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# Handle-cores from northern Jutland and regionality in the Danish Mesolithic – is the assumed east-west split as clear-cut as generally perceived?

*Handgriffkernsteine aus Nordjütland und Regionalität im dänischen Mesolithikum – ist die angenommene Teilung zwischen Ost und West so klar begrenzt wie weitläufig angenommen?*

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**ABSTRACT** - It is generally assumed that Mesolithic southern Scandinavia was subdivided into a number of social territories, with the Great Belt subdividing this region into an eastern part and a western part. These two main territories were characterized by a number of differences in their material culture repertoires, and it has been suggested that, during a part of this period, the eastern part was characterized by the presence of handle-cores and the western part by such cores being absent or rare. The present paper presents typical handle-cores from northern Jutland, and explains that the traditionally held view may be at least partly incorrect. It also discusses the presence of handle-cores throughout southern Scandinavia, including Scania and Schleswig-Holstein, and, not least, what the actual distribution of handle-cores means to our understanding of the territorial structure of the region during the Mesolithic period.

**ZUSAMMENFASSUNG** - Es wird weithin angenommen, dass das mesolithische Südsandinavien in eine Anzahl von sozialen Territorien unterteilt war, wobei der Große Belt die Region in einen östlichen und einen westlichen Teil trennt. Diese beiden Hauptterritorien werden durch eine Anzahl von Unterschieden in der materiellen Kultur charakterisiert, und es wurde darauf hingedeutet, dass, während eines Abschnittes dieser Periode, der östliche Teil durch das Vorhandensein von Handgriffkernsteine charakterisiert wurde, und der westliche Teil durch ihre Abwesenheit bzw. Seltenheit. Die vorliegende Ausarbeitung zeigt typische Handgriffkernsteine aus Nordjütland, und erklärt, dass die traditionell angenommene Sichtweise eventuell zumindest teilweise inkorrekt ist. Sie beschäftigt sich außerdem mit dem Vorhandensein von Handgriffkernsteine in gesamt Südsandinavien, einschließlich Scania und Schleswig-Holstein, und, nicht zuletzt, was die Verteilung von Handgriffkernsteine für unser Verständnis der territorialen Struktur der Region während des Mesolithikums bedeutet.

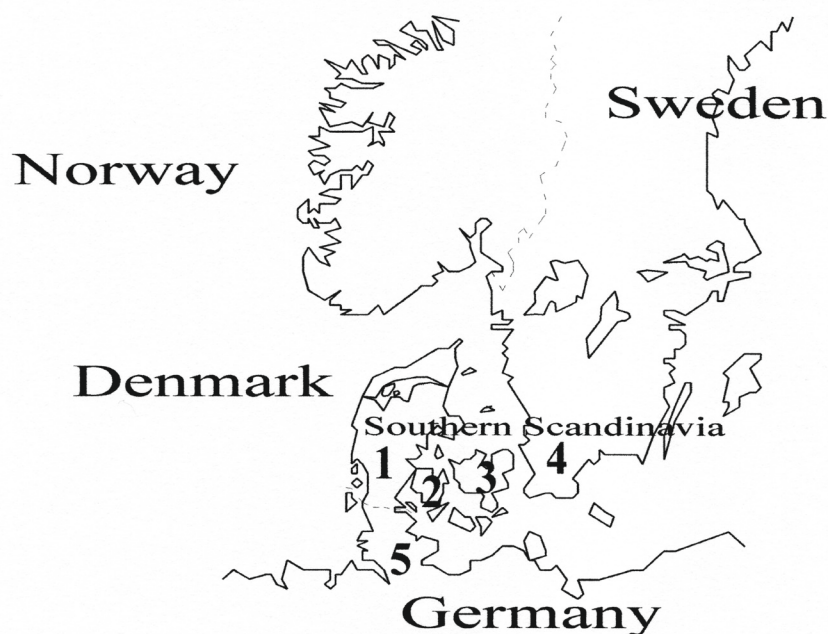
**KEYWORDS** - Southern Scandinavia, Maglemosian, hunter-gatherer, lithic technology, territoriality  
Südsandinavien, Maglemose Kultur, Jäger/Sammler, lithische Technologie, Territorialität

## Introduction

Over the past decades, several contributions have been made to the on-going discussion of regionality in the Mesolithic of southern Scandinavia (Denmark, southernmost Sweden, and northern Germany), and this term covers the area settled by the populations of the Maglemosian, the Kongemosian and the Ertebølle culture (cf. Jensen 2006), although largely focusing on the later Kongemosian and the Ertebølle culture (Vang Petersen 1982, 1984; Andersen 1991, 1995; Hartz 2009). A consensus has developed regarding the regionality of this period, including a hierarchy of regional divisions (Fig. 1): 1) the later Kongemosian/Ertebølle culture in southern Scandinavia represents

an over-arching material culture (or techno-complex) of complex hunter-gatherers, which differs in terms of lithic types and technology from surrounding groups of early farmers (towards the south) and traditional hunter-gatherers (towards the north; e.g. Ballin 2013a); 2) the later Kongemosian/Ertebølle culture is itself divided into two main parts (or social territories), Jutland/Funen/Schleswig-Holstein towards the west and Zealand/Scania towards the east, defined by stylistic differences within their assemblages of lithic and bone/antler implements (e.g. Vang Petersen 1984: Figs. 11-14); and 3) smaller social groups appear to occupy topographically well-defined areas along rivers and around fiords, defined *inter alia* by (on Zealand) differences in flake axehead style (Vang Petersen 1984: Fig. 15), and (in the Jutish Limfiord area) general technological differences (Andersen

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**Fig. 1.** Scandinavia and southern Scandinavia. The main geographical units of southern Scandinavia are: 1) Jutland; 2) Funen; 3) Zealand; 4) Scania; and 5) northernmost Germany.

**Abb. 1.** Skandinavien und Südsandinavien. Die Hauptteile Südskandinaviens sind: 1) Jütland; 2) Fünen; 3) Seeland; 4) Scania; und 5) das nördlichste Deutschland.

1991: 91). It has also been suggested that, in southern Scandinavia, the later Mesolithic bands and/or tribes, to whom the river systems may have been prehistoric equivalents to our motorway networks, defined themselves by patterns on their paddles (Andersen 1986: 104). For a general discussion of Stone Age kinship-based regionality, as well as the terminology of regional studies, see Ballin (2007, 2009, 2013a).

Although Mesolithic research on Zealand has been relatively broad, including studies of the Maglemosian, Kongemosian and Ertebølle culture in equal measure, Jutish Mesolithic research has mainly focused on the later Mesolithic and, in particular, the Ertebølle Culture. It has therefore been exceedingly difficult to explore the development of the regional divisions described above, and to answer questions regarding the regionality of Early and Middle Mesolithic in southern Scandinavia: did the hierarchy of regional units become more complex with time, as has been suggested for Scandinavia as a whole (e.g. Ballin 2007), or was the regional subdivision of the Maglemosian possibly as complex as that of the Ertebølle culture?

