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ARCTIC ARCHAEOLOGY IN GERMANY IN THE 20th CENTURY

ABSTRACT: German research in arctic archaeology started with artefact collection in the 19th century, the excavation of an ex-pat in the 1930s and ended with fieldwork in the Russian Far East in the 1990s. The main contribution of German research to arctic archaeology in the 20th century resulted out of fieldwork done on Banks Island in the early 1970s. The results of this research are reviewed in more detail in the context of recent knowledge. The article ends with a discussion of results which may be of interest to Palaeolithic archaeologists.

KEY WORDS: History of research – Pre-Dorset – Inuinnait – Banks Island – Hansjürgen Müller-Beck – Joachim Hahn

"Looking at the history of a discipline, we normally see it in reverse. It often creates an image of the discipline consciously und purposefully unfolding through time, but in most cases this image is false. Every event on this route is a result of someone's choice, conscious or impulsive, voluntary or forced" (Vakhtin 2016: 193*).*

1. INTRODUCTION

The contribution of German research to arctic archaeology is not or just briefly mentioned in recent reviews (Arnold 1983: 15, Collins 1984: 20, Fitzhugh *et al.* 2002, Krause 1993, Krause, Thiede 2016, Krupnik 2016a, Maxwell 1985: Fig. 3.1, Reinke-Kunze 1992). The article presented here summarize the partly scattered references and the few major contributions to arctic archaeology in Germany. This is done by following the advice of Schweitzer (2013: 11) to focus on researchers of German origin or who were raised in a German speaking environment. Despite the close relationship of arctic archaeology to ethnography, ethnohistory and history (Friesen, Mason 2016), the focus is on scientists who have a university degree in archaeology.

2. THE BEGINNINGS

200–300 years ago the first ethnographic accounts of arctic people were written by natural scientists,

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historians, geographers and physicians travelling in the arctic. One example from Germany is historian Gerhard Friedrich Müller who participated in 1733 to 1743 on the "Second Kamtchatka expedition" of Vitus Bering (Vermeulen 2009: 255) to become "the father of Sibirian archaeology" (Parzinger 2006: 31 – translation by the author). Examples from the second half of the 19th century are accounts written by self-taught ethnographers like Emil Bessels on the Inughuit in North Greenland, by Aurel Krause on people of the Bering Strait or by Heinrich Abbes on foragers of Baffin Island (Krupnik 2016b; see *Figure 1* for place names). In particular, ethnographic fieldwork by Franz Boas on Baffin Island in the early 1880s has to be emphasized as this was the starting point of Boas to become "a monumental figure in the history of Inuit (...) studies" (Krupnik *et al.* 2016: 73) and, in general, in cultural anthropology (Barnard 2000: 100–102). One of the rare geographical exploits by Germans to polar exploration was the "Second German North Pole Expedition" from 1869 to 1870. During their stay in North-East Greenland expedition members took a substantial collection of artefacts from abandoned but well-conserved Thule winter houses, graves, tent rings and caches to the Prussian museums in Berlin (Grønnow 2010: 120–121). Beside, German missionaries sent ethnographic and archaeological artefacts to their brethren in Saxony (Israel 1979). Also, Alfred Wegener, the most famous polar researcher of Germany – the Institute of Polar and Marine Research of Germany is named after him – made a small contribution to arctic archaeology: Wegener participated in the "Danmark Expedition" of Ludvig Mylius Erichsen to North-East Greenland from 1906 to 1908 as a meteorologist but also recovered few archaeological artefacts (Thomsen 1917, Thostrup 1911: 185). This listing indicates that in the 19th century German scientists were not much interested in studying material culture of arctic people. This contrasts with the general admiration of Inuit by Germans during that time period (Baehre 2008, Jensz 2012, Jensz, Petterson 2021, Kim 2012, Murphy 2002).

3. THE 20th CENTURY

3.1 Research before 1970

130 years ago German prehistoric archaeology started as an academic discipline when the positions of a university professor were established in 1899 in Vienna, in 1902 in Berlin and in 1909 in Munich (Reisch 2000:

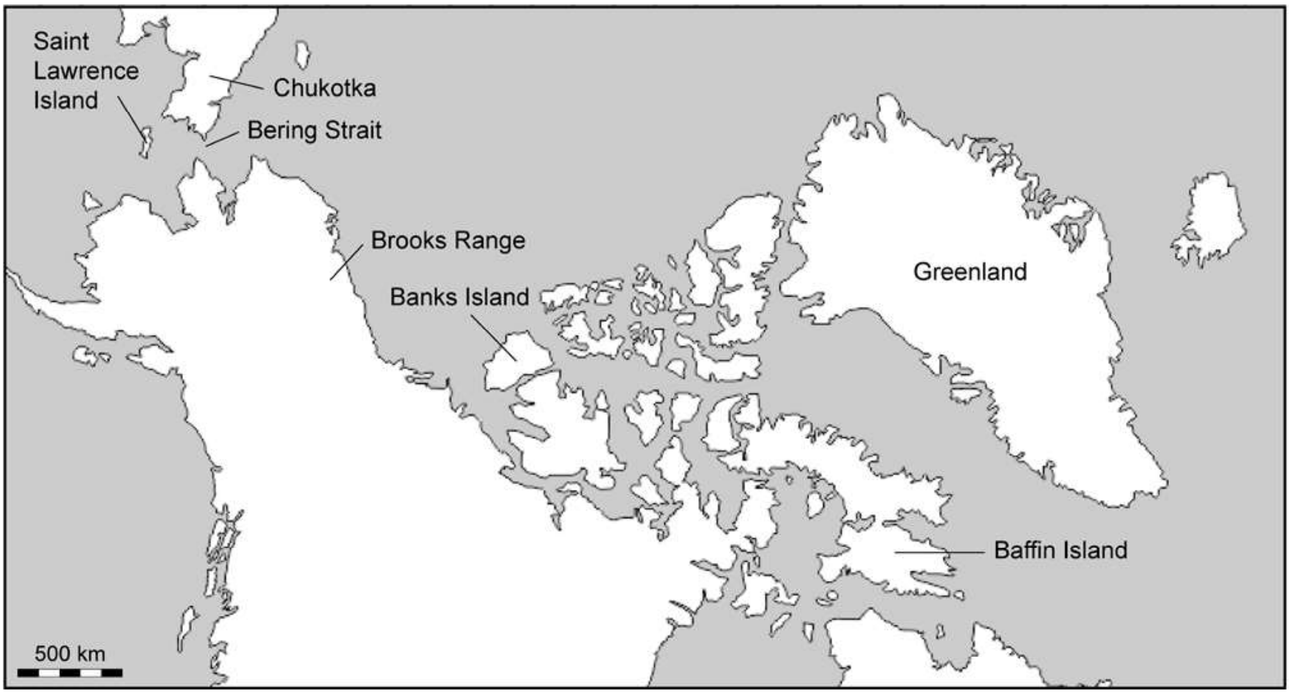

FIGURE 1: North American Arctic with place names mentioned in the text (map base: https://d-maps.com/carte.php?num_car=3188&lang=de).

178). The first Dr. phil. thesis on the Palaeolithic by a German archaeologist was delivered by Hugo Obermaier in 1904 at the University of Vienna (Züchner 1997), followed by one at a German university in 1907 (Bolus, Conard 2012: 65, Strobel 2000: 32–33). However, the contribution of Germans to arctic archaeology was rare and anecdotal (e.g. Gripp 1941/42). The only proper archaeological fieldwork in the arctic by a German was done by Otto Wilhelm Geist (1888–1963). Otto Geist was a mechanic from Bavaria who emigrated in 1910 to the U.S.A. (Keim 1969). After taking part as a U.S. army soldier in World War I, Geist moved to Alaska in 1923 to do archaeological fieldwork and later palaeontological research (Skarland 1965). "A self-made archaeologist" (Fitzhugh 2016: 169) but representing the University of Alaska, he started fieldwork in 1926 on St. Lawrence Island to excavate at Kukulik and Okvik (Dumond, Bland 2002: 2, Geist, Rainey 1936, Rainey 1941).

In the former German Democratic Republic, between 1949 and 1989, fieldwork on Palaeolithic and Mesolithic archaeology was done only by few scientists who did important research in Eastern Germany only (Gramsch 2010) as, in general, East German archaeologists made only a limited number of fieldwork abroad (Schücker 2012: 167). Archaeological research in the polar regions of Russia and Siberia, which started systematically in the 1960s (Khlobystin 2005: 2), was restricted to Russian archaeologists (oral inf. R.-D. Kahlke, Weimar 18/10/2022). Scientific research by East Germans in polar regions was done on glacialogy and cartography in Svalbard in the 1960s (Pillewizer 1986: 155–182) but had a focus on natural sciences in Antarctica (Hempel 2009, Krause 1993, Paech 1992). In the German Democratic Republic empiric fieldwork in cultural anthropology was, "with a few exceptions, of minor importance" (Rössler 2007: 25 – translation by the author). This resulted in ethnographic studies with a historical perspective and research of material culture from museum collections (Flitsch, Noack 2019, Rössler 2007, van der Heyden 2019), among them also about Inuit (Israel 1969, 1977, 1979).

Karl Schlesier (1927–2015), a West German with a Dr. phil. in cultural anthropology, became Professor at the University of Wichita in Kansas in the U.S.A. in the 1960s to contribute to Plains ethnography and "action anthropology" (Dömpke *et al.* 2015). One of his first investigations in the New World was to look for Late Pleistocene and early Holocene lithic artefacts in Alaska (Schlesier 1964a): in 1964, supported by the German Science Foundation, Schlesier and a graduate student did fieldwork in the Central Brooks Range (Schlesier 1964a, b, 1966, 1967). Beside excavations on small hills, they followed a 11 km long stretch of a creek to select artefact-like specimens out of the flint-rich fluvial gravels, sometimes by test piting till reaching frozen ground. American archaeologists were "not convinced that we are dealing with an artifact assemblage" (Irving 1971: 71). Today, the collection is seen as of "natural origins of the stream-rolled gravels" (Morlan, Cinq-Mars 1982: 355).

The first German speaking researcher working in the arctic with a university degree as an archaeologist may has been Hans-Georg Bandi (1920–2016) from Switzerland (Hafner 2016). In the 1940s he wrote his Dr. phil. thesis on the Swiss Late Upper Palaeolithic and translated the book "The Eskimo" of famous Danish ethnographer Kaj Birket-Smith into German. In 1948, Bandi joined Danish archaeologist Jørgen Meldgaard for excavations in North-East Greenland, an enterprise which was part of the "Danish Peary Land Expedition" of Eigil Knuth (Bandi 1997, Bandi, Meldgaard 1952). In the 1950s Bandi became professor of prehistoric archaeology at the University of Bern in Switzerland but continued to work in the arctic: from 1963 to 1974 he made excavations of cemeteries and dwellings of the Okvik, Old Bering Sea and Punuk periods on St. Lawrence Island (Bandi 1965, 1967, 1968, 1996, Bandi, Blumer 1997). As this research was done by Swiss scientists funded by Swiss institutions it will not be discussed further here but the close relationship of Bandi and German archaeologist Hansjürgen Müller-Beck has to be emphasized.

Hansjürgen Müller-Beck (1927–2018) wrote a Dr. phil. thesis in 1955 on the Lower and Middle Palaeolithic of South Germany at the University of Tübingen (Kind 2018). From 1956 to 1959 he was assistant professor at the institute of Hans-Georg Bandi at the University of Bern. Bern, the capital of Switzerland, remained one of his centers till his death as his wife and son lived there. In 1965 Müller-Beck delivered his "habilitation" on the bifacial lithic points of northern Eurasia and North America at the University of Freiburg/Breisgau in Germany (Müller-Beck 1966). From 1969 to 1995 he was professor of palaeolithic and mesolithic archaeology at the University of Tübingen where his first fieldwork was conducted in the arctic (chapter 3.2). Beside, Müller-Beck became president of several local, national and international unions and foundations in archaeology and geo-sciences. Students, post-docs, employees and guest researchers felt at home at his institute as he was not a power-obsessed, narcissistic boss but a liberal and reliable, nearly father-like partner devoted to promote them. However, "as a world citizen in the best sense of phrase, he (...) was not a cloistered resident of scientific ivory towers and did not only interprete the past (...) [for example] he would end his popular course "Prehistory and World History" with a section on the prospects for future research, including space archaeology" (Haidle, Eriksen 2019: 1).

3.2 Research in the 1970s

3.2.1. Paleo-Inuit archaeology

In 1965 Canadian archaeologists William Taylor and Robert McGhee visited two archaeological sites of the Pre-Dorset period near Shoran Lake (*Figure 2:1, 2*) in the inland of Banks Island, 60 km from the sea. At the

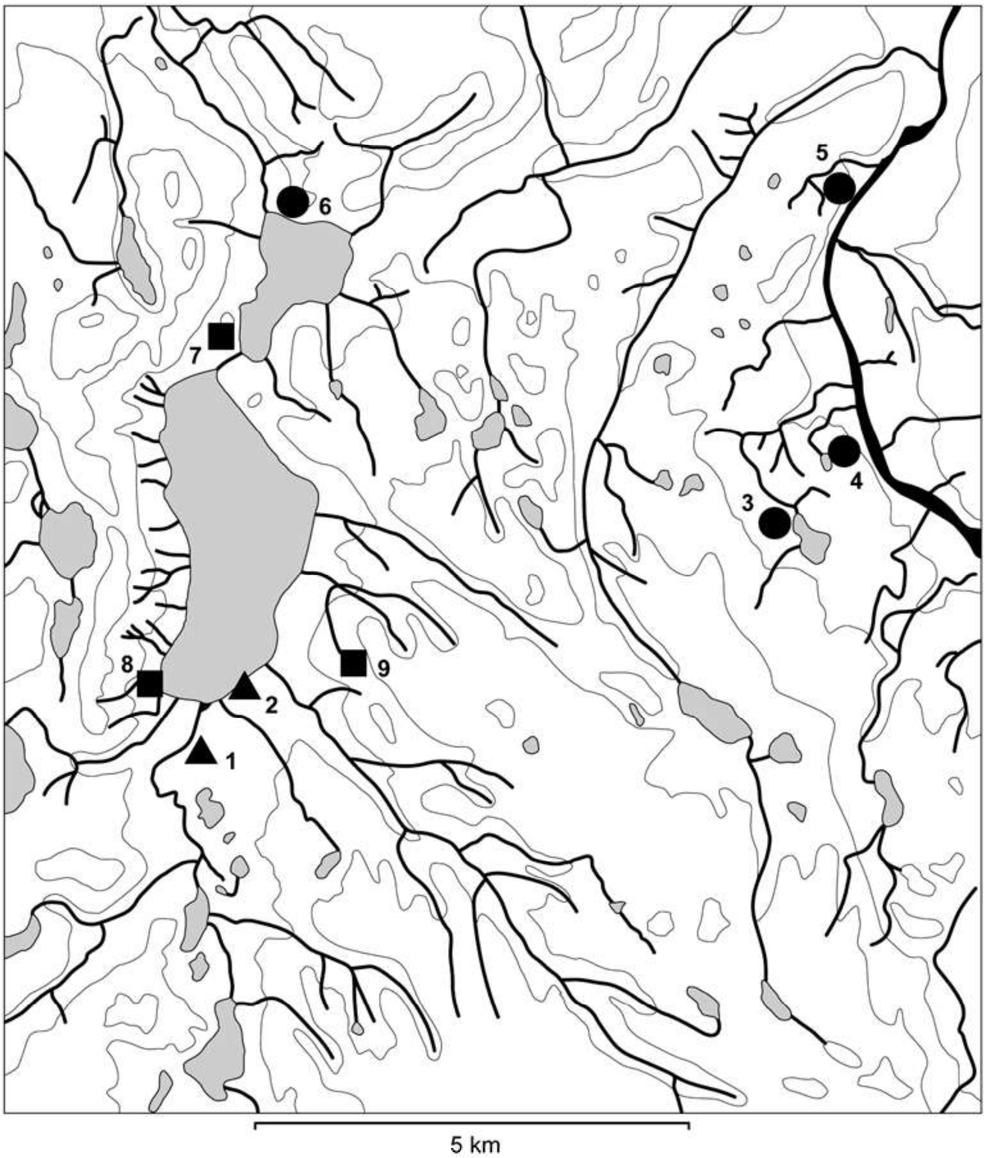

FIGURE 2: Topographic map of Umingmak – triangle: Paleo-Inuit site, dot: Inuinnait site, rectangle: unspecified site, 1: PjRa2 (Umingmak), 2: PjRa1 (Shoran Lake site), 3: PjRa6 (Arrow Lake site), 4: PjRa7 (Thomsen River site 1), 5: "emplacement (...) not extensively studied"(Albrecht, Berke 1977: 148), 6: PjRa5 (Stefan Lake site), 7: Albrecht, Berke (1977: fig. 43:9), 8: PjRa3, 9: PjRa4. Equidistance: 100 m. The large lake surrounded by 1, 2, 7–9 is situated at c. 250 m above sea level (map redrawn from Albrecht and Berke 1977: Fig. 43).

Umingmak site (*Figure 2:1*) they documented and excavated twelve spots with artefacts, animal bones and many musk ox skulls which occured scattered over several hundred square meters on a small hill beside a pond (Taylor 1967: 227). No dwellings but many Pre-Dorset lithic and bone artefacts were found. Hansjürgen Müller-Beck, who investigated the finds in the late 1960s (Taylor 1967: 228), choose this site for excavation in 1970.

At Umingmak, three excavations were done in 1970, 1973 and 1975. Two aims of the fieldwork were to get experience on archaeological sites in an active periglacial environment and to apply the excavation method of European palaeolithic sites in arctic archaeology (Müller-Beck 1977b: 15–16). The participation of several natural scientists lead to a detailed recording and mapping of relief, land forms, frost induced structures, soils (*Figure 3*), vegetation, climate, recent mammals and plant phenology (B. Albrecht 1996, Bleich 1977a, Bleich, Stahr 1978, Ruhnau 1977, Schweingruber 1977a, b, Thannheiser 1989, Thannheiser, Schweingruber 1974, Wagner 1977). Also, palaeontologist Hans-Dietrich Kahlke from Weimar, who was familiar with Pleistocene musk ox remains (Kahlke 1963, 1964, 1966, 1969), was invited but could not participate as authorities of the German Democratic Republic refused him permission to travel for research to non-socialist countries (oral inf. R.-D. Kahlke, Weimar 18/10/2022). Thus, palaeontologist Wighart von Koenigswald took part as he was employed at the Collaborative Research Center "Palecology" of

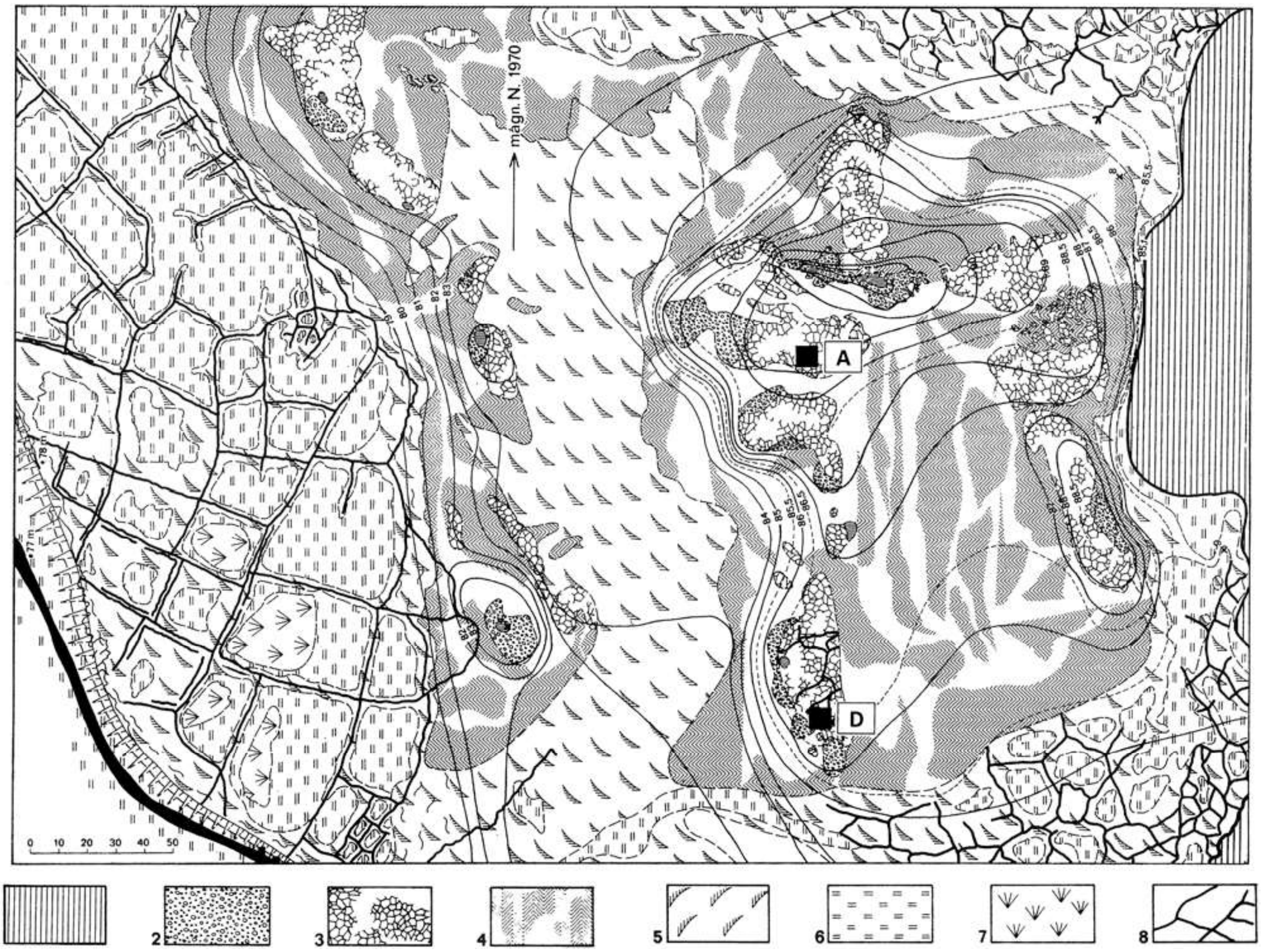

FIGURE 3: Umingmak site with excavation areas A and D – 1: bird perches, 2: gravel ridge, 3: polygon soil, 4: humocky soil, 5: string bog, 6: lowland fen, 7: pingo-like uprising, 8: water channel (from Bleich 1977a: Fig. 36). Note: in the publication the Roman number "I" is added to letter A and D to connect the areas excavated by Müller-Beck (1977a) to the areas designated by Taylor (1967). For the sake of simplicity the number "I" was not included here.

the University of Tübingen. Not all participating archaeologists are known: beside the head of the institute, Gerd Albrecht, Hubert Berke, Jacques Brochier, Ingo Campen, Maryke Hemsoth-LeMouël, Karl-Heinz Rieder and Wolfgang Torke took part. Last not least, Joachim Hahn (1942–1997) has to be mentioned (Biel, Pasda 1998): after writing a Dr. phil. thesis on the Aurignacian in Central and Eastern Europe at the University of Cologne, where he introduced the attribute analysis into German palaeolithic archaeology, Hahn became assistant professor at Tübingen in 1973 to participate on two excavations at Umingmak. Hahn, who stayed at Tübingen till his untimely death, became well-known due to his excavations of Aurignacian cave sites, where he introduced the modern excavation methods in Southwest Germany, his discovery of the Aurignacian "lion man" and the oldest music instruments of mankind. He wrote textbooks for students and made ground-breaking research on early modern human way of life in Central Europe, on Aurignacian mobile art and, due to refitting studies, on site formation processes and lithic technology. Without his research no acceptance of the cave sites as an UNESCO world heritage in 2017 may have been possible (Kind *et al.* 2016). Joachim Hahn was admired and beloved by his students as well as by local citizens: today the high school of Blaubeuren, the town near his most famous excavation sites, is named after him (Joachim-Hahn-Gymnasium n.d.).

