Migrations and interactions in prehistoric Beringia: the evolution of Yakutian lithic technology

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Flaked-tool technology can provide insights into social and cultural changes and interregional connections. This study of changing tool production covers the Upper Palaeolithic to the Late Neolithic in the Yakutia region of eastern Siberia. This region is home to the Palaeolithic Dyuktai complex, the Mesolithic Sumnagin complex and Neolithic traditions; it thus enables a better understanding of the material culture of these societies in Siberia and improves our knowledge of the complex migration processes towards the New World.

Keywords: Siberia, Yakutia, Upper Palaeolithic, Late Neolithic, lithic technology

Introduction

The prehistory of Beringia offers an intricate array of different cultures and technological traditions that are closely interrelated. Indeed, the peopling of the New World is the result of various migration waves arriving from north-east Asia. From the Palaeolithic to the Late Holocene, Siberian prehistoric societies have played a major role in the large-scale migration processes towards the Americas. Siberian Palaeolithic sites such as Ushki Lake in Kamchatka have been considered as possible ancestors for the Nenana and Clovis complexes (Dikov & Titov 1984), although recent research suggests otherwise (Goebel *et al.* 2010). The Siberian Palaeolithic sites assigned to the Dyuktai complex are considered to be the Asian equivalent of the Denali complex in Alaska (e.g. Plumet 2004a; Holmes 2008; Gómez Coutouly 2011a, 2012) based on the very similar type of technological implements. The Sumnagin Mesolithic complex of Siberia is also seen by a few researchers as having technologically influenced some of the Early Holocene Northwest Pacific coastal occupations such as

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Anangula (Kozlowski & Bandi 1984; Slobodin 2011). Finally, it has been argued that the Palaeoeskimo cultures found their roots in the Siberian Neolithic cultures (e.g. Anderson 1980; Dumond 1984a; Powers & Jordan 1990; Plumet 1994, *pers. comm.*; Tremayne 2011). Hence, better understanding the material culture from Palaeolithic to Neolithic societies in Siberia will definitively improve understanding of the complex migration processes towards the New World.

Pressure microblades are found in Beringian prehistoric assemblages for tens of thousands of years, from the early Upper Palaeolithic in most of greater Beringia, up to the Late Holocene in some areas such as the interior of Alaska and regions of Siberia (Gómez Coutouly 2011a). Thus, study of pressure-based assemblages is of major importance in understanding more comprehensively the technological and cultural relations between prehistoric groups from the North Pacific. Indeed, the first artefacts used to draw a cultural connection between Asian and American prehistoric sites were pressure-flaked microblade cores (Nelson 1935, 1937). The pressure technique had not yet been formalised at that time and the comparison was made on typological grounds.

Yakutia region: a case study

The archaeological record of Yakutia serves as an excellent case study given that the archaeology of Yakutia has played a major role well beyond its borders, from comparisons to its Siberian neighbouring regions (Kamchatka, Chukotka and so on), to comparisons involving the wider research question of the peopling of the Americas. This region is home to major Siberian prehistoric sites and complexes such as the Dyuktai complex (where this Palaeolithic culture was first defined), the Sumnagin complex (also first defined based on Yakutian assemblages) and some of the Neolithic assemblages discussed as possible ancestors for the Palaeoeskimo. My analysis of Upper Palaeolithic to Neolithic archaeological collections from the Museum of the Centre for the Archaeology and Palaeoecology of Arctic People (Russian Academy of Sciences, Siberian Branch, Yakutsk, Russia) (see online supplementary material for further details), indicates that for more than 10 000 years prehistoric people in the region used pressure-flaking as the primary technique for the production of tools. This technique evolved over time from the production of pressure microblades to that of pressure bladelets, and finally to the production of large pressure blades. Therefore, this is a rare opportunity to look in detail at the evolution of this particular manufacturing technique over a period of thousands of years within a specific region and to examine the broader technological changes in order to draw some large-scale cultural and technological connections. This article will not attempt to characterise the entire lithic industry, nor will it challenge the presently established cultural chronology for the region. While this discussion mainly revolves around the pressure microblade and blade components, other elements of the lithic industry will be discussed when appropriate. The chronology of the prehistoric complexes in Yakutia (the case study region) is as follows (mainly based on Mochanov & Fedoseeva 1986; all dated using the CalPal2007 calibration curve at 68.2% probability):

- Dyuktai complex (Upper Palaeolithic): *c.* 17 000–13 000 cal BP
- Sumnagin complex (Mesolithic): *c.* 13 000–7000 cal BP

- Syalakh complex (Early Neolithic): *c.* 7000–*c.* 5700 cal BP
- Belkachi complex (Middle Neolithic): *c.* 5700–*c.* 4300 cal BP
- Ymyakhtakh complex (Late Neolithic): *c.* 4300–*c.* 3300 cal BP

A note on pressure-flaking

Crabtree's experiments on pressure flaking and blade production clearly demonstrated that "the wider the blade, the greater the amount of pressure that is required [to produce it]" (Crabtree 1968: 468). Pelegrin has experimented with several different pressure techniques (termed 'modes') for the removal of blades and microblades in order to reproduce various archaeological examples that vary widely in size from small microblades to very large blades (Pelegrin 1988, 2003, 2012; Gómez Coutouly 2011a, 2011b). As a result, Pelegrin has proposed five main pressure-flaking modes for the production of microblades and blades (Figure 1): hand-held (mode 1), shoulder crutch (mode 2), short abdominal crutch (mode 3), long crutch (mode 4) and pressure with a lever device (mode 5). In sum, modes 1 and 2 produce microblades; mode 3 produces slightly larger microblades or bladelets; mode 4 produces blades; and mode 5 produces large blades (see online supplementary material Figures S2 & S3).

Key features of pressure flaking include edge regularity and parallelism, a straight rather than curved profile, maximum width at the shoulder (i.e. immediately below the bulb) and the presence of a very small point-like pressure bulb.

The Dyuktai complex (Upper Palaeolithic, *c.* 17 000–13 000 cal BP): the Yubetsu method and pressure microblades

Mochanov's investigations at Dyuktai Cave led to the definition of the Dyuktai Palaeolithic complex. This is primarily characterised by the presence of wedge-shaped microblade cores that are part of a broader bifacial industry (Mochanov 1980; Mochanov & Fedoseeva 1986). Burins, bifacial projectile points and knives, and expedient flake tools are also common in these assemblages. The artefacts discussed here were recovered from Dyuktai Cave and Verkhne-Troitskaya.

