

Counterpoint:
Essays in Archaeology and
Heritage Studies in Honour of
Professor Kristian Kristiansen

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THE ROUTE TO A HISTORY OF THE CULTURAL LANDSCAPE: A DANISH RECORD OF PREHISTORIC AND HISTORIC ROADS, TRACKS AND RELATED STRUCTURES

Jette Bang

Abstract: Traces left by thousands of years of traffic through the Danish landscape provide both inspiration and ample opportunity for archaeological and geographical studies. Compared with many other ancient structures, considerable experience is required to identify and interpret traces of roads in the form of abandoned tracks. As a consequence, their recording and preservation present many challenges.

Nonetheless, in the mid-1990s, under the leadership of Kristian Kristiansen, the former Division of Cultural History of the National Forest and Nature Agency, under the Danish Ministry of Environment, took on the task of creating a national database of remains of prehistoric and historic tracks and roads. The database, and other tasks formerly the responsibility of the Division of Cultural History, have now been transferred to the Danish Agency for Culture under the Danish Ministry of Culture.

Nationwide gathering of data and field studies resulted in a Danish record of ancient road-related structures containing more than 2,300 sites, ranging in date from the Stone Age to the Middle Ages and beyond. This article describes the main impressions gained from the distribution and character of the road structures. It also presents case studies involving the interpretation of three selected sites with remains of early tracks and their potential geographic links and context.

Keywords: Danish tracks and road heritage, early road structures, prehistoric travel routes, historic roads, hollow ways, sunken roads, wheel tracks, cultural landscape

Introduction

They are still there

A large part of the earliest Danish road network lies buried beneath the roads we use today. But away from these modern roads, in areas that have not been cultivated or planted with trees in modern times, many of the old tracks still survive. This network of individual tracks and broad traffic corridors results from the traffic of millennia, where the development of actual roads must be seen in connection with the emergence of wheeled vehicles – carts and carriages. The oldest Danish records of cart wheels and roads date from the middle Neolithic, at the beginning of the third millennium BC (Rostholm 1978:185-222; Nielsen & Faber 1986:124; Jørgensen 1988:101; Olesen & Skov 1989: 9; Fabricius & Becker 1996:246, 257).

Most known prehistoric and historic traffic routes in Denmark are now included in the Danish Agency for Culture's archives (Fig. 1). Until 1995 there was no comprehensive overview of these remains, and only an insignificant number had been recorded or were protected as scheduled ancient monuments.

A threatened heritage treasure

As ancient monuments, roads are composed of numerous layers and sites in both time and space, but they also represent structures that have been used throughout several millennia. As a consequence, the geography of the earliest roads constitutes part of the road network we know today. However, it also provides an insight into former and very different structures. These hold great value by virtue of the many stories and tales that surround

them and the landscape or culture-historical context of which they form part. If the traces left by traffic and communication are not preserved, together with other ancient monuments such as settlements and cemeteries, defensive earthworks or animal pens and sacred springs, our opportunity to comprehend the cultural landscape in its entirety will be lost with them.

But the surviving traces of these ancient monuments are disappearing, due to urban development, expansion and amalgamation of farms, extraction of mineral aggregates and forestry activities. Over time, movements of drift sand and flooding have similarly obliterated many traces of tracks and roads.

New urban areas are continually being planned and ancient road structures can represent an asset in this process rather than simply being removed. The most well-preserved traces often lie in areas of great natural beauty where they offer significant leisure potential (Bang 1997:192-194). In the laying out of, among other things, new recreational or urban areas, culture-historical values must be taken into account. However, in order to involve traces of ancient roads as an asset in the planning process, it is necessary to know where they are.

In Denmark only about 40 proper road structures are protected as scheduled ancient monuments and prior to the national recording exercise about 100 localities were accessible via public records (the national database has recently been updated [the Danish Agency for Culture 2012]). The remainder appeared solely in the archaeological and historical literature or were known to only very few people.

The construction of a database

A new statute

The Division of Cultural History, at the time part of the National Forest and Nature Agency under the Danish Ministry of Environment,¹ was very aware that traces of roads and road-related structures enjoyed very limited legal protection and it was therefore decided to establish a national record (Bang 1997; Kristiansen 2002).

Kristian Kristiansen was head of the Division of Cultural History from 1987-1994. One of the Division's duties was to record and protect the visible or constructed heritage (Kristiansen 1985), also with a view to preserving intact entities and environments within modern contexts. In addition to directing the Division's work towards culture-historical links and contexts in the landscape (Kristiansen 1988), Kristiansen supported the initiatives of his staff in recording and protecting cultural heritage, including the preparation of new legislation.

The new Nature Protection Act of 1992 therefore made it possible to protect, through scheduling, all forms of road traces (today § 29e of the Museum Act 2006). Previously, it was only possible to protect actual built structures, such as bridges, causeways and paved roads, as scheduled ancient monuments (Kristiansen 1985:143; Bang 1997:190).

The visual interplay between ancient monuments and their surroundings is important in relation to the preservation of culture-historical or landscape entities. Ancient roads figure prominently as important connecting elements, linking together other ancient monuments and the landscape.

A database

Between 1994 and 1996, the author, together with Karsten Kristiansen, recorded well over 2,300 sites showing the visible remains of roads in a map-based database (Kristiansen 2002) (Fig. 1). The overall aim was to accumulate a basic record which could then be used as a foundation for actual designation and legislative protection, i.e. scheduling.

The database is the first complete inventory of prehistoric and historic road traces in Denmark. It was established on the basis of questionnaires circulated to culture-historical museums, the county authorities of that time and State Forestry Districts. The information received was supplemented with records gathered by a few private individuals and literature studies, the greatest part the extensive surveys by the historian Mads Lidegaard (1975, 1976, 1977, 1979, 1980, 1983, 1988).

State of the art

Many people have both written about and excavated the remains of prehistoric roads in Denmark, but few of these studies build on an exhaustive examination of extended sequences of road traces in the landscape.

The first Danish archaeologist known to examine systematically the course of prehistoric roads in the landscape was Sophus

Müller.² He demonstrated a connection between roads and rows of barrows and published evidence and examples from western and southern Jutland (Müller 1899, 1904). In the 1920s and 1930s, and inspired by the work of Müller, engineer and later professor at the Technological University in Copenhagen, J.T. Lundbye, reconstructed several networks of historic roads. He did this on the basis of an interpretation of the limitations imposed by the terrain, locations of fortifications and place names. These hypotheses were later tested in the field (Lundbye 1925). Just less than a decade later, historian Vilhelm la Cour continued where Müller had left off. Using the evidence provided by place names, among other accomplishments, he drew roads linking Zealand's earliest settlements (la Cour 1923, 1927).

In 1927, historian Hugo Matthiessen submitted his dissertation on *Hærvejen* (the Military or Ox Road) running north - south through central Jutland (Fig. 1). He was of the opinion that the road was only 1,000 years old and had its origins in the Viking Age. Matthiessen later elaborated his studies in publications based on early written sources and field studies (Matthiessen 1971 [1930], 1933). The southern section of *Hærvejen* has subsequently been studied in more detail (Svensson 1984; Becker-Christensen 1986).