In 1970 the excavation at Umingmak was done in area A (*Figure 3*) to record archaeological finds with two dimensional measuring in a grid of several square meters. The finds of two artificial, 5–10 cm thick layers were mapped, the upper one on 26 m^2 (*Figure 4*: above), the lower one on 17 m^2 (*Figure 4*: below). In 1973 the excavation method developed by Hahn (1989a) was applied in area A (Müller-Beck 1977b: 12) but also in a new excavation, on the 8 m^2 of area D (Hahn 1977a) which is situated 130 m south (*Figure 3*). Now, each find was recorded in three dimensions. One research aim was the "preparation of old land surfaces and, if possible, of living floors" (Hahn 1977a: 23). The excavations in area A and D were continued in 1975 when additional 4 m^2 were excavated in area A2 just east of area A where the whole sediment was sieved in water to collect small artefacts (G. Albrecht 1996: 63).

At area A most archaeological objects occur in an up to 10 cm thick, blackish-brown silt which is covered by dryas peat (Müller-Beck 1977b: 16–18). The base of the stratigraphy are sands and sandy gravels. Several musk ox skulls, mandibles and long bones occur on the surface of area A. The musk ox skulls were interpreted as representing "some sort of a structure" (Müller-Beck 1977b: 22), maybe "blocks for small wind-breaks" (Müller-Beck 1977b: 21). After excavating the upper 10 cm of the archaeological layer more musk ox skulls and large rocks were exposed which form two 2 m^2 large spots separated by a 2 m long, 50 cm wide, NW/SE oriented zone which is more or less devoid of finds (*Figure 4*: above). Three spots with burnt stones and charcoal were interpreted as a fire place (Müller-Beck 1977b: 21): in area A2 one hearth is a 20 × 10 cm wide and 10 cm deep hole filled with charcoal, burnt and unburnt rocks (G. Albrecht 1996). Without checking the original excavation documentation this spatial arrangement is impossible to interprete as remains of a mid-passage dwelling (for a description and discussion see Darwent *et al.* 2018: 526). For example, the lower part of the archaeological layer is seen as disturbed by frost action (Müller-Beck 1977b: 21) but the occurrence of long bones matches those of rocks and musk ox skulls from the upper part (*Figure 4*: below). However, Pre-Dorset sites are not only characterized by mid-passage dwellings but also by 1 m^2 small clusters of stones, lithic artefacts and debris or by a jumble of larger rocks and cultural debris without spatial patterning (Ramsden, Murray 1995: 106). This may have been the case also at area A.

Area D is situated beside a trench excavated in 1965 and its back dirt (*Figure 5*). Musk ox skulls occur to the south. Ice wedges criss-cross the area. The stratigraphy is characterized by "their marked peaty character" (Hahn 1977a: 27): below the humic surface and decomposed peat most archaeological objects occur in a decomposed peat with silty sand. Below a peat is situated. As in area A the base of the stratigraphy are sterile silts and small gravels. Hahn (1977a: 30, 1977b) interpretes the stratigraphy as human occupation within a temperate climatic period of soil formation which was later disturbed by formation of frost wedges and overgrowth of saxifraga. The vertical distribution of artefacts shows a clear separation of small objects in the upper part and large finds in the lower part (Hahn 1977a: Fig. 11). Horizontal distribution is influenced by the presence of frost wedges (*Figure 6*). No hearth was found but many lithic artefacts, burnt and unburnt animal bones. In contrast to area A with losts of refitting of fragmented lithics and knapping sequences (G. Albrecht 1996: Fig. 12, Müller-Beck *et al.* 1971: 147) only few were possible in area D (Campen 1977a: 56). Presence of rocks here is due to "natural, rather than cultural agencies" (Hahn 1977a: 42). Thus, area D is interpreted as "a refuse dump for bones" (Hahn 1977a: 44).

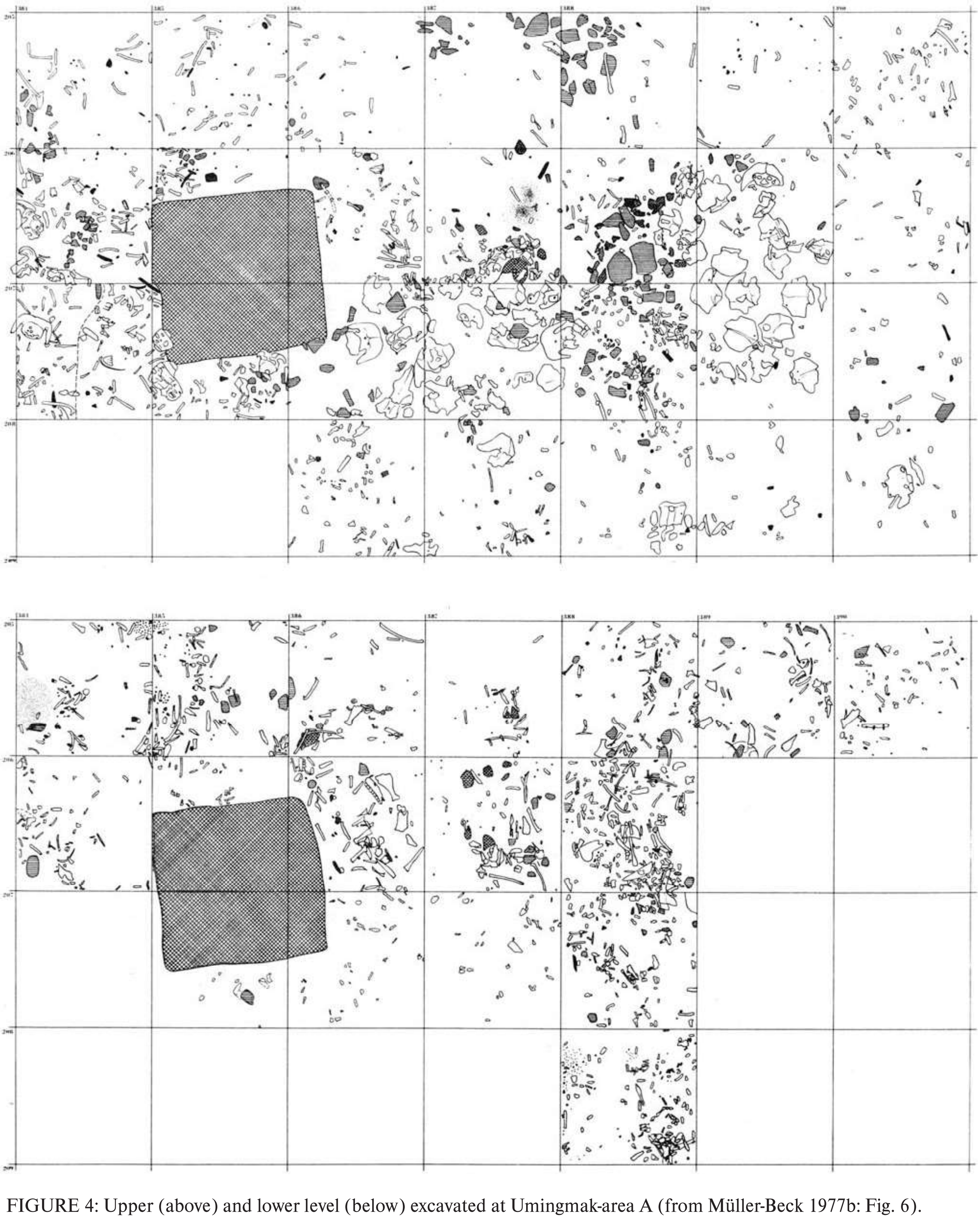

FIGURE 4: Upper (above) and lower level (below) excavated at Umingmak-area A (from Müller-Beck 1977b: Fig. 6).

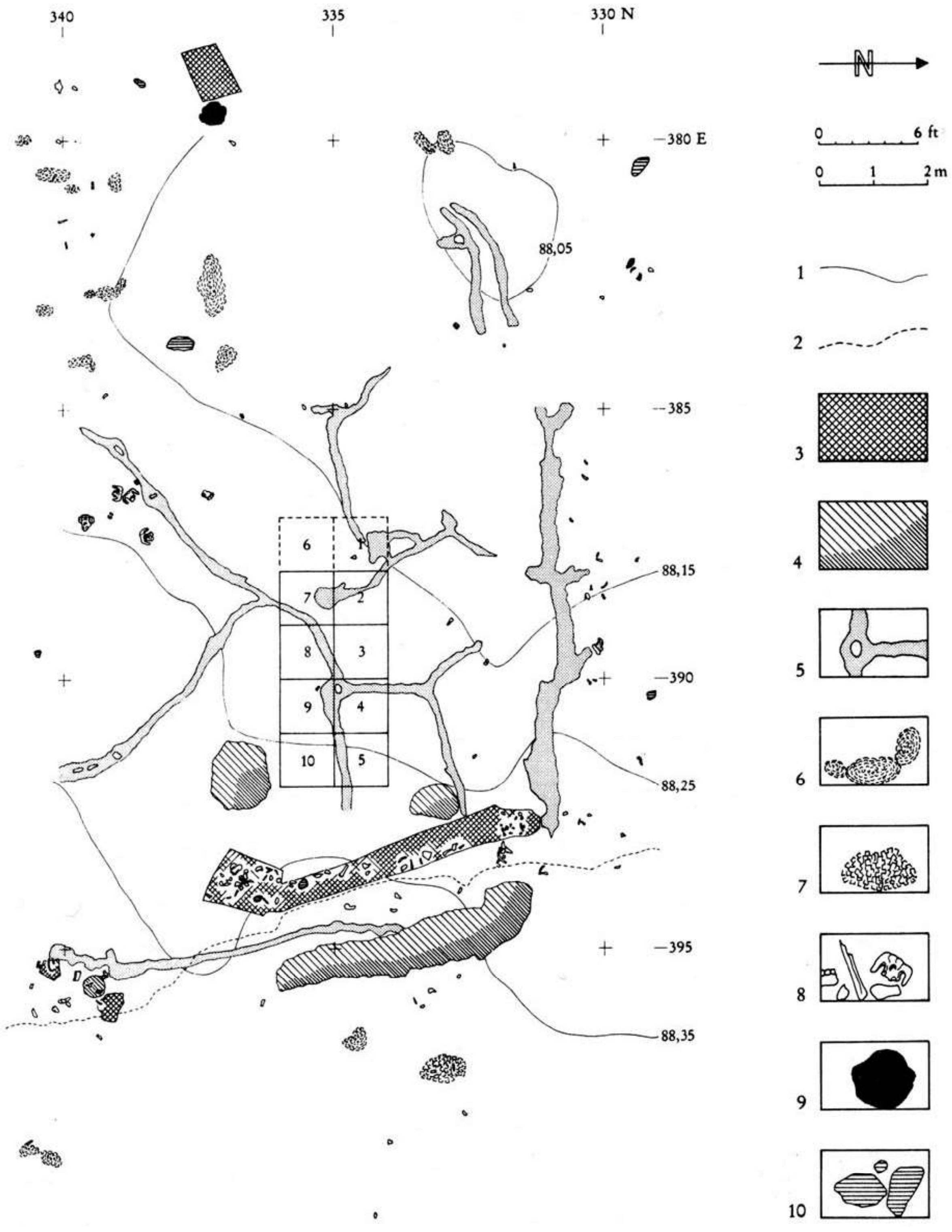

FIGURE 5: Overview of Umingmak-area D with 8 m² of the 1973 and 1975 excavation – 1: contour lines, 2: limit between dry sand and hummocky zone, 3: area excavated in 1965, 4: backdirt of 1965 excavation, 5: ice wedge, 6: gravel and sandy areas, 7: coarse gravel, 8: bones, 9: bone concentration, 10: stones (from Hahn 1977a: Fig. 9).

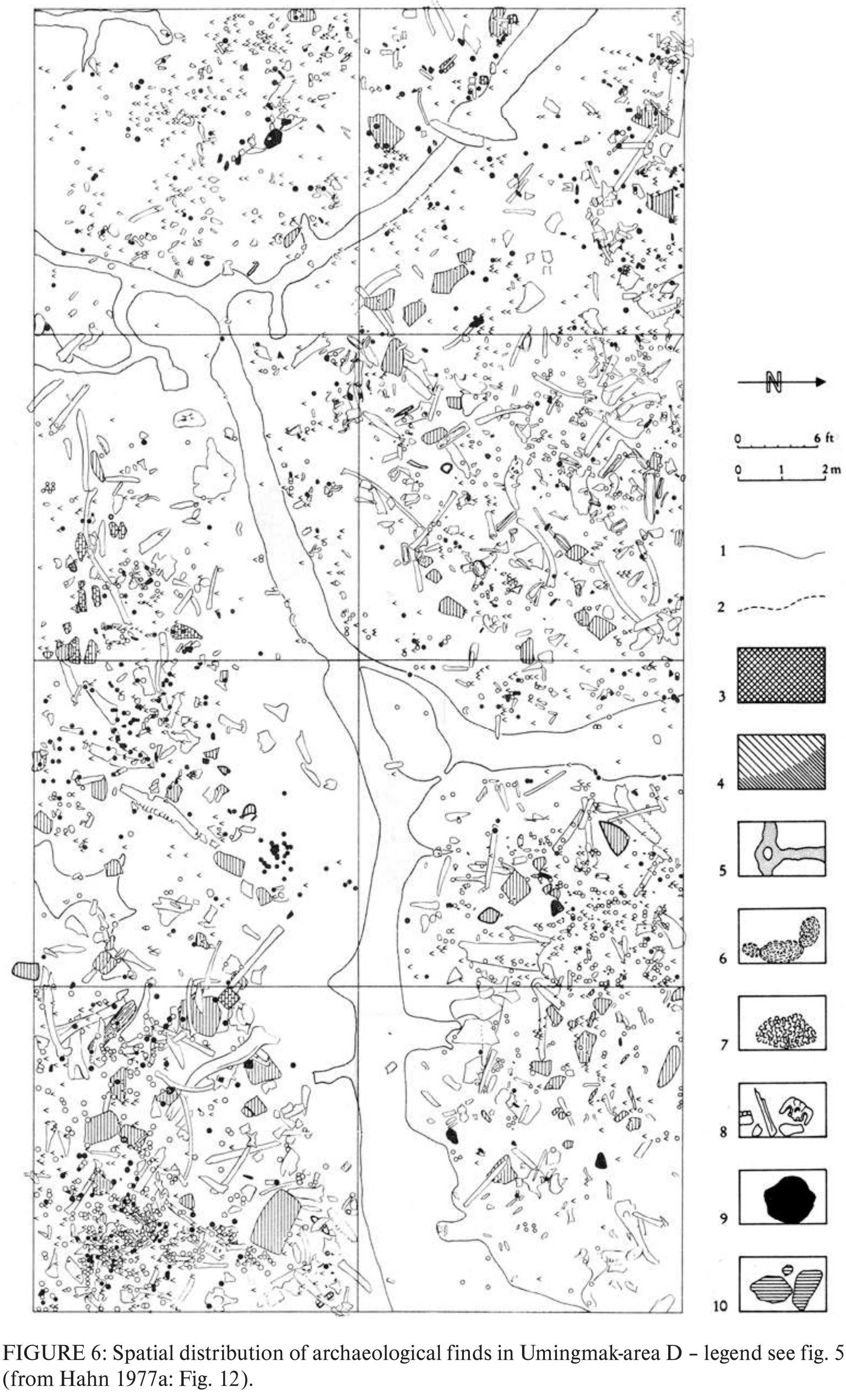

FIGURE 6: Spatial distribution of archaeological finds in Umingmak-area D – legend see fig. 5 (from Hahn 1977a: Fig. 12).

Nearly 3000 lithic artefacts were excavated at Umingmak (*Table 1*). The high amount of small lithics (<5 mm) in areas excavated in 1973 is the result of the more sophisticated excavation strategy but indicates also that knapping and modification of lithics took place here. Three different lithic raw materials were used (*Table 1*) of which only quartzite occurs locally in fluvial gravels (Campen 1977a: 53). In area A quartzite predominates in contrast to area D where flint is much more present. Cores are rare among flint (*Figure 8:19*) but seem to be present in higher numbers among quartzite (Campen 1977a: 56, Müller-Beck *et al.* 1971: 147, Torke 1977: 48). In both areas endblades are made of quartzite whereas flint was the prefered raw material for other tools (Campen 1977a: 56, Torke 1977: 48). The amount of tools is low (*Table 1*). The higher percentage in the inventory excavated in 1970 may result out of the low amount of small lithics. Among the lithics of area A and D are 238 microblades and microblade fragments which were investigated by Owen (1984, 1988): a fine-grained, homogenous flint was used to produce the up to 4 cm long, 5 mm wide and 1 mm thick microblades (*Figure 7:14, 8:8–11*), among them two primary ridge blades. The microblades have oval shaped, smooth and facetted platforms with dorsal reduction. 16 % show a fine, dorsal retouch on the right or left side of the microblade.

