A Craft Perspective on Pitted Ware Point Typology

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ABSTRACT

The Pitted Ware Culture of the Neolithic in southern Scandinavia is famous for its tanged flint points made from retouched blades. Scholars have long agreed that there are three distinct types, A, B and C, and academic discussions have suggested various regional, functional and chronological differences. However, in these discussions the technological perspective is largely overlooked. In this paper, the author presents technological evidence to correlate Pitted Ware point types to different production stages, within the same production process, which explains the typological differences. The results show that the initial crested blades present the ideal morphology for the type C points, which explains the form, flaking, length and scarcity. The type A points follow the morphology of blades from the later stages of production, which corresponds to their shape and length and their more numerous appearances in the assemblages. Blades from the intermediate production stage correspond to the B type. This study suggests that all Pitted Ware point types are derived from the same production process, and the typological differences are closely linked to the distinct blade morphologies that occurred during the production.

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Introduction

During the Neolithic in Scandinavia, the phenomenon of the Pitted Ware Culture (3400-2200 BCE) appears (Iversen et al. 2021). This Neolithic culture is known for a more hunter-gathered-like society with distinct material culture, like Pitted Ware pottery and cylindrical blade cores, but most importantly for this paper - the Pitted Ware flint points, that are synonymous with this culture. These projectile points are distinctive and captures the imagination of what Stone Age life must have been like – likely quite brutal to the modern eye.

Several scholars have written dedicated works on the Pitted Ware Culture, its chronology and its typologically distinctive forms (Becker 1951, 1955; Edenmo et al. 1997; Iversen 2010). In this article, the author will shed new light on some of the discussions of the Pitted Ware Culture, only this time focusing on what the flint technology can reveal from a craft perspective.

The author has been involved in craft reproductions, lithic analysis and experimental archaeology since 2012 with a specialization in Neolithic flint technology. This experience has come to use in the reproduction of cylindrical blade cores, blade manufacture and Pitted Ware point production. A total of 11 cylindrical blade cores have been produced and blade production has been carried out until the cores were exhausted. A selection of blades from each core has been flaked to form the distinct tanged point types. During this production, a number of observations have been made that will shed new light on the Pitted Ware point typology and the associated technology. The observations in the experimental material have been compared to the archaeological finds from Denmark, namely Helgeshøj in Taastrup (Sparrevohn 2016), Musefælden and Neden Skiden Enge on Djursland (Rasmussen 2020), Ginnerup on Djursland (Klassen et al. 2023) and Kirial Bro and Kainsbakke on Djursland (Rasmussen and Boas 1982; Wincentz 2020).

The central finding is that the typological distinction between Pitted Ware points of type A, B and C correspond to separate production stages where the morphology of the flint blades limits the range of possible modifications when producing projectile points. In essence, Pitted Ware point morphology is defined by the production stage from which the blade was produced.

Research Context

The Pitted Ware Culture in Denmark was defined in the 1950s by Carl Johan Becker (1951), who defined the culture based on the distinctive Pitted Ware ceramics, cylindrical blade cores and tanged flint projectile points. Three types of arrowheads (A, B and C) were defined with a number of subtypes for each main type (Becker 1951). All three types share a flaked tang, a mostly symmetrical outline and are all made of straight flint blades. The type A is a simple projectile point with minimal edge retouch around the tip and tang of the blade. The type B is characterized by further retouch, as both the edges and ventral side of the tip and tang are flaked, some with serrating edge retouch. The type C is characterized by a triangular cross-section and has flaking that covers nearly all three sides, often with a fine, serrated edge (Becker 1951).

Since the 1950s, a number of Pitted Ware sites have been discovered in southern Scandinavia, and the possibility of a chronological subdivision of this culture was discussed on the basis of the tanged flint points (Becker 1951; Iversen 2010; Rasmussen 1986). This theory likely arose from the general archaeological thought of prehistoric cultures as developing from simple towards complex or refined, especially when looking at the technology. This general trend is found in the development from the Stone Age, to the Bronze Age and into the Iron Age – all the way to modern technology (Thomsen 1836). This is the idea of a growing sophistication with its regressions and explosive break-throughs, but with a general trend towards the better. One such example, that scholars dealing with the Pitted Ware chronology must have been aware of, is the flint dagger typo-chronology of the Late Neolithic in southern Scandinavia and northern Germany (Hübner 2005; Lomborg 1973). In this case, the flint daggers are advancing in technological complexity and technique throughout the period, again, a general developing sophistication.

