly how many wrecks there are on the bottom of the Waddensea. This presents a problem but also an interesting challenge for doing this research. To be able to examine the hidden maritime landscape, the landscape is perceived as a layered landscape, containing four layers (Fig. 2). The bottom layer is the hidden maritime landscape where shipwrecks lay, often covered with sand. The second layer is the sea. Tidal movements make this layer dynamic, and on this layer ships are sailing and wind is blowing. The third layer is the land, or in this case: the islands. From here it was possible to save people. The fourth layer is an abstract layer. This layer is the layer of the people, culture and stories.

Because the landscape is perceived as multilayered, and the layers are interconnected, the hidden maritime landscape can be unveiled by investigating the other three layers. The focus will be on the rescue service because it played a key role in creating the hidden wreck-landscape: it could influence the sinking of a ship or not, and when it sank: to rescue the crew on board, or not. So this paper aims to study the hidden wreck landscape of the Dutch Waddensea area by means of an investigation of the three other landscape layers using a case study on the rescue service. Three different approaches that focus on different layers in the landscape, will together address

Fig. 1 The inhabited Dutch Wadden Islands (http://www.klaustueshaus.com/travel/nlwaddeneilanden/nlweindex.html).
this main question. The first approach is the maritime historical which deals with the rise and development of the rescue services in the period from the eighteenth century until 1920. This approach focuses mainly on the layer of the islands and the cultural layer. The second approach is the historical geographical and studies the location of the lifeguard stations in correlation to the location of the shipping disasters. This approach focuses mainly on the layers of the islands and sea. The third approach is the cultural historical. In this approach there are two central questions: why did the men sailing in the lifeboats risk their lives for strangers? And: which part of the cultural heritage related to the hidden wreck-landscape is remembered, and which is not? These questions focus mainly on the cultural layer.

This cultural approach may seem surprising, because how does culture relate to landscape? While landscape may be seen as a part of cultural heritage, many researchers combine the study of landscape with the study of cultural heritage. Rob van der Laarse for example, researches Second World War landscapes, like Westerbork and Auschwitz. These kind of landscapes he calls ‘terrorscapes’ or ‘perpetrator’s heritage’. Van der Laarse’s research points out that, when studying the heritage of the Second World War, the things that are remembered and conserved are as important as the things that are forgotten, thrown away or hidden (Van der Laarse, 2009). I will examine if this concept can also be applied to the cultural heritage connected with the hidden maritime landscape of the Waddensea.

Maritime historical approach

Arise of the rescue services

An anonymous manuscript map, made in 1735, shows a ship that stranded on Schiermonnikoog (Fig. 3). People are lying on the beach, dead or apparently dead. Although someone seems to be helping a drowned person on the left side of the map, many others are beachcombing: they plunder the ship and try to get hold of the floating cargo.

Emperor Charles V made beachcombing an illegal act in 1529. (Vandermissen, Zeeman and Brinkman, 1999: 8). But the struggle to stop people from beachcombing had hereby not ended. In 1725 an ordinance was made by the States of Holland and West-Frisia, stating that shipwrecked men had to be helped. This ordinance was made to stop the misbehaviour of people living along the Dutch coast and on the islands against stranded ships and their crew. Examples of this misbehaviour are setting fire to ships, robbing under the cloak of help, stealing from dead bodies and misleading ships with signal-lights. People who did not keep to the ordinance, could get the death penalty (Doedens and Houter, 2010: 227-228). More than forty years after the implementation of this ordinance, a report was drawn up which stated that most sea-villages did not have any equipment to help drowned persons, and the beachcombing and robbing had continued. This again lead to a new ordinance in 1768 with specified rules to stop beachcombing, with no success however (Uilkens and Van den Brink, 1924). The fact that beachcombing could not be eliminated easily and continued throughout the nineteenth century, can be explained by the poverty of the people living on the Wadden Islands. The stranding of ships which often occurred several times per year, led to some extra income (Doedens and Houter, 2010: 223).

One of the aspects of the ordinance of 1768 was that the government tried to start regulating a lifeboat service, by stationing lifeboats in coastal villages. These boats were barely used, probably because their flat shape was very unsuitable in the surf (Fig. 4). In 1808 five new lifeboats of a better model were stationed, but there are no stories of the boats having contributed to the saving of people, because they where to heavy to get into the water. After these failed attempts, the government regulated lifeboat service ends (Vandermissen, Zeeman and Brinkman, 1999: 8-9).
In October 1824 a dramatic event occurred in front of the Dutch coast, during the stranding of a Dutch ship. After rescuers had saved eleven shipwrecked men, the lifeboat capsized during the third expedition and six out of seven rescuers died. After this accident, two societies were established to save drowning persons. The first one, the Noord en Zuid Hollandsche Reddingsmaatschappij (North and South Holland Lifeboat Association, hereafter referred to as the Lifeboat Association) was responsible for the larger part of the Dutch coast, except the southernmost part, which the other society would look after. Aim of the Lifeboat Association was to provide good saving equipment so that the rescuers could do their work with the least amount of risking their own lives. The Lifeboat Association was financed by voluntary contributions. It was thought that the lifeboat service was in better hands when regulated by a private organisation, not by the government. England and Germany already had those kinds of private Lifeboat Associations (Uilkens and Van den Brink, 1924: 34–52). But where did this philanthropic idea suddenly come from?

The eighteenth century is often called ‘the age of Enlightenment’. The leading ideas of the Enlightenment are an optimistic belief in the historical advance of reason, science, education, social reform, tolerance and enlightened government (Palmer, Colten and Kamer, 2007: 297). In the second half of the eighteenth century, all kinds of societies were established in the Netherlands: scientific societies, and cultural societies for poets, artists and players. Their goal was mainly to entertain themselves. But with the establishment of the Maatschappij tot Redding van Drenkelingen (Society for the Saving of Drowning persons) in 1767, a new kind of society arose that sought its goal outside its organisation: they wanted to achieve social reforms. This goal derived from common humanity. The aim of the society was to make sure that shipwrecked men received the right medical treatment when they were rescued. This was necessary because far too often people that were rescued died anyway because good reanimation methods were nonexistent those days (Brokken and Frijhoff, 1992: 1–3; De Booy, 1967).

The establishment of philanthropic societies makes clear that a change in mentality had occurred. The establishment of the Lifeboat Association should be seen against this background, from where it was only logical that this association was in better hands when organised private, and relied on voluntary donations. In 1824 however, no immediate changes had occurred for the shipwrecked men. Firstly because before 1824 drowning persons were also occasionally rescued, often by the pilotage, the organisation that helped ships sailing in and out the harbour safely. The pilotage also kept doing this after 1824 (Doedens and Houter, 2010: 226). Secondly, the Lifeboat Association itself was still in its infancy. In a gradual development the association would become better in its saving methods.

Development in rescue methods and equipment

When the Lifeboat Association was established, it started with 14 lifeboat stations along the Dutch coast, each containing one lifeboat. The islands Texel, Vlieland, Terschelling and Ameland all had one of these boats (Uilkens and Van den Brink, 1924: 56). Over the years more stations were added, and the stations had more equipment available. In 1920 the Lifeboat Association managed 35 lifeboat stations, most of them equipped with a lifeboat, boat wagon and rocket apparatus (vuur-pijltoestel, used to fire a rope to a ship so a connection with the land could be made), (Statistiek der Zeescheepvaart, 1920).

Technical improvements were very important in the development of the rescue service. Probably the most important technical improvements were carried out to the lifeboats. The first lifeboats were all rowboats. The Lifeboat Association started with twelve ‘whaleboats’ from Greenland. These boats were light and slim and suitable for six rowers. A floating mechanism made of a heavy canvas filled with rushes should make the boat, according to the makers, ‘unsinkable’. The boat that became the standard-type in 1858, had two big improvements: it was self-draining and self-raising. Self-raising means that the boat, when it capsizes, automatically turns itself up again. Throughout the nineteenth century new boats were being tried that were better capable of self-drainage, or came closer to the term ‘unsinkable’. In 1908 the Lifeboat Association used its first motorboat, stationed at Scheveningen. In 1910 Terschelling receives a motor-boat as well: ‘de Brandaris’, at the time the most modern lifeboat in Europe. In 1920 the Lifeboat Association had three motorboats (Statistiek der Zeescheepvaart, 1920)). In the years thereafter the transition from rowboat to motorboat took place and in 1953 the last rowboat was replaced by a motorboat (Haanstra and Zeeman, 1977: 69). Although the Lifeboat Association tried to standardise the boats used, not all the stations had the same boats. The crew was allowed to decide which boat to use,
because they had to rely on it (Vandermissen, Zeeman and Brinkman, 1999: 54-61).

When complaints were reported about a broken boat, or material that did not function well, the Lifeboat Association usually fixed this within a year. When tests with new materials were received positively, they were soon implemented in several lifeguard stations. This is for example the case with the boat wagons. The rescuing started with bringing the lifeboat to the place on the beach from where it was easiest to row to the ship in need. The boat wagon was pulled by several horses. It could easily take a few hours, sometimes even four or five, to bring the boat to the right place (Fig. 5). One of the reasons why this took so long, was that the wheels sank in the sand. In 1912 the Lifeboat Association did a test with a German boat wagon type, that had iron plates constructed on the wheels to prevent the wagon from sinking away in the sand. The test was received very positively, after which other boat wagons of the Lifeboat Association also received iron plates on the wheels (Statistiek der Zeescheepvaart, 1912).