Paleo-Inuit had highly effective tools for butchering and carpentry (Walls 2010). At Umingmak a lithic tool type occurs which is common in early Paleo-Inuit sites of the Canadian arctic and Greenland (Grønnow 2017: 352). These bifacially retouched, thin (<5 mm), up to 7 cm long endblades (*Figure 7:1–5, 8:1–3, 9:1–5*) are the most common lithic tool type of Umingmak (*Table 2*). Often fragments occur of which some could be refitted (*Figure 7: 1–3*). The base is round (*Figure 7:1, 2, 5*) or straight (*Figure 7:4*). Rounded and lightly crushed, lateral edges near the base (Campen 1977a: 56, Müller-Beck *et al.* 1971: 151, Torke 1977: 1–3) indicate hafting to use the lateral sides and the point as a knife (Grønnow 2017: 115–131, Sørensen 2012: 105–106). Few very small bifacially retouched tools with two pointed ends occur (*Figure 7:6, 8:4*). Here, these tools are interpreted as arrow points (Grønnow 2017: 56–73, Sørensen 2012: 109). Many burins characterize Umingmak (*Figure 7:9–13, 8:12–18, 9:11–13*). One burin preform, as defined by Sørensen (2012: 102), may be present (*Figure 7:8*). The burins exhibit different stages of rejuvenation which result in changes from beak-form to pointed ends, from dihedral burins to double burins (Grønnow 2017: 142, Sørensen 2012: 102–104). Burin spalls were detached from retouched and grinded platforms as well as from burin negatives (Campen 1977a: 57, Torke 1977: 49) but no grinded burin surface is mentioned. The distinct feature of Pre-Dorset burins – the detachment of series of flakes from the burin edge (Sørensen 2012: 299–301, Sørensen, Diklev 2022: 6) – seems to occur at Umingmak (Müller-Beck *et al.* 1971: 151). Microwear traces indicate transversal scraping and smoothing with lateral burin edges as well as grooving and engraving with the tip of the tool (Unrath 1987). Rounded and lightly crushed areas characterize the retouched edges of burins (Campen 1977a: 57, Müller-Beck *et al.* 1971: 151, Torke 1977: Fig. 14:1–3, 5, 6, Unrath 1987) which may indicate hafting of burins in handles (Grønnow 2017: 134–140, Sørensen 2012: 102). On some burins organic residues may be the leftovers of glue fixing the lithic tool onto the shaft (Unrath 1987). The use of burin spalls as tools is in debate (Stewart 1989: 86, Sørensen 2012: 105). At Umingmak, end scrapers are present in lower numbers (*Table 2*). Among them are scrapers on broken blades (*Figure* 7:15), on flakes (*Figure 7:16, 8:7*) and with lateral and/or ventral retouch (*Figure 7:17–21; 9:8–10*). One scraper (*Figure 7:20*) is grinded on both sides (Müller-Beck *et al.* 1971: 151). The ligthly crushed edges of

TABLE 1: Lithics excavated at Umingmak. References: Campen 1977a, Müller-Beck *et al.* 1971, Torke 1977. Notes: total number of lithics deviate a little from numbers indicated in the references and the amount of lithics <5 mm was only recorded for certain lithic rock types.

area (excavation year)	flint	quartzite	silicified slate	lithics total	lithic tools	lithics <5 mm
area A (1970)	n=212	n=743	n=23	n=978	11%	low
area A (1973)	n=350	n=613	n=12	n=975	2%	63%
area D (1973)	n=798	n=224	n=17	n=1039	4%	56%

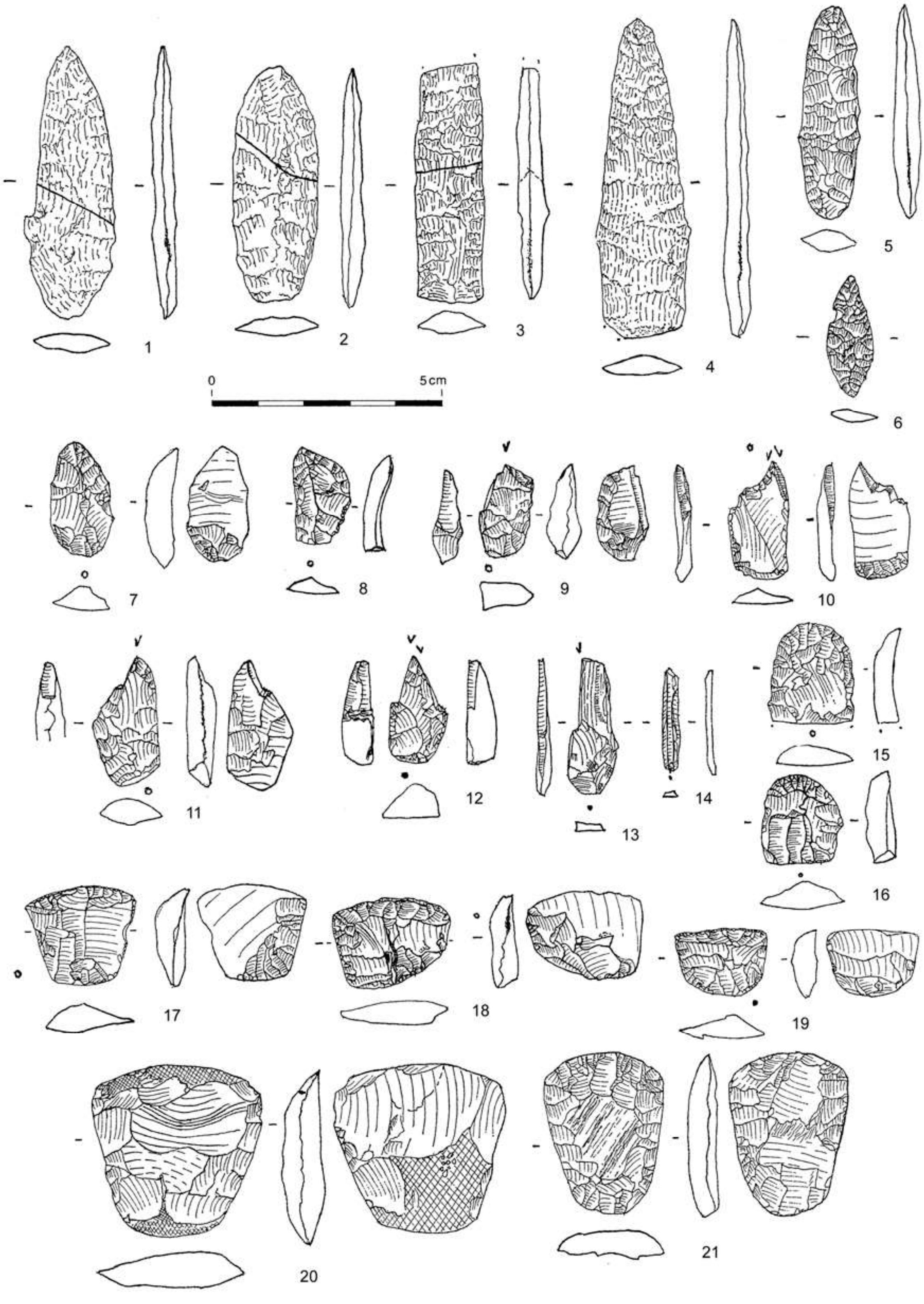

FIGURE 7: Lithic artefacts of Umingmak-area A excavated in 1970 (from Müller-Beck *et al.* 1971: Fig. 2–4).

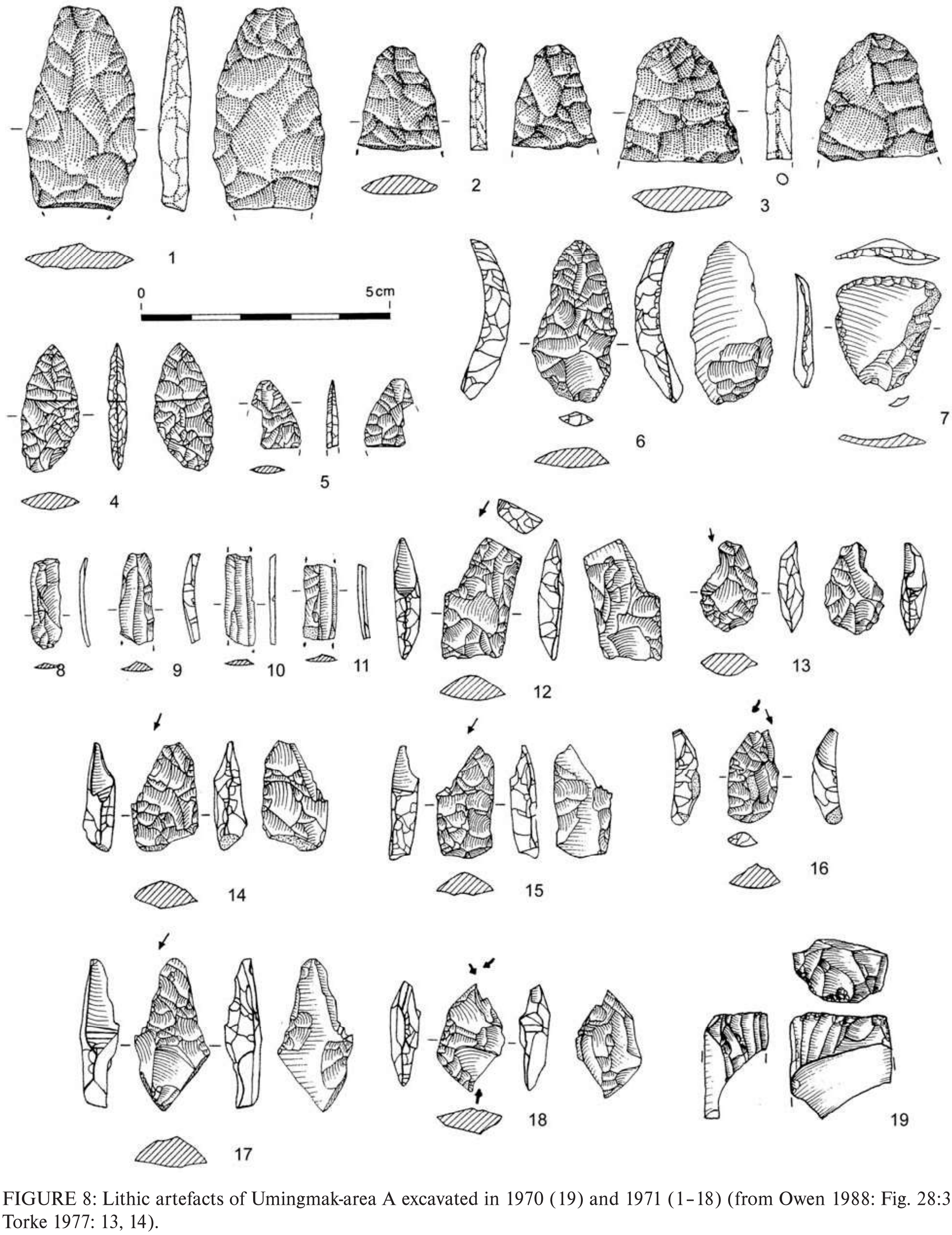

FIGURE 8: Lithic artefacts of Umingmak-area A excavated in 1970 (19) and 1971 (1–18) (from Owen 1988: Fig. 28:3, Torke 1977: 13, 14).

scrapers (Campen 1977a: 57, Müller-Beck *et al.* 1971: 151) indicate hafting (Grønnow 2017: 134–139, Sørensen 2012: 105).

Two harpoon heads are published from the 1965 campaign (Taylor 1967, Fig. 11: b, c), among them a barbless, self-bladed harpoon head with a long, narrow medial spur, an open socket and a drilled line hole (Maxwell 1984: 86, Taylor 1967: Fig. 11: d). Beside, an awl (Taylor 1967: Fig. 11: e), an object with side notches of unknown function (Taylor 1967, Fig. 11: f) and a possible spear thrower for light darts (Maxwell 1984: 87, Taylor 1967: 228, Fig. 11: g) were found. According to Maxwell (1984: 99) comparable artefacts occur in sites on Victoria Island. The bone and antler tools excavated in the 1970s were described by Müller-Beck (1977c, Müller-Beck *et al.* 1971: 146). At area A occur the following artefacts: a 20 cm long bone rod with rectangular cross-section and engravings on both flat sides (*Figure 10:1*), a 20 cm long (antler?) rod with engravings and vertical lines on the compacta and a long, narrow, cutted groove on the spongiosa side (*Figure 10:2*). Beside, a 15 cm long but only 2–4 mm thick bone rod with engravings and an eye-shaped hole at its base (*Figure 11:1*), a fragmented, 10 cm long and 3 mm thick bone rod with two basal holes, a vertical line and engravings (*Figure 11:2*) occur as well as a 9 cm long and a 13 cm long bone rod with worn, blunt ends and a bevelled point (*Figure 11:3, 4*). The latter type, also found by Taylor (1967: Fig. 11:h), is interpreted as a flaker (Müller-Beck 1977c: 69, Grønnow 2017: 354). Also excavated in area A were a small, 3,5 cm long and 2 mm wide harpoon with two tiny barbs (Müller-Beck *et al.* 1971: Taf. VII:5), several small (3 mm wide) needles with a drilled hole (Müller-Beck *et al.* 1971: Taf. VII:6) and a 20 cm long, T-shaped, line-ornamented antler handle (Müller-Beck *et al.* 1971: Taf. VII:3). The latter may be a shaft for a narrow adze head (Grønnow 2017: 353). At area D a toggle harpoon head (*Figure 12:1*) and a fragmented, heavily ornamented object with C-shaped cross-section and a denticulated end (*Figure 12:2*) were found. Beside, working of caribou antler and a worked fragment of a bone from a sea mammal are present (Münzel 1987).

A detailed archaeostratigraphic discussion of West Canadian Paleo-Inuit sites, including Umingmak, was made by Arnold (1981) which will not repeated here as precise dating by harpoon head typology remains difficult (Houmard 2018: 27, 30): the toggle harpoon head of Umingmak (*Figure 12:1*) reminds of the self-bladed, thin Pre-Dorset harpoon with open socket, lashing bed and one or two lateral barbs (Maxwell 1985: 86, Park, Stenton 1998: 29). But this type has two weak lateral spurs in contrast to the harpoon head from Umingmak which only has a single medial spur which characterize another Pre-Doset harpoon head type (Houmard 2018: Fig. 3, Maxwell 1985: 86, Park, Stenton 1998: 30, Stordeur-Yedid 1980: 45–50). A harpoon head comparable to the Umingmak specimen occurs on the Lagoon site on Banks Island, but is c. 1000 years younger, from the Dorset period (Arnold 1980: 412, 1981). Beside, Umingmak is one of few Pre-Dorset sites in Canada with ornamented artefacts (Helmer 1986: 181). According to Grønnow (2017: 360–361) the ornaments of Umingmak are skeleton patterns.

The chronostratigraphic position of Umingmak is indicated by 51 radiocarbon dates (*Table 3*) which show human occupation of the site between c. 3600–3100 ^{14}C yrs BP. This is c. 1000 years after the first appearance of Pre-Dorset in the Canadian arctic which ended around 2800 ^{14}C yrs BP (Milne, Park 2016: 694; Savelle, Dyke 2002, 2014a). At Umingmak, a fragment of a human mandible was found in 1975 in fluvial gravels 400–500 m south of the excavation (Bocherens *et al.* 2014, Haidle 1992). This is the remain of an adult, presumably male individual who relied heavily on maritime food. Without taking the marine reservoir effect into consideration (Dyke *et al.* 2019, Reuther *et al.* 2021), the two radiocarbon dates of the mandible (*Table 2*) indicate its Pre-Dorset age.

Huge amounts of musk ox bones characterize the excavated areas of Umingmak (Münzel 1983, 1987a, b, 1988, 1996, von Koenigswald 1977). In area D, at minimum, bones of over 70 musk ox individuals have been excavated. Beside musk ox, few bones of caribou, polar fox, hare, wolf and birds are present. Approximately 30 % of the postcranial bones represent calves, 38 % sub-adults and 32 % adult individuals, repectively for the teeth the proportions are 25%, 25% and 50 %. Among the horn cores both sexes occur equally in the calf group, while among sub-adults females predominate. At area A and D dumping of bones with low meat and low fat content was done. According to cutmarks and bone fragmentation, skinning, butchering

TABLE 2: Lithic tools of Umingmak. References: Campen 1977a, Müller-Beck *et al.* 1971, Torke 1977.

area (excavation year)	endblade	arrow point	burin	end scraper
area A (1970)	n=42	n=2	n=34	n=14
area A (1973)	n=8	n=1	n=13	n=3
area D (1973)	n=11	n=1	n=10	n=9
lithic tool type (total)	n=61	n=4	n=57	n=26

TABLE 3: Radiocarbon data from Umingmak.

no.	material	age (in ^{14}C yrs BP)	area	reference
H-4050-3188	Charcoal	2485±200	area A1 (near surface)	Müller-Beck 1977a
Hd-7555-7962	Musk ox bone	3120±35	Area D – layer 2a	Owen 1988
Hd-7558-7803	Musk ox bone	3170±40	Area D – layer 2c	Owen 1988
Hd-7566-7883	Musk ox bone	3170±45	Area D – layer 2a	Owen 1988
Hd-7564-7876	Musk ox bone	3200±50	Area D – layer 2c	Owen 1988
Hd-10590-109553	Musk ox bone	3210±50	Area D	Owen 1988
Hd-7550-7832	Musk ox bone	3215±35	Area D – layer 2e	Owen 1988
Hd-10593-10520	Musk ox bone	3220±40	Area D	Owen 1988
Hd-7568-7897	Musk ox bone	3220±50	Area D – layer 2s	Owen 1988
Hd-7554-7839	Musk ox bone	3230±45	Area D – layer 2a	Owen 1988
Hd-7567-7896	Musk ox bone	3245±35	Area D – layer 2a	Owen 1988
Hd-10586-10535	Musk ox bone	3250±50	Area D	Owen 1988
Hd-10587-10569	Musk ox bone	3250±50	Area D	Owen 1988
Hd-7561-7874	Musk ox bone	4270±45	Area D – layer 2s	Owen 1988
Hd-10588-10543	Musk ox bone	3270±60	Area D	Owen 1988
Hd-10592-10556	Musk ox bone	3275±40	Area D	Owen 1988
Hd-7445-7522	Musk ox bone	3280±40	Area D – layer 2c	Owen 1988
Hd-7552-7766	Musk ox bone	3285±40	Area D – layer 2e	Owen 1988
Hd-7557-7802	Musk ox bone	3285±40	Area D – layer 2c	Owen 1988
Hd7569-7900	Musk ox bone	3300±35	Area D – layer 2c	Owen 1988
Hd-7556-7801	Musk ox bone	3310±40	Area D – layer 2a	Owen 1988
Hd-7565-7882	Musk ox bone	3320±40	Area D – layer 2a	Owen 1988
Hd-7447-7524	Musk ox bone	3320±40	Area D – layer 2g	Owen 1988
Hd-7451-7505	Musk ox bone	3330±35	Area D – layer 2s	Owen 1988
Hd-10585-10520	Musk ox bone	3330±50	Area D	Owen 1988
Hd-7559-7853	Musk ox bone	3340±40	Area D – layer 2e	Owen 1988
Hd-7448-7532	Musk ox bone	3350±35	Area D – layer 2g	Owen 1988
Hd-7551-7764	Musk ox bone	3350±45	Area D – layer 2e	Owen 1988
Hd-7449-7523	Musk ox bone	3360±45	Area D – layer 2s	Owen 1988
Hd-7453-7506	Musk ox bone	3360±25	Area D – layer 2s	Owen 1988
Hd-7562-7875	Musk ox bone	3360±40	Area D – layer 2s	Owen 1988
Hd-7563-7865	Musk ox bone	3365±35	Area D – layer 2s	Owen 1988
Hd-7446-7531	Musk ox bone	3370±30	Area D – layer 2c	Owen 1988
Hd-12045	charcoal	3376±43	Area A2	G. Albrecht 1996
Hd-7452-7530	Musk ox bone	3380±40	Area D – layer 2s	Owen 1988
Hd-7553-7800	Musk ox bone	3380±40	Area D – layer 2e	Owen 1988
Hd-7450-7533	Musk ox bone	3400±40	Area D – layer 2s	Owen 1988
ETH-5637	Human bone	3400±100	surface find in fluvial gravels	Haidle 1992
Hd-10594-10598	Musk ox bone	3410±60	Area D	Owen 1988
GSC-651	Burnt bones and willow	3420±150	Testpit Taylor 1965	Müller-Beck 1977a
Hd-10591-10621	Musk ox bone	3425±50	Area D	Owen 1988
Hd-4051-3189	Charcoal	3425±100	area A1	Müller-Beck 1977a
Hd-7560-7854	Musk ox bone	3430±35	Area D – layer 2s	Owen 1988
GSC-669	Burnt bonees and willow	3440±160	testpit Taylor 1965	Müller-Beck 1977a
Hd-12044	charcoal	3445±42	area A2	G. Albrecht 1996
Hd-12023	charcoal	3463±48	area A2	G. Albrecht 1996
Hd-7454-7507	Musk ox bone	3470±40	Area D – layer 2b	Owen 1988
Hd-10589-10620	Musk ox bone	3495±60	Area D	Owen 1988
Hd-12022	charcoal	3554±49	area A2	G. Albrecht 1996
Hd-12043	charcoal	3664±112	area A2	G. Albrecht 1996
GrA-38,561	human bone	3875±40	surface find in fluvial gravels	Bocherens *et al.* 2016

and intensive marrow extraction was conducted. Some musk ox heads were also imported in different stages of preservation as single specimens. Wear pattern and thin-sectioning of muskox and fox teeth, excavated bones of a very young polar fox and presence of several migratory bird species indicate occupation of Umingmak in the warm season (Münzel 1987a: 189–191, Savelle, Beattie 1983, von Koenigswald, Kubiak 1979). This is supported by the analysis of charcoal which indicates that arctic dwarf willow was gathered in summer on hill tops to be dried and then burnt slowly (Schweingruber 1977b). However, Münzel (1987a: Tab. 17) has determined 16 of 58 mandibles as those of six or seven months old musk ox calfs (Münzel 1987a: 58–59). This is interpreted by Münzel (1987a: 187) as evidence of hunting also in November and December.

3.2.2. Inuinnait archaeology

Already in 1973, before flying to Banks Island, the participants of the excavation at Umingmak made observations on geomorphology (Bleich 1977b) and ethnoarchaeology (Hahn, Rousselot 1975) in Tuktoyaktuk at the mouth of the Mackenzie River. Here, remains of recently abandoned canvas tents were recorded. The interpretation of the structures was based on the detailed information gathered from its waste and oral lore about life in modern Tuktoyaktuk. Beside, two used, modern houses and their surroundings were mapped and human behavior concerning structure types and their spatial arrangement recorded. During the 1973 and 1975 excavations on Banks Island the German archaeologists made surveys along the Thomsen River (Albrecht, Berke 1977, Campen 1977b, Hahn 1976b, 1979). This river is situated east of the excavation (*Figure 13*) to reach the Arctic Ocean at the northern shore of Banks Island. By chance, in 1973 wildlife biologists also recorded archaeological sites in this valley (Wilkinson, Shank 1975). Later, more surveys were done by others (Hickey 1984, Hodgetts 2012: 83, 2013). All sites can be attributed to the Inuinnait (Finkelstein et al. 2009: 450, Hodgetts 2012) who, 110 years ago, were designated as "Copper Eskimo" by Stefansson (1913: 33).