Microblade cores from the Dyuktai complex (Figure 2) are dominated by wedge-shaped forms that are usually prepared according to the Yubetsu method (e.g. Gómez Coutouly 2011a) and virtually all pressure-flaked microblades are made using the hand-held or shoulder-crutch technique (modes 1 and 2) (see online supplementary material for further details). Along with the Yubetsu method, more expedient microblade cores on flakes are also present in various Dyuktai complex assemblages, such as at Ezhantsy or Verkhne-Troitskaya (e.g. Gómez Coutouly 2011a). Although there are some scarce counterexamples (Figure 3d; Gómez Coutouly 2011a), microblades of the Dyuktai complex are almost never retouched or transformed into tools following detachment (Figure 3e–j). Instead, they were used as insets in grooved bone, antler and ivory tools (e.g. projectile points and knives). The associated

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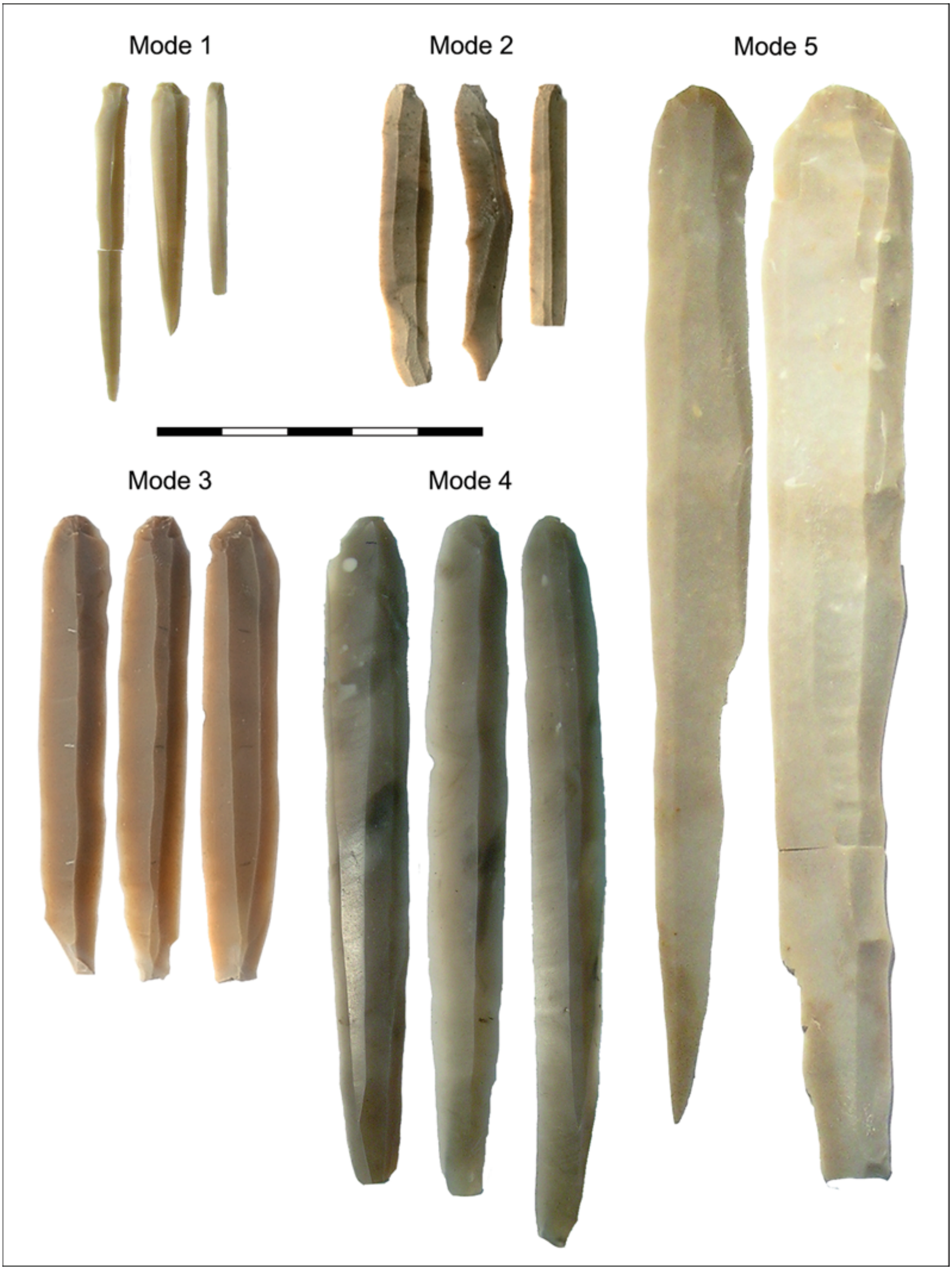

Figure 1. Experimental microblades and blades produced by Jacques Pelegrin using different pressure-flaking modes.