Another important development are reanimation methods. When the Society for the Saving of Drowning persons was established in 1767, the reanimation methods used often made the conditions of the victim only worse: hanging people upside down and rolling them over a barrel (Fig. 6). This last method often caused nothing but broken ribs. After its establishment, the Society for the Saving of Drowning persons tried to propagate ‘better’ reanimation methods. In the nineteenth century those were to blow smoke in the intestines, put salt or ammoniac on the head, and bloodletting. Only in 1960 the mouth-to-mouth resuscitation was officially accepted as the best reanimation method (De Booy, 1967).

Technical improvements likes the ones on the lifeboats and boat wagons, but also in reanimation methods, made the Lifeboat Association better suited to save drowning persons. More saving locations also meant that the lifeboats were launched faster. All these improvements made the saving actions go safer, faster and more efficient. When is was established, the aim of the Lifeboat Association was to provide good saving material so that the rescuers could do their work with the least amount of risking their own live. As is reflected in the annual reports of the organisation, this kept being the goal of the Lifeboat Association (Statistiek der Zeescheepvaart, 1884-1920).

Historical geographical approach
In this approach the locations of the rescue equipment will be compared to the locations of shipping disasters, using the source Statistiek der Zeescheepvaart. For the period 1884-1920, annual maps are available on which the locations of shipping disasters and the locations of lifeguard stations is depicted. The shipping disasters are registered irrespective the nationality of the ship. Although the ‘Statistiek der Zeescheepvaart’ is a rich source, it must be mentioned that not all shipping disasters may be documented. Also the locations of the ships are not very precise. The mapping of the shipping disasters is most likely based on descriptions of the locations documented on forms (for example: on the north-western side of a particular sandbank). For the goal of this research however, the locations are accurate enough.

To see if there is any pattern in the locations of the shipping disasters, the locations were digitised for this research, using the annual maps (Fig. 7). The shipping disasters were counted per island, where it was examined which shore of which island would be the closest. The island of Texel is not taken into account because of the clustering of many shipping disasters and many locations.
of saving equipment around Texel and the main shore. This would make the decision if a disaster ‘belongs’ to Texel or not, very random. The results of the analysis are presented in Fig. 8. The $R^2$ number tells how strong the correlation is between the number of recorded shipping disasters and time, and is always between zero and one. If the number is zero, this means there is no correlation whatsoever between time and the locations of shipping disasters. If the number is one, it means there is a hundred percent (positive or negative) correlation. It is clear from Fig. 8 that the $R^2$ numbers are close to zero for Vlieland, Ameland and Schiermonnikoog. This means...
that the number of recorded shipping disasters around these islands did not increase or decrease, but mainly show a capricious pattern. The island of Terschelling however, shows a slightly increasing pattern, where the $R^2$ number is about 0.3. In comparison to the other islands, this difference could have been noticeable to the inhabitants, especially during the years where seven or eight ships stranded around Terschelling.

To see if this increase in shipping disasters led to extra lifeguard stations on Terschelling, the locations of the lifeboat stations were examined, using the same annual maps. On these maps the locations where saving equipment was available (very often a lifeboat), are also depicted. In Fig. 9 the number of lifeguard stations per island through time is depicted. Both Vlieland and Terschelling are very stable in the period 1884-1920: they have respectively two and one lifeguard station. Ameland gets a third station in 1903 and a fourth in 1914. In 1920 something changed: whereas Terschelling had three stations since 1889, it gets an extra station in 1920. At the same time, neighbouring island Ameland is reduced from four stations to two. This change might be caused by the growing number of shipping disasters around Terschelling. It is hard to say however how much influence this might have had on the decision. It could also be caused by the overall increase in the number of lifeguard stations.

Cultural historical approach
Motives to become a hero
To answer the question what motivated people to work for the Lifeboat Association, literature was examined. The last decennia several books were published about the Lifeboat Association. Some of the books deal with a specific region in the Netherlands, like the Wadden Islands, or relate the story of one famous lifeboat or family of courageous rescuers. Very often these books are aimed at a general public, occasionally sponsored by the Lifeboat Association itself, or by the local companies on the islands.

The studied literature does not present a consensus on the motivation to work for the Lifeboat Association. In some books their reasons seem to be romanticised, underlining that it was particularly common humanity that motivated the men, not money. Other books mention that money might have been an important motivation as well, since often the rowers and their family were very poor. Another motivation mentioned, is the honour that was paid to the men that had taken part in a heroic saving-action, by medals and certificates that were given to them.

The book ‘Redders aan de riemen’ (saviours on the oars) may serve as an example here. It portrays rowers during their time with the Lifeboat Association, based on interviews. (Fig. 10) The wives of the rowers are also portrayed. In the introduction it is stated that the rowers did not care for medals and hero-worship. They worked for the Lifeboat Association because it was their passion and their common humanity. Money used to be a reason too, but when society became wealthier, it was especially common humanity that motivated the rowers. However, this broad spectrum of motivations is not reflected further on in the book in the stories of the rowers themselves. Their lives do not seem very romantic at all, neither for the wives. The book tells stories of poverty and women with young children who found it awful that their husband had to go out to the sea during stormy weather. But working for the Lifeboat Association, although not richly rewarded, could provide the so-needed income. From these stories it seems that men worked for the Lifeboat Association because they had to, they needed the money, and it was by the lack of any better work.

Remembering cultural heritage
Both beachcombing and life-saving are part of the cultural heritage of the Wadden Islands related to the wreck-landscape on the bottom of the Waddensea. To examine which part(s) of this cultural heritage are remembered in which way, two sources were used: firstly literature, and secondly monuments and museums on the Wadden Islands. With these last sources, the connection with the landscape itself is made explicit. In the monuments and museums placed on the Wadden Islands, it is possible to see how this specific part of the cultural heritage, related to the invisible wreck-landscape surrounding the islands, is remembered on the islands themselves. When investigating the process of remembering, Van der Laarse’s notion that what is remembered is as important as what is not, is kept in mind.

Scientific literature sketches an image where beachcombing and rescuing went side by side. Beachcombing on the Wadden Islands continued well into the twentieth century (Doedens and Houter, 2010). In publications for the general public, this image is often quite different. Although some books are explicit about the history of beachcombing, more books tend to mention this history very briefly in the introduction, to soon confirm that luckily after 1824 things changed and many people on the islands became heroic saviours. The book
‘Skip op strân’ (ship on the beach) does not even mention beachcombing. In the introduction, the aim of the book is made explicit: “‘Skip op strân’ is a salute to the people living on the islands, who during 180 years of rescuing have risked their lives to bring hundreds, mostly nameless sailors safely to the shores’ (Beukema, 2004, 5; my translation). That the rescuers were brave indeed, is also confirmed in scientific literature, although not always described with the same feeling for drama. But the true history of beachcombing and misbehaviour against stranded ships and their crew often does not get the same amount of attention in popular scientific books. The goal of the publications for the general public is clearly to remember the glorious history of brave men.

Books like ‘Skip op strân’, which deal with one specific island, also represent the people living on the island by the history described in the book. Of course, the image created will highly depend on the part of the history chosen to describe. This type of publication often prefers to represent the people on their island as heroic saviours, not as beachcombers who stole golden teeth from shipwrecked men, although both stories would be exiting to read. The function a book has in representing the island, also applies to the monuments and museums on the islands. The fact that the islands are popular holiday destinations for tourists makes this representation-function even stronger.

Many museums and monuments on the islands have to do with the sea. The islands are strongly related to the sea around them, and throughout history this has had a huge influence on the economy and culture. There are several monuments on the islands, dedicated to fishermen. On Vlieland there is a monument called ‘the beachcomber’, and a ‘monument for the unknown drowning person’. On Ameland a special monument exists. In 1979 eight horses died while launching the lifeboat, because the mechanism that should separate the horses from the boat after it was launched, did not work where after the horses were dragged into the sea. This event is still commemorated by a horse grave and a horse monument. It can be concluded that neither the beachcombing nor the Lifeboat Association part of the historical heritage are large in number among the monuments on the islands.

In contrast, museums are dominated by one part of the cultural heritage. There is no museum about the Lifeboat Association on any of the islands. Surprisingly enough, every island does have a museum about beachcombing, often called ‘Juttersmuseum’ (beachcombing museum) or ‘Wrakkenmuseum’ (wreck museum). The ‘Wrakkenmuseum’ on Terschelling, ‘a slightly eccentric museum full of exciting stories’, even has a ‘combing-terrace’, ‘combing-diners’ and a ‘pirate-garden’ (wrakkenmuseum.nl). The museums on the islands that deal with beachcombing are often filled with collected items that people found on the beach: the modern beachcombing. On Vlieland this museum is ironically placed in a little house that was built to give shelter to shipwrecked men. Beachcombing is remembered on the islands, and is presented as a part of the history. But not every part of this beachcombing-history is remembered. The part that would make it look like a criminal act or something you should be ashamed of doing, is left out. Rather, it is presented as something fun and adventurous, as a part of cultural heritage the Wadden Islands can even be proud of. So although the beachcombing receives a lot of attention, it is presented in a light that makes it seem a normal act, not a criminal one.

Conclusions
What glimpse do we get of the hidden wreck landscape of the Dutch Waddensea area, when other layers in the landscape that are connected with this layer are investigated, and the focus is on the rescue service? In this interdisciplinary study that combines history, statistics, geography and cultural heritage, an attempt was made to make a hidden landscape more visible.

The wrecks on the bottom of the sea around the Wadden Islands tell dramatic stories. The wreck landscape is connected at one hand to the history of misbehaviour and beachcombing, and on the other hand heroic savings, both accomplished by the islanders. The islanders could in other words have a positive effect on ships in need by saving the drowning persons, or have a negative effect by setting ships on fire, stealing the cargo and sometimes even kill the shipwrecked men. These two went side by side, with beachcombing continuing next to the Lifeboat Service. The establishment of the Lifeboat Association has a ‘prehistory’ of beachcombing and misbehaviour of islanders against shipwrecked men. Rules set up by the government to stop beachcombing went hand in hand with rules to obligate the saving of drowning persons. After a period in which the government tried to regulate the lifeboat service with no success, the Lifeboat Association was established in 1824, financed by voluntary donations. This marks a huge swing in mentality. The goal of the Lifeboat Association was to provide good saving equipment. Since 1824 technical improvements made the rescuing safer, faster and more efficient.