Beside the Thomsen River large sites with many tent rings, stone-built caches, outdoor hearths, skin and meat-drying facilities occur beside smaller ones (*Figure 13*) like the Stefan Lake site (*Figure 2:6*) with two tent rings. But also kill sites occur (*Figure 2:3*), indicated by a single cache, hunting blinds, presence of musk ox bones and few fragments of hunting weapons, like an arrow shaft (*Figure 16:7*). The largest site is Head Hill Scarp (*Figure 14*: above left) where four agglomorations of tent rings and other stone-built structures as well as remains from at least 441 musk ox occur on 400 × 400 m of a wind exposed gravel ridge. A detailed recording of rocks and bones on a smaller part shows two tent rings and an outdoor hearth, all surrounded by musk ox bones (*Figure 15*). To the west of the tent rings, remains of at least 60 musk oxen occur on a several square-kilometer large area. On the valley bottom, at Head Hill Flats, a 60 × 80 m large area contains 34 tent rings and the remains of at least 134 musk oxen (*Figure 14*). The tent rings are characterized by single stones marking roughly the periphery of c. 4 × 4 m large tents. Inside, the western part was empty, in contrast to the south-eastern part where, in front of the entrance, a T-shaped hollow was present (*Figure 14*). Two other sites, Isachsen Sands and Thomsen River site 1 (*Figure 13*), are characterized by a much lower number of tent rings, stone-built meat caches, 30–60 cm deep pits covered with stone slabs and at least 50–75 remains of musk oxen. As on the other sites, few Inuinnait artefacts were found. Among them are fragments of hunting weapons, like arrow shafts (*Figure 16:4, 7*) and harpoon heads. Among the latter is a Thule-type toggle harpoon head made of caribou antler (*Figure* 16:1) which was in use in this area till the late 18th or 19th century for sea mammal hunting in areas with seasonal ice cover or at breathing holes (Fitzhugh, Kaplan 1982: 67, Jenness 1946: 115–116, McGhee 1972, Morisson 1981: 262, Park, Stenton 1998: 46). Also few parts of dog harnesses, sled shoes, iron nails, bronze parts, glass sherds, sawn antler and green painted wood fragments were found (*Figure 16*). The light construction of tents, the low amount of artefacts, the presence of bones of musk-ox calves and the wear pattern of musk ox teeth indicate short human stays during spring, summer and autumn (Hemsoth-LeMouël 1999: 82, Hodgetts 2013: 56, 60 – for North-East Greenland see: Jensen 2009: 172, 174). Their use of musk ox was the same as during Pre-Dorset times (von Koenigswald 1977: 80). Excellent preservation made observations of antler and horn technology possible (Hahn 1976a, 1980). Musk ox horn was used for ponders, ladles, vessels or snow knifes (Jenness 1946: 6, 69–72, 98).

At Isachsen Sands an exceptional assemblage of artefacts was found (Hahn 1976b). The variety of well preserved Inuinnait tools as well as their documentation by the highly skilled scientific drawer (Hahn 1992) must lead to its renewed representation. The assemblage was found surrounded by stones (*Figure 17*) within a tent ring. 12 m far away another tent ring was situated, containing parts of a sledge, a lamp made of stone and an ulu, the woman's knife (Rankin, Labrèche 1991).

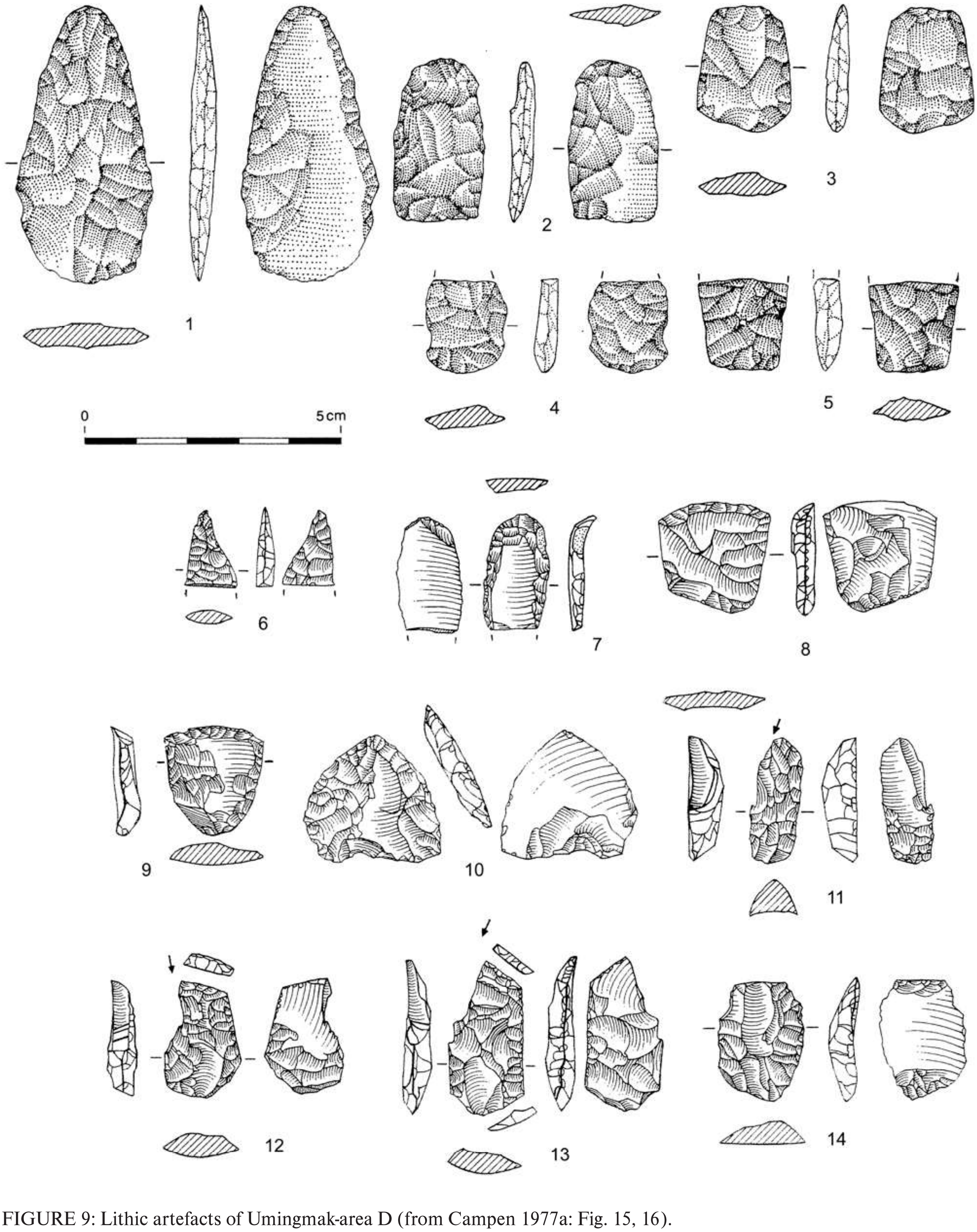

FIGURE 9: Lithic artefacts of Umingmak-area D (from Campen 1977a: Fig. 15, 16).

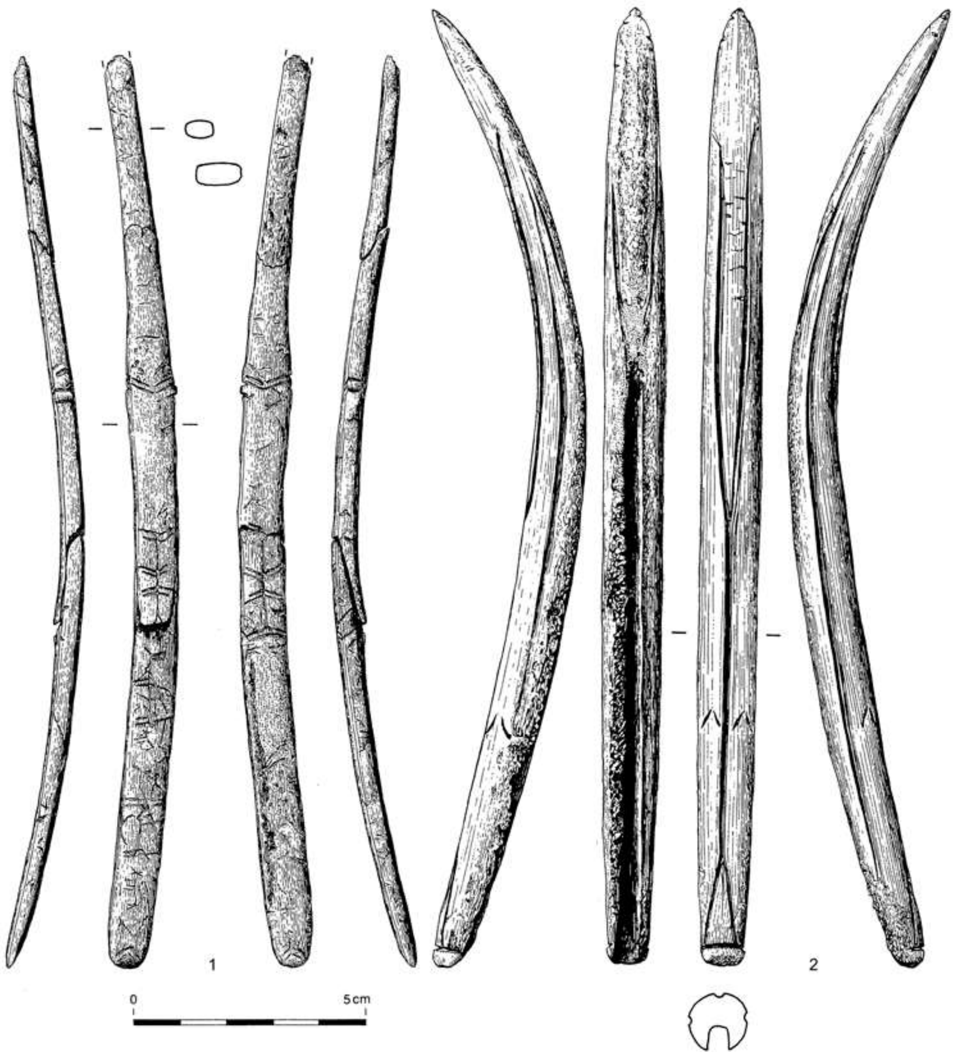

FIGURE 10: Organic artefacts of Umingmak-area A (from Müller-Beck 1977c: Fig. 17, 20).

The assemblage contains more than 50 artefacts (*Figure 17, 18*) among them tool types known from the local Thule culture and the historic Inuinnait (Jenness 1946, McGhee 1972, Morrison 1981, 1987, VanStone 1994). Among these artefacts are tools for hunting land mammals (*Table 4:1-20*), for fishing with a line (*Table 4:22*) and with a spear (*Table 4:23, 24, 25*), for manufacture and domestic activities (*Table 4:21, 26-30*), for travelling (*Table 4:33*) as well as long wooden shafts (*Table 4:34, 35*) and numerous unfinished or broken fragments of iron, copper, wood and antler (*Table 4:31, 32, 36-51*). Maybe one of the wooden shafts represents a quiver stiffener (Fitzhugh, Kaplan 1982: 107). Only for tools drawn in detail by Hahn (1976b) a more precise dating can be presented. Characteristic for Inuinnait tools is the high amount of copper rivets in contrast to the low amount of copper artefacts (Morrison 1987: 8-9) and the presence of several types of arrow points (Jenness 1946: 126). The arrows with separate iron points that riveted into antler fore shafts (*Figure 18:2, 8*), the lanceolate arrow point (*Figure 18:9*) and the bow made from three pieces of wood and musk ox horn (*Figure 18:3, 4*) characterize Inuinnait archery (Jenness 1946: 122, 126, McGhee 1972: 83, VanStone 1994: 8-10). Typical Inuinnait tools are the snow goggle (*Figure* 18:6; Jenness 1946: 51) which prevents snow blindness when travelling (Norn 1996), the handle (*Figure 18:7*) "to carry any small bundle, but principally (...) the head of the caribou or the bag containing its blood" (Jenness 1946: 129), the trident fish spear (*Figure 18:10*; McGhee

1972: 85–86, VanStone 1994: 12) used for catching migrating salmon in lakes (Jenness 1946: 111, Fig. 134:b), the knife with shaft and handle connected by rivets (*Figure 18:11*; Jenness 1946: Fig. 110:a, McGhee 1972: 89, VanStone 1994: 14), the drill bit with iron point (*Figure 18:12*; Jenness 1946: 101, McGhee 1972: 92, VanStone 1994: 14–15) and the whittling knive (*Figure 18:13*; Jenness 1946: 98–101, McGhee 1972: 91, VanStone 1994: 14). A typical detail of Inuinnait tools is the presence of a small hole in the handle of the whittling knive (*Figure 18:13*) to fit the top of the spindle of the bow drill (Jenness 1946: 55, 102). The assemblage is interpreted by Hahn (1976b) as representing a now weathered quiver for arrows (*Figure 18:2, 8, 9*) on which the container for a bow (*Figure 18:3, 4*) and bags for other hunting weapons as well as tools for cutting (*Figure 18:11*), carving (*Figure* 18:13), drilling (*Figure 18:12*) and other domestic activities were fastened (see pictures in Damas 1984: Fig. 9, Jenness 1946: 126–129, VanStone 1994: Fig. 4). This ensemble may have been the personal belongings of a deceased Inuinnait hunter in the decades before c. AD 1920, when bow and arrow came out of use (Jenness 1946: 1, VanStone 1994: 22), who's corpse was wrapped in skin and deposited nearby (Hahn 1976b). This behaviour, the deposition of many valued and curated artefacts as grave goods is described

TABLE 4: Inuinnait artefacts at Isachsen Sands (Hahn 1976a).

no.	description
1	60 cm long, medial fragment of a bow with triangular ends and sinew wrap-up (*Figure 17:35; 18:4*)
2	two 18 cm long bow parts of musk ox horn (*Figure 18:3*)
3	4 cm long, broken copper arrow point (*Figure 17:42*)
4	iron arrow point fastened with a rivet to antler fore shaft with two barbs (15 cm lenght), conical base of fore shaft with two protruding edges (*Figure 17:11; 18:8*)
5	iron arrow point fastened with a rivet to antler fore shaft with one barb (18 cm length), conical base of fore shaft with two protruding edges (*Figure 17:33*)
6	iron arrow point fastened with a rivet to antler fore shaft (18 cm length), conical base of fore shaft with two protruding edges, fastened to a long wooden shaft (*Figure 17:18, 26; 18:2*)
7	17 cm long, lanceolate antler arrow point, conical base with two protruding edges (*Figure 17:16*)
8	20 cm long, lanceolate antler arrow point, conical base with two protruding edges
9	10 cm long, lanceolate antler arrow point with bevelled and striated base (*Figure 17:25; 18:9*)
10–20	eleven, up to 50 cm long, wooden arrow shafts (three distal, five medial, three proximal) with round cross section (*Figure 17:9, 19, 21, 23, 27, 29, 49*), some are fastened together with sinew wrap-up on v-shaped or double bevelled ends (9×) or on single bevelled bases (2×)
21	handle of antler (*Figure 18:7*)
22	5 cm long fish hook of antler with copper hook (*Figure 17:44*)
23	31 cm long antler side prong of fish spear with unilateral side prongs and a single bevelled base (*Figure 17:37*)
24	33 cm long antler side prong of fish spear with bilateral side prongs and a single bevelled base (*Figure 17:38*)
25	distal part of a barbed harpoon head with two side prongs, proximal part is sawn-off (*Figure 18:13*)
26	40 cm long hunting knife with short iron blade fastened with copper rivet on an antler handle with antler knob (*Figure 17:36; 18:11*)
27	35 cm long whittling knife with long handle and short iron blade fastened with two iron rivets on a bevelled base (*Figure 17:24; 18:13*)
28	23 cm long drill bit with wooden handle with v-shaped end for an antler containing an iron point (*Figure 17:30; 18:12*)
29	19 cm long drill bit with wooden handle with v-shaped end for an antler containing an iron point (*Figure 17:22*)
30	17 cm long chisel, sawn-off from antler (*Figure 17:17*)
31	unfinished iron ulu blade (*Figure 17:39*)
32	iron ulu fragment
33	13 cm long, wooden snow google (*Figure 17:10; 18:6*)
34	wooden shaft with two 46 cm and 80 cm long parts (Figure *17:31, 32*) fastened together on single bevelled bases, with double bevelled distal end (to take the side prongs?)
35	two parts of a 1.06 m long wooden staff, fastened together on bevelled bases and two antler rivets (*Figure 17:28; 18:5*)
36–41	six worked wooden framents
42–45	four worked antler parts
46	sawn-off musk ox horn
47	copper rivet
48–50	three iron fragments
51	copper fragment

for Inuinnait (Hemsoth-LeMouël 1999: 80, 82, Morrison 1987: 7). A comparable but younger cache was found by Manning (1953: 117) also on Banks Island, containing a lever-action Winchester 30–30, a box of cartridges, a telescope with a support stick, a box of matches and, like in the assemblage described above, a wooden snow goggle. This cache can be dated between AD 1894, when this type of rifle was released (Barnes 2006: 56), and "several years" (Manning 1953: 117) before its discovery in 1952.

3.3 Research in the 1980s and 1990s

A fourth excavation was made in Umingmak in 1987 (Müller-Beck 1989: 20) but no information is known and published from this campaign (written inf. S. Münzel 19/10/2022). In the early 1990s Hansjürgen Müller-Beck got in contact with the State Museum of Oriental Art in Moscow (Russia). The museum excavated at the Neo-Inuit site Ekven in Chukotka where, in 1991, Swiss archaeologist Riccardo Carazzetti, curator at the archaeological museum of Locarno in

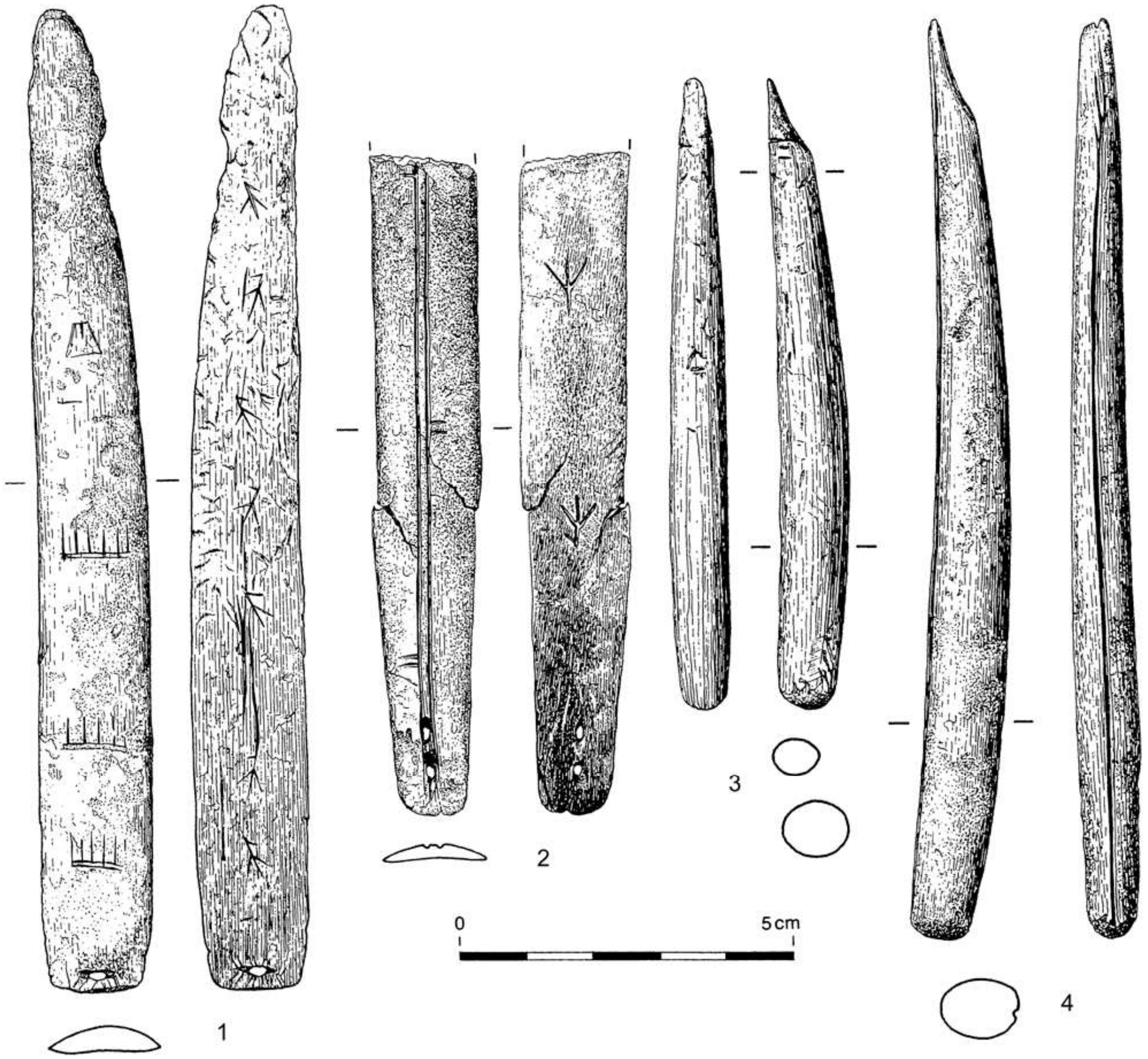

FIGURE 11: Organic artefacts of Umingmak-area A (from Müller-Beck 1977c: Fig. 18:1, 19:1, 21).