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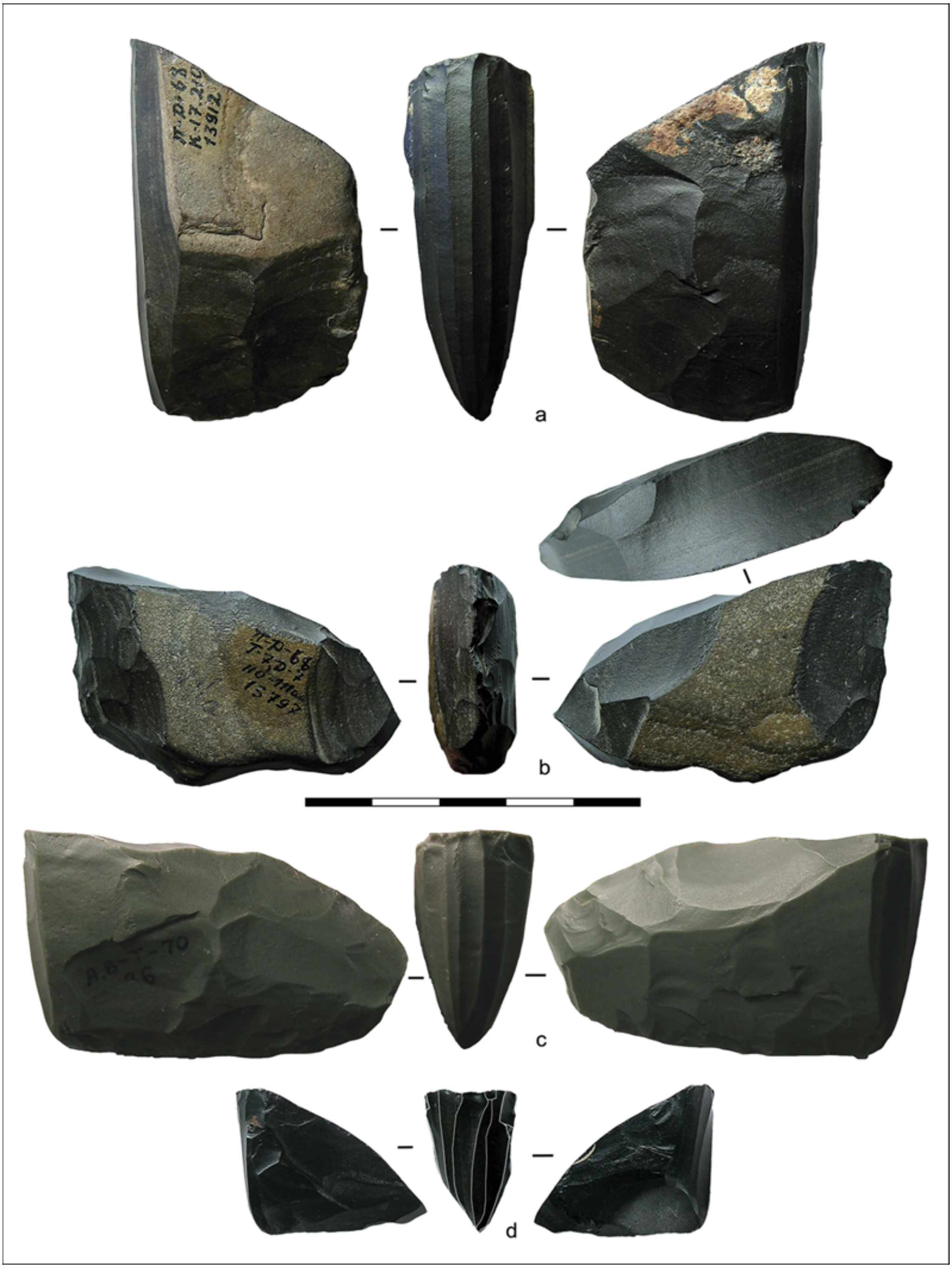

Figure 2. Upper Palaeolithic (Dyuktai complex) cores: a–d) wedge-shaped microblade cores and core preforms.

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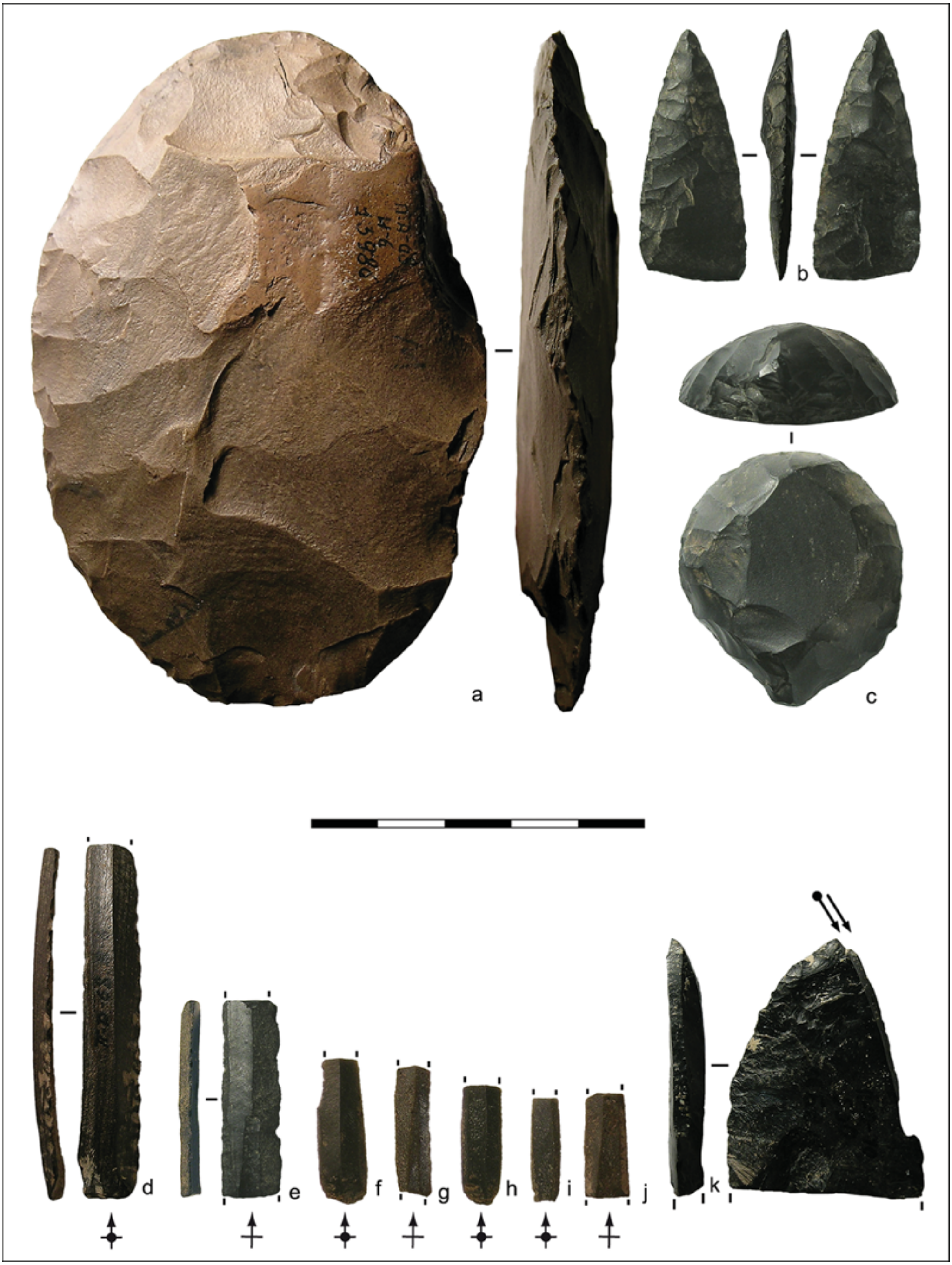

Figure 3. Upper Palaeolithic (Dyuktai complex) tools: a) biface; b) bifacial point; c) obsidian end scraper; d) retouched microblade; e–j) microblades; k) burin.