After having investigated the source ‘Statistiek der Zeescheepvaart’, it can be concluded that the location of shipping disasters may have influenced the location of lifeguard stations. It is hard to say however how strong the causality is, because there is also an overall increase in the number of lifeguard stations during the period. Further research into this topic, for example by comparing the results with other locations in the Netherlands and investigating reports of the Lifeboat Association, would put the results in more perspective.

There is no consensus in publications for the general public on the motivations of the men sailing in the lifeboats to risk their lives for strangers. Reasons often
mentioned are money, common humanity and honour. The two-sided history that surrounds the wreck-landscape, consisting of both beachcombing and the Lifeboat Association, is reflected in scientific literature. Popular scientific literature however focuses only on heroic deeds.

The way in which the history related to the hidden wreck landscape is remembered on the islands, is very ambiguous. The duplex history is only partially presented in the museums on the islands: there are many museums about beachcombing but none about the Lifeboat Association. But beachcombing is depicted in these museums as something fun, adventurous and as a part of cultural heritage the Wadden Islands can even be proud of – not as a criminal act. The way in which this part of history is remembered and presented to tourist, does not help to reveal the hidden wreck landscape. So even though the tourist do receive information about the history that is related to the wreck landscape, this information rather covers the history with a subjective story, than that it unveils a true glimpse of the cultural heritage.

Notes
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Introduction
The common thought is that culture and nature are different entities. Culture is artificial while nature is not influenced by mankind. Controversially, these entities are often dependent of each other. No nature area can be defined as being in a pristine state and no cultural object is free from environmental pressures (Lowenthal, 2010). Most people think that the Waddensea is pristine nature. However, this is not the case. This paper will investigate the relationship between culture and nature for the Waddensea area. The Waddensea is a wetland in the northern part of the Netherlands, which contains important ecological values. However, many cultural historic remains can be found here, as well.

The Waddensea is a large area. It not only comprises a Dutch part, but also German and Danish parts (see also figure 1). The history of the Waddensea goes back to the beginning of the Holocene. The area was first part of the vast plain formed in the Pleistocene. When the climate became wetter the low-lying parts were inundated (Bazelmans et al., 2012). From c. 4000 BC onwards the sedimentation and sea level rise were equal, which provided an area with mud flats, marsh lands and islands. The first human settlements originated in prehistory (Niederhofer, 2010). In this period a gradual change took place from hunting, fishing and gathering towards agriculture and livestock farming. From the early Iron Age onwards, humans slightly changed the Waddensea area; they developed dwelling mounts to protect them against the stormy sea, but also the extraction of peat changed the environment in which they lived. The Waddensea consists thus also of a strong man-made component that influenced the environment of the Waddensea (Bazelmans, 2012).

Nowadays the Waddensea is well known for its environmental values. Since 2009 it is also a UNESCO World Heritage site, based on natural criteria. They found that: “The Waddensea area is the largest unbroken system of intertidal sands and mud flats in the world, with natural processes undisturbed throughout most of the area. It encompasses a multitude of transitional zones between land, the sea and freshwater environment, and is rich in species specially adapted to the demanding environmental conditions.” (UNESCO, 2013a). The indication is based on natural criteria VIII, IX and X. Here criterion VIII stands for the geological and geomorphological features, IX for the ecological features and X for the biological features of the Waddensea (UNESCO, 2013a). Although man has influenced the environmental processes, none of these are mentioned by UNESCO. Vollmer et al. therefore argued that the Waddensea region is more than an important ecological identity, the cultural identity is as important as the ecological identity (Vollmer et al, 2001). The ecological identity is most of the time more valuable and important than the cultural identity because society has the idea that people have influenced nature which has lead to the depleting of the legacies of nature (Lowenthal, 2006). The UNESCO indication contains only the Dutch and German parts of the area, Denmark has now also requested submission (UNESCO, 2013b). In its proposal, Denmark considered the Waddensea as a mixed site: an area important because of its natural and cultural values, both important for the submission of an area as UNESCO world heritage site. Besides international agreements, the three countries also have a trilateral foundation for the Waddensea since 1978 and on national level also planning memorandums for the Waddensea exist. Different policies exist thus for the Waddensea, but what kind of perspective did they take? This raises the question of what is more important in the policy of the Waddensea; the natural or the cultural perspective. The following research question is hereby posed: Has the policy for the Dutch Waddensea area shifted to a natural or cultural perspective from 1950 onwards? This time period is taken because from this moment on the Waddensea appeared on the Dutch political agenda.

The purpose of this paper is to indicate that the Waddensea area is more than a natural area and thereby to frame the problem into a management perspective where the broader issues in society are addressed as well. The issues around culture and nature can be helpful in other areas of the Netherlands. This paper indicates not only the case of the Waddensea, but also the theoretical framework for defining nature and culture. The case-study area is the Waddensea which is determined by the borders of the UNESCO world heritage directive for the Waddensea, which means that the area only comprises the wetland and not the islands or the mainland part of the provinces.
Cultural or natural perspective

Preliminary, nature and culture are the same concepts (Lowenthal, 2010). However, during the 19th century the relationship between mankind and nature changed, which leads to a separation between the concepts culture and nature. The publication of ‘man and nature’ in 1864 contributes also to this separation. In this publication mankind is seen as the destroyer of nature because of its major impact on the environment. The division between nature and culture is also “reinforced by traditional and educational structures, as well as polarized worldviews” (Pollock-Ellwand, 2011: 236). Until now, nature and culture are still separate concepts, which is illustrated by the different policies in the Netherlands. The policies for nature are about controlling the biodiversity of flora and fauna and thereby excluding human interventions. The policy for cultural remains is different, here are human interventions seen as desirable since most monuments are used by humans. The attention for cultural remains and nature is also quite different, in most cases nature is more valuable than culture and no human interventions are preferable (Lowenthal, 2010). When people are intervening with nature, this is seen as destruction and decline of environmental values. However, the controversial thing is that nature does not exist without human interventions. Lowenthal argues thereby that each aspect of nature is impacted by human agency and not an artefact devoid of environmental pressure.

Lowenthal pointed out that culture and nature are dependent of each other (Lowenthal 2010: 81). Previous
studies from Olwig clarify this relationship between culture and nature, as well. He identifies three types of relations between culture and nature; nature as part of our culture, culture as part of nature or a combination of culture and nature (Olwig, 2006). In the first relationship no real nature exists, it is all constructed by people. Nature is in this definition part of our culture. In the second relationship nature is dominant and culture is a product of our nature. The last relationship depends upon place and time what the role of nature and culture is. Olwig argues: "the natural or cultural heritage of places treated here is … very much a function of the discursive frameworks that define it" (Olwig, 2006: 4). It depends upon your framework which definition fits best. Parallel to Lowenthal and Olwig, Szabo and Hedel state that culture and nature need to be combined more. However, Szabo stronger argues that human societies should be acknowledged as integral part of ecosystems and societal processes (Szabo and Hedel, 2010). He argues thereby that when this integration is accomplished this will give more insights in current ecological processes, it will lead to better informed management, policy decisions and it put ecology and conservation in a wider context (Szabo, 2010). Culture and nature are separated entities in traditions, education and in worldviews. However, in the scientific debate is a tendency which suspects that those entities needs to be integrated more. The term 'co-evolution', which is used by Knottnerus, can be useful in this discussion, it means that nature and culture interact (Knottnerus, 2009).

Most of the researchers support the fact that nature and culture are more integrated than separated. However, nature and culture differ in appearance, which mostly is the effect of the different policies for nature and culture. The integration of the two entities is very difficult, as long as the policies and maintenance plans stick to the idea of pristine nature. Because of the different policies and appearances the nature and culture perspective are assumed separated. The definition that is used for the nature perspective refers to Olwig which says that nature is part of our culture (Olwig, 2006). Nature can thereby be seen as the geological, geomorphic and ecological aspects of a certain area (UNESCO, 2013a). The definition for the culture perspective is used from the trilateral project for landscape and heritage Lancewad. In this project culture is defined as "all elements and structures which give a picture of the history of human settlement in the Waddensea region" (Vollmer, 2001: 9).

Cultural layer
The trilateral cooperation of the Waddensea started the Lancewad project in 2001 (Common Wadden Secretariat, 2007). In this project the landscapes and cultural history in the Waddensea are the key aspects. According to this project, cultural heritage in the Waddensea is important because it gives evidence of the interaction of man and nature during different centuries (Vollmer, 2001). Human influences have also served as impetus for nature. The project has five research periods, of which the maritime period has the closest relation with the UNESCO world heritage site borders. The maritime period lasts from 1500 until 1800 when the trade from the Waddensea to the Baltic sea and Atlantic ocean was important. Ship wrecks are one of the most important remains of this period. However, due to natural processes many shipwrecks are threatened. It is necessary to pay more attention to this 'maritime layer', otherwise the remains of it will disappear.