Following these ideas, it seems obvious that the Pitted Ware point type A resembles simplicity by having minimal modification of the blade. The type B is slightly more refined with more extensive modification. Lastly the type C, which is highly modified, most refined, and has three flaked sides with serrations. The natural conclusion is that these differences represent the same kind of increasing sophistication, which developed over time, making the typology a typo-chronology. This idea was presented already in the late 19th century (Müller 1888). However, as Rune Iversen has pointed out, there is no reason to think of this typology as a basis for subdivision of the Pitted Ware Culture in a chronological sense in southern Scandinavia (Iversen 2010; 2015, 42-44). This paper argues that the contemporaneous nature of the Pitted Ware point types is rooted in the production sequence, which clearly connects all types to the same craft procedure.

Experimental Reproduction

In order to study the technology behind the Pitted Ware points, the author has reproduced the production sequence, based on the finds of blade cores and points from the period. To the author's knowledge, no complete assemblage suitable for a complete refitting of a blade production from the period has been found. This means that the production is puzzled together from the indications on the Pitted Ware finds, and analogies to other blade production processes that have been studied and analysed (Pelegrin 2006; Sørensen 2006; Sørensen et al. 2013). In the following section, the method of replication is described with emphasis on the critical observations that underline the interpretations of the Pitted Ware technology.

Preparing the Core

Reducing raw flint nodule to a ready blade core requires strategic reduction, in order to establish a cylindrical preform with two platforms, one at each end, and one or more pronounced front ridges or crests, stretching from end to end, which is the prerequisite of initiating the blade production. These crests are used to steer the first blades to run true across the face of the core (Figure 1). This core morphology is reached using direct percussion with hammerstones and further refined flaking using indirect percussion with antler punches (Bye-Jensen 2011, 68). These are tools consistent with the finds from the site at Ginnerup (Klassen et al. 2023).

At this stage, the blade core is at the maximal length and will, in turn, produce the longest blades. These initial blades, that are removed from the prepared crests, called crested blades, are three-sided (trihedral) and one core only yields up to around four of this blade type. Pitted Ware core preforms with prepared crests and crested blades have been discovered at sites like Musefælden and Neden Skiden Enge on Djursland (Rasmussen 2020, 147). A core preform from Musefælden is 16 cm long and slightly conical with three prepared crests (Rasmussen 2020, 147).

Figure 1. Experimental bi-polar cylindrical blade core with detached crested blade (Photo: S. Stenak).

The creation of the core requires flaking of the surfaces, which will steer the blade morphology as the blades detach across the flaked surface. This means that the earliest blades are rather thick and will have meandering edges (Figure 1). In order to produce Pitted Ware points from these blades, a straightening of the edge is required. The straightening of the blade edges is done by pressure flaking from the edges, which covers all sides of the blade.

As defined by Becker (1951), the degree to which the blades have been modified or flaked, determines the typological classification. Consequently, the crested blades cannot be flaked into points of type A or B, since the crested blades do not follow the required morphology. These initial crested blades precisely mirror the morphology of the type C point, by being trihedral and longer than later blades, which also is reflected in the archaeological record (Iversen 2016, 76). In order to use the crested blades in the production of projectile points, a modification of the blade is needed. This will in most cases result in the flaking of all three sides, since the blade is trihedral, which demands a classification as a type C point. In general, the type C points are the largest of the group, the record being 18,6 cm (Becker 1958; Iversen 2016, 76). The lengthy type C points coincide with the length of the core at this earliest stage where it is at its largest. Undoubtedly, short type C points can be identified in the assemblages, but must simply be attributed to the fact that blades can be shortened, but never made longer.

Additionally, the true trihedral cross-section of a type C projectile point that has three edges, is exceptionally difficult to create from a blade that does not have three edges. Flaking a type C point from a trihedral blade is the only plausible way of retaining the three edges, which falls in line with the observations of both the length of the crested blades and the required edge straightening, as described above.