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toolkit also includes bifaces and bifacial points (Figure 3a–b), end scrapers (Figure 3c) and burins (Figure 3k).

The Sumnagin complex (Mesolithic, *c.* 13 000–7000 cal BP): the end of the Yubetsu method and the appearance of pressure bladelets

The Sumnagin complex found across Siberia is a terminal Upper Palaeolithic or Mesolithic complex (Mochanov & Fedoseeva 1986; Slobodin 1999; Pitul'ko 2001; Plumet 2004a, 2004b) that was originally defined based on assemblages from the region of Yakutia (Mochanov 1977). The toolkit includes conical microblade cores, multifaceted burins, end scrapers, large bifacial adzes and other lithic tool types. Apart from the large bifacial adzes, no bifacial tools are associated with this complex. Some of the new tool forms that appear during this time period are also present in the subsequent Neolithic complexes (Pitul'ko 2001; Dyakonov 2007). The Mesolithic artefacts discussed here were all recovered from the Ust-Timpton I site.

Microblade cores of the Siberian Mesolithic are no longer wedge-shaped as were those of the Dyuktai complex. Instead, they are almost exclusively conical or tabular in shape (Figure 4). This is not only a morphological variation, but also a radical technological shift that has direct implications for the core-holding device (clamp *vs* grooved system) (see online supplementary material for further details).

Along with this change in morphology, and thus in the core-holding system, appear slightly larger microblades (or small blades), corresponding to pressure-flaking modes 2 and 3 (Figure 5b–h). Indeed, mode 3 seems to be widespread for the production of larger microblades (or bladelets) during this time. The mean width of microblades from the Sumnagin complex at the Ust-Timpton I site suggests a combination of mode 1 or 2, with mode 3 pressure-flaking (supplementary Figure S3). These three changes (core morphology, core-holding device and pressure-flaking modes) should be considered as parts of a fundamental change in microblade technology, and not as separate inventions.

The microblades produced by Mesolithic cores were either used unretouched, or were subsequently transformed into formal tools. Microblades that lack intentional retouch (Figure 5a–d & f–h) were probably intended for use as insets in grooved bone, antler or ivory tools (e.g. projectile points and knives), as was the case in the Palaeolithic. Good examples outside Yakutia are furnished by the Siberian Mesolithic site on Zhokov Island (New Siberian Islands), where various organic tools with microblade insets have been preserved in permafrost (Pitul'ko 1993, 1998; Pitul'ko & Kasparov 1996). But microblades were also regularly transformed into various types of tools, such as burins, end scrapers, drills and points (Dyakonov 2007; Figure 5e & i–k), which is one of the main differences when compared with microblades from the Palaeolithic period. One artefact, a blade blank with a partial retouch along the edges in order to create a small bifacial tip (Figure 5l), suggests the possibility of pressure-blade production mode 4 during the Mesolithic. As shown here, this type of tool is also characteristic of the subsequent Neolithic periods when pressure blades are common. Therefore, a Mesolithic date for this particular tool may be questionable. Multifaceted burins (Figure 5m), typical of subsequent Siberian Neolithic cultures, also make their appearance during the Sumnagin complex.

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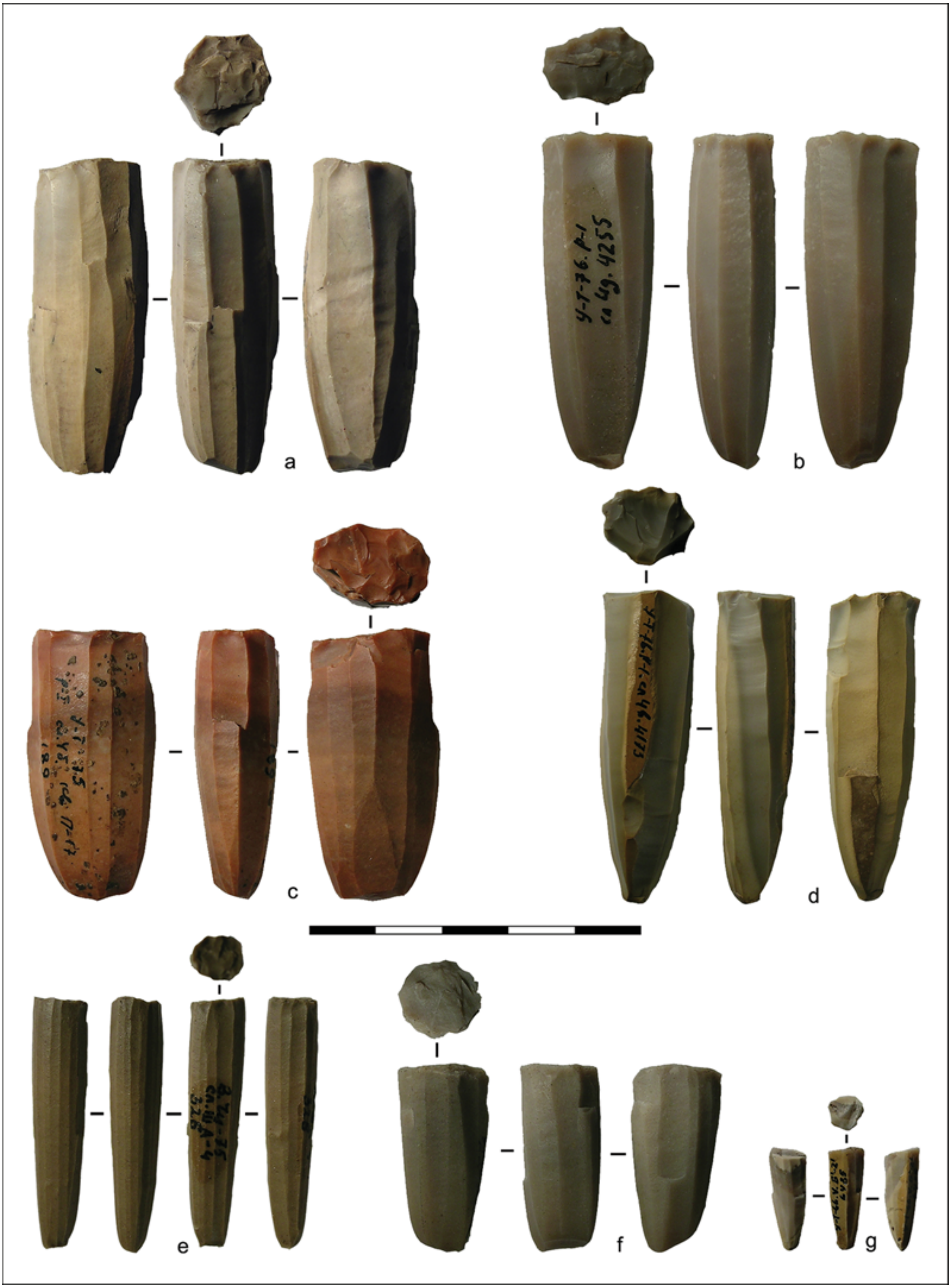