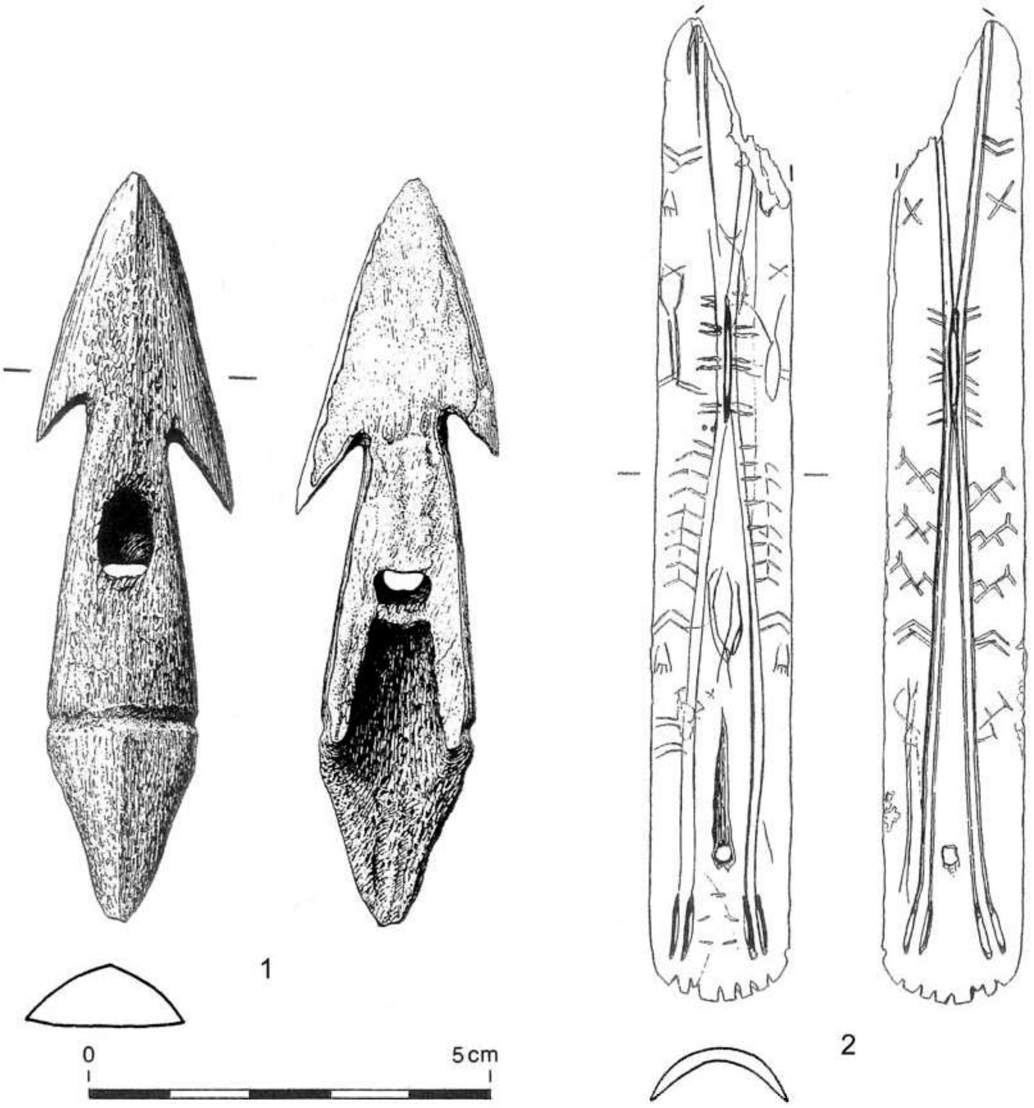

FIGURE 12: Organic artefacts of Umingmak-area D (from Müller-Beck 1977c: Fig. 18:2, 19:2).

Switzerland, participated. The first outcome of the Russian/German cooperation were exhibitions of the precious organic artefacts, representing "art" from a western European perspective, from the Old Bering Sea, Okvik and Punuk cultures of Chukotka (Leskov, Müller-Beck 1993). In 1993 a German palaeolithic archaeologist took part on the excavation of the Ekven site led by cultural anthropologist Michail Bronshtein and archaeologist Kirill Dneprovsky (Pasda 1996). In 1995 Müller-Beck participated on the Russian excavations together with, among others, arctic archaeologists Robert McGhee from Canada, Reto Blumer from Switzerland and Hans Christian Gulløv (1996) from Denmark. The focus was to excavate a winter house of the settlement below the Ekven cemetary. In the following years several German students of palaeolithic archaeology participated on this excavation which ended in 1998 (Müller-Beck 1997, 1998, 2003). The results of these campaigns on geoarchaeology (done by Norbert Moulin), on paleoclimate (done by Owen K. Mason) and on pottery (done by Agnès Gelbert) were published by Csonka (2014). The archaeology of the winter house was published by Dneprovsky (2002).

4. DISCUSSION

The rich ethnography and archaeology of arctic hunter-gatherers has inspired interpretation of the European palaeolithic record for over a century now (Sommer 2005). Despite this strong relationship, fieldwork in the arctic was not attractive for German archaeologists in the 20th century. The first contribution to arctic archaeology by someone of German origin is the excavation of U.S. citizen Otto Geist on Saint Lawrence Island around 1930 which contributed to the "unbroken 2000 year sequence (...) from Okvik-Old Bering Sea [culture] to the present time" (Collins 1984: 15). The second contribution is the fieldwork at Umingmak on Banks Island by the German archaeologist Hansjürgen Müller-Beck in the early 1970s which contributed mainly to knowledge on the Pre-Dorset, the oldest part of Paleo-Inuit archaeology in the North American arctic (Milne, Park 2016: 701). Later research by Müller-Beck on the Asian side of Bering Strait was restricted to participation in excavation. The major contribution of Swiss archaeologists to the Inuit prehistory of Bering Strait in the 1960s and 1970s is beyond the scope of this paper. Despite this scarce evidence for fieldwork by German archaeologists in the arctic it is an ironic turn of history that the material remains of the few secret, high arctic weather observation stations of the German "Wehrmacht" in World War II (Selinger 2001) have become, 70 years later, objects of archaeological research (Jensen, Krause 2011, 2014a, b, Krause, Jensen 2012). By the way, the extraordinary life of Hermann Ritter – an Austrian officer of the merchant marine, a polar sailor and trapper on Svalbard in the 1930s, one winter together with his wife (Ritter 1938) – and his ambivalent behaviour during the operation "Bassgeiger" in North-East Greenland (Schultz 2020) is a story worthwhile to remember.

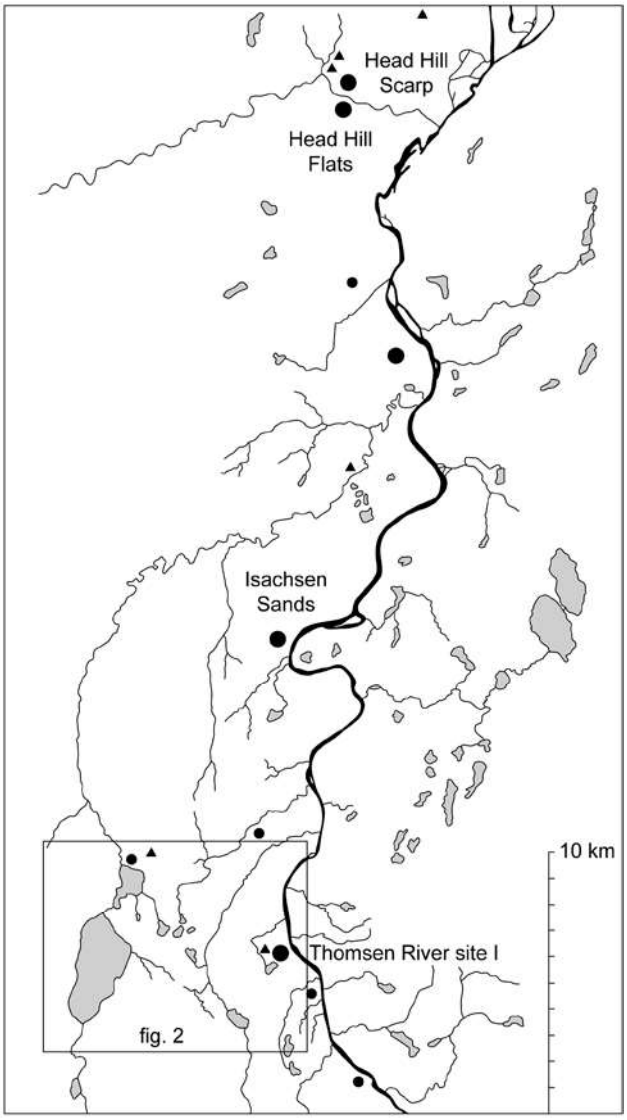

FIGURE 13: Inuinnait sites along the Thomsen River (from Hahn 1979: Fig. 3.2.1).

Pre-Dorset people came into the North American arctic during the later stages of the relatively warm Holocene climatic optimum in the third millenium BC (Friesen 2016: 674). Paleo-Inuit subsistence was based on marine mammals but these foragers lived and hunted far inland in different regions of the arctic during diverse time periods (Jensen, Gotfredsen 2022, Milne *et al.* 2012). Umingmak is just one example of this way of life. The occupation of Umingmak, which is considered as very brief (Arnold 1981: 144, Hahn 1977a: 45, 1977b: 31–32), corresponds to the estimated Pre-Dorset population maximum around 3200 ^{14}C yrs BP (Savelle, Dyke 2002, 2014a, Tremayne, Brown 2017: 342). Pre-Dorset maritime foragers came here mainly in the warm season to hunt mainly musk oxen. Some bones may indicate musk ox hunting in early winter. Of course, historic Inuit hunted musk ox in winter (Wilkinson 1975: 31) when, at Umingmak, temperatures ranged around -30°C, resulting in high calf mortality (Larter, Nagy 2001) and when snow cover made summer grazing areas "useless for the animals" (Schweingruber 1977a: 104). However, more seasonal data from inland sites of early Paleo-Inuit is necessary to get the full picture of the human way of life during that time period: there are only two, more or less contemporaneous inland sites in the

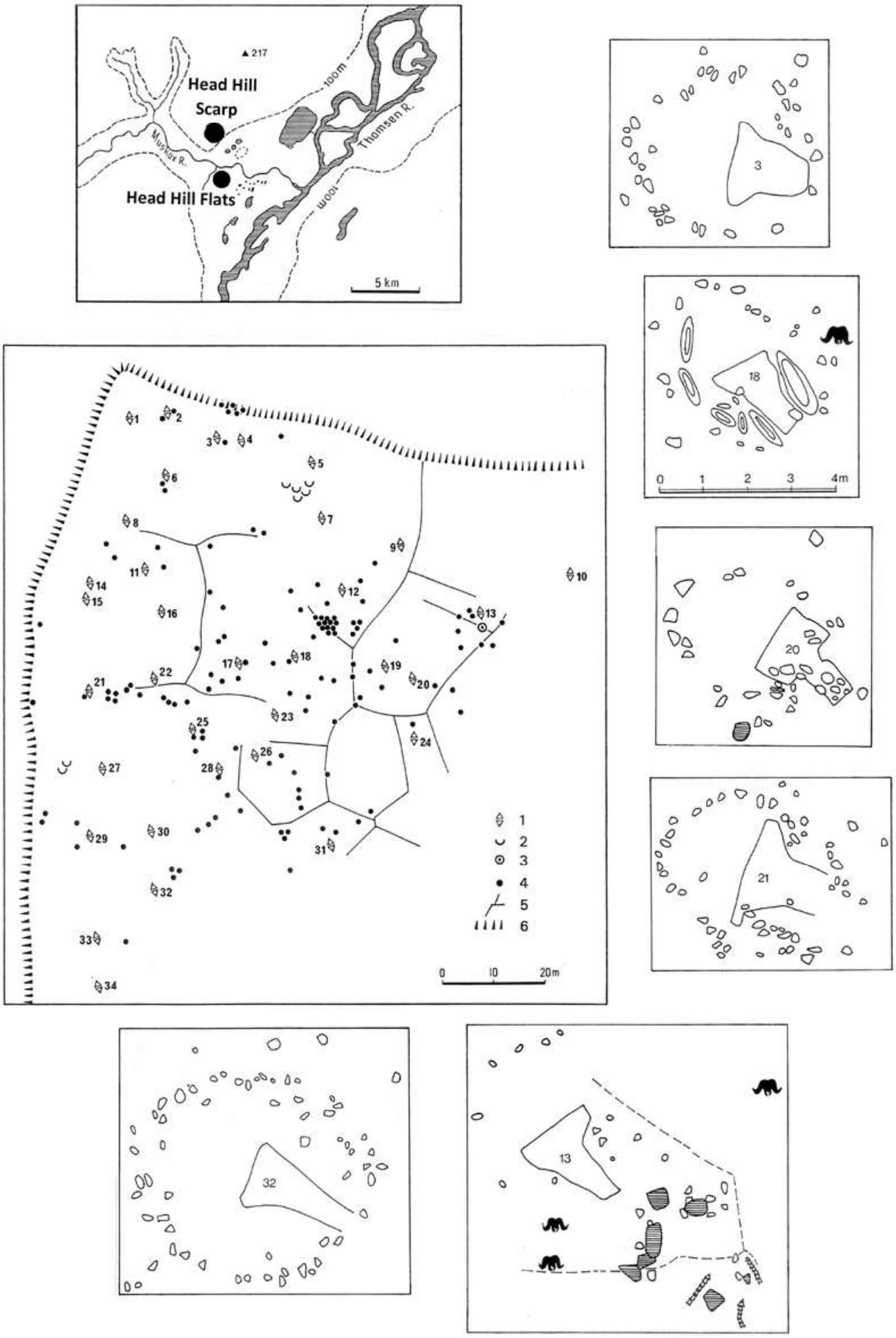

FIGURE 14: Archaeological structures of Inuinnait at Head Hill Flats – center: overview sketch, 1: tent ring, 2 small pit, 3: cache, 4: musk ox skull, 5: polygon soil, 6: river bench – right and below: tent rings (from Campen 1977b: Fig. 1–3).

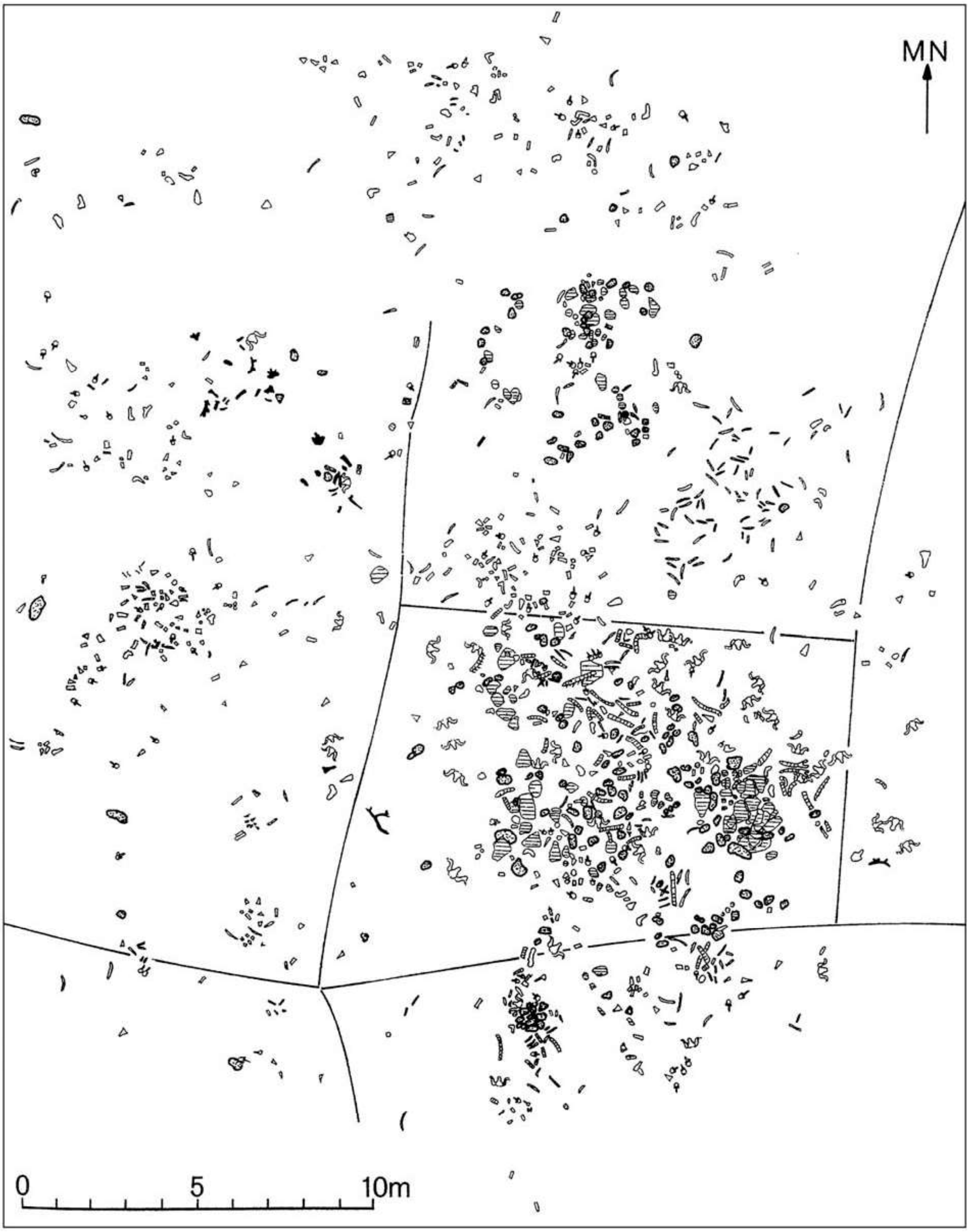

FIGURE 15: Archaeological structures of Inuinnait at Head Hill Scarp-area A – white: bone, black: antler, hatching and pointed: rock (from Hahn 1979: Fig. 3.2.2).

North American arctic, at both animal bones indicate the warm season, in contrast to winter occupations which is interpreted from tool frequencies and design of structures (Jensen, Gotfredsen 2022: 34, Sutherland 1996: 278–279). Musk ox hunting at Umingmak may has been done with a focus on calves and females but also adult musk ox have been killed. The prey was butchered, parts consumed on the spot, others exported. No dwelling features have been discovered at the site and its surroundings which is supported by the general lack or scarce evidence of Paleo-Inuit inland sites in northern Banks Island (Hodgetts 2012: 59–60). However, the lack of dwelling features highlights that the spatial arrangements of material remains left by arctic foragers do not necessarily have to represent tents. Few organic artefacts have been excavated at Umingmak. The amount of lithic artefacts is high but does indicate only intensive on-site knapping. Thus, Umingmak is the material outcome of the way of life of Pre-Dorset foragers when, according to Savelle *et al.* (2012), small groups, one or two families, lived and hunted without caching food while moving frequently to meet with other groups only in small, short-term aggregation sites (see also Milne *et al.* 2012: 270–271). The end of the use of Umingmak has to be seen in a wider geographical perspective as Pre-Dorset human occupation is characterized by population changes with often but not synchronous crashes and local abandonment (Savelle, Dyke 2014a: 263, 268). The use of raw material, shape and decoration of artefacts was influencd by the cosmology of Pre-Dorset people (Grønnow 2012a) who, beside using the spear thrower, introduced bow and arrow technology into the Canadian arctic (Grønnow 2012b: 29; Maschner, Mason 2013: 135; Milne, Park 2016: 693) which changed creativity and technical experience (Walls 2019, Walls, Malafouris 2016). It is important to emphasize that later, during the Dorset period (c. 2800–700 yrs BP), no archery and drilling technology was known in the eastern American arctic (Maschner, Mason 2013: 136, Ryan 2016: 769, 773). This indicates that in prehistoric times technology was not a result of an innovation which remained unchanged over millennia but was an outcome of culture-specific traits: in contrast to the land-sea economy during Pre-Dorset, people of the Dorset culture had greater emphasis on marine resources, especially due to seal hunting at floe edges or leads on the ice-covered sea which also influenced their symbolic ecology (Betts *et al.* 2015, Ryan 2016). It should be pointed out that, in general, culture change in the North American arctic is not connected with a single climate trend (Desjardins 2020, Finkelstein *et al.* 2009, Friesen 2016, Friesen *et al.* 2020): presence of the early Dorset culture is connected with a more colder climate than during the preceding Pre-Dorset period, in contrast to Late Dorset which is connected with indications of warming, whereas, after AD 1200, the very fast expansion of the people of the Thule culture is connected with the onset of a cooling trend. Thus, population movements due to social, political and economic factors may better explain culture change in the arctic.