In the 1940s and 1950s, archaeologist Therkel Mathiassen carried out further field investigations. Now graves and roads became linked to settlements along *Oldtidsvejen* (the Prehistoric Road), a linked stretch of road and line of barrows in western Jutland (Figs. 1, 2). A similar study was carried out in north-western Zealand (Mathiassen 1948, 1949, 1959).

Thirty years on, historian and high school teacher Mads Lidegaard published seven guide books (Lidegaard 1975 - 1992) based on extensive surveys and studies of aerial photographs of *Oldtidsvejen*, *Hærvejen* and *Ravvejen* (the Amber Road), a western equivalent of *Hærvejen* running along the west coast of Jutland, and all the roads branching from them (Fig. 1). An equally detailed, if not quite so regionally comprehensive, record of previously unknown prehistoric roads was produced by cartographer Børge Johannes Steiner in 1984. It was based on field-walking and reconnaissance through the woods of north-eastern Zealand.

Around 1990, the woods of eastern Jutland were studied in a similar way by archaeologist Jesper Laursen. The aim of this latter study was, however, to record all ancient monuments, not just traces of roads (Laursen 1994). At the end of the 1980s, in connection with the production of a scheduling plan for the former Ringkøbing County, Holstebro Museum surveyed and examined records of ancient monuments along *Oldtidsvejen* (Figs. 1-2) from central Jutland to the North Sea (Olesen & Skov 1989). The connection between roads and lines of barrows has most recently been examined in western Jutland (Egeberg 2004).

Barrow lines as long-term structures were examined in a case study carried out in south-west Jutland (Johansen et al. 2004). However, this study dealt primarily with barrow lines as a spatial reflection of Early Bronze Age networks of social interaction and 'down-the-line' exchange, as demonstrated by the correlation between barrow-line network centrality and artefact patterning.

Several smaller or more local road studies have been carried out in, for example, parishes (Damgaard 1985), jurisdictions

¹ In November 2001 this area of responsibility was moved to the Ministry of Culture. The division is today the Centre of Culture Heritage and Architecture and is part of the Danish Agency for Culture.

² Sophus Müller was the head of the Department of Prehistory at the National Museum of Denmark 1892 - 1921.

(Pedersen 1986), around urban areas (Hansen 1984), in river valleys (Mikkelsen 1974) and along some stretches of road (Høgsbro 1980).

The distribution of, and routes followed by, tracks and ancient roads in Denmark have accordingly been studied and addressed by many scholars during the course of the twentieth century. A characteristic feature of this work is, however, that none of these individual studies has provided a comprehensive picture of the distribution of the traces or given an overall interpretation of their culture-historical or landscape context in Denmark as a whole.

From dots on a map to linear structures

Dots on a map

The database established in 1994 contains primarily records of traces of roads that are no longer in use. These ancient monuments comprise paths, tracks, wheel tracks, hollow ways, extended systems of roads and tracks, causeways, fords, sequences of stepping stones, bridges and remains of bridges.

These occurrences shown on the map (Fig. 1) are an expression of traffic over several hundred to several thousand years, where the same stretch of traffic route may have had a different significance and function at different times and may also have lain unused for longer periods.

With several exceptions, the recorded tracks are undated. They are interpreted as being ancient on the basis of an overall assessment of their features and character: they arose through erosion in the terrain, their breadth, their location and context relative to dated road structures in, for example, fords (Bang 1997:191-194). Excavations have yielded datable finds, constructions or organic material, or the traces have been overlapped by datable traces or other ancient monuments (Fabricius & Becker 1996; Hansen & Nielsen 1979; Jørgensen 1977, 1987; Kunwald 1996). The orientation of the roads straight towards early villages, castle mounds or barrows suggests that, for example, barrows or towers may have been used as sighting points, but not necessarily what was built first or that there was a connection in age (Bang 1997:191-194).

Based on the record and data extracted from our (unpublished) field surveys there is an overall impression that traffic corridors, such as structures used over long periods of time, are of as great an interest as a precise date for an individual road tracé.

If we return to the map (Fig. 1) it is evident that considerably more than half of the 2,300-plus recorded sites are located in Jutland, where the main long-distance route *Hærvejen* following the watershed running along the central ridge dominates the record. This is due in part to the fact that central Jutland is relatively extensively cultivated and that this stretch of road received major attention from researchers at an early stage; as a consequence, they concentrated their reconnaissance efforts here. The latter is also the reason for the more than 350 records seen located in the forests of north-eastern Zealand (Steiner 1984). Bornholm is densely covered with roughly 100 records, and here, too, the many uncultivated areas have protected the remains and local archaeologists have been active recorders.

Conditions for preservation and recording are less favourable in more intensively cultivated regions such as eastern and southern Jutland and the Danish islands: most of Zealand, Funen (just 100

localities), and Lolland and Falster (which combined have almost a dozen localities).

Linear structures

The recorded road traces comprise local, regional and long-distance routes. The various types of road are mentioned in the Jutlandic Law from AD 1241. This distinguishes between roads within the parish, district roads connecting several villages and public highways which went from market town to market town, linking the provinces (Pedersen 1986:16). Mention is only made below of the longer and relatively major routes. These are also very ancient, judging from the extended and often densely-packed rows of barrows which are assumed to have been sited alongside them, both for practical reasons and in order that they should be seen (Olesen and Skov 1989:4-8; Egebjerg 2004:44; Eriksen et al. 2009:104-105). *Oldtidsvejen* (Figs. 1, 2) is the most prominent example of a concurrent stretch of barrows and road traces in Denmark.

The best known prehistoric road or rather 'traffic corridor' is *Hærvejen* which is seen as a direct connection through Jutland, linking Denmark/Norway with the Continent (Fig. 1). Its Danish name, i.e. *hærvej*, was used in the Middle Ages to refer to a main traffic thoroughfare intended to facilitate the army's movements around the country. The route's military function was only one of many; it was also used as a drove road for cattle transport, for trade and for long-distance travel and it comprises many diverse local and regional stretches. Over time, many other names were applied to it, according to use or location: Ox Road, Pilgrim Road, Noble Road, Old Viborg Road to name but a few (Matthiessen 1971: 7-20). It followed the watershed in order to avoid crossing the many rivers which cut transversely across Jutland. Until the twentieth century, water levels were significantly higher than today and the river valleys were generally difficult to cross (Pedersen 1986: 96).

Another long-distance route, which must be presumed to be as old as *Hærvejen*, comprises a system of road traces running along the west coast of Jutland, linking Germany and northern Jutland. In addition to the name the Western Main Road, it has, by and large, been known by the same names as *Hærvejen* and is similarly flanked by rows of barrows. In contrast to *Hærvejen*, which runs along the watershed, the western road has to cross many watercourses. Lidegaard, who recorded the stretches of road in the field, named it *Ravejen* (Fig. 1) in order for it not to be confused with the old central Jutish '*Hærvejen*' (Strandgaard 1883; Pedersen 1986:101-115; Lidegaard 1988; Egeberg 2004).