One of the most important places where shipwrecks can be found is the Texelse Rede which is located on the south side of the island (see figure 2). The ‘Rede van Texel’ is an anchorage for ships to load, unload or sail further. It is a place to wait until good weather conditions occur to resume the trip, see figure 2 (Vos, 2012). Shipping and anchoring at the Rede van Texel occurred since the 12th century till 1800. However the period of 1500 until 1800 is the most important period of shipping in the Waddensea because the golden age initiated a lot of shipping towards other countries. Most of the ship wrecks also originate from this period. The anchorage place was not always safe; due to south west storms some ships came into trouble when their anchor was broken. Most of the time those ships stranded at a higher sandbank. After a ship wrecked the cargo was taken, and sometimes the whole boat was removed. When a ship was wrecked it did not mean that it was preserved in the bottom of the Waddensea. Natural processes of water and wind, and also human inferences causes destruction of the shipwrecks. It is unknown how many ships were wrecked in this period due to limited written sources. While it is unknown how many ship wrecks remain, it is clear that the Texelse Rede has been an important place in the different shipping routes, and that the ship wrecks have a connection with the island Texel and the different shore provinces, as well.

The government department for cultural heritage and a group of researchers from the department of underwater archaeology pay attention to the phenomenon of ship wrecks and the maritime period (Deeben 2008; Vos, 2012). In the policy plans of the Waddensea the shipwrecks and maritime layer are not always an important topic. The UNESCO world heritage directive only takes care of the natural criteria and how the natural conditions of the Waddensea can be preserved well (UNESCO, 2012a). The cultural aspects and the cultural history or the hidden maritime landscapes are not mentioned in the directives for the Waddensea. A UNESCO convention for protection of underwater archaeology was launched in 2001. However, the ideas of this convention over the conservation of the underwater archaeology are not converted for the Waddensea (UNESCO, 2013c). The
trilateral Lancewad project does deal with ships wrecks and the maritime period of the Waddensea (Common Wadden Sea Secretariat, 2010). The Lancewad project also aims to publish an atlas of the underwater archaeology and it wants to carry out maritime archaeology projects (Common Wadden Sea Secretariat, 2007). On the national level, the 3th memorandum of the Waddensea of 2007 (VROM, 2007) mentions also the shipwrecks and the problem of their degradation. While it is stated that research is needed, an extraordinary status for ship wrecks or the maritime cultural layer is not reached yet.

The example of ship wrecks as remainder of the maritime period of the Waddensea illustrates that there is some attention for the cultural history in the Waddensea. However, when UNESCO does not reach consensus or agree upon the fact that the underwater archaeology is as important as the natural values, the cultural history of the Waddensea will be neglected. The entrance of Denmark in the Waddensea UNESCO world heritage site can be the first step in the preservation of the cultural history in the Waddensea. When the mixed status is not reached this will have the most negative effects on the underwater archaeology in the Waddensea.

**Policy outline**

Since the 20th century the area of the Waddensea is interesting for policy and management strategies (Oosterveld, 2011). The first policy plan was the nature clean up law from 1928. Gradually more plans were written for the Waddensea. However, most plans were actively pursued only after World War II. In the 60s and 70s many policy documents were launched concerning the Waddensea. Ever since then, the Waddensea has maintained a place on the political agenda. In the same period the Waddensea foundation was created, which aimed to preserve the natural values of the Waddensea against driving forces of urbanization and technology. All plans in this period consider only the nature aspects of the Waddensea, landscape or cultural remains are not mentioned in these plans. This period can be seen as a period with 'more ecological awareness', as shown in figure 3.

During the 80s and 90s policies were focusing on nature management and protection of nature. In the 80s the ‘Planologisch kernbesluit’ was launched, which considers "the protection, the preservation and where needed the restoration of the Waddensea as a nature area" (Kabat, 2012: 9) as very important. In the 90s many other plans evolved: namely the nature policy plan, the directive for special attention zones for birds, the second memorandum Waddensea and the new nature conservation act. All those plans are based upon nature values and how to restore the Waddensea as a nature protection area. This period can be assumed as 'the management and protection of nature' period. In the same century a ‘trilateral interest’ period can be recognized. The first steps for trilateral collaboration between the Netherlands, Germany and Denmark were made in the 70s, during the first international scientific Waddensea symposium (Oosterveld, 2011). Since 1982 there is a joint declaration on the protection of the Waddensea. In 1987 a common Wadden sea secretariat followed, which coordinates research in the Waddensea. In 1997 the first trilateral Waddensea plan was written, which has been updated in 2010. In this trilateral Waddensea plan the first steps were constructed in recognizing the landscapes of the Waddensea. The ‘international interest’ starts in the 90s, when the VN appoints the Waddensea as a vulnerable area and the UNESCO world heritage commission identified it as world heritage site in 2009.

Nowadays the policy of the Waddensea is gradually shifting towards a more ‘socio-ecological agenda’. In 2004 the socio-economic development plan is launched, in 2006 the integrated coastal zone management and in 2007 the 3th memorandum Waddensea (VROM, 2007). In 2009 plans are launched for realizing a combined economic and ecological approach in the Waddensea. Many important directives and rules concerning nature are also implemented; the bird and habitat directive, the nature 2000 directive and a law for closing vulnerable areas in the Waddensea. The LANCEWAD is organized since 2001, which raises more attention for landscapes and cultures of the Waddensea (Common Wadden Sea Secretariat, 2007). In 2007 the third memorandum on the Waddensea was launched from the Dutch parliament, which also pays attention to the cultural identity of the Waddensea. There is thus more acknowledgement for landscape and also economic activities. However, the main perspective is still nature. Kabat argued thereby that the area has overcome: 'A gradual mind shift commenced in the public perception of the Waddensea from an intertidal wasteland from agricultural perspective and an often threatening stormy sea towards a natural wetland of global importance and towards a sea threatened by pollution and
other human impacts” (Kabat, 2012: 8). This quote characterizes the shift towards a nature perspective in the 60s and 70s in not only politics but also in the perception of the Waddensea. Although there are slight changes towards integrating landscapes and cultural history of the Waddensea, there is still more continuity of the nature perspective than change.

Societal changes
Each policy episode is driven by certain actors or movements in society. The ecological awareness period is driven by a movement against the state of mind that everything can be created. During the 60s and 70s everything could be made or transformed into something better. Plans to reclaim the land of the Waddensea are a good example of this state of mind (Hooijmeijer & Steenhuis, 2009). As reaction to the reclamation plans for the Waddensea the Waddensea foundation was created. This foundation aims to stop these plans and focus on nature values (Kabat, 2012). This period can be named as the first movement towards a nature perspective. In the 80s and 90s the attention for preservation of nature is high, biodiversity is an important issue. Human influences on flora and fauna in the Waddensea are seen as distasteful and preservation of all natural values was the solution for this problem (Kabat, 2012). In the same period also more attention for the Waddensea as nature area emerges from the trilateral and also international organizations. A growing realization started that the Waddensea has enormous environmental values, and they see the collaboration as essential to maintain this large wetland. The current period of socio-economic awareness of the Waddensea fits in the societal change in which ecological values and economic values need to be combined, otherwise it is hard to conserve these kind of areas (Kabat, 2012). The submission of Denmark for participation in the Waddensea world heritage site fits in this movement, because Denmark wants the Waddensea to become a mixed site. However, until this submission is finished the Waddensea is still a nature area for the UNESCO, as well as in the perception of people (Kabat, 2012). The influences of people in the nature area of the Waddensea are thereby seen as undesirable. The role of UNESCO is important to change the perceptions of the Waddensea. It is quite evident that nature and culture are dependent of one another in the Waddensea. However, when UNESCO does not apply the status of mixed site for the Waddensea, the cultural history will be neglected and will also disappear within a few centuries. It is the task of the UNESCO to inform the public and government authorities about the diversity of the Waddensea. The diversity is not only the natural aspects in the Waddensea, but also the cultural historic remains which show evidence of the relationship between man and nature. This relationship is important to consider in the Waddensea.

Conclusion
In most nature areas the cultural history is neglected. For the Waddensea this is also the case. The Waddensea is well known because of its UNESCO world heritage status based on natural criteria. Conversely, humans influences the natural conditions, and some nature would not exist without human intervention. This paper posed to answer the question if the policy of the Dutch Waddensea shifted to a natural or cultural perspective from 1950 onwards. The nature and culture debate is thereby explored and also the policy line for the Waddensea is analysed. The scientific debate about nature and culture is shifting towards more integration between culture and nature. However, the society vision is that nature and culture are separated entities and that nature most of the time dominates culture. ‘Co-evolution’ can be the solution for integration of the concepts nature and culture. This concept takes into account that man and nature have existed coincidently.

Cultural history is important for the Waddensea, because it proves the interaction between human and nature. One important period for the Waddensea is discussed here. This is the maritime period from 1500 till 1800. The ship wrecks are the remains of this time period.
It is evident that in the research field enough attention is paid to this maritime layer with ship wrecks. However, the UNESCO world heritage directive does not include a single sentence about this aspect of the cultural history yet. From the culture and nature debate and the case-study of the ship wrecks can be concluded that nature is still the dominating perspective. Slightly more attention is given to cultural aspects of the Waddensea, but this attention is still small.

Considering the policy perspective a transition is visible from an intertidal wasteland before the 50s towards a nature perspective since the 60s. High biodiversity and nature preservation is at the moment most important. The international attention for this area is also centred around natural values. Concluding can be said that the area has become a natural wetland of importance, where human intervention is seen as undesirable and also that the cultural history is neglected in the different policies. A little shift is however visible towards a more socio-economic agenda and towards combining nature and culture. The proposal of Denmark for the Waddensea to become a mixed site is important. When this proposal is been adopted more attention is preferable for the cultural identity and cultural historic remains of the Waddensea. It is quite evident that nature and culture are equal and cultural historic remains needs to get more attention as well. More research needs to be done on what is left of the cultural layer of the Waddensea. However, the connection with nature needs to be taken into account. The Waddensea is not a natural or cultural entity per se, but it is a combination which makes it such an attractive area. By neglecting nature or culture in the Waddensea the story and identity is not complete. A balance between nature interests and culture interests is therefore needed. UNESCO has an important role hereby and they need to pay more attention for the cultural identity of the Waddensea.