As published excavations and assemblages relating to the Jutish Maglemosian and Kongemosian are rare (most recently demonstrated by the papers in Eriksen 2006), any discussion of regionality in the earlier part of the Mesolithic of southern Scandinavia has had to rely on 'old' data, and statements from 'old' archaeological literature indicate that regional differences known from the transition between the Kongemosian / Ertebølle culture (c. 5400 calBC) were already in place at the transition between the Maglemosian /

Kongemosian (c. 6400 calBC; Fig. 2). One of the main typo-technological differences between the western and eastern variants of the Late Kongemosian is the presence of the iconic handle-cores in Zealand/Scania, whereas these cores have been claimed to be absent or rare in western Denmark (Vang Petersen 1984: 10-12). In Andersen and Sterum's paper (1971) on the Jutish Gudenå Culture (in which they rightly demolished this palimpsest-based material 'culture'), it is put that (this author's translation and emphasis): 'On Zealand, the later phases of the Maglemosian are

Period	Phase	calBC	Handle-cores
Ertebølle Culture	Late	4'500 - 3'900	
	Middle	4'800 - 4'500	
	Early	5'400 - 4'800	
Kongemose Culture	Late	5'700 - 5'400	
	Middle	6'000 - 5'700	
	Early	6'400 - 6'000	
Maglemose Culture	Late	7'000 - 6'400	
	Middle	7'800 - 7'000	
	Early	9'000 - 7'800	

**Fig. 2.** The Mesolithic chronology of southern Scandinavia; the shading to the right indicates the period during which handle-core technology was applied in Zealand and Scania (Jensen 2006: 58).

**Abb. 2.** Die mesolithische Chronologie von Südsandinavien; die Schattierung rechts zeigt die Periode, in der die Handgriffkernstein Technologie in Seeland und Scania angewendet wurde (Jensen 2006: 58).

characterized by the presence of, among other things, handle-cores, but this type is *exceptionally rare in Jutland*' (Andersen & Sterum 1971: 26), and '... at present, *no handle-cores or large picks are known from the Jutish [Kongemosian] settlements ...*' (ibid.: 27). Subsequently, it became the popular view amongst Danish archaeologists that there were no handle-cores in the Jutish Maglemosian, or almost none.

Before I decided to turn to archaeology as a profession, I was active as an amateur archaeologist (1981-1986), and for a period 'combed' the fields and shores in the eastern Limfjord area in northern Jutland in an attempt to find lithic artefacts, allowing me to identify prehistoric settlements (Fig. 3). In connection with this activity, I recovered several typical handle-cores (Fig. 4), dated by association with other artefact types, as well as shoreline displacement, to the later Maglemosian (Johansen 1988; also see below), as well as microblades and core rejuvenation flakes from such cores (Figs. 10-16). The presence of Maglemosian handle-cores in northern Jutland is obviously relevant to the general discussion of regionality in the Mesolithic of southern Scandinavia and the purposes of the present paper are 1) to define handle-cores precisely as a type, as well as related forms; 2) to give a brief account of handle-core research in southern Scandinavia and the development of different forms of handle-cores; 3) to present the new evidence from northern Jutland; and 4) discuss the regional subdivision of southern Scandinavia around the Maglemosian/Kongemosian transition in the light of these discoveries.

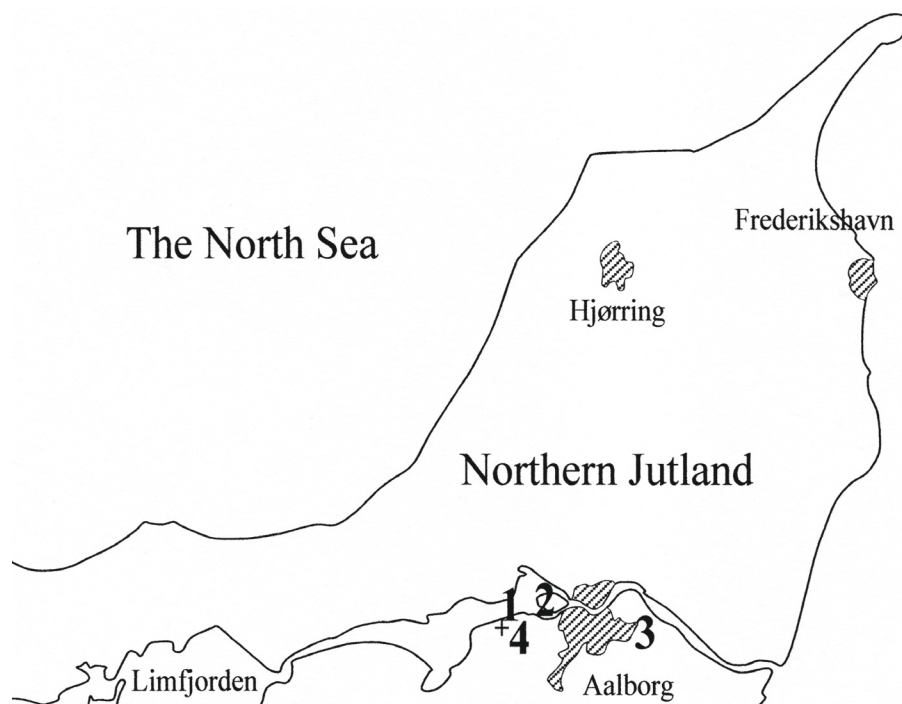
Hartz's (2009) discussion of the Middle and Late Mesolithic of Schleswig-Holstein indicates that in northernmost Germany specialized microblade cores included not only conical cores, but also handled specimens.

### The definition of handle-cores and related forms

Usually, single-platform cores are subdivided into two formal categories, namely conical cores (Fig. 5: A) and handle-cores (Fig. 5: B) (Ballin 1996: Figs. 1, 3-4). Conical cores are roughly bullet-shaped cores with a round to oval platform at one end of the core's long axis and a pointed apex at the other, and they may have been knapped from parts of, or the entire, platform circumference, whereas handle-cores have their flaking-front at one end of an elongated platform (or a flaking-front at either end of an elongated platform) and an opposed keel rather than a pointed apex.

Occasionally, specialized core rejuvenation flakes may indicate the use of handle-core technology – even when intact handle-cores were not recovered from a site – such as detached flaking-fronts or core tablets. As shown in figure 6, flaking-fronts and core tablets were detached when the angle between a handle-core's flaking-front and platform had become too obtuse to allow further microblade production.

Even the size and shape of the individual microblades might indicate whether handle-core technology has been applied at a given site. Bille Henriksen (1976: 15) explains that microblades from conical cores tend



**Fig. 3.** Map of northern Jutland, showing sites from which handle-cores and associated types have been recovered: 1) Nørholm Shore; 2) Egholm South; 3) Lodsholm South; and 4) Nørholm South.