People of the Thule culture were present on Banks Island in the thirteenth century AD (Friesen, Arnold 2008: 532) but it took several hundred years when the Thomsen River valley was used, this time by Inuinnait (Hodgetts 2013: 64). These were, in the beginning of the 20th century, 700–900 people living mainly on Victoria Island (Damas 1972: 7, Jenness 1922: 42). Their material record is evidence of the diverse inland subsistence strategies of the maritime hunters of the Thule culture and the historic Inuit (Burch 1978, 1988, Csonka 1995, Grønnow *et al.* 1983, Hall 1976, Jensen 2009). Due to many surveys numerous Inuinnait sites have been found in the Thomsen River valley. These sites contain also wooden artefacts. The wood derives from driftwood deposits (Alix 2005, Dyke *et al.* 1997, Jenness 1946: 3), from trade with other foragers (Jenness 1922: 20–21, Morisson 1991), from direct procurement further south (see below) or, in the 19th century, from looting of abandoned European ships (see below) as well as, in the early 20th century from commercial trading posts (Condon 1994, Treude 1975). Differences in preservation of structures and evidence of using rocks from former stays to build new structures indicate a certain time depth in the development of the inland sites, for example, according to an estimate made by Hahn (1979), at Head Hill Scarp not more than five families were present five to eight times. Their goal was hunting of musk ox mainly (for hunting methods see: Wilkinson 1975) but also hunting of birds and few caribou was done. As assumed by Wilkinson and Shank (1975: 111), recent radiocarbon dating of animal bones from these sites indicates that human presence started in c. AD 1650, to end in the early 20th century (Hodgetts 2013: 56, 59–60). This indicates that not "external stimuli" (Hodgetts 2012: 86), the presence of European goods cached by the British Marine after leaving HMS Investigator in 1853 (Albrecht, Berke 1977, Campen 1977, Hahn 1976b, 1979, Hickey 1984, Wayman *et al.* 1985) at Mercy Bay near the mouth of the Thomsen River on northern Banks Island, influenced Inuinnait to come inland (Hodgetts 2012: 84–85). Inuinnait were not foragers isolated in time and space: Inuinnait traded

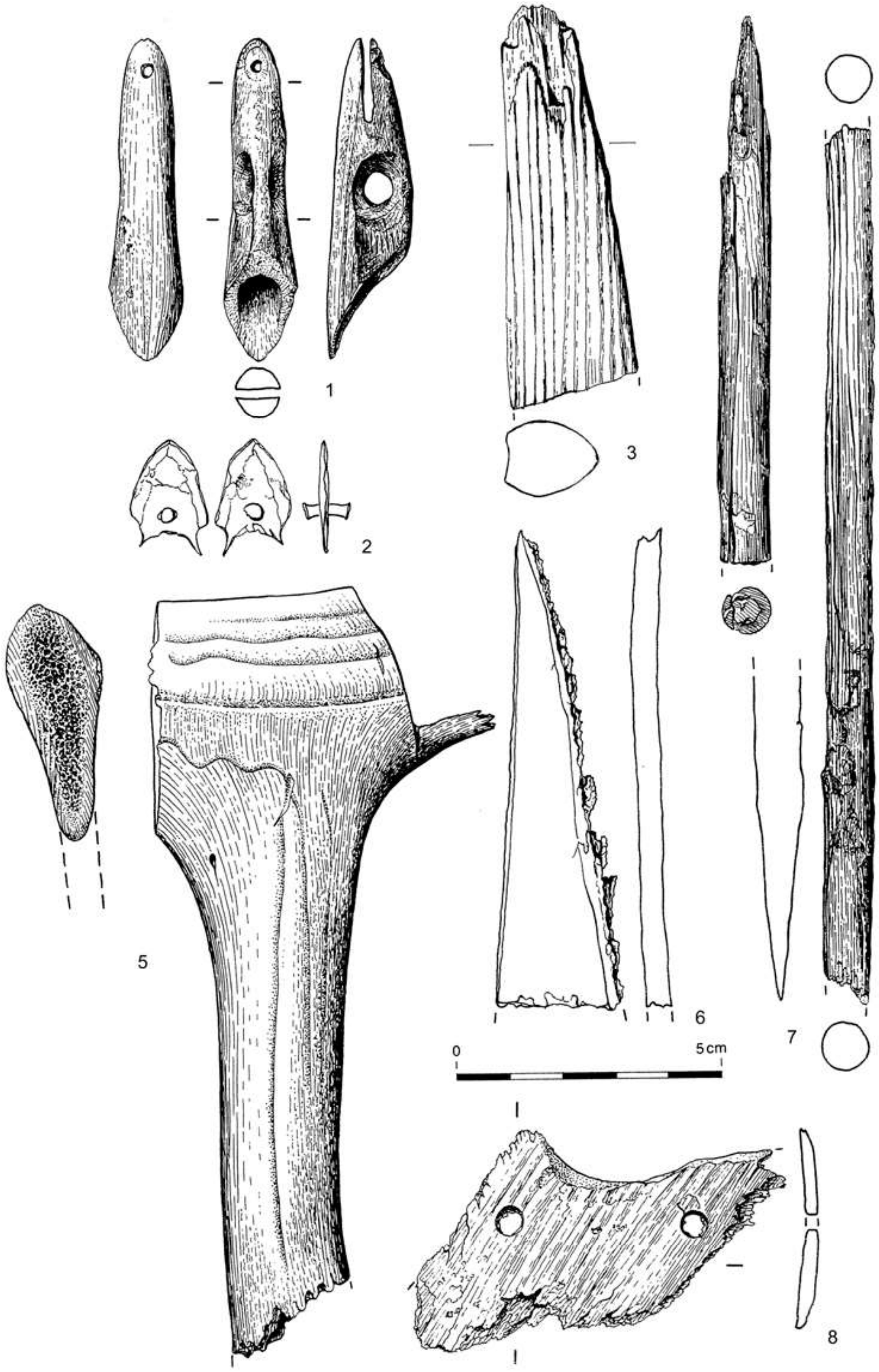

FIGURE 16: Inuinnait artefacts from Thomsen River site 1 (1–6, 8) and a kill site (7). 1: harpoon head, 2: hammered copper end blade with a removable rivet, 3: piece of worked wood, 4, 7: wooden arrow shaft, 5: sawn caribou antler, 6: saw-like piece of iron, 8: caribou antler fragment with two drillled holes (from Albrecht, Berke 1977: Fig. 47, 48).

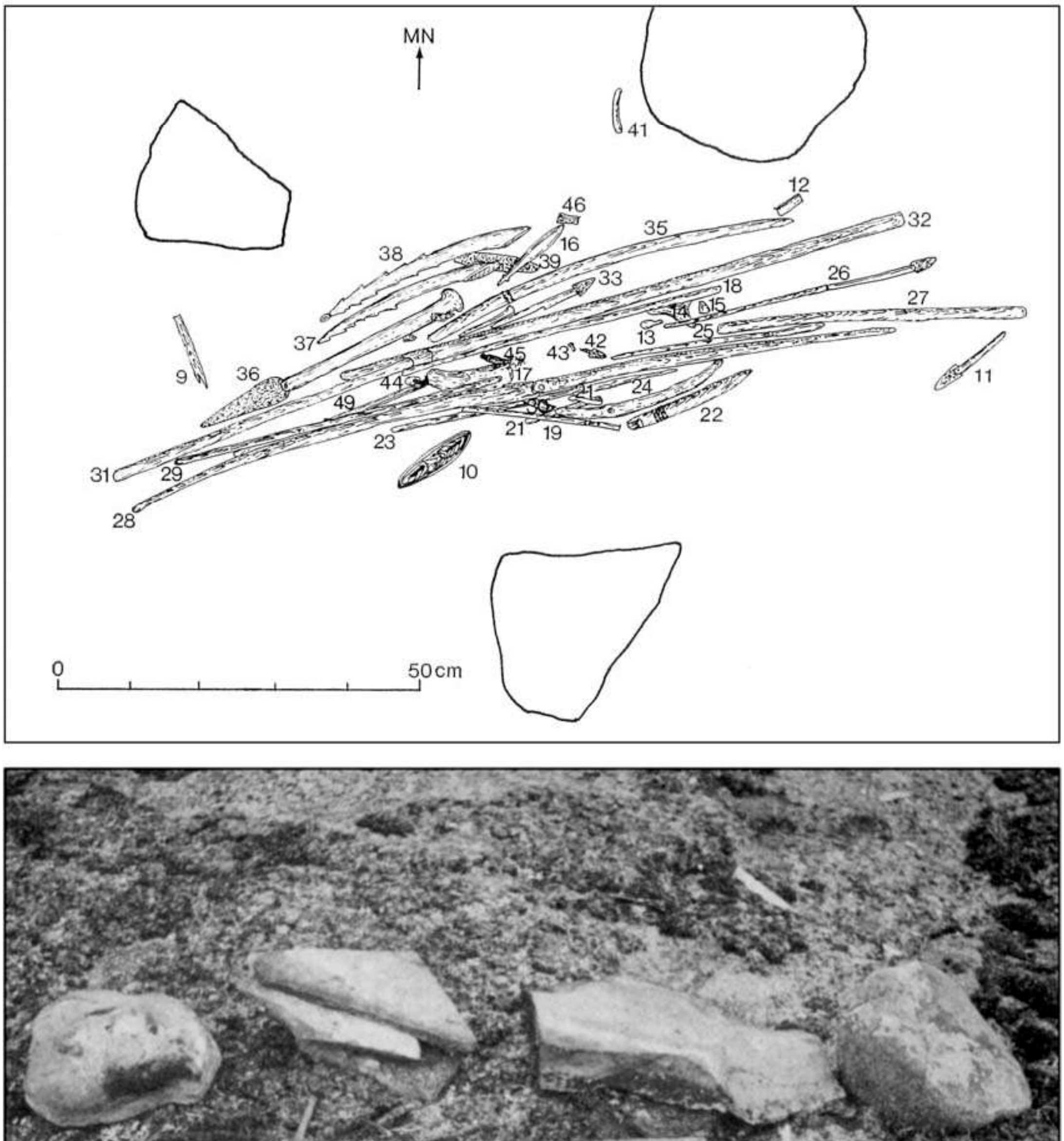

FIGURE 17: Stone-built structure with Inuinnait artefacts at Isachsen Sands (from Hahn 1976b: Fig. 3, 4).

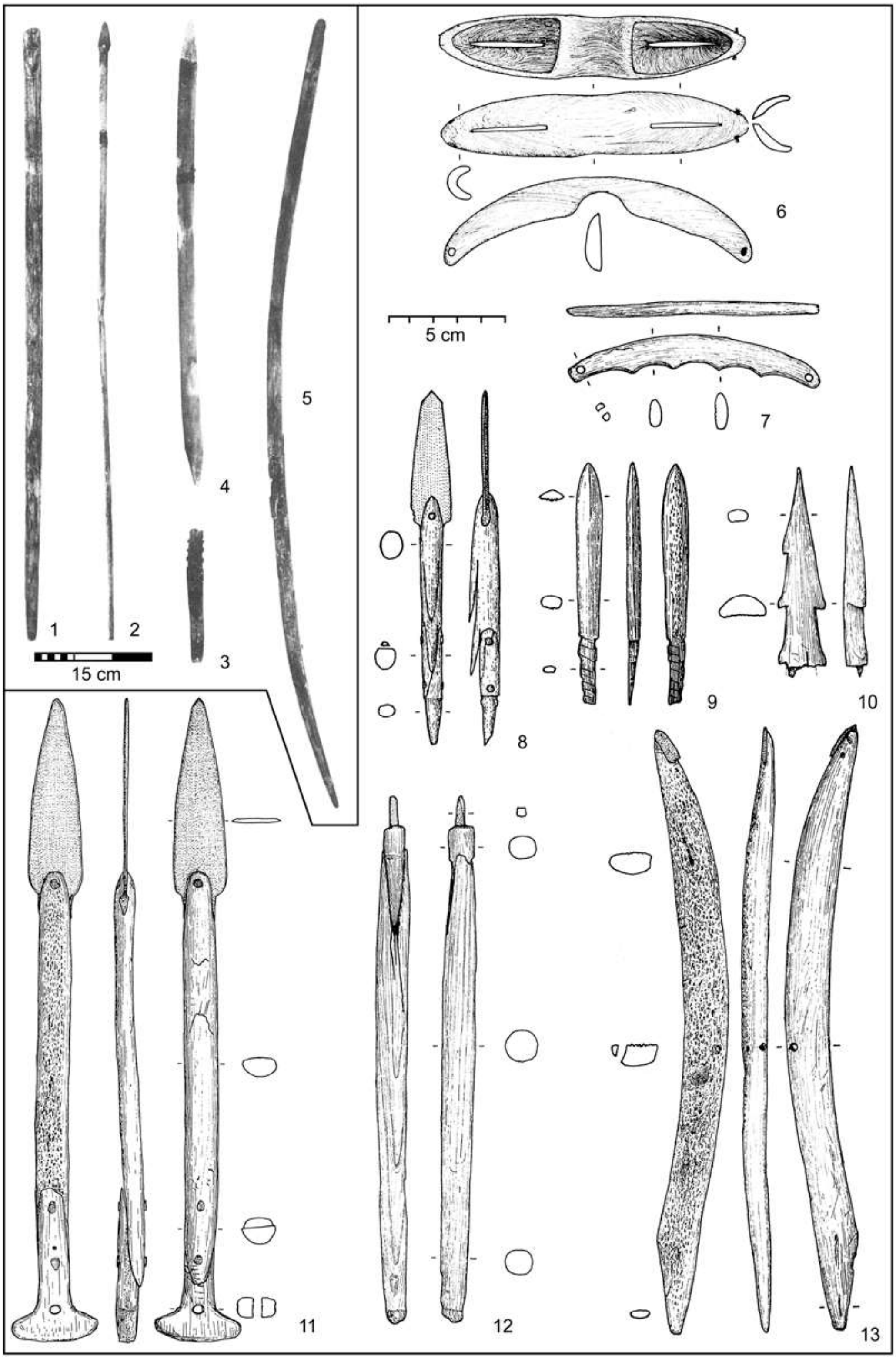

FIGURE 18: Inuinnait artefacts from Isachsen Sands (from Hahn 1976b: Fig. 5–8).

to get iron (Morisson 1987: 10, 1991) and were used to hunt on sea and ice as well as in the inland, sometimes travelling in summer 400 km (LeMouël 1983: 255–257, 259–260, Hemsoth-Le Mouël 1999: 78, 80). They made also year-long travels for direct procurement of raw material, for example to forests nearly 1000 km far away (Alix 2009: 190, Condon 1996: 52). Of course, travel with dog-sledges made transportation easier (Jensen 2009: 175) but a team of seven dogs need 1500 hours of provisioning time to get the 2850 kg of meat and fat the dogs eat within a year (Savelle, Dyke 2014b: 140).

How arctic archaeology and ethnography can contribute to palaeolithic archaeology remains to be discussed (Lane 2014). The German archaeologists incorporated their knowledge acquired in the arctic into palaeolithic archaeology in different ways. With a global perspective Müller-Beck (1979a, b, 1982, 1985, 1989, 1993, 2009, 2012) published papers on the Umingmak site, the Inuinnait, arctic foragers and human ecology. Hahn (1983) wrote one paper on art, contributed to a large volume on Inuit (Erpf *et al.* 1977) and supported his interpretation of animal bone frequencies in palaeolithic sites with observations made on Inuinnait sites (Hahn 1989b: 126). His interpretation of site formation processes in Upper Palaeolithic sites may have been influenced by his field experience in a recent periglacial environment (Hahn 1977c: 43, 1988: 52–54, 58–59, 78, 1989b: 28–31, 72, 76–78, 150). In a more general perspective, the results of German research on Banks Island support the statement of Davis (2009: 166) "[that] we have this conceit in the West that while been celebrating and developing technological wizardry, somehow the other peoples of the world have been static and intellectually idle. Nothing could be further from the truth": as shown above, the inland of Banks Island was used for over 4000 years for hunting musk ox by different people with specific and successful tools. Early hunters knapped delicate lithic cutting tools and made small lithic implements for scraping and engraving as well as diverse bone and antler tools (*Figure 7-12*). Approximately 300 years ago, hunters made tools by fastening diverse parts with tiny copper rivets in holes made with a bow drill (Jenness 1946: 101, McGhee 1972: 92, Morisson 1987: 8). The exceptional artefacts published by Hahn (1976b) give an impression of these tools. This assemblage is dominated by bow and arrows which were used for land mammal hunting (Fitzhugh, Kaplan 1982: 106) but also by many small fragments of antler, wood, metal and horn. This may give a glimpse on what a hunter saw as valuable to keep. As lithic knapping produces a lot of waste, the excavated area from the Paleo-Inuit differ from later Inuinnait sites where no flint knapping was done. However, after hunting and consumption both Pre-Dorset humans and Inuinnait left only few organic tools. The Inuit way of life, its cosmology and philosophy should not be judged against a benchmark set by western science (Bates 2007) as "we have this idea that these (...) distant others (...) are failed attempts at being modern, failed attempts at being us. This is simply not true" (Davis 2009: 167). Inuinnait were not stone-age people as "stone played an astonishingly small role in the[ir] economy" (Jenness 1946: 4). For example, only soapstone was used to carve vessels and lamps, no stone arrow points were manufactured and no bone but copper needles were used for sewing (Jenness 1946: 4, 92, 124–125). Also, ceramic vessels for cooking were made by their predecessors, the humans of the Thule culture (Arnold, Stimmell 1983). Furthermore, as shown above for Inuinnait, historic Inuit were not isolated but had pan-arctic connections (Aporta 2009). Historic Inuit have to be admired for innovation and engineering: among their impressive equipment, two tools have to be emphasized, the bow-drill (*Figure 18:12*) and the knife (*Figure 18:11, 13*). These tools are considered as "the most important and most indispensible of the [Inuit]" (Porsild 1915: 191) with which, beside the tools shown in *Figure 17* and *18*, clothing, the sea-going vessels kayak and umiak as well as whaling tools were manfuactured which do not only show high engineering skills but influence also our so-called "modern" way of life (Buijs, Oosten 1997, Cotel *et al.* 2004, Heath, Arima 2004, Issenmann 1997, King *et al.* 2005, Oakes 1991, 1992, Oakes *et al.* 1995, Petersen 1986, Rousselot 1983: 74, Stenton 1991, Walls 2016). To sum up, the results of fieldwork at Umingmak show diverse but conscious and successful ways of human living which was not driven by survival in an arctic setting. The results indicate also that, within population changes with non-synchronous crashes and local abandonment, brief, successive stays by few, small hunter-gatherer groups, maybe of one or two families only, created substantial material records still visible on the surface. From this palaeolithic archaeologists can learn about human site formation processes in a periglacial, hunter-gatherer landscape.

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REFERENCES

ALBRECHT B., 1996: Phänologische Untersuchungen und Klimamessungen in der Station Umingmak, Banks Island, Arktisch Kanada. In: I. Campen, J. Hahn, M. Uerpmann (Eds.): *Spuren der Jagd – Jagd auf Spuren (Festschrift für Hansjürgen Müller-Beck).* Tübinger Monographien zur Urgeschichte 11. Pp. 401–406. Mo Vince, Tübingen.

ALBRECHT G.,1996: Die Grabungsfläche A2 in Umingmak, Banks Island (Canada-NWT). In: I. Campen, J. Hahn, M. Uerpmann (Eds.): *Spuren der Jagd – Jagd auf Spuren (Festschrift für Hansjürgen Müller-Beck).* Tübinger Monographien zur Urgeschichte 11. Pp. 63–76. Mo Vince, Tübingen.

ALBRECHT G., BERKE, H. 1977: Archaeological survey in Shoran Lake. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973*. Urgeschichtliche Materialhefte 1. Pp. 139–150. Archaeologica Venatoria, Tübingen.

ALIX C., 2005: Deciphering the impact of change on the driftwood cycle contribution to the study of human use of wood in the Arctic. *Global and Planetary Change* 47: 83–98.

ALIX C. 2009: Persistence and change in Thule wood use, AD 1100–1450. In: H. Maschner, O. Mason, R. McGhee (Eds.): *The northern world AD 900–1400*. Pp. 179–205. University of Utah, Salt Lake City.

APORTA C., 2009: The trail as home: Inuit and their pan-arctic network of routes. *Human Ecology* 37: 131–147.

ARNOLD C. D., 1980: A Paleoeskimo occupation on Southern Banks Island, N.W.T. *Arctic* 33: 400–426.

ARNOLD C. D., 1981: *The Lagoon site (OjRi-3): implications for Paleoeskimo interactions*. National Museum of Man Mercury Series 107. National Museum, Ottawa.

ARNOLD C. D., 1983: A summary of the prehistory of the western Canadian Arctic. *Musk-ox* 33: 10–25.

ARNOLD C. D., STIMMELL C., 1983: An analysis of Thule pottery. *Canadian Journal of Archaeology* 7: 1–21.

BAEHRE R., 2008: Early anthropological discourse on the Inuit and the influence of Virchow on Boas. *Études/Inuit/Studies* 32: 13–34.

BANDI H.-G., 1965: *Urgeschichte der Eskimo*. Gustav Fischer, Stuttgart.