In order to regularize the core and begin the serial production of straight, regular blades, a number of semi-regular blades are removed following the crested blades (Figure 2). These blades are characterized by being relatively long as they are detached during the early stages of production. In addition, the technological function of these blades is to remove irregularities from the core face left by the preparation of the preform. This leaves irregular

Figure 2. Experimental bi-polar cylindrical blade core with detached intermediate blade and experimental type B point (Photo: S. Stenak).

sections on the dorsal face of the blades, which requires retouch to regularise. These blades are used to produce the type B Pitted Ware points, since they require further modification compared to the more regular type A.

Later in the reduction, the core is shortened repeatedly by platform rejuvenation, in order to prepare the core for further blade removals. As a consequence, the blades become shorter. Also, the core is continuously regularised by the removal of blade sequences, making the blades increasingly straighter and thinner (Figure 3). These blades meet the requirements of making the type A Pitted Ware points. The type A points are relatively thin, short and regular with minimal need for shaping retouch. The regular blades of the middle and late stages of production are significantly more numerous, since they belong to the stages of production where blade removals are the result of ridges, or erases, left by the previous blades. The repetitious blade production is carried out until the core is discarded by being flawed or used up as seen at numerous sites like Ginnerup (Klassen et al., 2023), Kainsbakke (Rasmussen and Richter, 1991) or Kirial Bro (Rasmussen and Boas, 1982). The useful blades are modified by retouch in accordance with the blade, some requiring more modification than others to straighten (Figure 3).

Discussions

In some aspects, the Pitted Ware point technology is characterized as rather opportunistic, meaning, that blade cores were not only fashioned from raw nodules of flint, but also from repurposed flint axes. Blades from repurposed square-sectioned flint axes are known from several sites like Helgeshøj (Sparresvohn 2016) and Kainsbakke (Rasmussen 1991, 35) (see Figure 4). This interpretation might also explain why the type A points are still considered the earliest type, even after Iversen has reiterated that the three types are contemporaneous in Denmark (Iversen 2015). If the type A truly is the first Pitted Ware point type, then it may be plausible that the characteristic cylindrical cores, producing crested blades, as described previously, was not a central technology from the onset, but was developed shortly after. Strictly looking at the flint points, any straight and thin blade can be used to produce the type A, it does not have to come from a prepared and planned production with that intent.

This is an important point to stress, since it is possible to produce blades for Pitted Ware points of type A and B without initiating the production by crested blades. Using a natural flint nodule as a core, or simply shaping the core using direct percussion can constitute the prerequisite of the blade production. This would lead to a blade production, only allowing for type A and B points to be made, which, in turn, could explain early Pitted Ware sites with no type C points in the assemblages. This would be an argument in favour of a typo-chronological development, where the technology moved from simple to advanced, by the addition of crested-blade technology and the type C points later in the Pitted Ware Culture. However, this seems like

Figure 3. Experimental Pitted Ware projectile points alongside their respective blade. From left to right: Crested blade and corresponding type C point, regular blade and corresponding type B point, late-stage regular blade with corresponding type A point (Photos: S. Stenak).

an unlikely scenario considering the technological complexes surrounding the Pitted Ware Culture.

Crested blades were part of flint blade technologies of Scandinavia since the Late Upper Palaeolithic Hamburgian Culture, and blades and cores with this distinct preparation can be attributed to periods throughout both the Mesolithic and Neolithic (Pelegrin 2006; Weber 2008, 85). Moreover, the central lithic technology of the Neolithic in southern Scandinavia is the square section technology used in the production of axes, chisels, daggers and blade cores. The dominant of these are the square sectioned axes that are flaked with four longitudinal "crests", and the technology is remarkably similar to the crested blade cores. With this in mind, it seems highly unlikely that the crested blade technology was not developed from the onset of the Pitted Ware Culture, especially considering the number of Pitted Ware points made from blades detached from repurposed square sectioned axes (Figure 4). With these considerations in mind, the crested blades were likely a technological component from the onset of the Pitted Ware Culture in Denmark, which leaves little reason to think of the type C arrow points as a late type and type A as an earlier type.