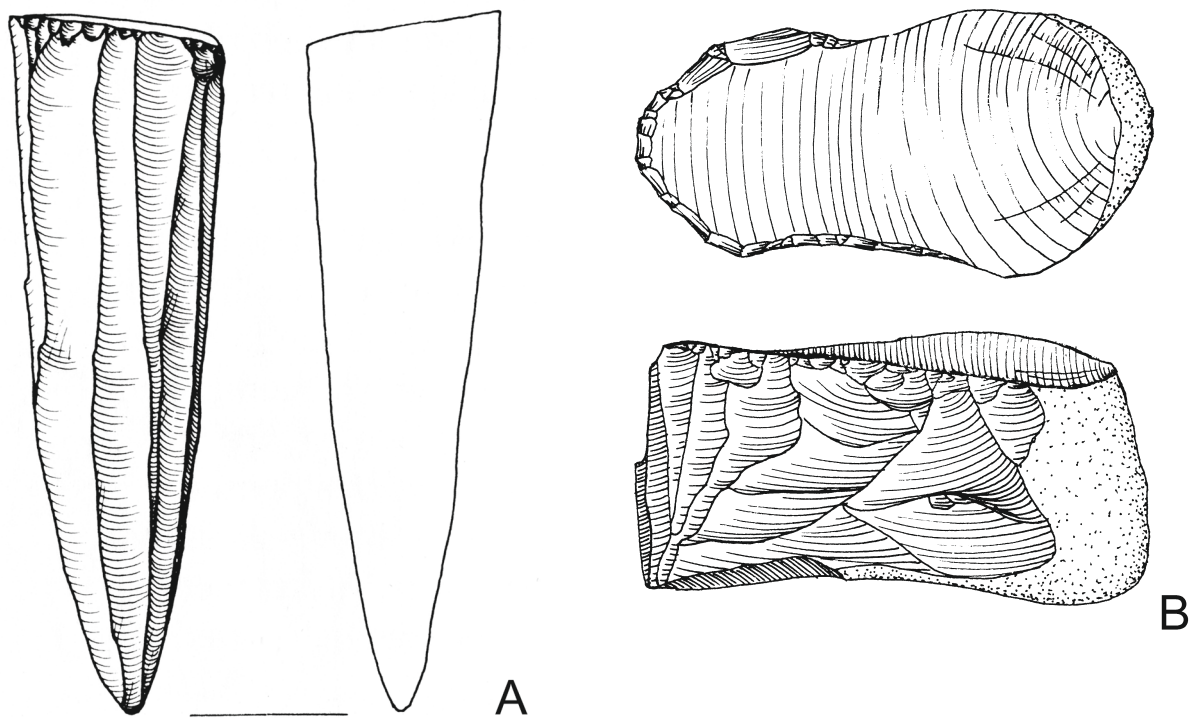
**Abb. 3.** Karte Nordjütlands, mit markierten Ausgrabungsstätten auf denen Handgriffkernsteine und ihnen verwandte Typen gefunden wurden: 1) Nørholm Küste; 2) Egholm Süd; 3) Lodsholm Süd; und 4) Nørholm Süd.





**Fig. 4.** Handle-core from Nørholm Shore, northern Jutland – side-view (A), platform-view (B) and front-view (C) (photo: Beverley Ballin Smith).

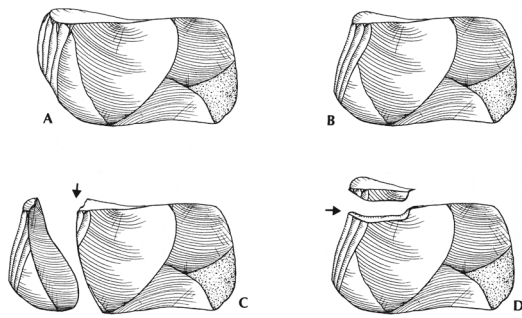
**Abb. 4.** Handgriffkernstein von der Küste Nørholms, Nordjütland – Seitenansicht (A), Aufsicht (B) und Vorderansicht (C) (Foto: Beverley Ballin Smith).



**Fig. 5.** A) A typical conical core (Vang Petersen 1993/Graphic: Lykke Johansen) and B) a typical handle-core (Vang Petersen 1992/Graphic: Eva Koch Nielsen).

**Abb. 5.** A) Ein typisch konischer Kernstein (Vang Petersen 1993 / Grafik: Lykke Johansen) und B) ein typischer Handgriffkernstein (Vang Petersen 1993 / Grafik: Eva Koch Nielsen).





**Fig. 6.** A) A handle-core with a usable (80-90 degrees) angle between flaking-front and platform; B) a handle-core with an overly obtuse angle between flaking-front and platform; C) adjustment of the flaking-angle by detachment of the core's flaking-front; D) adjustment of the flaking-angle by detachment of the core's platform (Vang Petersen 1993/Graphic: Lykke Johansen).

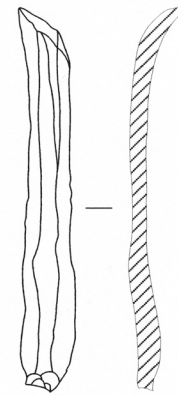
**Abb. 6.** A) Ein Handgriffkernstein mit noch verwendbarer Winkel (80-90°) zwischen Abbaufäche und Plattform; B) ein Handgriffkernstein mit stumpfer Winkel zwischen Abbaufäche und Plattform; C) korrigierung des schlagwinkels durch Ablösung die Abbaufäche; D) korrigierung des Schlagwinkels durch Ablösung der Plattform (Vang Petersen 1993 / Grafik: Lykke Johansen).

to be fairly straight, whereas microblades struck off handle-cores frequently have a notably curved distal end (Fig. 7; also see Callahan 1985; Sørensen 2006).

In connection with the discussion of Danish handle-cores it was suggested to distinguish between longer and shorter versions of these cores, with the shorter ones called 'keeled cores' and the longer ones 'handle-cores proper' (Bille Henriksen 1976: 16). This, however, is not recommended: 1) in a Danish context, keeled cores are probably just heavily exhausted handle-cores and, as shown by Bille Henriksen's own diagrams of the dimensions of these cores (ibid.: Fig. 66), the two core types form a metric continuum; and 2) in relation to international terminology, the term 'keeled cores' would present a problem, as in many countries this (now obsolete) term refers to a mixed bag of cores which were, until recently, poorly understood (bipolar cores, discoidal cores, Levallois-like cores, etc.; e.g. Clark 1960: 216). For a general discussion of handle-core technology, see Callahan (1985) and Sørensen (2006).