Notes
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References


A sublime force to be reckoned with
The maritime landscape in the works of Bas Jan Ader and Guido van der Werve

Agnes Winter

Introduction

For centuries waterways have played a pivotal role in Western society. Canals, rivers and seas were used to explore new worlds, establish trading routes or simply to get from one place to another. Until the nineteenth century boats and ferries remained important means of transport, especially when travelling to other cities or towns. The maritime landscape was simply a part of everyday life.

It is safe to say that the meaning of maritime landscapes, together with its functions, has changed over time. For centuries the seas and oceans were looked upon with awe, as they brought opportunities, but also death to so many of its sailors. Paintings represented the sea as a fierce and powerful entity, ready to overwhelm a human being in an instant. The paintings of Caspar David Friedrich (1774 – 1840) are a clear example of this, the rough sea and the futility of man being some of his favorite subjects. (fig.1) Friedrich is regarded as one of the most important representatives of Romanticism, a cultural movement that arose at the end of the 18th century and lasted until approximately 1850. Romantics preferred nature and strong, even primal, emotions over the industrialization and rationalization of nature that had become dominant during the Enlightenment (1650-1780). In this sense, the Romantics no longer regarded the maritime landscape as a world of opportunities, that was to be conquered using technology, but rather as a beautiful, yet violent force to be reckoned with. This shows that many different (symbolic) meanings were given to the maritime landscape in (visual) culture, according to the spirit of the times.

Since the twentieth century the everyday use of the maritime landscape has diminished greatly. The invention of the car and airplane has caused that we now travel mainly on land or by air. We are no longer in need of water to get around. The canals in Dutch cities, for example, are now more picturesque, than they are functional.

The question is what meaning is given to maritime landscape today, when it no longer serves the same everyday purpose that it used to. One could say that our worldview has changed from a maritime to a terrestrial or even aerial worldview. This change of worldview suggests that the maritime landscape now bears different meanings to us, than it did to our forefathers. This raises the question if modern and contemporary artistic expressions of maritime landscape still can be interpreted the same way as we interpret works that were made when a maritime worldview was still prominent, such as the paintings of Caspar David Friedrich.

To investigate these modern and contemporary meanings and interpretations of the maritime landscape, this paper will examine two artists in whose work the maritime aspect plays a pivotal role. The Dutch artist Bas Jan Ader famously died at sea in 1975, during a passage over the Atlantic Ocean that was part of his piece *In Search of the Miraculous*. Because of his disappearance Ader has often been identified as a tragic romantic, though this does not do justice to his critical conceptual oeuvre.

Guido van der Werve is a contemporary Dutch artist who is best known for his work *Nummer acht: Everything is going to be alright* (2007). (fig.5) In this film we see the artist walking slowly on the frozen Finnish gulf, while a great, daunting icebreaker breaks up the ice behind him. The film is part of his series *Numbered films*. This paper will concentrate on two works from this series in which the maritime landscape plays a role, *Nummer acht* and *Nummer vier: I don’t want to get involved in this, I don’t want to be part of this, talk me out of it*. (2005). (fig.4) In this last work we see a man playing piano on a raft in the middle of a lake, a choir and orchestra performing a requiem on a sailing ship and a man falling from the sky. This all is set in picturesque maritime landscapes. Van der Werve has also been called a romantic, even being compared with Bas Jan Ader and Caspar David

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Fig. 1 Caspar David Friedrich, *Monk by the Sea*, 1808-1810, oil on canvas, Alte Nationalgalerie Berlin. © Alte Nationalgalerie Berlin.
Friedrich. This, however, does not mean that Van der Werve or Ader necessarily interpret the maritime landscape the same way as Friedrich did. The two artists lived and worked in a very different time, with a different worldview.

In this paper three works are examined, *In Search of the Miraculous* by Bas Jan Ader and *Nummer acht* and *Nummer vier* by Guido van der Werve, in order to investigate how the maritime landscape can be interpreted by artists in our modern times, be it the 1970’s or the 2000’s.

**Bas Jan Ader, In Search of the Miraculous**

In April 1975 Bas Jan Ader (1942-1975) opened his show *In Search of the Miraculous* at the Claire Copley Gallery in Los Angeles. In this show he presented a photographic piece in which he recorded a night-time walk through Los Angeles, from dusk till dawn. On the photographs the artist wrote the lyrics of the 1957 song *Searchin’* from the Coasters. The photographs showed the romantic image of a solitary wanderer, combined with an old pop song about the search for love. During the opening traditional shanties – sailor songs – were sung by a choir. The guests had received an invitation on which a photograph was shown, taken on board of a sailing ship rocking on high waves. (fig.2) This first exhibition was a prelude to the second part of the conceptual art piece, Ader’s crossing of the Atlantic Ocean in a one-man yacht. On the 9th of July 1975 Ader set sail from Cape Cod, USA to cross the Atlantic to Amsterdam. However, after three weeks at sea, radio contact with Ader’s boat broke off and in April 1976 its wreck was found near the Irish coast. Ader himself was missing and his body was never recovered.

With the *In Search of the Miraculous* cycle, which was to be completed on Ader’s arrival in the Netherlands, Ader takes a key motif from the culture of Romanticism, that of the wandering tragic hero on a quest for the sublime, and puts it into practice. Ader uses the means of conceptual art, by which art is reduced to the execution of a specific idea, to research this romantic motif (Verwoert, 2006: 3). This physical execution of one simple idea can be found throughout Ader’s small, but compelling oeuvre. In his film *Fall I* (1970) the artist lets himself fall from his roof, landing in the bushes below, while *Fall II* (1970) shows the artist riding his bike into the canal in Amsterdam. Another famous work of Ader, *I’m too sad to tell you* (1970), documents the artist crying, without explaining why he cries. These works seem to investigate what happens when one reaches the limits of the rational and lets nature or emotion run its course. In this sense, his works can also be interpreted as existential dwellings, about the human inner conflict between rational and irrational.

Aders interest in nature and the sea becomes apparent in the works that he made in Sweden in 1971. Two slides, *Untitled (Swedish Fall)*, show the sun shining through the high, slender pine trees of a Swedish forest, while a small figure between the trees can be identified as the artist. The scene reminds us of the famous Romantic paintings of Caspar David Friedrich. The unpublished film *Untitled (The elements)* (1971) shows the artist standing on a rock in the sea, the water violently splashing up around him. While he struggles to remain standing, he alternately holds up signs saying ‘Earth’, ‘Water’, ‘Air’ and ‘Fire’. In this work we see the conceptual with the romantic combined, the rational thinking human being almost being overwhelmed by the forces of nature. (Den Hartog Jager, 2011: 145) It is not surprising that Ader is often described as a ‘conceptual romantic’.

In *In Search of the Miraculous* Ader boils the idea of the wandering romantic down to one premise: a man, silent and alone, decides to cross the Atlantic. With his announcement to cross the ocean and the choir performance of shanties it also becomes clear that he wanted to research a specific romantic genre: the sailor as romantic hero (Verwoert, 2006: 5). By putting the idea into practice, he investigates if this romantic concept still has truth and meaning today.

In his photographs of his nighttime walk through LA the artist stages himself as a lone wanderer, drawing upon Caspar David Friedrich’s paintings of lonely wanderers facing sublime landscapes. (fig.3) He combines this with lyrics from a romantic pop song about travelling the world to find love, by which he links the historic idiom of romanticism to the modern language of pop culture. On the one hand he seems to ridicule romanticism, by comparing it to a banal pop song. On the other hand, by combining the romantic quest with a modern interpretation, which says that one must travel to find love, it is also given new meaning and relevance (Verwoert, 2006: 4).
By carrying out his romantic quest, Ader approaches the maritime landscape, the ocean, like the Romantics did, as a sublime landscape. The sublime can be described as a combination of the beautiful and the dangerous or grotesque. The ocean can be a beautiful and serene place, offering a world of possibilities to explorers and adventurers like Ader. It is the unknown that is one of the pulling forces for the men who ventured on these never-ending seas. Having regulated and civilized almost all our surroundings, the ocean remains one of the few 'uncivilized' and unpredictable places to go. By sailing off into the ocean, Ader seemingly transcended the limits of society and encountered pure nature. In a way, this work can be regarded as a culmination of his earlier works, in which the artist pushes the boundaries between the secure and the uncontrollable. That pure and sublime nature is indeed uncontrollable and even dangerous is proven by his tragic disappearance.

Guido van der Werve

Guido van der Werve (1977) can easily be described as one of the most successful and promising young artists from the Netherlands. Already during his studies at the art academy he received international recognition. Especially his film Nummer Acht: Everything is going to be alright (2007), which he produced while studying at the Rijksacademie in Amsterdam, received raving reviews and was acquired by the Museum of Modern Art (MoMA) in New York (fig.3).

Since 2003 Van der Werve has made a series of works, mostly films, which he numbered as if they were classical compositions. All films feature the artist himself, as we follow the leading character on his ventures. In Nummer Twee: Just because I’m standing here, doesn’t mean I want to. (2003) we see the artist walking backwards in a Dutch suburban street, when he is suddenly hit by a car. While his body lies lifeless on the street a police van pulls up. Five ballerinas come out of the van and start to dance to classical baroque music, a dramatic, sad and slightly absurd tribute to the man lying dead in the street. Other films, like Nummer Acht, show the artist physically interacting with the landscape. For Nummer Negen: The day I didn’t turn with the world (2007) the artist stood on the axis of the Earth on the North Pole, turning counter clockwise to the Earth’s rotation.