In the field

In order to gain an impression of the character and quality of the recorded road traces, in 1995 two areas were chosen for survey (Bang 1997). The intention was to examine evidence that was as varied as possible with regard to degree of preservation and location in various landscape types. Consequently, two sections of the *Hærvejen* corridor were chosen: one in the north, a c. 20 km long track in undulating wooded natural terrain to the south of *Viborg*, and one further south, an almost 40 km long sequence running across the large cultivated plains to the west of *Kolding* (Fig. 1).

In all areas of unspoilt natural landscape, where roads are shown on old maps from the late eighteenth and the nineteenth century,

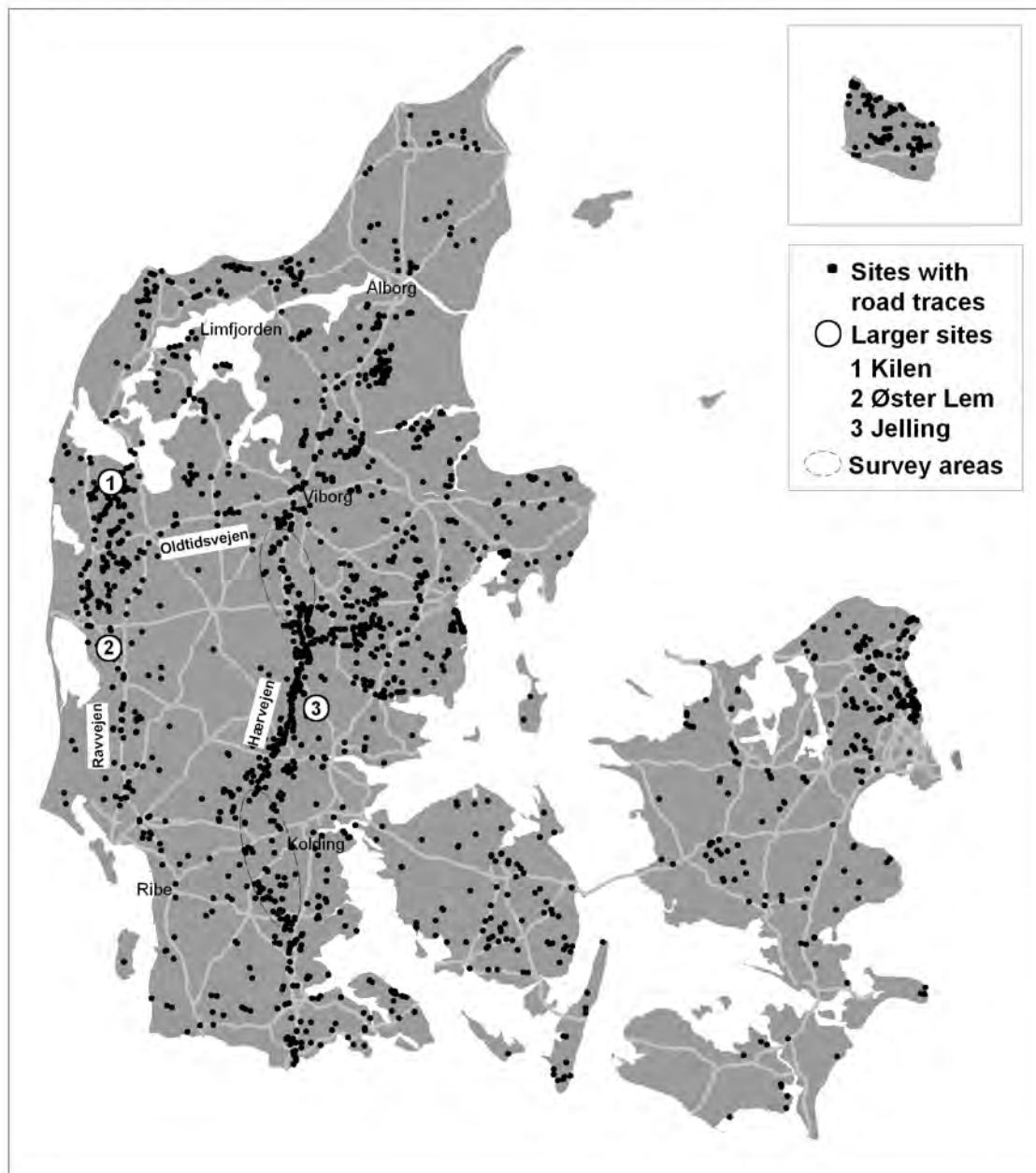


Fig. 1 The recorded sites are the remains of a more complex system of local communication, but also reflect longer robust and resilient overland sections of road. Hærvejen (the Military or Ox Road) meanders over a c. 20 km wide tract, following up to four or five different sequences of road traces along the central Jutland ridge, from Germany, via Viborg, towards the Limfjord region. It represents a wide complex communication corridor, with numerous roads running in parallel. These cross each other in places, form junctions at fords and byroads, before again dividing up or merging to form even fewer tracks. The most distinctive branches extend out towards the fjords of the east coast. Other less clear sections depart for the Limfjord to the north-west, Jelling and the fjords of the southern part of the east coast, as well as the Ribe area on the west coast. Ravvejen (the Amber Road) follows Jutland's west coast. It crosses the Limfjord, partly along the isthmus running between sea and fjord and partly over the sound to the north of Kilen (cf. 6.1 Kilen). It too has many parallel sections, merging, dividing and crossing again, and the greatest concentration of visible tracks south of the Limfjord. Illustration: Claus Dam, the Danish Agency for Culture.

the tracks are still visible.³ Many tracks, such as the so-called barrow roads, showing evidence of great antiquity are virtually absent from the maps. Normally, only roads that were in use at the time the map was drawn up were recorded.

With regard to choice of route, the impression given is that the

shortest distance possible was chosen between point of departure and destination. In prehistory and early historic times, the greatest obstacles were waterlogged terrain and steep inclines (Kunwald 1964:7–10). Approximately half of the tracks in the two areas form a straight line running between two medieval churches. This indicates that these villages must be of significant age, if they represented the intended destination, or that people moved in this direct way well up into the Middle Ages. Evidence relating to

³ The Royal Danish Academy of Sciences and Letters' map (Videnskabernes Selskabs kort (1762-1820) and the ordnance survey map (Generalstabskortet) drawn in the 1870s.