### Handle-cores in southern Scandinavia

In southern Scandinavia, handle-cores were first defined by Friis Johansen (1919: 156) in connection with his excavations in Sværdborg Bog, Zealand, and he suggested that these elongated 'handled cores', might be a Mesolithic form. Later, they were included as key diagnostic parts of Becker's two Late Maglemosian phases (Phases 4 and 5 in his 5-phased chronology of Maglemosian material culture; Becker 1951: Fig. 21). Handle-cores with neat platform-edge trimming were, erroneously, perceived as keeled scrapers by Becker and contemporary archaeologists, and traditionally illustrated with their platforms – and perceived 'scraper-edges' (trimmed platform-edges) – facing down.



**Fig. 7.** Typical microblade from a handle-core with a notably curved distal end (Bille Henriksen 1976, Fig. 3; redrawn by the author).

**Abb. 7.** Typische Mikroklinge von einem Handgriffkernstein mit deutlich geschwungenem distalem Ende (Bille Henriksen 1976, Abb. 3; neu gezeichnet vom Autor).

In her discussion of the finds from the Sværdborg I site, Zealand, Bille Henriksen (1976: 16) defined and discussed Late Maglemosian keeled and handle-cores, which were later joined by others to form different metric parts of a handle-core continuum. Sørensen (2006) discussed the various Maglemosian blade- and microblade industries by experimentally replicating lithic blanks from Becker's six phases (a Phase 0 was added to Becker's original sequence of five stages by Brinch Petersen in 1973), and he suggested that it was possible to subdivide the Zealand Maglemosian into a sequence of four technological groups, where Group 4 was defined by the use of handle-core technology (corresponding to Becker's Phases 4-5).

The Kongemosean was first recognized in connection with Westerby's (1927) excavations at Bloksbjerg, northern Zealand, and defined in detail after the discovery of the eponymous Kongemose settlement site in 1952 (Jørgensen 1956). It was obvious that handle-cores were characteristic elements of lithic assemblages from Kongemosean sites on Zealand.

In 1974, the Vedbæk Project was initiated (Brinch Petersen et al. 1976, 1977, 1982; Brinch Petersen & Vang Petersen 1978), resulting in the discovery of a number of later Mesolithic domestic sites as well as hunter-gatherer cemeteries around a fossil inlet in north-east Zealand. This project, as well as the analysis of Kongemosean and Ertebølle sites and assemblages from Zealand and Scania in general (Vang Petersen 1979), led to Vang Petersen's (1982, 1984) subdivision of Zealand's and Scania's Middle and Late Mesolithic periods into a number of phases, defined by variations in tool typology and technological approaches, as well as the creation of a territorial hierarchy for the later Kongemosean and Ertebølle culture in eastern Denmark.

According to Vang Petersen, handle-cores are diagnostic elements of the Kongemosean of eastern Denmark, but they are absent in Ertebølle contexts. He

describes (Vang Petersen (1984: Fig. 8) how the handle-cores of the Early Kongemosian have negative (dorsal) striking-platforms (Fig. 8B), whereas those of the Late Kongemosian have positive (ventral) striking-platforms (Fig. 8C). In Vang Petersen (1993: 58), he describes how handle-cores from the later part of the Maglemosian tend to have a long flaking-front (frequently 40–50 mm; Fig. 8A), whereas those from the Kongemosian tend to have a shorter flaking-front (30–40 mm; Figs 8B–C).

Scanian research (e.g. Larsson 1978; Andersson et al. 2004) suggests that the Mesolithic lithic traditions of southernmost Sweden by and large correspond to those of Zealand. Research in Schleswig-Holstein show that handle-cores are common in this area and Hartz (2009: 410) suggests that the area, in terms of its lithic industries, should be perceived as an integral part of Mesolithic southern Scandinavia.

In Jutland, some research has been carried out on assemblages from the earlier part of the Maglemosian (e.g. Boas 1986), and even more on Ertebølle settlement sites and kitchen middens (cf. Andersen 2001), but has, so far, hardly focused on Jutland's later Maglemosian and Kongemosian sites and assemblages. Older research sheds some light on the period's settlement along the Jutish rivers (e.g. Mathiassen 1937; Berthelsen 1944), but few of these palimpsest sites were excavated, and some confusion was created by the concept of a Jutish inland 'Gudenå Culture' (this cultural concept was deconstructed by Andersen & Sterum in 1971). Although minor excavations have been carried out and published (e.g. Juul Pedersen 2006; Sindbæk 2006), other work has only been made available in the form of short preliminary reports (e.g. Brovst in Northern Jutland; Andersen 1969) and, with the exception of a small number of illustrations of possible handle-cores (e.g. Mathiassen 1937: Fig. 11: 10; Berthelsen 1944: Tavle 1.3), the presently available archaeological literature does not reveal whether or not handle-cores formed part of the Jutish later Maglemosian or the region's Kongemosian. In the east, however, handle-cores, and their various sub-types, remain strong diagnostic elements of the later Maglemosian and the Kongemosian.

### The handle-cores from northern Jutland and associated pieces

In the mid 1980s, I collected several thousand pieces of worked Maglemosian flint from sites in the tidal zone of the present Limfjord sound east of Aalborg, northern Jutland (Fig. 2). These pieces were generally produced on pitch-black flint with small white dots (referred to by Becker as 'Jutish small-dotted flint' but now referred to as Maastrichtian flint; Becker 1952; Högberg & Olausson 2007: 88). The fact that the cortex of many cortical pieces is frequently very soft and soapy (e.g. handle-core 953, below) indicates the finds are currently being washed out of undisturbed prehistoric contexts. A small number of