What all of Van der Werve’s films have in common is a certain existential contemplation. Themes like life and death and how to live one’s life are, to a certain extent, embedded in his films. This, together with his love for epic landscapes in contrast to the futility of man, makes that he is often compared to romanticists like Caspar David Friedrich and Bas Jan Ader (Herbert, 2009: 219). The romantic melancholia in his works is however often counterbalanced by irony and an absurd sense of humor.

Music is an important part of his films, as music has always been his passion. Van der Werve is also a classically trained pianist, and in his films we see him playing piano or even composing the music for his films. Next to these literal references to music, Van der Werve also wants his films to work the same way as music does. Van der Werve does not aim to create understandable, theoretical art, but rather artworks that convey a certain mood or emotion, like poetry or music does (Heingartner, 2007: 46). In this sense Van der Werve’s work is very personal, as it originates from his own moods and feelings.

Nummer vier: I don’t want to get involved in this. I don’t want to be part of this. Talk me out of it

The film Nummer vier: I don’t want to get involved in this. I don’t want to be part of this. Talk me out of it. (2005) opens with the words: “I woke up early and watched the sun rise; I felt it came up just for me.”. Next we see the black-clad artist standing on a beach facing the sea. A plane flies overhead with a banner reading: “It was not enough!” In the next scene the artist is sitting at a piano on a platform in the middle of a misty lake, playing Chopin’s Nocturne no.1 in B-flat Minor. We then see a typical Dutch river with a barge sailing down the river, on which a complete orchestra and choir are performing the Lacrimosa from Mozart’s Requiem. The barge sails past and finally a black-clad man, the artist, falls from the sky, only to disappear in the water with a big splash. (fig.4) Nummer Vier is a film incomprehensible in terms of narrative. At first sight the scenes and events seem unrelated.
and slightly absurd. Instead, rather than seeing the film as a narrative, one should regard the film as a poem (Herbert, 2009: 220). Just like a poem, the meaning of the work is not clear-cut. By using text, images and music the artist creates a certain atmosphere to which different meanings can be ascribed. We see the artist from behind, looking out over a picturesque landscape, a theme that seems to reference to the lonesome figures seen in Caspar David Friedrichs paintings. Overlooking these sublime landscapes, the artist seems to be contemplating his life and his inevitable death (Martinez, 2009). The theme of life and death is suggested by texts like “I woke up early and watched the sun rise; I felt it came up just for me.” and “It was not enough!”. Also, the music that the orchestra is playing, Mozart’s Requiem, was commissioned by Franz von Walsegg in commemoration of his wife’s death. The final act, the artist falling from the sky into the water, can even be interpreted as metaphor for death; it is inevitable and irreversible, and over before you know it.

Van der Werve’s use of the maritime landscape in this work, suggests that the artist approaches the landscape in a similar way as the Romantics did. First and foremost, the maritime landscape seems to be a beautiful framework for existential contemplation. Drawing upon the solitary figures in Friedrich’s paintings, the man facing the greatness of nature is confronted with his own futility and subsequently his own death. In the final scene this futility is acted out by the artist dropping for the sky, helpless, and disappearing into the water. In this sense the water also stands for death, as an infinite unknown dark mass.

Nummer acht: Everything is going to be alright

Opposed to Nummer vier the film Nummer acht: Everything is going to be alright (2007) can be described with one single image: the artist walking on the frozen sea while being pursued by an icebreaker, forcibly breaking up the ice the artist has just walked on. (fig.5) The man seems unalarmed by the enormous ship behind him and the violent noise of ice cracking. With the air of a nineteenth century ‘flâneur’ he walks slowly towards the camera, never looking behind him. Van der Werve managed to create a powerful and iconic image, which fascinates almost everyone who beholds it. As spectators we fear for the artist’s safety, who as a true romantic hero ventures where we dare not.

The vast ice landscape and the enormous icebreaker emphasize the futility of the tiny man walking in front of it. The man could be swallowed and killed by the water at any moment. In the work man is confronted with nature and its relentless power. It seems that, even though man has been attempting to control and overcome nature ever since the Enlightenment, nature is still a force to be reckoned with. Yet, to look at it from another perspective, it is also technology (or man) that seems to conquer nature. The icebreaker is after all a human invention, enabling us to create waterways where it once seemed impossible. In this regard it is not nature that is the threatening force,
but it is man itself and its use of technology. It seems that man is being chased by its own inventions.

The maritime landscape in this work can be given different meanings. On the one hand the artist seems to stand in awe of the grand frozen sea. By displaying himself as a tiny figure, he emphasizes the vastness. In addition, the loud, growling sounds of the ice breaking attributes to the image of the sea as a threatening entity, ready to swallow the artist whole. On the other hand it seems to be the sea itself that is threatened, namely by the huge icebreaker, that easily breaks through the vast ice surface. Consequently, while being a great entity itself, the maritime landscape is being controlled and suppressed by man. However, the big, uncontrollable craft turns not only against nature but also against a human being, chasing the artist indefinitely. It seems that our conviction to overcome nature with technology in the end has turned against us.

Conclusion
Both Bas Jan Ader and Guido van der Werve seem to approach the maritime landscape as romanticists, though each in their own contemporary way. In their works both artists physically engage with the maritime landscape, out of an existential exploration of what it is to be human. *In Search of the Miraculous* by Ader is based on a conceptual and critical research of the Romantic concept of the lone sailor in search of the sublime. In this he approaches the ocean as a sublime landscape, beautiful yet dangerous. This is also the way the sea is represented in Van der Werve’s *Nummer acht*. Being threatened by the frozen sea breaking up behind him, Van der Werve emphasizes the futility of man in face of nature. This futility tragically became apparent in Aders disappearance. In *Nummer vier* Van der Werve presents the maritime landscape not so much as a dangerous entity, but more he seems to underline the beauty of nature, and how this beauty can incite existential contemplation.

It seems that the maritime landscape, though no longer a part of our everyday lives, can still be given different symbolic meanings, that are not so different from those given centuries ago. The maritime landscape, being beautiful, yet dangerous, still seems to invoke certain feelings in human beings that these artists translated into their works. Perhaps this is why the maritime landscape remains so appealing for these artists. In a world where we, being rational beings, control most of our environment and little is left to chance, we are in need of beautiful things that invoke emotions that cannot be rationally explained. In this sense Bas Jan Ader and Guido van der Werve are not so different than their Romantic forefathers, fighting the stern rationalism of the Enlightenment.

Notes
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   University of Groningen, The Netherlands
References
R. Wolfs (red.), 2006. Bas Jan Ader; Please Don’t Leave Me. Rotterdam, Museum Boijmans van Beuningen.
Introduction and problem statement

It is becoming increasingly difficult to ignore the urgency of sustainability in contemporary society. Since the Club of Rome, which stated the limits of growth in their 1972 book also called ‘Limits to Growth’, sustainability has become a common issue in discussions. Sustainability represents the concept of maintaining the natural capital of the earth in order to continue life on earth (Wackernagel, 1999: 1). During the last decades environmental organizations have started to enforce sustainability on political agendas. Despite the fact that this has a serious effect on policies and public opinion, the earth’s resources are still exhausted by the demands of mankind. Many others beside me think we should continue to improve society towards a sustainable future, and live within the carrying capacity of nature, because: “human life and all human activities depend on nature” (Wackernagel, 1999: 1).

Self-sufficiency is often mentioned as a possible contribution to a more sustainable world. Self-sufficiency can be defined in different ways. Dictionary.com defines it as “[being] able to supply one’s own or its own needs without external assistance” (Dictionary.reference.com, 2013). Self-sufficiency is sustainable because it limits external influences, which leads to a minimizing of transport. In this way a lot of energy is saved and the ecological footprint of the self-sufficient village has become smaller. The project ‘Duurzame Wadden’ [English: ‘Sustainable Wadden’] is a local sustainability project in the Dutch Waddensea area (see figure 1), the location of the case study discussed in this paper. Within the project self-sufficiency is defined for energy. This definition consists of three aspects: (1) the energy must be generated within the area, (2) the energy account has to be neutral in the end of the year, without taking peaks into account and (3) different types of energy (like gas, electricity and fuel) are interchangeable (Duurzame Wadden, 2008). While a variety of definitions of the term self-sufficiency have been suggested, this paper will use the following definition: if the production of an area equals the use of food, water and energy, within the area. It goes beyond the scope of this paper to do exact calculations on how many arable lands, water and energy is necessary to be self-sufficient, but it is possible to give some recommendations based on estimations.

In order to explore the possibilities of self-sufficiency, it should be studied in different environments (urban and rural) and on different scales. This paper covers a case study on the local scale: the island of Schiermonnikoog in the Dutch Waddensea area (see Fig. 1). This case study is chosen for multiple reasons. Firstly Schiermonnikoog is an island with a maritime landscape, which means that it is an isolated unity with clear borders. This makes it easier to control the import and export on the island, because everything will cross the sea at some point. In that way the external factors that threaten the self-sufficiency of the island can easily be identified. Secondly Schiermonnikoog is a typical Wadden-island (Het tij geleerd, 2008: 66), which makes it possible to transfer the results and recommendations to other Wadden-islands. This is relevant since the Wadden-islands have expressed to have similar ambitions in becoming more sustainable. One of the project groups is C2CI (Cradle-to-cradle islands), which also aims for self-sufficiency on the Wadden-islands. This urge for self-sufficiency matches well with the historical background of Schiermonnikoog because its habitation originates in a monastery. A monastery often lived without external assistance, often aiming to live from own labour and produce (Bond, 2004: 29).