Figure 4. Mesolithic (Sumnagin complex) cores: a–g) conical microblade cores.

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Figure 5. Mesolithic (Sumnagin complex) tools: a–h) microblades and small blades; i–k) microblades with a truncated edge; l) blade tool with bifacial tip; m) multifaceted burin.

Siberian Neolithic cultures: the spread of pressure blades

It is important to clarify that the term 'Neolithic' does not have the same meaning in Siberia as it does in Europe. In Siberia, the appearance of pottery (supplementary Figure S4) is not associated with the establishment of sedentary settlements as it is in the European Neolithic. So far, studies concerning ceramics in Siberia have mainly focused on styles, chronology and geographic distribution, and "it must be recognized that very little is known currently about the reasons why pottery was adopted in the region and for what purposes it was used" (McKenzie 2009: 197). Some authors notice, however, that the appearance of ceramics coincides with an intensification of an economy based on fishing, a pattern that can be generalised not only to Yakutia and Siberia, but to the whole of the Eurasian continent: "it is possible to make a broad and overreaching generalization that much of the pottery use [by foragers across Eurasia] occurred in fishing contexts" (Barnett 2009: 556). Siberian Neolithic cultures (Mochanov 1969; Chard 1974; Mochanov & Fedoseeva 1986; Pitul'ko 2001; Hoffecker 2005) were mobile groups with an economy based on hunting reindeer and moose, as well as exploiting river and lake resources. The subsistence economy does not vary significantly during the three stages of the Siberian Neolithic. The most distinctive feature of Siberian Neolithic tool industries is the appearance of polished tools (supplementary Figure S5), but also the widespread use of pressure-blade production mode 4. Evidence of this technique is clearly visible on both cores and blades from these assemblages. Along with blades, microblade cores (mode 2 and 3) are still found in Neolithic assemblages. Use of the mode 4 technique during the Siberian Neolithic was determined from the regularity of blade and blade scar lengths and widths in the assemblages. The artefacts ascribed to the Syalakh, Belkachi and Ymyakhtakh complexes are primarily from the sites of Belkachi I, Sumnagin I, Ust-Timpton I, Tommot I and Onn'yosskogo.

1. The Syalakh complex (Early Neolithic, c. *7000–5000 cal BP): the appearance of pressure-flaking with a lever device*

The Syalakh complex shows strong continuity with the Sumnagin Mesolithic complex in several respects and is marked by the introduction of pottery and the presence of bone harpoons. The lithic industry consists mainly of blade products (Dyakonov 2007), adzes, partly polished points and bifacial arrowheads. Small blade (Figure 6a–b) and microblade cores persist throughout the Neolithic, but large, pressure-flaked blades and blade cores first appear during the Early Neolithic. In most cases, these cores are pressure-flaked using the mode 4 technique (Figure 6c), but there is at least one example of mode 5 technique (Figure 7) (see online supplementary material for further details). Production of very large blades using this technique is known in other parts of the world during the Neolithic (e.g. Manolakakis 1996; Perlès 2004), but this is the first recognition of this technique in a Siberian context. Furthermore, given the nomadic nature of Siberian Neolithic populations, this is rare evidence of pressure-flaking using a lever within nomadic populations. Pressure-flaked microblades and blades are left unretouched (Figure 8b–g), probably to be used as insets, such as those of the Palaeolithic and Mesolithic. Some of the blades, however, are further modified into tools, as with the typical blades with bifacially flaked

Figure 6. Early Neolithic (Syalakh complex) cores: a–c) blade cores.

Figure 7. Early Neolithic (Syalakh complex) blade core proving the presence of pressure-flaking with a lever (mode 5).

tips (Figure 8h–j). Multifaceted burins (Figure 8k–l) and bifacial points (Figure 8m–n) are also part of the tool-kit. The retouch on the bifacial points is also made by pressure-flaking.

2. The Belkachi complex (Middle Neolithic, c. *5700–4300 cal BP): the persistence of pressure-flaked microblades and blades*

The lithic industry of the following period, the Belkachi complex, is characterised by tools made from microblades and blades, multifaceted burins, axes, projectiles and drills. No evidence of mode 5 pressure-flaking with a lever device has been identified, but blade cores (mode 4) are clearly represented (Figure 9a–b) (see online supplementary material for further details). Small blade cores and microblade cores (Figure 9c–e) are still present and, in morphological and technological terms, have not evolved much since the Mesolithic Sumnagin complex. Blade and microblades are unretouched (Figure 10a–e), intentionally retouched or transformed into tools (Figure 10f–g). A number of grooved points of bone and antler have blade insets still attached to them (Figure 10j). Multifaceted burins persist and it is interesting to note that some are made on exhausted pressure-flaked microblade cores (Figure 10h–i).

3. The Ymyakhtakh complex (Late Neolithic, c. *4300–3300 cal BP): pressure-flaked microblades and blades and little evidence for the presence of pressure with a lever*

Late Neolithic communities in Yakutia were more mobile than those of earlier Neolithic periods, but the Ymyakhtakh complex is characterised, as before, by blade production. Small blades and small microblades persist (Figure 11a–c), as well as large, pressure-flaked blades (Figure 11d). There is no direct evidence for the use of pressure-flaking with a lever device. Some tenuous evidence could indicate the presence of this technique, but it is far from demonstrated (see online supplementary material for further details). Multifaceted burins (Figure 12a–b) and various sorts of bifacial points and tools (Figure 12c–f) remain a feature of these assemblages. New types of tools were also introduced, such as the standardised rectangular insets with bifacial pressure-flaked retouch (Figure 12g–k) mentioned above.