Another argument for a subdivision of the Pitted Ware Culture, based on the point typology, is that the type A is more numerous on the earlier sites, whereas the type B and C are more dominant on later sites (Iversen 2016, 82). The technological explanation would be that of technological refinement during the Pitted Ware Culture. Considering the arguments above, one explanation could be that the goal of the blade production in the early Pitted Ware Culture was shorter and thinner blades for projectile points, even if crested blades were part of the production of blades. The crested blades were not deemed fit for projectile point production, but as the technology advanced,

Figure 4. Pitted Ware points from Helgeshøj, Denmark. From left to right: Type C point showing the original crested blade morphology, two type B points made of blades from repurposed ground flint axes (Photo: Mette W. Skjødt).

they were included, which turned into the type C points as we have defined them now. This would explain the typological distribution of Pitted Ware points from sites with no type C points, but finds of crested blades like Alvastra Pile Dwelling in Sweden (Browall 1986, 294; 2011, 185-197; Malmer 2002, 103-111).

As stated earlier, the crested blades used for the type C points are few in number in the production, which limits the access to this resource. The most abundant blades from the core are shorter, thinner and more regular blades suitable for type A points. This distribution of blade types mirrors the distribution of Pitted Ware point types found on sites in Denmark and western Sweden. Out of 1567 Pitted Ware points, classified by Rune Iversen, type A covers 75.7% of finds, type B covers 15.1% and type C covers 9.2% (Iversen 2016, 76). The same relative distribution of blade types can be observed in the reproduction. The experimentation shows that a blade core yielding 35 usable blades, no more than four crested blades are produced, and of these, not all are detached intact or usable for projectile points. This further supports the idea of Pitted Ware point typology as directly associated with the blades from various production stages.

In the 2011 experimental reproductions of Pitted Ware points done by Bo Madsen, it was observed that almost every blade from the core was usable to produce Pitted Ware points (Bye-Jensen 2011, 68). The experimental results of this study support the observations made by Bye-Jensen, in that only the rejuvenation flakes from the platform and the core front were unsuitable for point production. If this analogy is applicable, this could imply that the Pitted Ware point production was defined by the blade morphology as the blade production was effective at producing suitable material throughout the stages with minimal waste products. The point production was not limited by focusing on a very specific blade morphology that seldomly occurred like the Levallois points (Crassard and Thiébaut, 2011).

The interpretations as presented in this paper does not imply that no technological developments were made during the Pitted Ware Culture. Craft refinement is likely to have evolved throughout the culture, and may be observable in the archaeological assemblages, but the criteria used in the current typology does not offer such a division. In southern Norway and western Sweden, the tanged blade point technology was implemented in the early Middle Neolithic without evidence of type C Pitted Ware points (Olsen 2020, 130). At this early stage, the technology was focused on using the regular blades for the production of points with minimal retouch. Later, during the Middle Neolithic, the type C points were introduced in these geographical areas, which suggests a technological development in Pitted Ware point morphology.

In regards to the subtypes (A1-A3), that are defined by being retouched from either the ventral or dorsal side of the blade (Becker 1951, 189), there are no major technological comments to be made. The subtypes seem to be variations defined in modern literature to distinguish regional or other variation. Retouching blades from the ventral or dorsal side does not offer any significant differences in the production techniques. In some cases, the flint-knapper may be forced to flake from the opposing side to the intended, as a result of flaws in the blade or a crushing of the edge. However, in general, the blades can be modified in any which way the knapper chooses with ease.