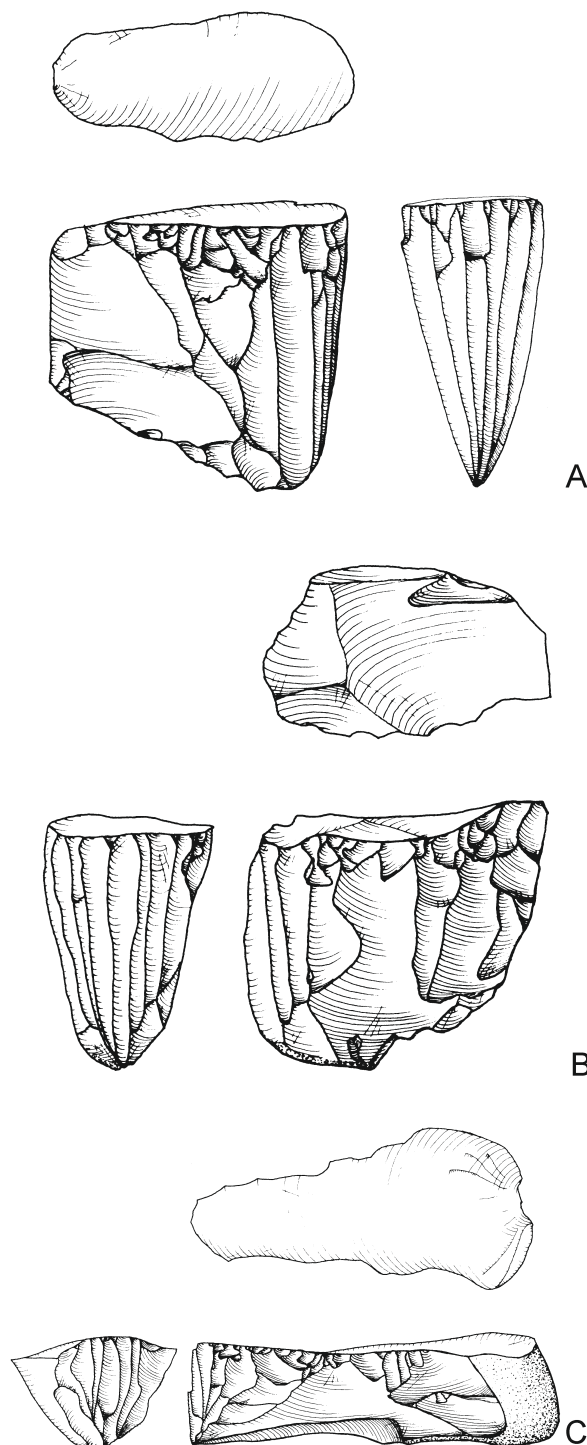


Fig. 8. A) Later Maglemosian handle-core with a long flaking-front; B) Early Kongemosian handle-core with a negative striking-platform; and C) Late Kongemosian handle-core with a positive striking-platform (Vang Petersen 1993/Graphic: Lykke Johansen).

Abb. 8. A) Handgriffkernstein der späten Maglemose Kultur mit langer Abbaufäche; B) Handgriffkernstein der frühen Kongemose Kultur mit negativer Schlagfläche; und C) Handgriffkernstein der späten Kongemose Kultur mit positiver Schlagfläche (Vang Petersen 1993 / Grafik: Lykke Johansen).

Maglemosian objects (including narrow microliths and handle-cores) have been collected from beach walls along these shores.

In 1988, a small excavation was carried out by the

then Museum Inspector Erik Johansen (Aalborg Historical Museum), in the meadows immediately behind the beach walls at Nørholm, west of Aalborg, with the participation of Dr Søren Andersen, Aarhus University, and the author (Johansen 1988). In one trench, several flint flakes and one narrow microlith were recovered from layers below marine sediments, and in addition *in situ* tree-stumps around the location were recorded. Two samples from tree-stumps were identified as alder (*Alnus* sp.), and one sample returned a radiocarbon date of 6'523 – 6'292 calBC (K-5198; 7'560 BP +/- 110; 1 sigma), or the transition between the Late Maglemosian/Early Kongemosean; the date was calibrated using CalPal2007.

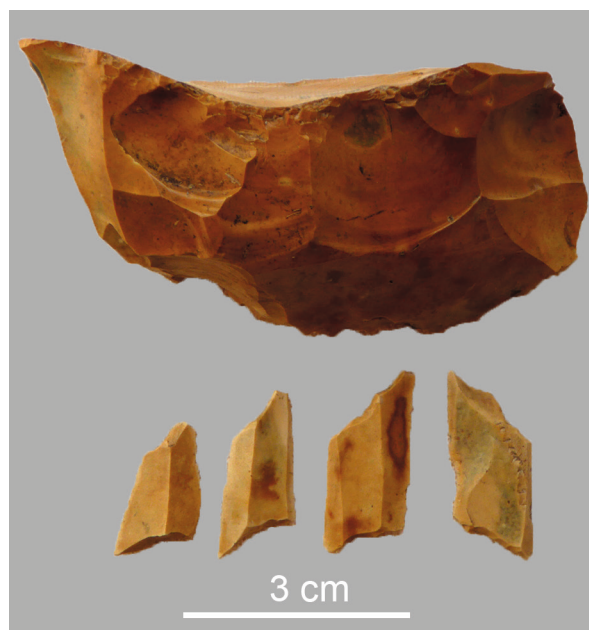
As the dated material was not in direct association with the handle-cores or any other worked flint, the date does not provide the exact age of the site's lithic industry. However, these results, in conjunction with other lithic finds I recovered in the area, suggests that near Aalborg the Late Maglemosian corresponds to a prehistoric level of the Limfiord waters roughly identical to that of the present-day sea level; near Aalborg, Late Kongemosean finds are associated with a level of c. 5 m above present sea level, and Middle and Late Ertebølle finds are associated with a level of c. 6 – 7.5 m above present sea level.

Theoretically, the radiocarbon-date does not rule out that the handle-cores could have been manufactured during the earliest part of the Kongemosean, but the area behind Nørholm beach is a flat meadow only slightly higher than the sea level, and when the sea level started rising around the Maglemosian/Kongemosean transition (transforming the Limfiord from a broad river to a salty sound connected to the sea at either end), the meadow and the flint scatters would have been flooded very quickly.

In addition to the handle-cores and their associated preparation flakes, the Late Maglemosian finds from northern Jutland include robust broad blades and microblades, numerous crescentic blade knives, side-scrapers and core axeheads, as well as some awls and coarse burins.

From a Late Kongemosean site south of Nørholm (at a level 5 m above present sea level), one handle-core (Fig. 9) has been identified, associated with typical Late Kongemosean rhomboid points with concave bases, similar to the points recovered from the Late Kongemosean layers at Brovst, just north of the Limfiord (Ballin 2013b; Andersen 1969). However, more research into this period is needed to make it possible to determine whether in northern Jutland handle-cores were produced *systematically* after the Late Maglemosian period.

In this section, the handle-cores from northern Jutland, as well as some associated forms, are characterized briefly. The dimensions (L x W x T) of platform cores are generally measured in the following standard manner: the length is measured from platform to apex or keel, the width is measured perpendicular to the



**Fig. 9.** Handle-core and four rhomboid microliths from Nørholm South (Stramborg). Presently the only handle-core recovered from a Jutish Kongemosean context (photo: Beverley Ballin Smith).

**Abb. 9.** Handgriffkernstein und vier rhombische Mikrolithen aus Nørholm Süd (Stramborg). Bis zum jetzigen Zeitpunkt der einzige Handgriffkernstein aus dem Kontext der jütlandschen Kongemosekultur (Foto: Beverley Ballin Smith).

length with the main flaking-front orientated towards the analyst, and the thickness is measured from flaking-front to the often unworked/cortical 'rear-face' of the core. In the case of handle-cores, the 'thickness' (as just defined) would correspond roughly to the length of the elongated platform.