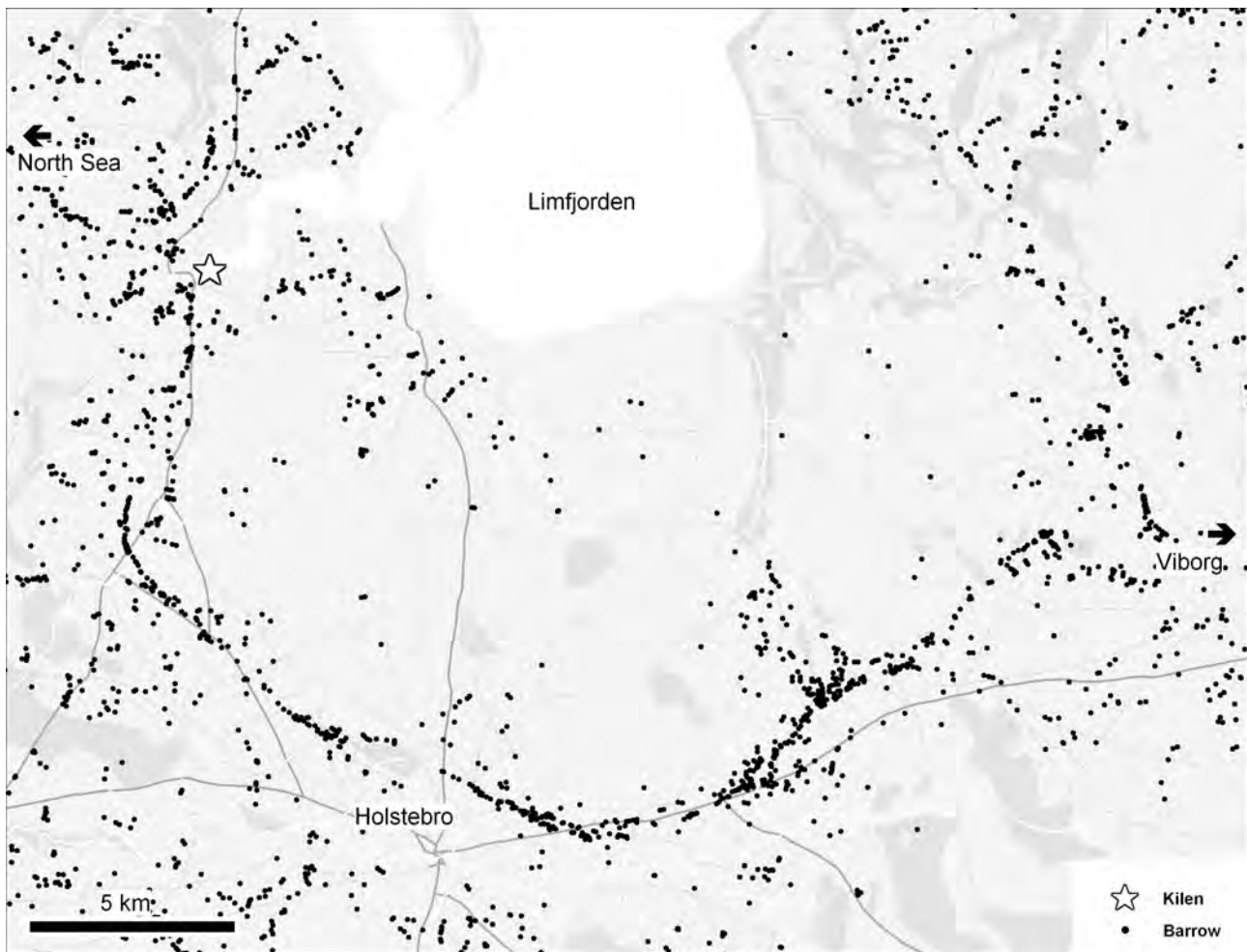


Fig. 2 Oldtidsvejen (the Prehistoric Road) is not so clearly apparent in the record of road traces (cf. Fig. 1), because its route is not so much sketched by preserved tracks as by the more than 2,000 barrows from the Neolithic and the Bronze Age, which flank it. Furthermore, over 500 prehistoric settlements have been recorded in its proximity (Mathiassen 1948; Pedersen 1986:141-147, 153-156; Olesen and Skov 1989; Eriksen et. al. 2009:104-106). Like Hærvejen and the northern part of Ravvejen, Oldtidsvejen follows the watershed formed where the ice front halted during the last Ice Age in order to avoid waterlogged terrain and river crossings. Remains of it can be seen to the west of Viborg, where it probably had a link to Hærvejen, via Holstebro to the North Sea. Illustration: Claus Dam, the Danish Agency for Culture.

Hærvejen is more consistent with its character as a transit road; only slightly more 30% of the tracks run between ‘church’ villages.

As expected, the degree of preservation and the diversity of the traces are both greatest in the wooded and heath-covered areas to the north. A total of 40 localities were recorded; most in conifer plantations and deciduous and mixed forest, a smaller number on heath, commons and pastures. The fact that so many tracks are preserved in conifer plantations is probably due to the latter being older stands, planted around the middle of the twentieth century, before the practice of sub-soiling became commonly used in forestry. In the southern area, under much greater agricultural influence, only 14 sites were recorded.

In general, the presumed earliest road routes are better preserved than the latest. *Hærvejen*’s so-called ‘barrow roads’ often have a marginal location relative to settled areas, whereas stretches thought to have been used in historical times have frequently been repaired and possibly covered with tarmac such that they now coincide with entirely modern roads or have been totally obliterated by other urban developments.

The variation in the surviving record is surprisingly great: Classical hollow ways are preserved as stretches up to 300 m in length, between 0.5-4.0 m deep and – if not disturbed by use in recent times – barely 1 m to 1.5 m wide at their base. They typically appear in hillsides but are also found in level terrain where they tend not to be quite so deep. Fan-shaped systems on hillsides measure up to 150 m in width, and were formed where new tracks were cut up next to the old worn and eroded ones. They may cross each other, but more commonly two tracks merge or one track splits into two. Steep hollow ways may have been reinforced with a layer of stones at their base. This layer has often been eroded through and can be seen as one or more ‘strings of beads’ along the roadside. On rare occasions, a narrow bridleway or footpath appears alongside a hollow way.

In level terrain the preserved roads in the studied areas take the form of 15-200 wide and 40-400 m long tracts of 5-25 cm deep, parallel wheel tracks. In some cases the parallel tracks lie so close together that the surface of the terrain resembles a washboard and the features may even be mistaken for planting furrows. But the wheel tracks are neither as evenly distributed nor as arrow straight

as this agricultural phenomenon. The track width (gauge) of the hollow ways and the wheel tracks has been found to vary between just over 70 cm and 130 cm.

In heathland with a firmer base, where the wheels have not cut such deep tracks, the roads are revealed by differences in the vegetation: grass in the tracks, due to manure from the draught animals, and a band of heather along the edge, before the next track.