BANDI H.-G., 1967: *Alaska – Urgeschichte, Geschichte, Gegenwart*. Kohlhammer, Stuttgart.

BANDI H.-G., 1968: *Eskimo Prehistory*. University of Alaska, Fairbanks.

BANDI H.-G., 1996: Strandferne Eskimosiedlungen auf der St. Lorenz Insel, Alaska. In: I. Campen, J. Hahn, M. Uerpmann (Eds.): *Spuren der Jagd – Jagd auf Spuren (Festschrift für Hansjürgen Müller-Beck).* Tübinger Monographien zur Urgeschichte 11. Pp. 77–90. Mo Vince, Tübingen.

BANDI H.-G., 1997: Arctic prelude 1948: a summer full of experience in North East Greenland. In: R. Gilberg, H. C. Gulløv (Eds.): *Fifty years of arctic research – Anthropological Studies from Greenland to Siberia*. Publications of the National Museum, Ethnographical Series 18. Pp. 57–64. National Museum of Denmark, Copenhagen.

BANDI H.-G., BLUMER R., 2002: Investigations by Swiss archaeologists on St. Lawrence Island, Alaska. In: D. E. Dumond, R. L. Bland (Eds.): *Archaeology in the Bering Strait Region – Research on two continents.* University of Oregon Anthroplogical Papers 59. Pp. 25–59. University of Oregon, Eugene.

BANDI H.-G., MELDGAARD J., 1952: *Archaeological investigations in Clavering Ø, North East Greenland.* Meddelelser om Grønland 126. C. A. Reitzels, Copenhagen.

BARNARD A. 2000: *History and theory in anthropology*. Cambridge University, Cambridge.

BARNES F. C., 2006: *Cartridges of the world*. F+W, USA.

BATES P., 2007: Inuit and scientific philosophies about planning, prediction, and uncertainty. *Arctic Anthropology* 47: 87–100.

BETTS M. W., HARDENBERG M., STIRLING I., 2015: How animals create human history: relational ecology and the Dorset-polar bear connection. *American Antiquity* 80: 89–112. DOI: https://doi.org/10.7183/0002-7316.79.4.89

BIEL J., PASDA C., 1998: Nachruf Joachim Hahn, 1942–1997. *Fundberichte aus Baden-Württemberg* 22: 871–879.

BLEICH K. E., 1977a: Soil and landscape development in the region of Umingmak. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973.* Urgeschichtliche Materialhefte 1. Pp. 112–131. Archaeologica Venatoria, Tübingen.

BLEICH K. E., 1977b: Zur Entstehung der Pingos im Mackenzie Delta, N.W.T. *Polarforschung* 44: 60–66.

BLEICH K. E., STAHR K., 1978: Ein Eisen-Bändchen-Stagnogley in der Bodengesellschaft der mittleren Arktis Kanadas. *Eiszeitalter und Gegenwart* 28: 179–188.

BOCHERENS H., DRUCKER D. C., HAIDLE M. N., MÜLLER-BECK H., MÜNZEL S., NAITO Y. I., 2016: Isotopic evidence (C. N. S.) for a high aquatic contribution for a Pre-Dorset muskox hunter from Umingmak (Banks Island, Canada). *Journal of Archaeological Science – Reports* 6: 700–708. DOI: https://doi.org/10.1016/j.jasrep.2015.08.021

BOLUS M., CONARD N. J., 2012: 100 Jahre Robert Rudolf Schmidts "Die diluviale Vorzeit Deutschlands". *Mitteilungen der Gesellschaft für Urgeschichte* 21: 63–89.

BUIJS C., OOSTEN J., 1997: *Braving the cold – Continuity and change in arctic clothing*. Research School CNWS, Leiden.

BURCH E. S. 1978: Caribou Eskimo origins: an old problem reconsidered. *Arctic Anthropology* 15: 1–35.

BURCH E. S., 1988: Knud Rasmussen and the "original" inland Eskimo of southern Keewatin. *Études/Inuit/Studies* 12: 81–100.

CAMPEN I., 1977a: The stone artefacts from Umingmak ID. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973.* Urgeschichtliche Materialhefte 1. Pp. 53–57. Archaeologica Venatoria, Tübingen.

CAMPEN I., 1977b: Head Hill Flat Site, ein Herbstlagerplatz der Kupfer-Eskimo auf Banks Island, N.W.T. *Polarforschung* 47: 36–46.

COLLINS H. B., 1984: History of research before 1945. In: D. Damas (Ed.): *Handbook of North American Indians 5 – Arctic.* Pp. 8–22. Smithsonian Institution, Washington D.C.
CONDON R. G., 1994: East meets West: Fort Collinson, the fur trade, and the economic acculturation of the northern Copper Inuit, 1928–1939. *Études/Inuit/Studies* 18: 109–135.
CONDON R. G., 1996: *The northern Copper Inuit – A history*. University of Toronto, Toronto.
COTEL A. J., GOLINGO R., OAKES J. E., RIEWE R. R. 2004: Effect of ancient Inuit fur parka ruffs on facial heat transfer. *Climate Research* 26: 77–84.
CSONKA Y., 1995: *Les Aharmiut: à l'écart des Inuit Caribous*. Victor Attinger, Neuchâtel.
CSONKA Y. (Ed.), 2014: *The Ekven settlement – Eskimo beginnings on the Asian shore of Bering Strait.* BAR Archaeological Reports 2624. Archaeopress, Oxford.
DAMAS D., 1972: The Copper Eskimo. In: M. G. Bicchieri (Ed.): *Hunter-gatherers today*. Pp. 3–50. Waveland, Prospect Heights.
DAMAS D., 1984: Copper Eskimo. In: D. Damas (Ed.): *Handbook of North American Indians – Volum 5: Arctic*. Pp. 397–414. Smithsonian Institution, Washington D.C.
DARWENT J., SAVELLE J. M., DARWENT C. M., DYKE A. S., LANGE H., LEMOINE G. M., PINARD C., 2018: Late Dorset triangular midpassages in the Canadian Arctic and Northwest Greenland: origins and disersal. *American Antiquity* 83: 525–535.
DOI: https://doi.org/10.1017/aaq.2018.18
DAVIS W., 2009: *The wayfinders - Why ancient wisdom matters in the modern world*. Anansi, Toronto.
DESJARDINS S. P. A., 2020: Neo-Inuit strategies for ensuring food security during the Little Ice Age climate change episode, Foxe Basin, Arctic Canada. *Quaternary International* 549: 163–175. DOI: https://doi.org/10.1016/j.quaint.2017.12.026
DNEPROVSKI K. A., 2002: Ekven house H-18: a Birnirk- and early Punuk-period site in Chuktotka. In: D. E. Dumond, R. L. Bland (Eds.): *Archaeology in the Bering Strait – Research on two continents.* University of Oregon Anthropological Papers 59. Pp. 166–206. University of Oregon, Eugene.
DÖMPKE S., SEITHEL F., SCHUKIES R., BENDER C. 2015: Karl H. Schlesier 1927–2015. *Zeitschrift für Ethnologie* 140: 263–268.
DUMOND D. E., BLAND R. L., 2002: Introduction. In: D. E. Dumond, R. L. Bland (Eds.): *Archaeology in the Bering Strait Region – Research on two continents*. University of Oregon Anthropological Papers 59. Pp. 1–6. University of Oregon, Eugene.
DYKE A. S., ENGLAND J., REIMNITZ E., JETTÉ H., 1997: Changes in driftwood delivery to the Canadian Arctic archipelago: the hypothesis of postglacial osscilations of the transpolar drift. *Arctic* 50: 1–16.
DYKE A. S., SAVELLE J. M., SZPAK P., SOUTHON J. R., HOWSE L., DESROSIERS P. M., KOTAR K., 2019: An assessment of marine reservoir corrections for radiocarbon dates in walrus from the Foxe Basin region of Arctic Canada. *Radiocarbon* 61: 67–81.
DOI: https://doi.org/10.1017/RDC.2018.50
ERPF. H., BOSSHARD E., HAHN J., TREUDE E., 1977: *Das große Buch der Eskimo*. Stalling, Oldenburg.
FINKELSTEIN S. A., ROSS J. M., ADAM J. K., 2009: Spatiotemporal variabilty in arctic climates of the past millenium: implications for the study of Thule culture on Melville Peninsula. *Arctic, Antarctic and Alpine Research* 41: 442–454.
FITZHUGH W. W., 2016: Solving the „Eskimo problem“: Henry Bascom Collins and arctic archaeology. In: KRUPNIK I. (Ed.): *Early Inuit studies – Themes and transitions, 1850–1980s.* Pp. 165–192. Smithsonian Institution, Washington D.C.
FITZHUGH W. W., KAPLAN A., 1982: *Inua - Spirit world of the Bering Strait Eskimo*. Smithsonian Institution, Washington D.C.
FITZHUGH W. W., LORING S., ODESS D. (Eds.) 2002: *Honoring our elders – A history of Eastern Arctic Archaeology*. Arctic Studies Centre, Washington D.C.
FLITSCH M., NOACK K., 2019: Überlegungen zur Parallelität und Zeitgenossenschaft von DDR/BRD-Ethnologien im Hinblick auf eine Standortbestimmung mit Zukunftsaussichten. *Zeitschrifft für Ethnologie* 144: 163–198.
FRIESEN T. M., 2016: Pan-arctic population movements. In: T. M. Friesen, O. K. Mason (Eds.): *The Oxford Handbook of the North American Arctic*. Pp. 673–691. Oxford University, Oxford.
FRIESEN T. M., ARNOLD C. D., 2008: The timing of the Thule migration: new dates from the western Canadian arctic. *American Antiquity* 73: 527–538.
DOI: https://doi.org/10.1017/S0002731600046850
FRIESEN T. M., MASON O. K., 2016: Introduction – Archaeology of the North American Arctic. In: T.M. Friesen, O.K. Mason (Eds.): *The Oxford Handbook of the North American Arctic*. Pp. 1–24. Oxford University, Oxford.
FRIESEN T. M., FINKELSTEIN S. A., MEDEIROS A. S., 2020: Climate variability of the common era (AD 1-2000) in the eastern North American arctic: impacts on human migrations. *Quaternary International* 549: 142–154.
DOI: https://doi.org/10.1016/j.quaint.2019.06.002
GEIST O., RAINEY F., 1936: *Archaeological excavations at Kukulik, St. Lawrence Island, Alaska.* Miscellaneous Publications of the University of Alaska 2. Government Printing Offfice, Washington D.C.
GRAMSCH B., 2010: Paläolithforschung in der ehemaligen DDR. *Mitteilungen der Gesellschaft für Urgeschichte* 19: 157–172.
GRIPP K. 1941/42: Grönländische Rentierjäger. *Offa* 6/7: 40–51.
GRØNNOW B. 2010: The history of archaeological research in North East Greenland: putting the geoArk project into perspective. *Geografisk Tidsskrift/Danish Journal of Geography* 110: 117–129.
GRØNNOW B., 2012a: The backbone of the Saqqaq culture: a study of the nonmaterial dimensions of the early Arctic Small Tool Tradition. *Arctic Anthropology* 49: 58–71. DOI: https://doi.org/10.1353/arc.2012.0024
GRØNNOW B., 2012b: An archaeological reconstruction of Saqqaq bows, darts, harpoon, and lances. *Études/Inuit/Studies* 36: 23–48.
GRØNNOW B., 2017: The frozen Saqqaq sites of Disko Bay, West Greenland – Qeqertasussuk and Qajaa (2400–900 BC).

Monographs on Greenland – Man & Society 45. Museum Tusculanum, Copenhagen.

GRØNNOW B., MELDGAARD J., NIELSEN J. B., 1983: *Aasivissuit – The great summer camp.* Meddelelser om Grønland – Man & Society 5. National Museum, Copenhagen.

GULLØV H. C., 1996: Ved porten til den nye verden – Nationalmuseet og russiske udgravninger ved Bering Strædet. *Nationalmuseets Arbeidsmark*: 163–175.

HAFNER A., 2016: Nachruf Prof. Dr. Dr. h.c. Hans-Georg Bandi (1920–2016). https://www.iaw.unibe.ch/unibe/portal/fak_historisch/dga/iaw/content/e39448/e39449/e39450/e625088/Nachruf_H.G.Bandi_ger.pdf.

HAHN J., 1976a: L'utilization du bois de caribou chez les Esquimaux de cuivre sur l'ile de Banks, N.W.T., Canada. In: H. Camps-Fabrer (Ed.): *Methodologie appliquée de l'industrie de l'os préhistorique.* Colloque International du C.N.R.S. 568. Pp. 339–346. CNRS, Paris.

HAHN J., 1976b: Ein Eskimo-Werkzeug-Cache von Banks Island, N.W.T. Kanada. *Polarforschung* 46: 95–105.

HAHN J., 1977a: The excavation at Umingmak, area ID. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973.* Urgeschichtliche Materialhefte 1. Pp. 23–46. Archaeologica Venatoria, Tübingen.

HAHN J., 1977b: Besiedlung und Sedimentation der Prä-Dorset-Station Umingmak D. Banks Island, N.W.T. *Polarforschung* 47: 26–37.

HAHN J., 1977c: Die Spitzbubenhöhle – Eine Magdalénien-Fundstelle bei Eselsburg, Gemeinde Herbrechtingen, Kreis Heidenheim. *Fundberichte aus Baden-Württemberg* 3: 38–50.

HAHN J., 1979: Kupfer-Eskimo-Siedlungen auf der Banks Insel, Nordwest-Territorien, Kanada. In: L. Müller-Wille, H. Schröder-Lanz (Eds.): *Kanada und das Nordpolargebiet.* Trierer Geographische Studien Sonderheft 2. Pp. 62–74. Universität Trier, Trier.

HAHN J., 1980: L'utilisation de la corne du boeuf musque chez les Esquimaux du Cuivre. In: D. Stordeur (Ed.): *Objets on os, historiques et actuels.* Maison de l'Orient et de la Méditerranée 1. Pp. 83–92. Maison de l'Orient, Lyon.

HAHN J. 1983: Elfenbeinfiguren der Eskimo und der späten Altsteinzeit – Ein technisch-funktionaler Vergleich. In: A. Schulze-Thulin (Ed.): *Inuit-Kunst*. Pp. 95–106. Linden-Museum, Stuttgart.

HAHN J., 1988: *Die Geißenklösterle-Höhle im Achtal bei Blaubeuren I.* Forschungen und Berichte zur Vor- und Frühgeschichte in Baden-Württemberg 26. Konrad Theiss, Stuttgart.

HAHN J., 1989a: Zur Methodik von Höhlengrabungen. In: E. Gersbach: *Ausgrabung heute – Methoden und Techniken der Feldgrabung.* Pp. 131–160. Wissenschaftliche Buchgesellschaft, Darmstadt.

HAHN J., 1989b: *Genese und Funktion einer jungpaläolithischen Freilandstation: Lommersum im Rheinland.* Rheinische Ausgrabungen 29. Rudolf Habelt, Bonn.

HAHN J., 1992: *Zeichnen von Stein- und Knochenartefakten*. Archaeologica Venatoria 12. Archaeologica Venatoria, Tübingen.

HAHN J., ROUSSELOT J.-L., 1975: Eskimo-Sommerplätze in Tuktoyatak, N.W.T., Kanada, aus archäologischer und ethnologischer Sicht. *Tribus* 24: 157–178.

HAIDLE M. N., 1992: Der menschliche Unterkiefer von Umingmak – Morphologie und Funktion. *Mitteilungsblatt der Archaeologica Venatoria* 17: 17–20.

HAIDLE M. N., ERIKSEN B. V., 2019: Hansjürgen Müller-Beck (13 August 1927–2 August 2018). *Journal of Anthropological Research* 75: 1–5. DOI: https://doi.org/10.1086/701759

HALL E. S. (Ed.), 1976: *Contributions to anthropology: the interior people of Northern Alaska.* National Museum of Man Mercury Series 49. National Museum, Ottawa.

HEATH J. D., ARIMA E., 2004: *Eastern arctic kayaks – History, design, technique*. University of Alaska, Fairbanks.

HELMER J. W., 1986: A face from the past: an early Pre-Dorset ivory maskette from Devon Island, N.W.T. *Études/Inuit/Studies* 10: 179–202.

HEMPEL G., 2009: Blühende Landschaften im Ewigen Eis. *Polarforschung* 79: 181–191.

HEMSOTH-LEMOUËL M., 1999: The presence of intact, complete artifacts in archaeological sites: indications of a rupture in the way of life? In: L. R. Owen, M. Porr (Eds.): *Ethno-analogy and the reconstruction of prehistoric artefact use and production.* Urgeschichtliche Materialhefte 14. Pp. 75–90. MoVince, Tübingen.

HICKEY C. G., 1984: An examination of processes of cultural change among Nineteenth Century Copper Inuit. *Études/Inuit/Studies* 8: 13–35.

HODGETTS L. M., 2012: The rediscovery of HMS Investigator: archaeology, sovereignity and the colonial legacy in Canada's Arctic. *Journal of Social Archaeology* 13: 80–100. DOI:10.1177/1469605312458735

HODGETTS L. M., 2013: Gendered Inuinnait (Copper Inuit) landscapes of Banks Island's northern interior, Arctic Canada, 17th–20th century, A.D. *Journal of Field Archaeology* 38: 54–67. DOI: https://doi.org/10.1179/0093469012Z.00000000036

HOUMARD C., 2018: Cultural continuity from Pre-Dorset to Dorset in the eastern Canadian Arctic highlighted by bone technology and typology. *Arctic Anthropology* 55: 24–47. DOI: https://doi.org/10.3368/aa.55.1.24

IRVING W. N., 1971: Recent early man research in the North. *Arctic Anthropology* 8: 66–82.

ISRAEL H., 1969: *Kulturwandel grönländischer Eskimo im 18. Jahrhundert.* Abhandlungen und Berichte des Staatlichen Museums für Völkerkunde Dresden 29. Akademie, Berlin.

ISRAEL H., 1977: Fredriksdal 1890. Demographische Dokumantation über eine Gruppe westgrönländischer Eskimo. *Abhandlungen und Berichte des Staatlichen Museums für Völkerkunde Dresden* 36: 129–150.

ISRAEL H., 1979: The exhibition "Eskimo" in the ethnographic museum at Herrnhut (outpost of the Staatliches Museum für Völkerkunde Dresden). *Études/Inuit/Studies* 3: 135–137.

ISSENMANN B. K., 1997: *Sinews of survival – The living legacy of Inuit clothing*. University of British Columbia, Vancouver.