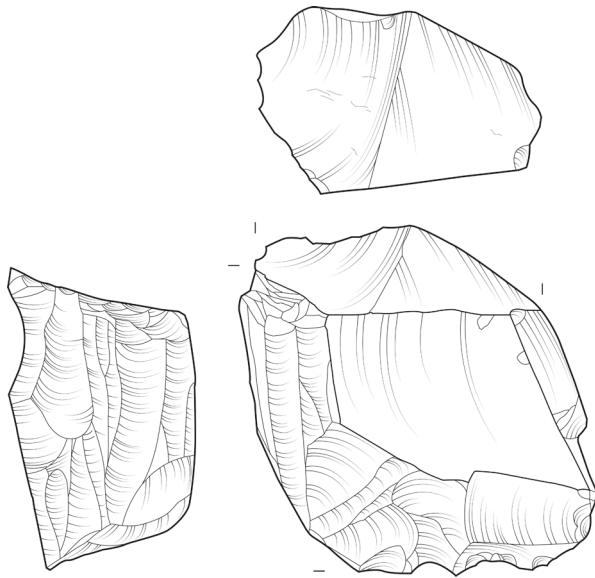
#### Handle-core 399 (Nørholm Shore)

Handle-core 399 (Fig. 10) measures 57 x 31 x 54 mm. Its flaking-front is characterized by the presence of a number of parallel flaking scars, showing that at least 12 microblades were detached from this piece. The platform-edge has regular trimming, and the platform is 'negative' in the sense that at least one platform rejuvenation flake has been detached. The core has no well-defined keel, but was formed by detaching small flakes from a number of different directions, including the rear of the core. One lateral side is fully cortical, whereas one has no cortex.

#### Handle-core 662 (Nørholm Shore)

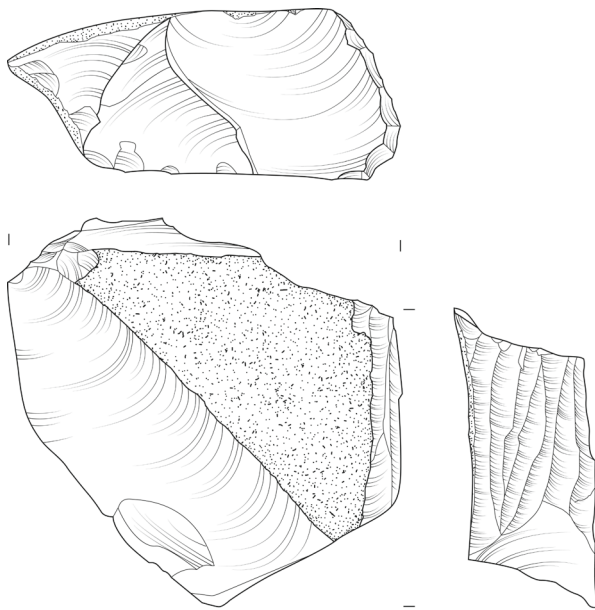
Handle-core 662 (Fig. 11) measures 61 x 24 x 62 mm. Its flaking-front is characterized by the presence of a number of parallel flaking scars, showing that at least seven microblades were detached from this piece. The platform-edge has regular trimming, and the platform is 'negative' in the sense that at least one flake was detached by striking one lateral side, whereas another flake was removed from the platform as a result of frost-action, with the ripples of the resulting scar being centred on a small impurity near





**Fig. 10.** Handle-core 399 from Nørholm Shore (Graphic: Leeanne Whitelaw).

**Abb. 10.** Handgriffkernstein 399 von Nørholm Küste (Grafik: Leeanne Whitelaw).



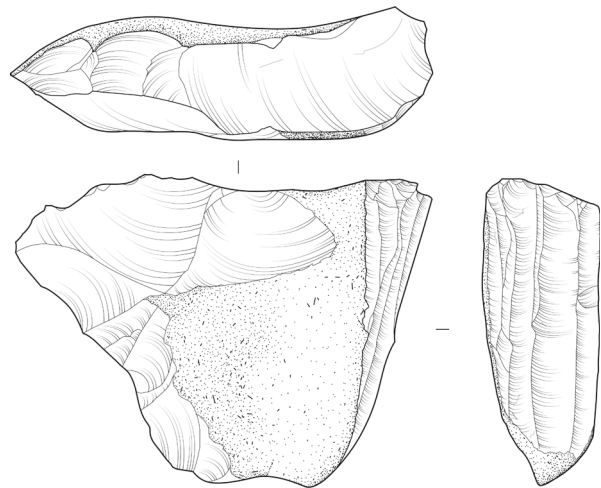
**Fig. 11.** Handle-core 662 from Nørholm Shore (Graphic: Leeanne Whitelaw).

**Abb. 11.** Handgriffkernstein 662 von Nørholm Küste (Grafik: Leeanne Whitelaw).

the lateral side. The keel was removed when a large flake was detached along one lateral side by striking the core's rear end. One lateral side is fully cortical, whereas the other is partially cortical.

#### Handle-core 953 (Nørholm Shore)

Handle-core 953 (Fig. 12) measures 66 x 27 x 86 mm. Its flaking-front is characterized by the presence of a number of parallel flaking scars, showing that at least seven microblades were detached from this piece.



**Fig. 12.** Handle-core 953 from Nørholm Shore (Graphic: Leeanne Whitelaw).

**Abb. 12.** Handgriffkernstein 953 von Nørholm Küste (Grafik: Leeanne Whitelaw).

The platform-edge has regular trimming, and the platform is 'negative' in the sense that at least one long platform rejuvenation flake has been detached. As shown in figure 12, the scar left by this platform rejuvenation flake ends in a well-defined distal hinge. The core has a well-defined keel running from the distal part of the flaking-front, along the 'bottom' and rear parts of the piece, as well as along the centre of the 'top' part of the core, until it meets the distal part (hinge) of the scar left by the platform rejuvenation flake. This suggests that some rough-outs for Jutish handle-cores may have been elongated discoids (partly corresponding to the Japanese Yubetsu handle-core rough-outs described in Inizan et al. 1992: Fig. 23), with a crest running along the entire circumference, and where the platform was shaped by detaching a flake along one long-side of this discoid. The 'core rejuvenation flake' detached from core 953 should therefore probably be referred to as a 'platform defining flake'. One lateral side is fully cortical, whereas the other is partially cortical, and the cortex of both lateral sides is soft and powdery, indicating that this piece has been washed out of its *in situ* position recently.

#### Handle-core 1230 (Nørholm Shore)

Handle-core 1230 (Fig. 13) measures 50 x 42 x 105 mm. Its flaking-front is characterized by the presence of a number of parallel flaking scars, showing that at least eight microblades were detached from this piece. The platform-edge has regular, albeit light, trimming, and the platform is 'negative' in the sense that one long flake was detached by striking the flaking-front (like in the case of core 399) and running the entire length of the platform. There is no actual keel, and the 'bottom' of the piece is cortical. One lateral side is fully cortical, whereas the other is partially cortical and displays trimming along its entire length.