Where physical remains of the roads are, as such, not preserved, they can often be followed as depressions in the field or their route may be preserved in the form of field boundaries or dikes. As mentioned above, the roads are often flanked by barrows, and in places where the tracks have, over shorter stretches, been obliterated, their course can nevertheless be recognised because the burial mounds survive. Around a third of the stretches of road in the two above-mentioned parts of *Hærvejen* are flanked by barrows. The latter may be relatively closely-spaced and form long rows alongside the road without major gaps. In the few cases where a barrow is located in low-lying terrain by a watercourse, this occurs most commonly in association with a ford.

Around half of the road traces in the two areas are so well preserved that they are worthy of protection as scheduled ancient monuments. At present, only three of 25 preservation-worthy (out of 40) localities in the northern area and one of the seven preservation-worthy (out of 14) localities in the southern area are protected as scheduled ancient monuments.

Road traces: three case studies

Kilen

The experience gained from surveys along *Hærvejen* raised several new questions. Against the background of these, the site of crossings over the watercourse *Bredkær Bæk*, at the bottom of *Kilen* (part of the inlet *Limfjorden*) was examined (Figs. 1, 2). The tracks, which cross the valley over a c. 1 km wide zone, are possibly the most exceptional remains of ancient roads in Denmark. An interesting question in relation to this site concerns the extent to which the tracks were formed by water erosion during the Ice Age and the extent they are the result of traffic. *Kilen* is also interesting as two major road routes cross each other here in the river valley. Furthermore, there is evidence of considerable activity in the area as early as the Neolithic.

Traffic across the river valley made use of the water-eroded ravines in order to scale the steep slopes (Figs. 3, 4). This must have happened at a relatively early point in time as the tracks should be seen in association with the barrows that border the stretches of road. The eastern crossings are common to *Oldtidsvejen*, running between the *Viborg* area in the east and the North Sea, and the western version of *Hærvejen*, *Ravvejen*, running between south-western Jutland and the *Limfjord* (Figs. 1, 2).

Visible traces left by traffic in the landscape can link together with the aid of aerial photographs which create longer sequences, such that the routes of the ancient roads are revealed more clearly (Eriksen and Olesen 2002). This has also been recently confirmed by the Danish Agency for Culture's digital elevation model (DEM) (Fig. 4) which reveals even very tiny differences in the height of the terrain (Clemmensen 2010:4, 6, 8).⁴

The crossing at *Kilen* can be interpreted both as representing



Fig. 3 A crossing at Kilen. Travelling south: ramble down the hollow way, force the watercourse, stride up the hollow tracks and pass the barrows (see photo tag at Fig. 4). In prehistory and the Middle Ages, Kilen formed an open branch of the Limfjord. From the beginning, the landscape constituted a plateau, where melt water from the inland ice of the last Ice Age created a now submerged sub-glacial stream trench. Towards the south-west, the valley continues with Bredkær Bæk at its base and with the late-glacial erosion system of ravines running across the valley (Nielsen 1975:279ff, 303ff; Trap 1965:32-33, 215, 281). Photo: Torben Dehn, the Danish Agency for Culture.

a large intersection or crossroads, where the traffic routes at one particular time were largely coeval, possibly being used at different times of the year, and also as being completely separate and distinct in time. The road routes must be seen collectively as structures which were worn and eroded into the slopes over a very long period of time. Several Neolithic settlements on the plateau and on the slopes with cemeteries beyond them and rows of barrows alongside the tracks indicate that the traffic across the river valley is very ancient.⁴ There are not many records of either ancient monuments or finds from the Iron Age. However, wheel tracks are seen to cross Celtic fields (Fig. 4), and a Viking Age settlement has also been recorded on the plateau to the south of a more westerly crossing of the river valley (the Danish Agency for Culture 2012). As this place represents an important crossing point for the link across the *Limfjord*, trade and cattle droves have also left their marks in recent times. The hollow ways in the slopes may, furthermore, have provided access to the water mills that

⁴ Thanks to the isostatic land rise in northern Denmark the Neolithic beach line in this region may be slightly above present sea level, thus the watercourse might have been less accessible at the mouth by means of wading or 'bridging'. The zero line for transgression/regression is about 10 kilometres to the south of the site (the Danish Coastal Authority).