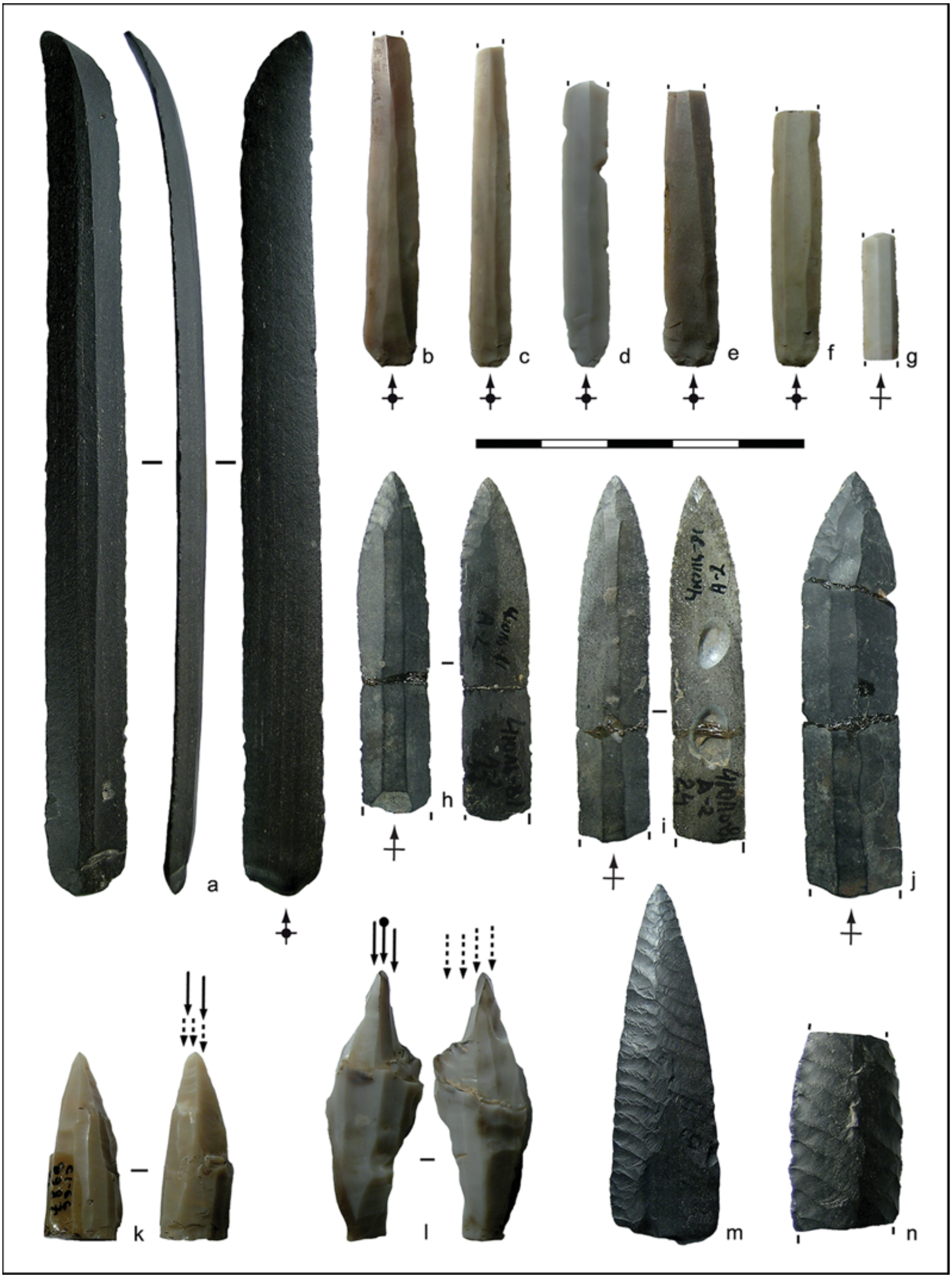

Figure 8. Early Neolithic (Syalakh complex) tools: a) blade; b–g) microblades; h–j) blade tools with bifacial tips; k–l) multifaceted burins; m–n) bifacial points.

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Figure 9. Middle Neolithic (Belkachi complex) cores: a–b) blade cores; c–e) microblade cores.

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Figure 10. Middle Neolithic (Belkachi complex) tools: a–e) microblades and blades; f–g) retouched microblades; h–i) multifaceted burins on exhausted microblade cores; j) bone or antler projectile point with small blade insets.

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Figure 11. Late Neolithic (Ymyakhtakh complex) cores: a–c) microblade cores; d) blade core.