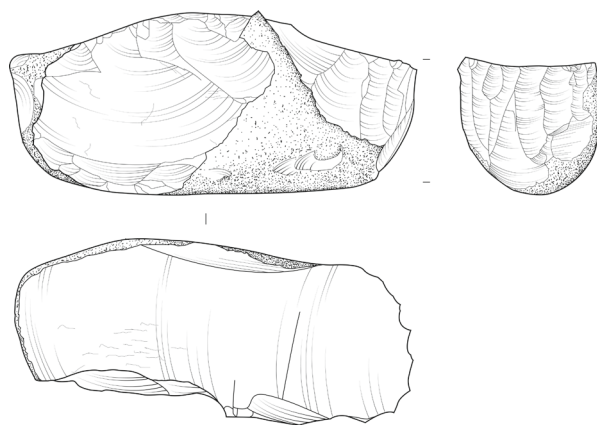


Fig. 13. Handle-core 1230 from Nørholm Shore (Graphic: Leeanne Whitelaw).

Abb. 13. Handgriffkernstein 1230 von Nørholm Küste (Grafik: Leeanne Whitelaw).

### Flaking-front C22 (Lodsholm South)

C22 (Fig. 14) is a detached flaking-front (corresponding to Fig. 6: C), and it measures 55 x 31 x 37 mm. This flaking-front is characterized by the presence of a number of parallel flaking scars, showing that at least 11 microblades were detached from this piece. The platform remnant is faceted, and the flaking-front was detached by the application of hard percussion. The platform-edge has sporadic trimming. There is no actual keel, and the 'bottom' of the piece is cortical. Both lateral sides appear to have been cortical.

### Platform rejuvenation flake G342 (Egholm South)

G342 (Fig. 15) is a platform rejuvenation flake (corresponding to Fig. 6: D), and it measures 64 x 32 x 11 mm. At its proximal end, this flake has the remains of a convex handle-core flaking-front, showing the scars of at least six microblades. The platform-edge is neatly trimmed. A dorsal scar shows the detachment of an opening-flake, and the fact that the dorsal face is partially cortical indicates an approach somewhat different to that indicated by handle-core 953 (i.e., the production of discoidal core rough-outs). In this case, a platform was formed simply by removing an area of the original nodule's cortical exterior.

### Microblade 14 (Nørholm Shore)

A small microblade was recovered from Nørholm Shore (Fig. 16). It measures 44 x 8 x 2 mm, and its lateral sides and dorsal arrises are parallel. Seen from the side, this piece has the typical bent distal end, defining this microblade as most likely having been struck from a handle-core (see Fig. 7).

### Handle-cores from southern Scandinavia outside Zealand/Scania

Apart from the handle-cores and related forms I recovered from sites in northern Jutland, handle-cores

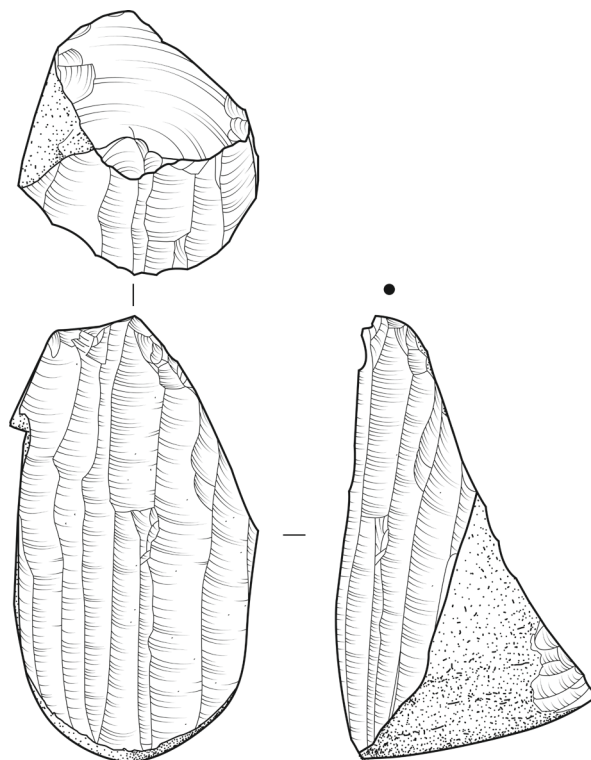


Fig. 14. Detached flaking-front C22 from Lodsholm South (Graphic: Leeanne Whitelaw).

Abb. 14. Abgelöste Abbaufäche C22 aus Lodsholm Süd (Grafik: Leeanne Whitelaw).

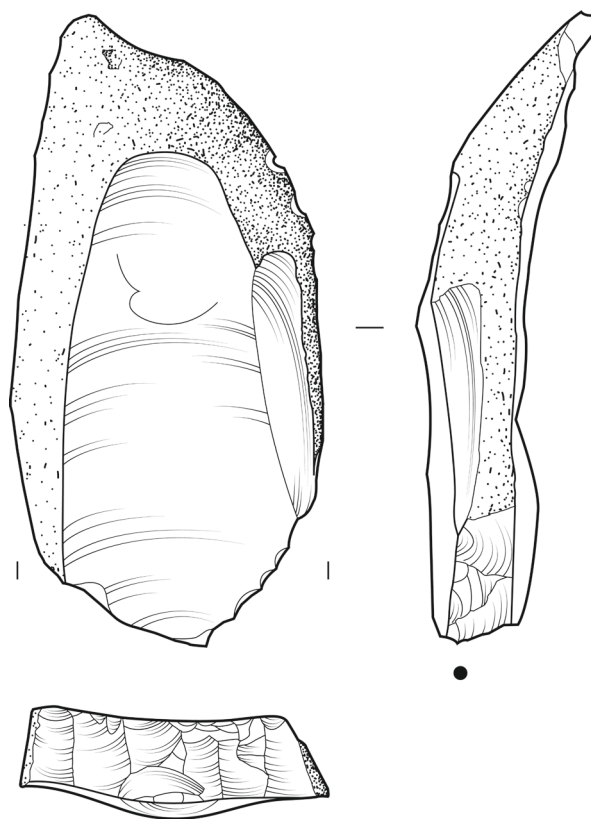


Fig. 15. Platform rejuvenation flake G342 from Egholm South (Graphic: Leeanne Whitelaw).

Abb. 15. Kernscheibe G342 aus Egholm Süd (Grafik: Leeanne Whitelaw).

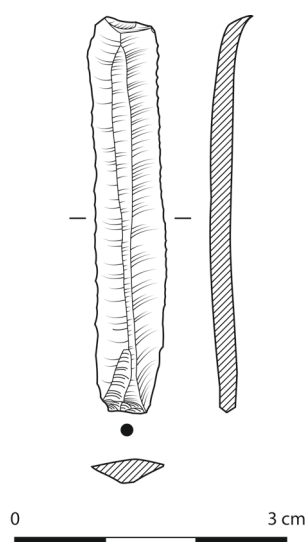


Fig. 16. Microblade 14 from Nørholm Shore (Graphic: Leeanne Whitelaw).

Abb. 16. Mikroklinge 14 von Nørholm Küste (Grafik: Leeanne Whitelaw).

do indeed seem to be rare in the rest of Jutland and on Funen, although they are not entirely absent. Interestingly, Hartz (2009) has shown that handle-cores were produced consistently during the Late Maglemosian and the Kongemosian of Schleswig-Holstein.