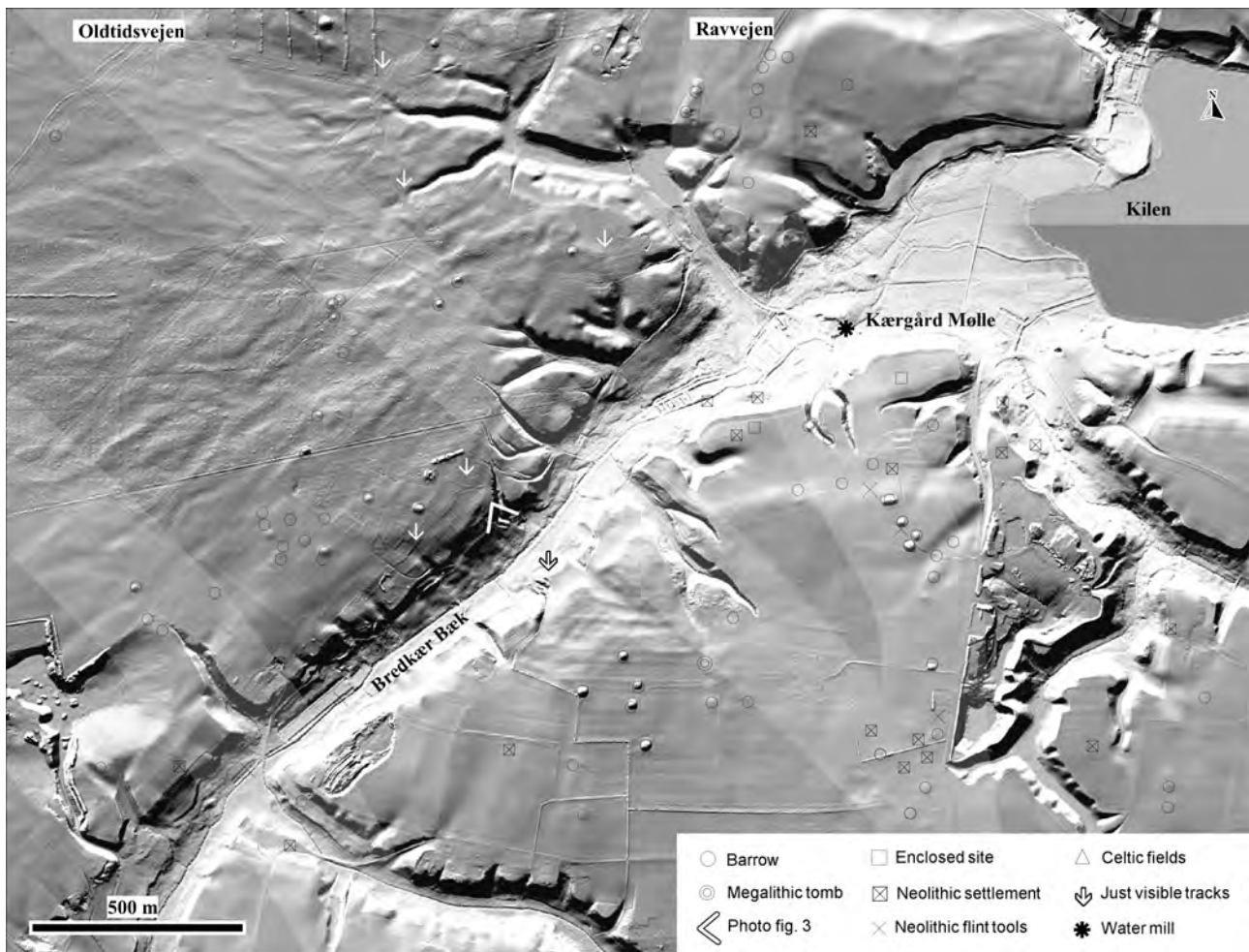


Fig. 4 The relief map (DEM), showing the crossings of the valley at the bottom of Kilen, reveals the many parallel bands and fans of tracks that pass between the burial mounds on the plateaus on each side of the valley, e.g. a group by a long barrow in the heathland to the north-west of the river valley, in order – as hollow ways or deep ravines – to scale the slopes to the north and south of the river.

Where a date is available, the mounds are Neolithic. Several collections of settlement finds, together with the remains of a house and pits, indicate the presence of Neolithic settlements on the plateau and the slopes. On the valley floor, the straightening out of the river and construction of two fish farms has now obliterated any traces of fords. On the plateau to the south of the valley, the tracks disappear into the field, e.g. in the direction of a group of barrows which include the remains of a passage grave. On the north-eastern part of the same plateau, the tracks and two very deep and slightly wider breaches in the slope run towards a row of barrows, including another long barrow (see also Lidegaard 1988:109-112, 127; Olesen and Skov 1989:69ff). On the headland, to the east and west of the two breaches, rows of system-ditches were detected by aerial reconnaissance; these may delimit Neolithic enclosed sites (Eriksen and Olesen 2002:26-29). © The National Survey and Cadastre. DEM: Niels-Christian Clemmensen, illustration: Claus Dam, the Danish Agency for Culture.

made use of *Bredkær Bæk* in historical times. In the Middle Ages the eastern crossings were replaced by a common bridge and main road constructed over the water mill *Kærgård Mølle* (Ringkøbing Amt 1992) (Fig. 4).

Øster Lem Hede

Around 50 km to the south of *Kilen*, to the east of the inlet *Ringkøbing Fjord* in western Jutland (Fig. 1), there is another example of how a traffic corridor has exploited the natural terrain. By the scheduled Celtic fields on the heath *Øster Lem Hede* (Fig. 5), road traces run between 40 and 70 m.a.s.l. over the southwestern heath-covered slope of the dissected edge of a sandy hilly landscape, offering a wide view over the fjord's flat foreland to the south-west (Trap 1965:32-33, 504). The tracks have both the character of local traffic and a major overland route and were made at different times.

Starting with the stretches of road with the earliest characteristics on the relief map (Fig. 5), the group of nine barrows, *Nihøje*, to the north-west of the *Øster Lem* heath, is presumed to represent a prehistoric crossroads based on the fact that this group of barrows is common to *Ravvejen* (Fig. 1) from southern Jutland to the *Limfjord* (here indicated by barrows along the western margin of the heath) and an east-west oriented row of barrows to the north of the heath (la Cour 1923; Lidegaard 1988:166-167; Egeberg 2004:51). On the heath-covered slope to the south and east of these two crossing barrow routes, a small track or livestock passage running between the numerous small fields was established along with these in the Pre-Roman Iron Age (Hatt 1949) (Figs. 5, 6). After the fields had been abandoned, a new broad spread of tracks cut diagonally south-east - some heading north-west facing *Nihøje* - across the slope between the valley and the plateau. The traces