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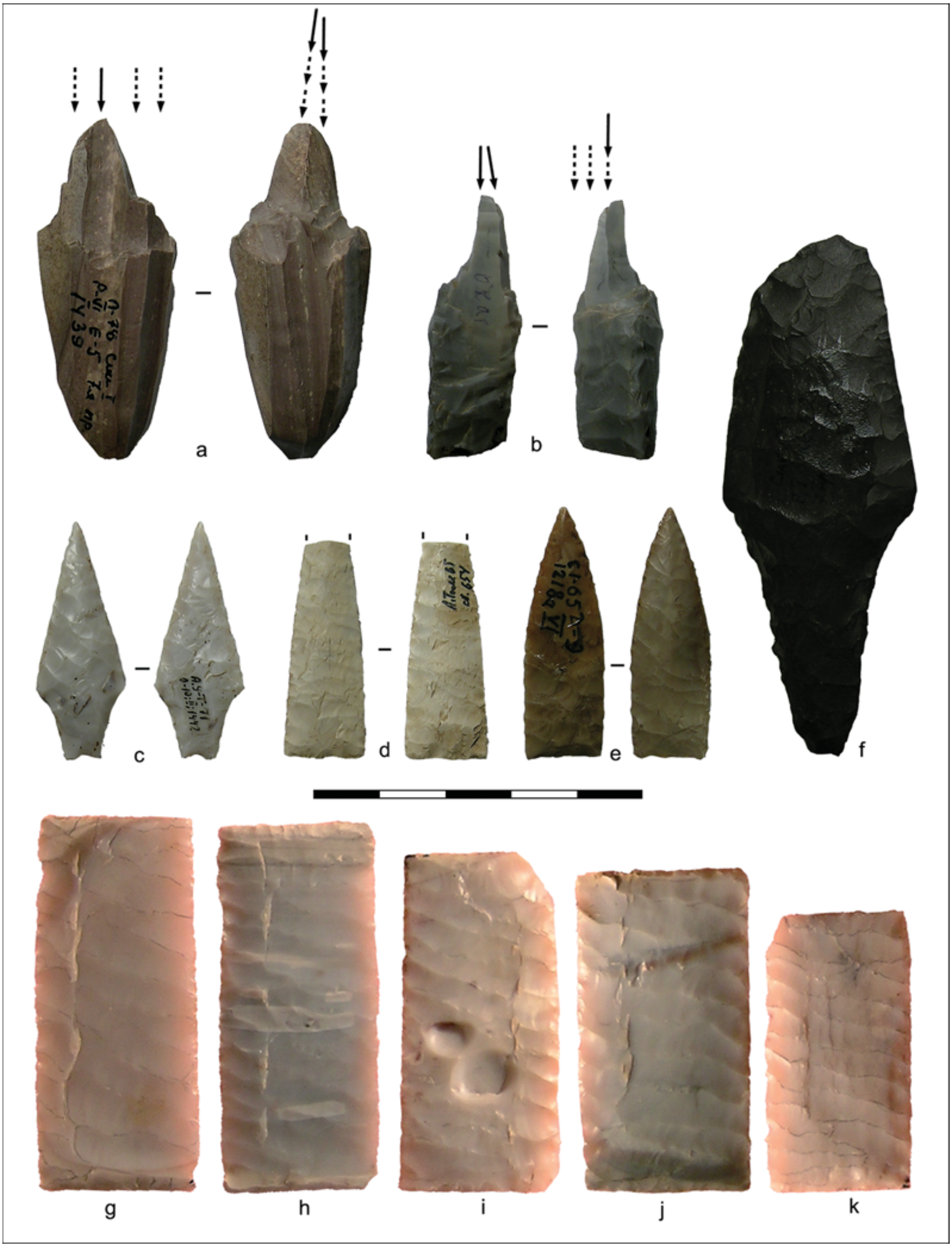

Figure 12. Late Neolithic (Ymyakhtakh complex) tools: a–b) multifaceted burins; c–f) bifacial points and tools; g–k) bifacially retouched rectangular insets.

The Palaeolithic to Neolithic assemblages of Yakutia

In Yakutia, the emergence of the Sumnagin Mesolithic complex at the Pleistocene–Holocene transition coincides with the appearance of conical microblade cores and the virtual disappearance of wedge-shaped cores produced by the Yubetsu method during the Palaeolithic, an evolution seemingly occurring throughout Siberia as well. Even in the absence of radiocarbon dates, stratigraphic context or other diagnostic artefacts, the presence of conical cores strongly suggests a Mesolithic or Neolithic occupation. Similarly, with very few, if any, exceptions, the presence of wedge-shaped Yubetsu-style cores is evidence for Upper Palaeolithic occupation. The transition from wedge-shaped to conical cores between the Palaeolithic and Mesolithic may have been a gradual process, but there is a clear technological and functional continuity in the pressure-blade assemblages. Unretouched microblades were still used as insets in grooved antler pieces such as projectile points and knives during the Mesolithic. There were also several important changes between the Palaeolithic Dyuktai complex and the Mesolithic Sumnagin complex. Microblades were retouched into formal tools such as burins, truncated blades, gravers, borers and projectile points; multifaceted burins and large bifacial adzes were produced; and bifaces and bifacial projectile points disappeared (Powers 1973; Mochanov & Fedoseeva 1986; Dyakonov 2007; Gómez Coutouly 2011a). The next major transition, from the Mesolithic to Neolithic, is also marked by continuity and innovation. The Neolithic Syalakh complex represents a major cultural change, with the appearance of pressure-flaked blades, the introduction of ceramics, new tool types including polished stone tools, the first signs of social stratification during the Neolithic and an economy based on hunting reindeer and moose. In flaked stone technology, the introduction of mode 5 pressure-flaking using a lever device is especially significant and further research should seek to determine whether blades obtained by this technique were intended for a specific purpose and were in use during the whole of the Neolithic or only during its first stage (the Syalakh complex). The identification of this apparently rare manufacturing technique in a Siberian context has significant implications for our understanding of social and economic changes during the Mesolithic–Neolithic transition. In Europe, pressure blades are often interpreted as a prestige item associated with higher social status. It is possible that a similar scenario was unfolding in Siberia.

The prehistoric migration waves towards the New World

One of the first migration waves from Siberia to Alaska that is easily recognisable concerns the diffusion of pressure-flaked microblades that spread during the Pleistocene–Holocene transition. The most ancient known human occupation in Alaska so far, Swan Point CZ4 (*c.* 14 000 cal BP), is the only one in this region to have unearthed a whole microblade toolkit made of Yubetsu microcores and therefore has clear technological ties with the Dyuktai complex of Siberia (Holmes 2008, 2011; Gómez Coutouly 2011a). Afterwards, in Alaska, the Yubetsu method was rapidly abandoned and replaced by the Campus method (Holmes 2008; Gómez Coutouly 2011a, 2012) and other conical and tabular microcores. As for the Palaeolithic of Siberia, most pressure-flaked microblades in Alaska were also made using the

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hand-held or shoulder-crutch technique, although there can be some exceptions (Gómez Coutouly 2011a).