Because Schiermonnikoog seems to originate in a self-sufficient monastery, this paper describes a comparative study between self-sufficiency in historical (since 13th century) and current times.
century) and contemporary Schiermonnikoog. This comparison could lead to insights on what is necessary to be self-sufficient, what is the cause that Schiermonnikoog is not self-sufficient now and what are the possibilities of self-sufficiency on future Schiermonnikoog. This paper aims to answer the question: can Schiermonnikoog be a self-sufficient island in the future as it seemed to be at its residential emergence? Comparing the contemporary landscape of Schiermonnikoog to the historical - more self-sufficient - landscape, gives insight in how Schiermonnikoog can be self-sufficient again.

**Research method: a historical and contemporary layer approach**

To understand and analyse the complex processes in a landscape the layer approach is used in this paper (VROM, 2004: 30). In the layer approach, three layers are used: the ground layer, the occupancy layer and the network layer. The ground layer of the landscape includes the subsurface processes like geology, geomorphology and water. Earth’s resources can be found in this ground layer. These elements form the foundation of the landscape. On top of the ground layer the cultural layer can be seen in the occupancy layer.

The occupancy layer is the spatial result of the use of landscape: everything visible in the landscape, the masses (buildings), the spaces (open fields), the cultural influences and land use. The occupancy layer can be seen as a result of the network flows in using the resources of the ground layer.

The network layer has two sides (VROM, 2004: 30). On the one hand it is the physical network of transportation like the infrastructural network or the cable network for electricity. On the other hand the network layer includes the flows of products, humans and animals. This includes the flows of food, water and energy. The network layer shows how the landscape works and how the physical ground layer relates to the occupancy layer or you could say: the network layer transforms the physical ground layer into the cultural occupancy layer.

The flows in the network layer are important for this research, because these flows represent the transport of food, water and energy and clearly show the external contributions to Schiermonnikoog. One of the objectives of a transition to a self-sufficient island is, as fore mentioned, reducing transport and living to nature’s capacities on the island.

This paper first discusses the ground layer and how the contemporary ground layer is a result of the history. After that, the same analysis is used for the occupancy layer and the network layer. When all three the layers are discussed some recommendations can be done on how self-sufficiency can be accomplished on the contemporary island of Schiermonnikoog, based on examples from earlier self-sufficient periods. This methodology has been made visible in Fig. 2.

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**Fig. 2 The layer approach applied in the comparison of the historical and contemporary Schiermonnikoog results in recommendations (Edited by author)**

<table>
<thead>
<tr>
<th>Ground layer</th>
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<tbody>
<tr>
<td>Physical landscape</td>
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<td>Natural resources</td>
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<table>
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<th>Occupancy layer</th>
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<td>Cultural landscape</td>
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<td>The needs of culture</td>
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<th>Network layer</th>
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<tbody>
<tr>
<td>(infrastructure)</td>
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<tr>
<td>flows of food, water and energy</td>
</tr>
</tbody>
</table>

**Recommendations**

Improving self-sufficiency on Schiermonnikoog based on historical principles
The layer approach draws a very complete image of the island landscape, but it does not include the mindscape and the way in which people experience the island. Aside from that, the limited insight in technological development and other time-bound characteristics are not taken into account when using the layer approach because it focuses only on the spatial elements. But, if aware of the limits of the layer approach, analysing the landscape of Schiermonnikoog with this approach perfectly points out how the transport flows relate to the islands resources and its occupancy. This outcome will be used to show the possibilities to minimize transport to and from the island.

**The physical opportunities of Schiermonnikoog**

The northern coastal area of the Netherlands is mainly influenced by the North Sea tide. Often the North Sea broke through the row of small dunes and flooded the Waddensea area. When the Waddensea was flooded, this row of dunes became a row of (Wadden-) islands. This dynamic process of flooding keeps silting sand in the Waddensea area and in that way heightens the sand banks, this process also affects the islands. This natural process of heightening the islands made the Waddensea area protect itself against the rising of the sea level (Het tij geleerd, 2008: 14).

The wind has also influenced the Waddensea area, because it formed dunes which gave opportunities for pioneering flora and fauna. These small dunes caused a lee on the east side behind the dunes, in which marshland was created. These marshlands included minor peat formation because of sweet seepage waters. The elements (beaches, dunes and marshlands) of a so called model Wadden-island can be seen in Fig. 3.

Despite the dynamic influences on Schiermonnikoog, the physical structure of contemporary Schiermonnikoog is comparable to the historical version of the island. This is because the dynamic islands are co-developing along the sea level rise, as mentioned above. The dynamics of the island provide opportunities for pioneer species to exist (Het tij geleerd, 2008: 38). Because of this rather unique characteristic Schiermonnikoog is a National Park and the Waddensea area is part of Natura 2000, a European ecological development program which protects the fore mentioned pioneer species. This protection limits the opportunities for new development on the island, since the unique species may not be disturbed.

When comparing the historical island with contemporary Schiermonnikoog physically, it can be said that the Waddensea area is still mainly influenced by tidal processes: during high tide it is a sea and during low tide a collection of sand banks (connected to the mainland)
appears. Because of human influences (diking and cultivating the island) Schiermonnikoog does not co-develop naturally with the sea level rise any more. The sea level rising has become a threat for the island nowadays. Additionally as a result of human excavation the forementioned peat lands cannot be found on the current island any more. The marshlands are still flooded from time to time and as a result the marshlands silt up (Het tij geleerd, 2008: 32). Aside from that the island still moves as a result of the sea stream.

It can be concluded that the physical opportunities of Schiermonnikoog have not changed that much over time, many of the island elements (see Fig. 3) are still present. However, human action has exhausted the peat and stopped the co-development along the sea level rise.

**Cultural influences on Schiermonnikoog**

One of the reasons for this case study on Schiermonnikoog is the origin of its occupancy in a monastery, or actually a grange (daughter-monastery) of the Cistercian monastery in Claercamp, Northern Fryslân. The motto of the Cistercian order is to live from own labour, which was a reaction to poverty against the rich Benedictine orders (Van der Stoep, 2011: 17). Cistercian monks are known for their reclamation of marginal lands, which was necessary because the Cistercian order emerged in the 12th century, several centuries after the Benedictine and Augustinian orders. These older orders owned large areas of already cultivated land (Bond, 2004: 34). The Cistercians reclaimed new lands, like the marshlands on the borders of the Dutch mainland, but also in the lee area behind the dunes, and thus on Schiermonnikoog.

In the 13th century the Cistercian monks brought their sheep to the island of Schiermonnikoog (Het tij geleerd, 2008: 20). Monks organized a grange and carried out religious tasks on the island, while the lay-brothers did most of the cultivating labour. Cultivation also included excavation of peat for fuel purposes. The monastery did not own all of the island’s land (Van der Stoep, 2011: 23 note 15), but was accompanied by local fishermen. Fishery stayed the main source of income. At that point urbanization started on the mainland, and as a result of this urbanization monasteries received fewer gifts and fewer labourers, forcing them to rent the monastic lands to private farmers. As more private farmers cultivated the island, the monastery gained less income.

As a result of the Reformation during the 16th century (around 1580) in northern Netherlands the monastic lands came into possession of the Frisian government (Mellema, 1964: 51). In 1639 the lands of the island were sold to Johan Stachouwer, member of a wealthy family. The local farmers kept leasing the arable lands and the mill. Meanwhile the dynamic island slowly moved eastward by means of the sea. As a result of this the sea threatened to wash away some of the houses. Fortunately, local inhabitants realized this in time. The village Westerburen was slowly rebuilt more eastward to its current location, where it was renamed ‘Oosterburen’. In 1760 the church was rebuilt as well and became the centre of the new village (Mellema, 1964: 60).

In 1859 Johan Eric Banck purchased Schiermonnikoog. At that moment the arable conditions of Schiermonnikoog were not very good so he decided to dike the marshlands, resulting in an increase of the arable area of the island. During those days most island inhabitants lived from fishery, but these changes gave the opportunity to some farmers (and fishermen) to cultivate the island again. At this time most farmers only cultivated potatoes in the dunes and sometimes they gained some additional income from their goat or sheep (Mellema, 1964: 78). The new dikes also provided the village with protection against floods. Since 1850 a daily boat provided the contact with the mainland, which increased the number of tourists on the island. Johan Eric Banck provided a boost in the appeal of the island by building the ‘Badhotel’ (Bathing-hotel), which was ruined by the sea in 1923, see Fig. 5 (Mellema, 1964: 19). Nowadays the tourists are by far the most important source of income for the island (Rijksdienst voor Monumentenzorg, 2004: 4). The inhabitants of the island largely depend on the tourism sector for their income. Four times a day he ferry brings tourists to Schiermonnikoog from the mainland.

Comparing the occupancy layer of the contemporary island with its historical counterpart we can conclude...
that much has changed in this layer on Schiermonnikoog over time. Firstly the Cistercian monks laboured for their own survival. These lay-brothers cultivated the island and exhausted the peat. Secondly the farmers increased in number along the ever important fishermen on the island. And, after a decline of the agricultural sector on the island, the inhabitants slowly turned to the tourism sector, stimulated by Johan Eric Banck. Nowadays, tourism is the most important source of income on the island. All these changes have formed the occupancy layer of the current island. As a result of these changes in the occupancy layer it is interesting to analyse how the network of food, water and energy flows reacted on this.

**The network layer: import, export and self-sufficiency**

The network layer displays the flows of food, water and energy on the island and thereby the actual degree of self-sufficiency of the island nowadays and in the past. These developments can be seen in Fig. 6, in which flows of food (red), water (blue) and energy (yellow) are illustrated in arrows. In the 13th century, the Cistercian grange on Schiermonnikoog was meant to be self-sufficient. The monks and lay-brothers lived from their own labour. They had a relation with the monastery in Claercamp and it is even suggested the Schiermonnikoog grange had to pay a form of tax to this monastery, which indicates a surplus production (Van der Stoep, 2011: 19). In the 14th and 15th century the monastery on Schiermonnikoog grew and the increasing number of lay-brothers on the island led to overproduction of food. This overproduction is very likely because the lay-brothers traded in grain, wool, wood, peat, salt, butter, cheese, bricks and later in meat as well (Van der Stoep, 2011: 15).