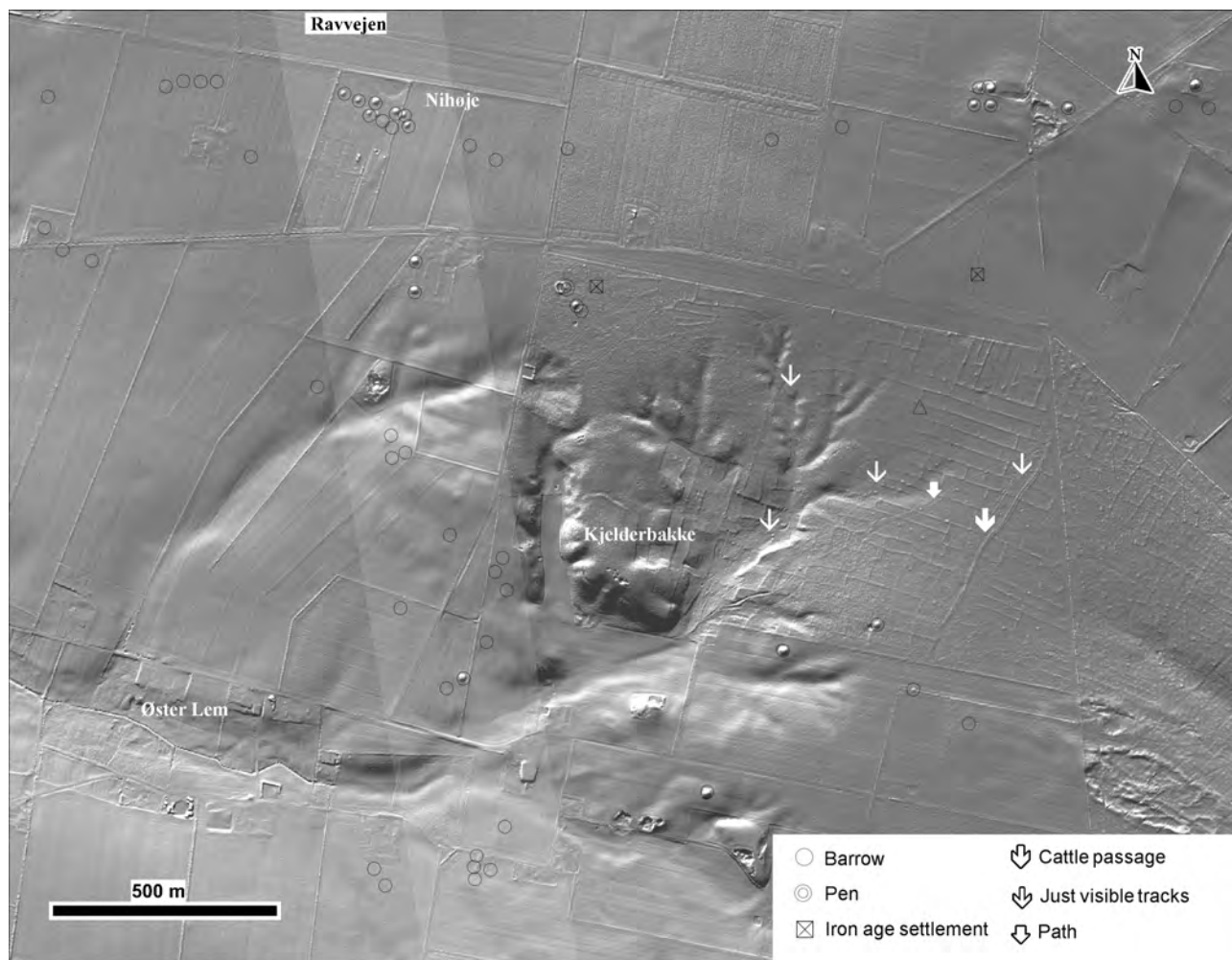


Fig. 5 Øster Lem Hede. On the Danish Agency for Culture's digital elevation model (relief map), Ravvejen (the Amber Road) can be recognized from a belt of barrows, probably in use during the Neolithic and Bronze Age, running along the western edge of the heath (Lidegaard 1988:164ff; see also aerial photos in Eriksen and Olesen 2002:37). To the east and west of Nihoje, a traversing row of barrows is also apparent. The heath was settled towards the end of the late Bronze Age or in the early Pre-Roman Iron Age. Overlapping with this phase, the entire slope – an area of rather more than 1 km² – was cultivated in the form of small rectangular Celtic fields (Eriksen 2001; Nielsen 2009:17). The shading effect of the field banks, small clearance cairns and barrows can be seen on the map. In the upper north-western corner of the heath, three house sites have been excavated, dating from the Pre-Roman Iron Age. Apparently coeval with the fields is a narrow track or livestock passage (Fig. 6), which is preserved over a distance of 400 m between the fields (Hatt 1949:92ff). On the plateau above the fields, remains have also been found of an Iron Age settlement. Perhaps the passage connects this with the fields and the pasture land. Later, a broad belt of wheel tracks cuts diagonally through the field banks, aiming towards the dissecting ravines which extend from the floor of the river valley up between the fields (Hatt 1949:93). From the map it can be seen that the ravines accommodate several parallel wheel tracks and hollow ways which make their way through the narrow pass at the foot of the hill, Kjelderbakke, towards the source of the stream (cf. *kjelder* = spring, *bakke* = hill, Jørgensen, B., 1982) and Øster Lem. In recent times, this road has re-emerged as a path. Its remains can be faintly seen on the relief map, whereas the earlier wheel tracks, crossing the fields above the ravines, are hardly visible. © The National Survey and Cadastre. DEM: Niels-Christian Clemmensen, illustration: Claus Dam, the Danish Agency for Culture.

left by traffic set solid and are 'preserved' both in the heathland and on the relief map (Fig. 5).⁵

In addition to the relief map, aerial photos show how the route of the later road exploited the old water-eroded ravines in order to ease access between the lower-lying areas and the plateau above

(Eriksen & Olesen 2002:89). On the floor of the river valley, these tracks meet Ravvejen. The solution to the mystery of whether the various routes were, at any point in time, in use simultaneously, or whether the tracks crossing the fields constitute a new, alternative route around Kjelderbakke, is hidden beneath the soil.

Jelling

In 1994, the Viking Age monuments at Jelling were incorporated into UNESCO's list over World Heritage Sites. To the south of the town, there is a road system which shows characteristics of long-term use by, among others, the Jelling kings (Fig. 7). The

⁵ The Danish Agency for Culture has, on the basis of the National Survey and Cadastre's contour data DTM (Digital Terrain Model), constructed a relief map, which under appropriate lighting gives a shading effect that emphasizes even small variations in the terrain. The data is an extract from the results of a national laser scan carried out from the air in which only those laser pulses which struck the earth are presented in the model. This method of data collection is known by the term LIDAR (Light Detection and Ranging) (Clemmensen 2010:4, 6, 8).



Fig. 6 In wintry weather, the Pre-Roman track or livestock passage on the heath of Øster Lem is revealed by the grass, which stands out yellow against the snow. Tracks left by traffic appear on heaths as green or yellow strips, because manure from the animals has enabled the grass to gain a footing. The sides of the passage also constitute a field bank out towards the fields (Hatt 1949:92ff). Photo: Torben Dehn, the Danish Agency for Culture.



Fig. 7 At the end of the lake Fårup Sø, there are several preserved stretches of systems of hollow ways, interwoven on the slope of the wood. The hollow ways lie on the steep northern side of a sub-glacial stream trench, with the lake and the river Grejs Å, which drains into Vejle Fjord, at its base (Trap 1964:778-779). Photo: Torben Dehn, the Danish Agency for Culture.