As mentioned above, handle-cores have been found along the Gudenå River, as well as along Vejle Å River. They are difficult to recognize in the various publication texts, due to the confusing terminology of the time (where many handle-cores are referred to as scrapers), but the illustrations in the reports suggest that they may be included in the assemblages from these two rivers. There is little doubt that the core illustrated by Mathiassen (1937: Fig. 11: 10) from Lysholtgaard North-East on the Gudenå River is a handle-core, just as Berthelsen's (1944: Tavle 1: 3) core from Bakkelygaard on the Vejle Å River clearly belongs to this core type. A search of the Internet resulted in the discovery of a photo of a handle-core found on the island of Funen, between Jutland and Zealand ([http://www.biopix.com/haandtagsblok\\_photo-8910.aspx](http://www.biopix.com/haandtagsblok_photo-8910.aspx); accessed 17.07.2016).

In addition, several Jutlish museums were contacted, as well as colleagues active in Jutland. The museums generally reported back that they knew of no handle-cores within their areas, but archaeologist Professor Søren Michael Sindbæk, Aarhus University, reported (email to the author dated 15.02.2014) that he had identified a handle-core with two opposed flaking-fronts from a site (Nørreholm, Hodsager parish) on the Storåen River in central Jutland, but that it was his impression that these cores are generally exceptionally rare in central and southern Jutland.

## Discussion

Based on the evidence presented above, the following scenario can be suggested: Most likely, handle-cores are an integral part of Late Maglemosian assemblages of northern Jutland, and it appears that the operational schema followed by northern Jutlish flint-knappers during this period corresponds closely to the one defined by Mikkel Sørensen for the contemporary period on Zealand (Sørensen 2006: 66). Some core rough-outs may have been formed by minimal decortication of suitable nodules, whereas some core rough-outs may have been more sophisticated discoidal pieces, not unlike Yubetsu rough-outs. The handle-core operational schema of northern Jutland clearly included the rejuvenation of the cores by detachment of flaking-fronts and old platforms in the way described by Vang Petersen (1993; see Fig. 6: A-D above). The platforms of the four handle-cores described above are 'negative' variants, corresponding to the platforms described as Vang Petersen (1993; see Figs. 8: A-C above) as early (i.e., Late Maglemosian and Early Kongemosian). Handle-cores also appear to be common in Schleswig-Holstein, at the 'foot' of the Jutlish peninsula (Hartz 2009).

Handle-cores seem to be present, but exceptionally rare, during the Late Maglemosian on Funen, and in the remainder of Jutland. It therefore appears that handle-cores *cannot* be used as a regionally diagnostic type (i.e., indicating an east-west split) as assumed for almost half a century, and its distribution and information value needs to be reassessed. This does not mean that there is no east-west split at the time of the Maglemosian/Kongemosian transition, as there clearly is at the Kongemosian/Ertebølle transition approximately a millennium later, but simply that more evidence is needed to allow this assumption to be made. Although the east-west split at the Kongemosian/Ertebølle transition does have some basis in lithic evidence, it is also very much supported by the presence of certain organic artefacts, and at the present time, organic artefacts are not known at Jutlish sites at the Maglemosian/Kongemosian transition.

In terms of the handle-cores themselves, it is possible that their presence and absence is to a degree a matter of raw material availability, and that they are common in parts of Denmark where chalk reaches the surface, and where flint from the chalk erodes out in large quantities and in the form of large plates, for example along the coasts or along rivers (northern Jutland, eastern Zealand, and parts of Scania; cf. Högberg & Olausson 2007). In the areas of southern Scandinavian listed above, flint was available in the form of very large, flat nodules and, for example, along the Limfiord Sound near Aalborg, these flat 'planks' may occasionally be up to a meter in length. In the remainder of Jutland, flint is rarer, with some flint having been mined during the Neolithic period in north-west and eastern Jutland. However, in larger



areas of central and southern Jutland, as well as on Funen and in Schleswig-Holstein, most flint would have been procured from moraine deposits in the form of cobbles or pebbles smaller than the ones available in northern Jutland.

The fact that handle-cores *do* occur in western Denmark outside northern Jutland, suggests that around the Maglemosian/Kongemosian transition people in the West generally knew of the operational schema associated with the production of microblades from handle-cores, and it may be that this operational schema was more widely used than the evidence indicates (for example in Schleswig-Holstein, where they are common). In central and southern Jutland, where good quality flint is scarce, many handle-cores may have been exhausted completely.

In an email to me, Professor Sindbæk (Aarhus University) writes (my translation and italics): 'In 1996-97 I examined the assemblages from the Storåen River, trying to identify Kongemosian sites, and among other things I also looked out for handle-cores. [...] According to my notes, I seem to have identified a handle-core with two opposed flaking-fronts in the collections of P.O. Overgaard from the site of Nørreholm in Hodsager parish [...]. Although the assemblages from other sites included quite a few core fragments with microblade scars, in my notes I concluded that handle-cores were generally absent from the Storåen area. Later (2001) I got the opportunity to do some flint refitting on material I excavated from the Kongemosian site Dalhus east of Holstebro (Sindbæk 2006). I have to admit that I was surprised to find how large cores could grow when you refitted originally very small core fragments [...]. I would therefore be careful in terms of concluding that handle-cores are *entirely* absent from Jutish inland sites: considering how on these sites flint cores were generally completely exhausted, I find it unlikely that handle-cores would have been discarded in a state that would allow us to identify them as belonging to this core type. They would probably be used secondarily for the production of small flakes, for example for scrapers. I think this would explain the core type's *apparent* absence [from large parts of Jutland].

## Conclusions

Following the above presentation of handle-cores and associated pieces from northern Jutland (Figs. 10-16) it is possible to conclude that, in this region, handle-cores clearly formed part of the typo-technological repertoire of the Late Maglemosian, with the use of handle-cores possibly continuing into the Kongemosian (Fig. 9). On the basis of these pieces, and the fact that handle-cores were also part of the Late Maglemosian/Kongemosian repertoire in Schleswig-Holstein (Hartz 2009), it is obviously not possible to use handle-cores as an indicator of an east-west territorial division of southern Scandinavia in the Late

Maglemosian and Kongemosian, although the distribution of other artefact categories suggests that a division was in place at the Kongemosian/ Ertebølle transition.

Handle-cores are still quite rare in central and southern Jutland, as well as on Funen, but it is presently uncertain why this is the case. This area is generally characterized by the absence of sources of good quality flint (that is, flint with good knapping properties), but the area is also characterized by a relatively low input in terms of archaeological excavations of sites from the period in question, and subsequently a low output in terms of academic papers discussing this period and its lithic industries. It will only be possible to understand the distribution of handle-core technology throughout western Denmark, and the meaning of this distribution, when more, secure evidence has been made available.

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