The clear division between microcore morphology in Palaeolithic assemblages and that in later Mesolithic and Neolithic assemblages in Siberia does not carry over to the archaeological record of eastern Beringia. Microcore forms recovered from Alaskan assemblages of Holocene date tend to be more conical or tabular (Holmes *et al.* 1996: figs 6–9), but wedge-shaped microcores are found throughout the Holocene (Broken Mammoth, Swan Point and so on). It has been proposed that the Sumnagin complex gave rise to some of the coastal sites from the Pacific Northwest area (Ackerman 1992, 2008; Dumond & Bland 1995; Slobodin 2011). There are some technological parallels between the Sumnagin complex and such Early Holocene sites as Anangula in the Aleutian Islands. But there are still some differences in how these microblade cores were prepared. Among them, Sumnagin cores have removals all around the circumference of the core—which is rarely the case in the Anangula assemblage (Gómez Coutouly 2015)—and are used to pressure-flake bladelets, in contrast to most coastal sites from Alaska and British Columbia, where only small microblades are being produced (Gómez Coutouly 2011a). Of course, the differences are not only seen in the pressure microblade component, but also in other aspects of the stone tool industry (Gómez Coutouly 2011a, 2015). The influence of the Siberian Mesolithic is not only perceived in Early Holocene sites of the Pacific coast, as it has also been proposed that the presence of conical microblade cores, along with wedge-shaped ones in interior Alaska during the early to mid Holocene, could have been the result of a Sumnagin technological influence (West *et al.* 1996; Slobodin 2011; Gómez Coutouly 2013).

Whether the Sumnagin complex influenced the Early Holocene archaeological record of Alaska's interior and its coastal regions is still to be demonstrated. Some researchers, however, consider that the Palaeoeskimo cultures that colonised the Arctic region during the Middle to Late Holocene have their roots in Siberia, maybe as early as the Mesolithic (Powers & Jordan 1990; Plumet 1994) or, at the very least, during the Neolithic. The Denbigh Flint Complex in Alaska, the first manifestation of the Arctic Small Tool tradition (ASTt), marks the onset of the Palaeoeskimo cultures (e.g. Irving 1957; Plumet 1994). This complex, dating to *c.* 4000 cal BP (Slaughter 2005), has a pressure microblade component (Desrosiers & Sørensen 2012), as do the earlier Pleistocene and Holocene complexes of Alaska (such as the Denali complex) (Gómez Coutouly 2011a). And yet most researchers believe that the origin of the Palaeoeskimo is not to be found in these earlier Alaskan complexes, but rather in the Neolithic cultures of Siberia, and more specifically in the Syalakh, Belkachi and Ymyakhtakh complexes of Yakutia (e.g. Mochanov 1969; Anderson 1980; Dumond 1984a; Powers & Jordan 1990; Plumet 1994, *pers. comm.*; Odess 2005; Tremayne 2011). This hypothesis is based on various close technological features, including the presence of similar types of ceramics (cord-wrapped), the fact that they are both interior-adapted populations with a subsistence economy relying on caribou hunting, as well as some similar stone artefacts (e.g. Anderson 1980; Plumet 1994). With regard to stone tool technology, Anderson (1980) and Plumet (1994) highlight the following resemblances: bifacially shaped burins, triangular end scrapers with bifacially retouched hafting ends, polished blades and small bifacial points, among other traits.

When comparing the Siberian Neolithic artefacts (Mochanov 1969; Mochanov & Fedoseeva 1986) to the Denbigh Flint Complex artefacts (Giddings 1951, 1964; Bandi 1965; Anderson 1984, 1988; Dumond 1984b; Giddings & Anderson 1986; Kunz 2005; Tremayne 2010, 2011; National Park Service n.d.), there are some parallels in the stone tool technology, but also some important differences. There are some small bifacial points from the Neolithic cultures (e.g. Figure 12c–e) that are similar, on typological grounds, to early Palaeoeskimo tools (c.f. Giddings 1964; Anderson 1984; Dumond 1984a). Some larger bifacial points are also very similar in shape, size and in the diagonal pressure retouch (cf. Figure 8m–n; Giddings 1964: fig. 56c). The importance of microblades being transformed into tools (retouched, burins, end scrapers and so on) is also a typical aspect of the Denbigh Flint Complex (Giddings 1964). The similarities in burin technology are, however, still to be demonstrated. Although there are various types of burins within the Denbigh Flint Complex (Giddings 1951, 1964; Kunz 2005; Tremayne 2010, 2011; National Park Service n.d.), they are largely made on bifacial or unifacial blanks. On the contrary, the Mesolithic and Neolithic burins from Yakutia are mainly made on exhausted microblade cores (Figures 5m; 8k–l; 10h–i; & 12a), although similar bifacially flaked burins do occur. Furthermore, various tool types of the Siberian Neolithic seem to be missing from Denbigh assemblages (such as the blades with a bifacial tip or the bifacially retouched rectangular insets). But the most obvious differences in the respective lithic toolkits can be seen in the complete absence of large, pressure-flaked blade production in Alaskan assemblages. Even if it is not the main type of production, blades and large blades are undeniably a distinctive characteristic of the Yakutian (and Siberian) Neolithic cultures. Indeed, pressure-flaked microblades have been produced in Alaska during the entire Holocene, but there is yet to be found an assemblage comprising large blades made with pressure techniques. The only core with small, pressure-flaked blades from Alaska is an obsidian core from Nogahabara I (Odess & Rasic 2007), an Early Holocene site. Moreover, Palaeoeskimo cultures that produce pressure-flaked microblades seem to be small, hand-held microblades, rather than the larger, pressure-flaked bladelets that are sometimes present in the Siberian Mesolithic and Neolithic assemblages.

The reasons for all of these differences between Siberian Neolithic and Alaskan ASTt assemblages may be multiple and diverse (group mobility, activities, raw material available and so on), and do not necessarily imply the absence of cultural connections. Nonetheless, if the Siberian Neolithic and the early Palaeoeskimo cultures are affiliated, these differences in stone tool assemblage composition will also have to be taken into account and explained.

Conclusion

The production of pressure-flaked blades within Siberia and the spread of the technique to other regions of north-east Asia and North America provide a major insight into broad cultural interactions, but also address specific and tangible aspects of these prehistoric populations. Through the analysis of the prehistoric stone tool artefacts from Yakutia and Siberia (their tool types, their evolution and their major technological shifts), we are truly able to glimpse the migration processes that have shaped the history of Beringia and the Arctic from the Late Pleistocene up to the Late Holocene. It is to be expected that the material presented in this article will also be used for comparison by the many specialists from Siberia, Alaska and the Arctic. This should lead to a better comprehension of the cultural and technical processes at stake, thereby enabling new technological (and hence cultural) correlations to be drawn.

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Supplementary material

To view supplementary material for this article, please visit http://dx.doi.org/10.15184/aqy.2015.176

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