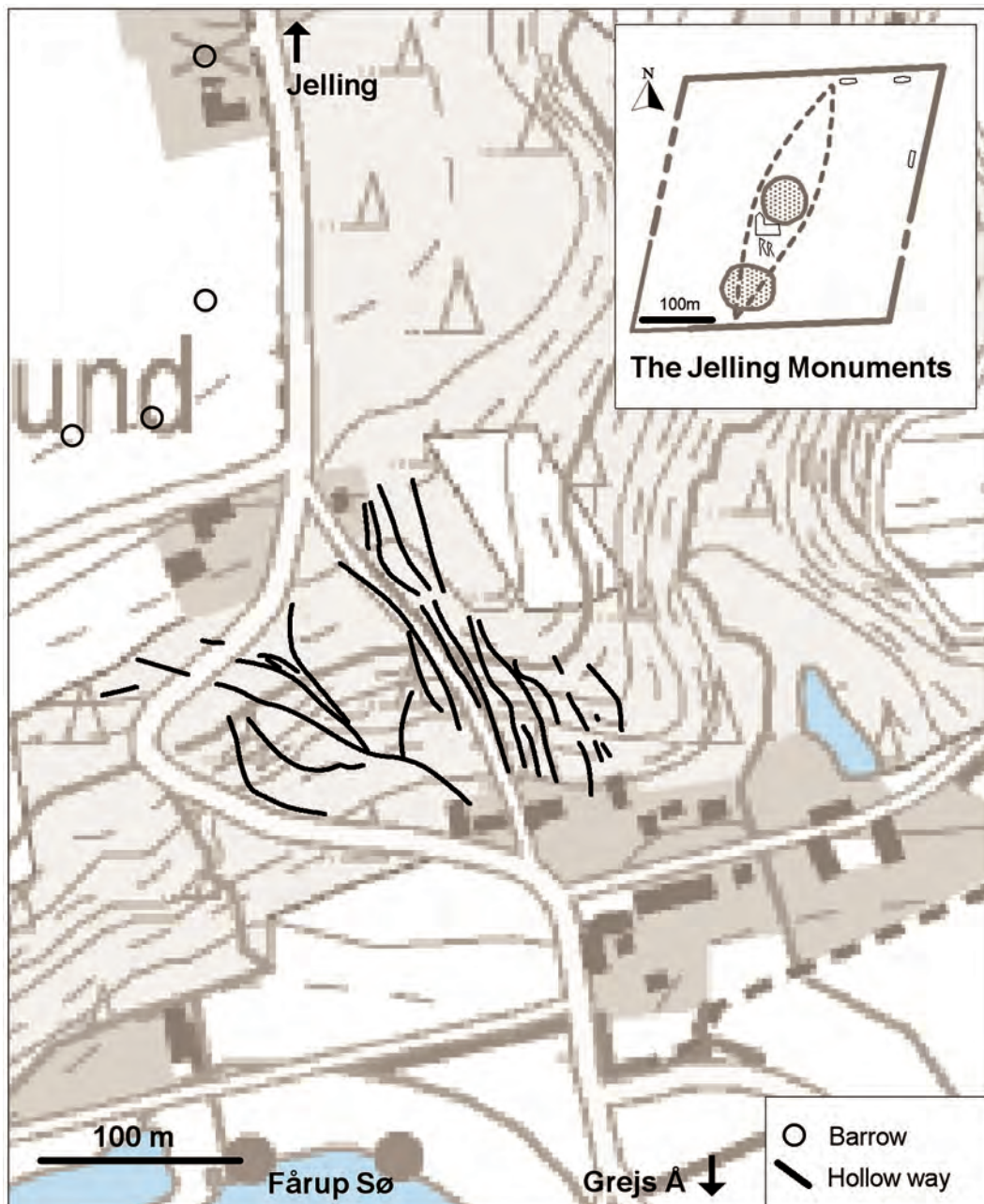


Fig. 8 Out of Jelling towards the south runs an older road bordered by settlement remains from the Pre-Roman Iron Age and the early and late Roman Iron Age with associated remains of cemeteries; in between these lie a number of undated barrows. The southern part of the road was relocated in the middle of the twentieth century, giving it an open serpentine curve in order to reduce the upward gradient. Its earliest predecessors lie preserved in the woods to the west and east of the old road: a broad tract of hollow ways. A hollow way to the west stands out as being wider and deeper than the rest; it is apparently also later as it is cut down through minor, shallower hollow roads. Shown on the nineteenth century map and here, this complex road situation had been simplified to give one direct constructed track cutting through the middle of the tract of hollow ways. Today this is used as a gravelled path and forest road. © The National Survey and Cadastre. Survey: Niels-Christian Clemmensen and Thomas Eriksen 2010, illustration: Claus Dam, the Danish Agency for Culture (the Jelling monuments, cf. the National Museum of Denmark 2012).

present-day highway represents perhaps the fourth generation of road routes running to the south of the town (Fig. 8).

In order to understand this road in its correct context, it must be seen in conjunction with *Hærvejen* running along the central ridge of Jutland (Fig. 1). To the north-west of *Jelling*, *Hærvejen* divides like the cascades of a waterfall towards the south and with changing centres through time. Opposite *Jelling*, the eastern route splits into two main tracks, again with several courses running towards the east and west, one of the eastern branches points towards the centre *Jelling* (Lidegaard 1977:8, 10, 39ff).

A report from 1589 tells that *Jelling birk* (judicial district) has always been owned by the king and that some of the Danish kings are buried there (Trap 1964:1118). During the Viking Age, *Jelling* was a very important place as a centre of power and the royal residence was situated here. This is confirmed by two rune stones raised by King Gorm and King Harald, two enormous barrows, the remains of a large ship tumulus and several old wooden buildings which were finally replaced by a stone church in the eleventh century. Archaeological investigations carried out in recent years have demonstrated the remains of several large buildings and a palisade encircling the whole structure (the National Museum of Denmark 2012).

The age of the oldest parts of the road system south of *Jelling* (Fig. 8) is unknown. Neither is it known when the individual tracks were used. It is probable that the road system constitutes part of the earlier main tracks or branches of *Hærvejen*. It has been suggested that, following *Jelling*'s decreasing significance as a centre of power, another and more direct long-distance section of *Hærvejen*, located on the other side of the lake, took over much of the north-south traffic (Matthiessen 1971:58-62; Lidegaard 1977:43ff).

The road route at the end of *Fårup Sø* may be much older than the famous royal residence at *Jelling*. The settlement remains and the barrows along the road indicate this, and the site by the end of the lake provided an obvious ford, being where the watercourse, *Grejs Å*, widened and made a crossing possible. However, there is little doubt that the king used the road as a route to the river, *Vejle Å*, and a further c. 10 km to the south towards the bridge across *Ravninge Enge*; a wooden structure more than 700 m in length which, in the Viking Age, led across *Vejle* river valley (Jørgensen 1997).

The significance of the database and the records contained within it

What can we use it for?

The data that have been gathered provide a comprehensive overview of more than 2,300 localities showing traces of roads, tracks or related structures of some form or other. Around 30% of the recorded localities have not previously been described in the literature and 85% were not previously recorded in a national register (Bang 1997:190; Kristiansen 2002:17). The ancient monuments proved to be very diverse and many are well-preserved.

An overview is necessary in order to understand each individual road trace in a wider topographic and geographic context. This also applies in an administrative sense. In order to be able to define standards for protection and to select which road traces should be

scheduled, we must have information on their distribution and diversity. The database means that this is now possible.

A national overview of the surviving traces left by the traffic of the past provides – in addition to the actual traces themselves – also the opportunity to create a picture of developments in society and the transportation of people, products and animals along extended linear structures in both time and space.

The digitalization of the road trace data makes it possible to relate these to other ancient monuments and elements within the cultural environment. In this way, the road traces can contribute to placing other ancient monuments and elements within a wider landscape context and promotes an understanding and interpretation of the cultural landscape as a series of intact entities, cf. the road structures at *Kilen*, *Øster Lem* and *Jelling*.

Where do we go from here?

In further work it will be necessary to operate on the basis of the understanding that many road tracks are 'long-term features' – i.e. robust and resilient structures that are the result of developments over a long period of time and which have perhaps been used during the course of several millennia. It is also important that further local studies be carried out in which the road traces are put specifically into context relative to surrounding settlements, cemeteries etc. (cf. Egeberg 2004).

In general, attention should be focused on exploring the opportunities in the landscape for the passage of traffic at various points in time and also on geological-archaeological investigations aimed at, for example, discovering the degree to which ravines, as described at *Kilen*, were created by natural erosion or by wear from the passage of wheeled vehicles.

It remains important to carry out archaeological investigations of road traces in association with other ancient monuments, and also in wetland areas where there is the greatest possibility of finding datable material. Many such investigations have already been carried out which can serve as examples (such as Jørgensen 1977, 1982, 1987; Kunwald 1944, 1962; Hansen & Nielsen 1979; Egeberg 2004).

Last, but not least, a major process of scheduling awaits, in part because preserved road traces are threatened with destruction, and in part because they are extremely valuable relative to an understanding of the major over-arching aspects of the cultural landscape. The traces left by prehistoric and historic traffic must be acknowledged on equal terms with settlements and burial mounds.

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