Most of the farmers grew independent in the 16th and 17th century, and farming became the most important income on the island, additional to the export of fish.
Over time the number of inhabitants increased (Table 1) and more and more food was necessary on the island. Since the 19th century the numbers of both permanent residents and tourists has increased. As a result of specialization in the agricultural sector most food is now imported on Schiermonnikoog and sold in the local supermarket. In present day Schiermonnikoog the agricultural sector is specialized in grain and grass. This is produced to feed the 650 dairy cows on the island (Tourist info centre Schiermonnikoog, 2013), from which the dairy is shipped to the mainland.

The early farmers (lay-brothers) who settled on Schiermonnikoog in the 13th century cultivated the land with the available water from small streams from the dunes. Until 1950 the island’s inhabitants provided their own water by using rain barrels. Since 1950 the water is pumped from the sweet water body under the dunes and transported over the island in a complex system of pipelines (Tourist info centre Schiermonnikoog, 2013). Because of the enormous increase of tourists coming to Schiermonnikoog since the 50’s, much water has been used, causing the dunes to dry out. With the help of a campaign in reducing water use the effects of drying on the island were limited and restrained. Schiermonnikoog has always been self-sufficient in water production and use. Water Company Vitens extracts less water than is allowed, but is still searching for sustainable methods in water production (Waterplan Schiermonnikoog, 2011, 19).

When the monks came to Schiermonnikoog in the 13th century, there was peat to use as a source of energy. All the peat land was reclaimed for agricultural purposes and fuel. Besides peat, also wood, mostly imported, was used as fuel in the early days of the islands inhabitation. Peat and wood remained the most important energy sources with an addition of some coal import. Since the 16th century wind energy was used on the island as well, but only on a small scale in the grain mill of the local bakery. The mill was used until 1872 (molendatabase.org, 2013) when it was demolished after a fire. Since the 15th century nearly all fuels and energy sources had to be imported to the island.

Schiermonnikoog receives its energy nowadays in the form of electricity and gas transported by Nuon cables from the mainland. There is no organized energy production on the island at all, although the local and regional government are considering solar energy (Deen, 2013). Schiermonnikoog does have the agreement with other Wadden-islands aiming to be self-sufficient in water and energy in 2020, so development can be expected in the coming years (Duurzame Wadden, 2008).

All in all, the network layer shows that the island was self-sufficient in food at the emergence of the grange in the 13th century. The increase of tourism made it necessary for the island to import food, which is still done today. Only dairy and fish products are exported from the island. Schiermonnikoog has always been sufficient in water and will probably stay self-sufficient in water, if the number of tourists does not increase dramatically. The traditional energy the island had in the form of peat was exhausted, after which all fuel and energy has been imported. In the near future this will probably change because Schiermonnikoog does want to be self-sufficient in energy in 2020.

**Future prospects and recommendations**

The aim of the comparison between historical layers and contemporary layers was to see how the self-sufficiency of Schiermonnikoog has changed over time. Another goal was to see what elements from these former times can be used in contemporary society to increase self-sufficiency. The comparison was executed by investigating three layers: physical ground layer, cultural occupancy layer and the network layer. These layers show the possibilities for Schiermonnikoog to become self-sufficient in food, water and energy.

Physically it is possible for Schiermonnikoog to be self-sufficient in food. Since the specialization in agriculture many areas have produced only one specific product. As a result much food is imported to these areas, making it less self-sufficient. This could also be stated for Schiermonnikoog. People should aim to be self-sufficient through own labour like in earlier days. Nowadays the concept of permaculture can be the new, self-sufficiency paradigm. Permaculture is described as a sustainable method of permanent agriculture based on a life-giving cycle (Hemenway, 2009, 5). In this paper it is assumed that permaculture is the most efficient (smallest land area used) way to produce a multitude of different

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of residents</th>
<th>Source</th>
</tr>
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<tbody>
<tr>
<td>1737</td>
<td>1251</td>
<td>Rijksdienst voor Monumentenzorg (2004)</td>
</tr>
<tr>
<td>Early 19th century</td>
<td>600-750</td>
<td>Estimation based on hisgis.nl</td>
</tr>
<tr>
<td>1911</td>
<td>620</td>
<td>Schiermonnikoog.nl (2013)</td>
</tr>
<tr>
<td>1952</td>
<td>800</td>
<td>Schiermonnikoog.nl (2013)</td>
</tr>
<tr>
<td>1995</td>
<td>1000</td>
<td>Schiermonnikoog.nl (2013)</td>
</tr>
<tr>
<td>2012</td>
<td>967</td>
<td>Schiermonnikoog.nl (2013)</td>
</tr>
</tbody>
</table>
types of food in a sustainable manner. It is estimated that 2000 m$^2$ (a quarter acre) is necessary per person to survive a year when following the permaculture movement (French, 1998, 1). How to optimize permaculture on Schiermonnikoog goes beyond the scope of this paper and should be discussed in future research. But we can do some calculations to estimate whether it is possible to grow sufficient food on the island of Schiermonnikoog, for the number of 1000 inhabitants.

Using the fore mentioned estimation, 2 km$^2$ of arable land is needed to feed 1000 inhabitants of Schiermonnikoog, which should be possible because at the moment there is 3 km$^2$ arable land on the island (CBS, 2010). In this calculation the tourists on the island are not taken into account, but they would need an additional 1,4 km$^2$ arable land. The recommendation to live from own produce again is based on the historical examples on Schiermonnikoog discussed in this paper.

Schiermonnikoog has always been self-sufficient on water production. From the 160,000m$^3$ of water (Schiermonnikoog.nl, 2013) which is extracted every year, only 43,800 m$^3$ is used for human purposes, the rest is used for agricultural purposes for example. The agricultural use of water is not taken into account. Since Vitens (Schiermonnikoogs water producer) is always looking for new (sustainable) ways to produce water (Waterplan Schiermonnikoog, 2011, 19), some recommendations will be given, based on the historical use of water on Schiermonnikoog.

It would be a good idea to use rain barrels again and develop a method for private water purification. In this way local rain water is used as a grey water system, for human purposes. Another formerly use of water was locating the arable lands along the streams from the dunes. This could reduce ground water extraction, but it is not certain that it is possible nowadays. While the quality of the water may have been sufficient several centuries ago, it is possible that, using the current guidelines and knowledge, the ground water, with its high degree of salt would not be accepted today. Aside from that it also causes drought in the dunes.

Aside from that some improvements can be made in the islands energy-system to become self-sufficient. The island has imported fuel and energy for long times which is why examples of energy production on historical ground can hardly be found. Therefore the physical possibilities of the islands landscape can be studied. And, since Schiermonnikoog is exposed to many dynamics like wind and sea there should be some possibilities. The inhabitants are not positive on wind mill parks and these will not be implemented easily. There are innovative methods in tidal energy, but these need more research, especially on the ecological effects in the Waddensea area because Schiermonnikoog is a National Park with ecological protection. Solar energy is another option, which is more realistic at the moment. Aside from these possibilities, tourists are a dynamic flow on the island. Tourists could contribute to energy production, so they can become a resource for the island. An example could be charging batteries on the bikes they rent, but this would need further research. These suggestions (visualized in Fig. 7) for producing energy with the available resources can be seen as recommendations to become less dependent on the mainland.

Conclusions
Sustainability is not only the vision of the Club of Rome; many others think of ways to maintain the natural capital of the earth as well. Despite that the shift towards sustainability already shows result, resources are still exhausted. In the ideology to live to the capacity of nature the idea of self-sufficiency is becoming an aim for local authorities more and more. This is not a new principle, in earlier more local oriented societies the production of
food, water and energy was produced almost completely in the area in which it was used.

In this paper a comparison has been made between a historical (more self-sufficient) and a contemporary society on a local scale. By this interdisciplinary approach many aspects of the landscape, sustainability and resources have been discussed. In the end self-sufficiency should also be researched on multiple scales: international, national, regional and local scale in urban and rural environment. The case study on the island of Schiermonnikoog is a good case study for the local scale. The fact that it is an island made the dependence of external assistance (the mainland) very good visible. And, since it is a model Wadden-island the results can be used on the neighbouring islands as well.

The case of Schiermonnikoog shows its resources in the physical layer which points out the opportunities of the island. The cultural layer shows that human influences on the islands nature made self-sufficiency possible in at the residential emergence of the island, but the increase of residents and tourist caused the difficulty the stay self-sufficient. Based on historical examples from the comparison it is recommended to do further research on permaculture so Schiermonnikoog can produce its own food again. Schiermonnikoog has always been self-sufficient on water, but on energy many improvements can and will be made in the nearby future.

This paper describes some recommendations based on examples from historical (self-sufficient) Schiermonnikoog. These recommendations give new insights in how self-sufficiency can be accomplished with the possibilities of the landscape and the islands cultural history. All in all it is possible for current day Schiermonnikoog to be living without external assistance and become self-sufficient again.

Notes
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Korenstraat 2, 9712 LX Groningen, The Netherlands.
2 1000 inhabitants need 2000 m² a year. 1000 x 2000m² = 2 km²
3 260,000 tourists counted for only one day (Schiermonnikoog.nl, 2013) will give 713 tourists a day, which is 72% of the local inhabitants. 2 km² (for the local inhabitants) x 72% = something like 1,4 km². This is a minimum estimation, most tourist stay longer than a day.
4 120,1 L of water is used per person every day (Vitens, 2010). So for 1000 persons this is 120.100 L a day. 120.100 L x 365 days = 43.800.000 L a year which is 43.800 m³.

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