In the experimental archery, using reproductions of type A Pitted Ware points, Bo Madsen used direct hammerstone percussion to retouch the points into shape, as opposed to pressure flaking (Bye-Jensen 2011, 68). The type A points does not require controlled, pattern-like flaking to shape the cross-section of the Pitted Ware points, like the type C. The type C points could not have been produced using hammer stone retouch, since this technique does not offer the fine, controlled flaking as seen on this type. However, the simple type A points are made of regular blades, which require minimal modification, and the steep retouch left by the hammer stone is consistent with the flaking seen on the tip and tang of some type A points. Additionally, the serrated edge retouch of some type B Pitted Ware points can be produced by both pressure flaking and hammer stone retouch. Simply crushing another flake perpendicular to the edge of the blade will create serrations. These possibilities of differing techniques also implies that technological developments could have been made during the Pitted Ware Culture. It is possible that pressure flaking was a later adaptation to the technology, which enabled the flaking of the type C points and finer examples of type A and B. However, if the point types are contemporaneous, the explanation could simply be that some type A points could have been made using hammer stone retouch, even if pressure flakers were part of the tool kit. Moreover, a steep and irregular retouch can be achieved by both hammer stone, antler or even copper tools, which means that the retouch seen on the type A Pitted Ware points cannot be exclusively linked to any production tool type.

In the 2016 article on Pitted Ware point typology, Iversen discussed the idea of attributing various functions to the three point types. Additionally, Bye-Jensen (2011, 77-78) has presented an interpretation of the functions of the Pitted Ware point types, hypothesizing a varying hunting related function to each sub-type (A0-A3) and a warfare and/or ceremonial function of the B and C types. The more recent finds at Helgeshøj sheds new light on this functional division, since all main types (A, B and C) are represented in the assemblage, all with clear indications of impact fractures (Sparresvohn 2016). This suggests that at all point types were used in a similar fashion, at least at Helgeshøj.

This paper presents no evidence to contradict the idea of varying functions attributed to the point types, but an argument to be made in this discussion is that the blade morphology likely plays a part in the interpretation of the three types. It is entirely plausible that the distinctly different point types correspond to separate functions, but we may also think of these different forms as derived from the types of blades available. A thick, crested blade requires more reshaping and narrowing retouch, in order to become a projectile point. A thin, straight and short blade requires little modification to become the same. By retouching a fragile blade edge, the edge will become serrated unless it is dulled by grinding. This is a simple and effective action that should be included in the understanding of why the points look the way they do. The root of this discussion is in essence the way we perceive craft and innovation of the past. In modern archaeological research it is easy to put forth ideas of prehistoric creative ingenuity that goes beyond the constraints of the material. Flint, clay, amber, wood and all other craft materials have natural properties that steer the innovation within the craft. The available material and its properties dictate on par with human ingenuity, how material innovation is developed. The question becomes: where does material understanding end and human ingenuity begin?

By making these suggestions, the author is applying a flint-knapper's logic that may transcend time and space. We cannot know what past thinking was like, but in flint-knapping we can know how the morphology could have been achieved, and in some cases how it must have been achieved.

However, one must not be blinded by the kind of inferences made in experimental flint-knapping (Eren and Meltzer 2024, 4). Experimental flint-knapping does not replicate past thinking or practice, but can present articulated arguments that contribute to our understanding of the past.

Conclusions

This study suggests that all Pitted Ware point types are derived from the same production process, and what defines their morphology is the stage from which the blade was produced.

Pitted ware points of Becker's (1951) type C correspond to points made from blades of the initial blade production. These crested blades are at the maximal core length, they are three-sided and are the least numerous of the blades from a core. Furthermore, this type of blade requires invasive flaking, in order to shape into a projectile point. These factors correspond to the archaeological finds, as the type C is the longest of the point types, has invasive flaking of all three sides and is only represented as 9.2% of the Pitted Ware tanged points (Iversen 2016, 76).

Points of Becker's type A correspond to blades from later production stages where the blades are increasingly regular, shorter, thinner and most numerous. In the archaeological assemblages, the type A represents 75.7% of the Pitted Ware points (Iversen 2016, 76), which mirrors the dominance of the regular blades of the experimental production.

The type B points correspond to all the blades from the intermediate stage by being non-crested with a medium build. These blades require less modification than the crested blades, but more than the regular blades.

This builds on the suggestion that the Middle Neolithic Pitted Ware point typology is rooted in the production stages, which challenges the idea of a chronological development between the three main types in Denmark. The idea of a growing technological refinement during the Pitted Ware Culture in Denmark, following the tanged point typology, is severely challenged by the technological analysis, however, it remains likely that technological refinement did take place in regards to how the points were produced and the level of refinement.

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