JENNESS D., 1922: *The life of the Copper Eskimo*. Report of the Canadian Arctic Expedition, 1913–1918 Volume 12, part A. F.A. Ackland, Ottawa.
JENNESS D., 1946: *Material culture of the Copper Eskimo*. Report of the Canadian Arctic Expedition 1913–18 Volume 16. Edmond Cloutier, Ottawa.
JENSEN J. F., 2009: Thule culture settlement patterns in Peary Land. In. B. Grønnow (Ed.): *On track of the Thule culture from Bering Strait to East Greenland*. Studies in Archaeology & History 15. Pp. 167–176. National Museum of Denmark, Copenhagen.
JENSEN J. F., GOTFREDSEN A. B., 2022: First people and muskox hunting in northernmost Greenland. *Acta Borelia* 39: 24–52.
DOI: https://doi.org/10.1080/08003831.2022.2061763
JENSEN J. F., KRAUSE T., 2011: Wehrmacht occupations in the new world: archaeological investigations in Northeast Greenland. *Polar Record* 48: 269–279.
DOI: https://doi.org/10.1017/S0032247411000180
JENSEN J. F., KRAUSE T., 2014a: Second World War histories and archaeology in Northeast Greenland. In. H. C. Gulløv (Ed.) *Northern Worlds – Landscape, interactions and dynamics*. Publications from the National Museum, Studies in Archaeology & History 22. Pp. 491–510. National Museum of Denmark, Copenhagen.
JENSEN J. F., KRAUSE T., 2014b: Ruins of the weather war: studying the material remains of Allied and wehrmacht activities in Nrtheast Greenland. In: B. Olsen, Þ. Pétursdóttir (Eds.): *Ruin memories – Materiality, aesthetics and the archaeology of the recent past*. Pp. 411–434. Routledge, London.
JENSZ F., 2012: The publication and reception of David Cranz's 1967 History of Greenland. *The Library* 13: 457–472.
JENSZ F., PETTERSON C., 2021: *Legacies of David Cranz's "Historie von Grönland" (1765).* Palgrave MacMillan, Cham.
JOACHIM-HAHN-GYMNASIUM, n.d.: Schulname. https://www.jhg-blaubeuren.de/schule/schulname.html.
KAHLKE H.-D., 1963: Ovibos aus den Kiesen von Süßenborn. Ein Beitrag zur Systematik und Phylogenie der Ovibovini und zur Stratigraphie des Pleistozäns. *Geologie* 12: 94–972.
KAHLKE H.-D., 1964: *Early Middle Pleistocene (Mindel/Elster) Praeovibos and Ovibos. A contribution to the systematics and phylogeny of the Ovibovini*. Commentationes Biologicae 26. Society of Science Fennica, Helsingfors.
KAHLKE H.-D., 1966: Moschusochsen – Heute und vor 100000 Jahren. *Urania-Universum* 12: 273–279.
KAHLKE H.-D., 1969: Die Ovibos-Reste aus den Kiesen von Süßenborn bei Weimar. In: H.-D. Kahlke (Ed.): *II. Internationales Paläontologisches Kolloquium 1866: Das Pleistozän von Süßenborn.* Paläontologische Abhandlungen A, III. Pp. 521–529. Akademie, Berlin.
KEIM C. J., 1969: *Aghvook, the white Eskimo – Otto Geist and Alaskan archaeology*. University of Alaska, Seattle.
KIM D. D., 2012: The mimicry of empire: reinventing autobiography in the arctic. *Austrian Studies* 20: 129–141.
DOI:10.5699/austrianstudies.20.2012.0129
KIND C.-J., 2018: Hansjürgen Müller-Beck 13.8.1927-2.8.2018. *Fundberichte aus Baden-Württemberg* 38: 411–413.
KIND C.-J., MEISTER C., HEIDENREICH S. M., 2016. *Caves with the oldest Ice Age art: world heritage nomination*. State Office for Cultural Heritage Baden-Württemberg, Esslingen.
KING J., PAUKSZTAT B., STORRIE R., 2005: *Arctic clothing of North America: Alaska, Canada, Greenland*. McGills-Queen's University, Montreal.
KHLOBYSTIN L. P., 2005: *Taymyr – The archaeology of northernmost Eurasia*. National Museum of Natural History, Smithsonian Institution. Arctic Studies Center, Washington D.C.
KRAUSE R. A., 1993: Hintergründe der deutschen Polarforschung von den Anfängen bis heute. *Deutsches Schifffahrtsarchiv* 16: 7–70.
KRAUSE R. A., THIEDE J., 2016: 150 Jahre Polarforschung und die Erschließung Grönlands: eine dänisch-deutsche Chronik – Plan für eine Ausstellung. *Polarforschung* 86: 135–144.
KRAUSE T., JENSEN J. F., 2012: The weather war: the German operation "Bassgeiger" on Shannon Island 1943/44. In: H. C. Gulløv, P. A. Toft, C.P. Hansgaard (Eds.): *Northern worlds – Callenges and solutions*. Pp. 46–54. National Museum of Denmark, Copenhagen.
KRUPNIK I. (Ed.), 2016a: *Early Inuit studies – Themes and transitions, 1850–1980s.* Smithsonian Institution, Washington D.C.
KRUPNIK I., 2016b: From Boas to Burch: eskimology transitions. In: I. Krupnik (Ed.): *Early Inuit studies – Themes and transitions, 1850–1980s*. Pp. 1–32. Smithsonian Institution, Washington D.C.
KRUPNIK I., MÜLLER-WILLE L., HARPER K., 2016: Franz Boas and the Inuit: beyond the Baffin Island years. I. Krupnik (Ed.): *Early Inuit studies – Themes and transitions, 1850–1980s.* Pp. 73–110. Smithsonian Institution, Washington D.C.
LANE P. J., 2014: Hunter-gatherer-fishers, ethnoarchaeology and reasoning. In: V. Cummings, P. Jordan, M. Zvelebil (Eds.): *The Oxford Handbook of archaeology and anthropology of hunter-gatherers*. Pp. 104–150. Oxford University, Oxford.
LARTER N. C., NAGY J. A., 2001: Calf production, calf survival, and recruitment of muskoxen on Banks Island during a period of changing population density from 1866-99. *Arctic* 54: 394–406.
LEMOUËL M., 1983: Sites côtiers et sites de l´intérieur de l´ile Victoria (Arctique Canada): complémentarité saisonnière des espaces. *Ethnologie Préhistorique*: 248–267.
LESKOV A. M., MÜLLER-BECK H. (Eds.) 1993: *Arktische Waljäger vor 3000 Jahren – Unbekannte sibirische Kunst.* Hase & Koehler, Mainz.
MANNING T. H., 1953: Narrative of an unsuccessful attempt to circumnavigate Banks Island by canoe in 1952. *Arctic* 6: 170–197.
MASCHNER H., MASON O. K., 2013: The bow and arrow in northern North America. *Evolutionary Anthropology* 22: 133–138. DOI: 10.1002/evan.21357
MAXWELL M. S., 1985: *Prehistory of the eastern Arctic.* Academic Press, Orlando.
MCGHEE R., 1972: *Copper Eskimo Prehistory*. National Museum of Man Publications in Archaeology 2. National Museum of Canada, Ottawa.

MILNE S. B., PARK, R. W., 2016: Pre-Dorset culture. In: T. M. Friesen, O. K. Mason (Eds.): *The Oxford Handbook of The Prehistoric Arctic.* Pp. 693–712. Oxford University, Oxford.

MILNE S. B., PARK R. W., STENTON D. R., 2012: Dorset culture land use strategies and the case of inland southern Baffin Island. *Canadian Journal of Archaeology* 36: 267–288.

MORISSON D. A., 1981: A preliminary statement on Neo-Eskimo occupations in western Coronation Gulf, N.W.T. *Arctic* 34: 261–269.

MORISSON D. A., 1987: Thule and historic Copper use in the Copper Inuit area. *American Antiquity* 52: 3–12.

MORISSON D. A., 1991: The Copper Inuit soapstone trade. *Arctic* 44: 239–246.

MORLAN R. E., CINQ-MARS J., 1982: Ancient Beringians: human occupation in the Late Pleistocene of Alaska and the Yukon Territory. In: D. M. Hopkins, J. V. Matthews, C. E. Schwegler, S. B. Young (Eds.): *Paleoecology of Beringia.* Pp. 353–381. Academic Press, New York.

MÜLLER-BECK H., 1966: Paleohunters in America: origins and diffusion. *Science* 152: 1191–1210.

MÜLLER-BECK H., 1977a: The excavation at Umingmak, Banks Island 1970 & 1973. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973.* Urgeschichtliche Materialhefte 1. Pp. 1–6. Archaeologica Venatoria, Tübingen 1–6.

MÜLLER-BECK H., 1977b: Preliminary results from the excavations at Umingmak I A. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973.* Urgeschichtliche Materialhefte 1. Pp. 7–22. Archaeologica Venatoria, Tübingen 7–22.

MÜLLER-BECK H., 1977c: Bone tools from Umingmak IA and ID. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973.* Urgeschichtliche Materialhefte 1. Pp. 58–71. Archaeologica Venatoria, Tübingen.

MÜLLER-BECK H., 1979a: Das Ökosystem der Moschusochsenjägerstation Umingmak. In: A. Pletsch, C. Schott (Eds.): *Kanada – Naturraum und Entwicklungspotential*. Marburger Geographische Schriften 79. Pp. 97–112. Universität Marburg, Marburg.

MÜLLER-BECK H., 1979b: Zur Archäologie der amerikanischen Arktis. *Beiträge zur Allgemeinen und Vergleichenden Archäologie* 1: 223–246.

MÜLLER-BECK H., 1982: Naturräumliche Nutzung als Basis kultureller Gliederung im arktischen und subarktischen Kanada. *Zeitschrift der Gesellschaft für Kanada-Studien* 2: 45–62.

MÜLLER-BECK H. 1985: Das Problem der archäologischen und historischen Kontinuitäten im Gebiet der Kupfer-Eskimo. In: A. Pletsch (Ed.): *Ethnicity in Canada – International examples and perspectives.* Marburger Geographische Schriften 96. Pp. 108–120. Universität Marburg, Marburg.

MÜLLER-BECK. H., 1989: Arktische Archäologie und Klimageschichte als biogeowissenschaftliche Gemeinschaftsforschung am Beispiel der Station Umingmak auf Banks Island. In: R. Vogelsang (Ed.): *Kanada in der Forschung der 80er-Jahre.* Kanada-Studien 5. Pp. 19–35. Brockmeyer, Bochum.

MÜLLER-BECK H., 1993: Arktische und subarktische Jägerkulturen in den eiszeitlichen Permafrostregionen Europas. In: R. Moser, M. Svilar (Ed.): *Lebensräume – Kulturhistorische Vorlesungen des Collegium Generale der Universität Bern 1992/93.* Pp. 49–70. Peter Lang, Bern.

MÜLLER-BECK H., 1997: A heavy duty chopping tool from a Birnirk house at Ekven, Chukotka. In: R. Gilberg, H. C. Gulløv (Eds.): *Fifty years of arctic research – Anthropological Studies from Greenland to Siberia.* Publications of the National Museum, Ethnographical Series 18. Pp. 221–226. National Museum of Denmark, Copenhagen.

MÜLLER-BECK H., 1998: Frauengräber des sibirischen Gräberfeldes Ekven. In: B. Auffermann, G.-C. Weniger (Eds.): *Frauen, Zeiten, Spuren*. Pp. 221–240. Neanderthal Museum, Mettmann.

MÜLLER-BECK H., 2003: Ekven, Chukotka – Eine Walfängersiedlung aus der Beringstraße 1992–2002. *Mitteilungen der Gesellschaft für Urgeschichte* 12: 87–112.

MÜLLER-BECK H., 2009: Comparative archaeology of Late Palaeolithic and Eskimo art. In. W.W. Fitzhugh, J. Hollowell, A.L. Crowell (Eds.): *Gifts from the ancestors – Ancient ivories of Bering Strait.* Pp. 64–69. Yale University, New Haven.

MÜLLER-BECK H., 2012: Zur paläolithischen Demographie in der heutigen Schweiz. Eine Annäherung aus der Arktis und Subarktis. In: A. Boschetti-Marade, A. de Capitani, S. Hochuli, N. Niffeler (Eds.): *Form, Zeit und Raum – Festschrift für Werner E. Stöckli zum 65. Geburtstag*. Antiqua 50. Pp. 21–36. Schweizer Gesellschaft für Urgeschichte, Basel.

MÜLLER-BECK H., TORKE W., VON KOENIGSWALD W., 1971: Die Grabungen des Jahres 1970 in der Prä-Dorset-Station Umingmak auf Banks Island (Arktisches Kanada). *Quartär* 22: 143–156.

MÜNZEL S., 1983: Seasonal activities at Umingmak, a muskox hunting site on Banks Island, NWT, Canada, with special reference to the bird remains. In: J. Clutton-Brock, C. Grigson (Eds.): *Animals and archaeology 1: hunters annd their prey*. BAR International Series 163. Pp. 249–257. Oxbow, Oxford.

MÜNZEL S., 1987a: *Umingmak – Ein Moschusochsenjagdplatz auf Banks Island, N.W.T., Canada – Archäologische Forschungen auf Banks Island 1970–1975.* Urgeschichtliche Materialhefte 5,2. Archaeologica Venatoria, Tübingen.

MÜNZEL S., 1987b: Arctic America: Umingmak, a muskox hunting site on Banks Island, N.W.T., Canada. Archaeozoological analysis of area ID. *Early Man News* 12–13: 93–108.

MÜNZEL, S., 1988: Quantitative analysis and archaeological interpretation. *Archaeozoologica* 2: 93–110.

MÜNZEL S., 1996: Quantitative Auswertung und archäologische Interpretation am Beispiel der Fauna von Umingmak, einem Paläoeskimofundplatz auf Banks Island, N.W.T., Kanada. In: I. Campen, J. Hahn, M. Uerpmann (Eds.): *Spuren der Jagd – Jagd auf Spuren (Festschrift für Hansjürgen Müller-Beck).* Tübinger Monographien zur Urgeschichte 11. Pp. 455–465. Mo Vince, Tübingen.

MURPHY D. T., 2002: "First among savages": the German romance of the Eskimo from the enlightment to national socialism. *German Studies Review* 25: 533–550.

NORN M., 1996: *Eskimo snow goggles in Danish and Greenlandic museums, their protective and optical properties*. Meddelelser om Grønland – Man & Society 20. Geografforlaget, Brenderup.
OAKES J. E., 1991: *Copper and Caribou Inuit skin clothing production*. Canadian Ethnology Service Mercury Series Paper No. 118. Canadian Museum of Civilization, Hull.
OAKES J. 1992: Eider skin garments used by the Ungava Inuit from Belcher Islands, Northwest Territories: construction and context. *Clothing and Textiles Research Journal* 10: 1–10.
OAKES J., WILKINS H., RIEWE R., KELKER D., FOREST T. 1995: Comparison of traditional and manufactured cold weather ensembles. *Climate Research* 5: 83–90.
OWEN L. R., 1984: *The microblades of Umingmak*. Urgeschichtliche Materialhefte 5,1. Archaeologica Venatoria, Tübingen.
OWEN L. R., 1988: *Blade and microblade technology – Selected assemblages from the North American Arctic and the Upper Palaeolithic of Southwest Germany.* BAR International Series 441. B.A.R., Great Britain.
PAECH H.-J., 1992: Die DDR-Antarktisforschung – Eine Retrospektivve. *Polarforschung* 10: 197–218.
PARK R. W., STENTON D.R., 1998: *Ancient harpoon heads of Nunavut: an illustrated guide*. Canadian Heritage Parks Canada, Ottawa.
PARZINGER H., 2006: *Die frühen Völker Eurasiens – Vom Neolithikum bis zum Mittelalter*. C. H. Beck, München.
PASDA C., 1996: Analogie oder Lüge – Jaranga oder gar nichts? Archäologie einer evidenten Struktur am Kap Verblyuzhiy (Chukotka). In: I. Campen, J. Hahn, M. Uerpmann (Eds.): *Spuren der Jagd – Jagd auf Spuren (Festschrift für Hansjürgen Müller-Beck).* Tübinger Monographien zur Urgeschichte 11. Pp. 121–128. Mo Vince, Tübingen.
PETERSEN H. C., 1986: *Skinboats of Greenland*. Viking ship museum, Roskilde.
PILLEWIZER W., 1986: *Zwischen Alpen, Arktis und Karakorum – Fünf Jahrzehnte kartographische Arbeit und glaziologische Forschung*. Dietrich Reimer, Berlin.
PORSILD M. P., 1915: *Studies on the material culture of the Eskimo in West Greenland*. Meddelelser om Grønland 51. Pp. 111–250. Bianco Lunos, København.
RAINEY F., 1941: *Eskimo Prehistory: the Okvik site on the Punuk Islands*. Anthropological Papers of the American Museum of Natural History 37. Pp. 453–569. Museum of Natural History, New York.
RANKIN C., LABRÈCHE Y., 1991: Traditional ulus and their prehistoric counterparts in the central and eastern arctic. *Études/Inuit/Studies* 15: 105–130.
RAMSEN P., MURRAY M., 1995: Identifying seasonality in Pre-Dorset structures in Back Bay, Prince of Wales, NWT. *Arctic Anthropology* 32: 106–117.
REINKE-KUNZE C., 1992: *Aufbruch in die weiße Wildnis – Die Geschichte der deutschen Polarforschung.* Kabel, Hamburg.
REISCH L., 2000: Von der "Praehistorika" der Anatomischen Sammlung zum Institut für Ur- und Frühgeschichte. In: H. Neuhaus (Ed.): *Geschichtswissenschaft in Erlangen*. Erlanger Studien zur Geschichte 6. Pp. 171–196. Palm & Enke, Erlangen.
REUTHER J., SHIRAR S., MASON O., ANDERSON S. L., COLTRAIN J.B., FREEBURG A., BOWERS P., ALIX C., DARWENT C. M., NORMAN L., 2021: Marine reservoir effects in seal (Phocidae) bones in the northern Bering and Chukchi Seas, Northwestern Alaska. *Radiocarbon* 63: 301–319. DOI: https://doi.org/10.1017/RDC.2020.127
RITTER C., 1938: *Eine Frau erlebt die Polarnacht*. Propyläen, Berlin.
RÖSSLER M., 2007: *Die deutschsprachige Ethnologie bis ca. 1960: ein historischer Abriß*. Kölner Arbeitspapiere zur Ethnologie 1. Institut für Völkerkundde, Köln.
ROUSSELOT J.-L., 1983: *Die Ausrüstung zur Seejagd der westlichen Eskimo, untersucht in ihrem kulturellen Kontext*. Klaus Renner, Hohenschäftlarn.
RUHNAU S., 1977: The contemporary mammalian fauna from Umingmak, Shoran Lake region. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973.* Urgeschichtliche Materialhefte 1. Pp. 151–161. Archaeologica Venatoria, Tübingen.
RYAN K., 2016: The "Dorset problem" revisited. In: T. M. Friesen, O. K. Mason (Eds.) *The Oxford Handbook of the Prehistoric Arctic*. Pp. 761–781. Oxford University, Oxford.
SAVELLE J. M., BEATTIE O. B., 1983: Analysis of dental annuli in muskoxen (Ovibos moschatus) as an aid in the determination of archaeological site seasonality. *Canadian Journal of Anthropology* 3: 123–129.
SAVELLE J. M., DYKE A. S., 2002: Variability in Paleoeskimo occupation on south-western Victoria Island, Arctic Canada: causes and consequences. *World Archaeology* 33: 508–522.
SAVELLE J. M., DYKE A. S., 2014a: Paleoeskimo occupation history of Foxe Basin, Arctic Canada: implications for the core area model and Dorset origins. *American Antiquity* 79: 249–276. DOI: https://doi.org/10.7183/0002-7316.79.2.249
SAVELLE J. M., DYKE A. S., 2014b: Prehistoric Neoeskimo komatiks, Victoria Island, Arctic Canada. *Arctic* 67: 135–142. DOI: https://doi.org/10.14430/arctic4383
SAVELLE J. M., DYKE A. S., WHITRIDGE P. J., POUPART M., 2012: Paleoeskimo demography on western Victoria Island, Arctic Canada: implications for social organization and longhouse development. *Arctic* 65: 167–181. DOI: https://doi.org/10.14430/arctic4198
SCHLESIER K.-H., 1964a: Die Bering-Landbrücke und die frühen amerikanischen Spitzenkulturen. *Saeculum* 15: 207–213.
SCHLESIER K.-H., 1964b: Vorbericht über die erste deutsche Archäologische Brooks-Range-Expedition, Nord-Alaska, 1964. *Anthropos* 59: 911–917.
SCHLESIER K.-H., 1966: Sedna Creek: Abschlußbericht über eine archäologische Feldarbeit in Nord-Alaska. *Zeitschrift für Ethnologie* 91: 5–39.
SCHLESIER K.-H., 1967: Sedna Creek: Report on an archaeological survey on the arctic slope of the Brooks Range. *American Antiquity* 32: 210–222.
SCHÜCKER N., 2012: Warum in die Ferne schweifen? An overview of German archaeology abroad. In: S. J. van der Linde, H. van den Dries, N. Schlanger, C. G. Sappendel (Eds.): *European archaeology abroad*. Pp. 157–190. Sidestone, Leiden.
SCHULTZ J. E., 2020: *The war in North-East Greenland*. Xsirius, Rønde.

SCHWEINGRUBER F. H., 1977a: Vegetation studies in the West Canadian Tundra of Central Banks Island. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973.* Urgeschichtliche Materialhefte 1. Pp. 82–104. Archaeologica Venatoria, Tübingen.

SCHWEINGRUBER F. H., 1977b: Results of the examination made on charcoal of Umingmak. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973.* Urgeschichtliche Materialhefte 1. Pp. 105–119. Archaeologica Venatoria, Tübingen.

SCHWEITZER P., 2013: Naturforscher, Weltreisende und nationale Forschungstraditionen: Bemerkungen zur ethnologischen Erforschung Sibiriens im 18. und 19. Jahrhundert. In: E. Kasten (Ed.): *Reisen an den Rand des Russischen Reiches: Die wissenschaftliche Erforschung der nordpazifischen Küstengebiete im 18. und 19. Jahrhundert*. Pp. 11–28. Kulturstiftung Sibirien, Fürstenberg/Havel.

SELINGER F., 2001: *Von "Nanok" bis Eismitte: meteorologische Unternehmungen in der Arktis 1940–1945.* Convent, Hamburg.

SKARLAND I., 1964: Otto William Geist, 1888–1963. *American Antiquity* 29: 484–485.

SOMMER M., 2005: Ancient hunters and their modern representatives – William Sollas's (1849–1936) anthropology from disappointed bridge to trunkless tree and the instrumentalisation of racial conflict. *Journal of the History of Biology* 38: 327–363.

STEFANSSON V., 1913: *My life with the Eskimo*. MacMillan, New York.

STENTON D. R., 1991: The adaptive significance of caribou winter clothing for arctic hunter-gatherers. *Études/Inuit/Studies* 15: 3–28.

STEWART H., 1989: The Arctic Small Tool tradition and early Canadian Arctic Palaeo-Eskimo cultures. *Études/Inuit/Studies* 13: 69–101.

STORDEUR-YEDID D., 1980: *Harpons Paléo-Esquimaux de la région d'Igloulik.* Recherches sur les grandes civilisations 2. ADPF, Paris.

STROBEL M., 2000: *Die Schussenrieder Siedlung Taubried I (Bad Buchau, Kr. Biberach).* Konrad Theiss, Stuttgart.

SUTHERLAND P., 1996: Continuity and change in the Paleo-Eskimo prehistory of northern Ellesmere Island. In B. Grønnow (Ed.): *The Paleo-Eskimo cultures of Greenland*. Pp. 271–294. Danish Polar Center, Copenhagen.

SØRENSEN M., 2012: *Technology and tradition in the Eastern Arctic, 2500 BC–AD 1200.* Monographs on Greenland – Man & Society 40. Museum Tusculanum, Copenhagen.

SØRENSEN M., DIKLEV T., 2022: The Qorluulasupalik site: an important puzzle piece in the interpretation of the Paleo-Inuit cultures in the high arctic Thule region in northwest Greenland. *Danish Journal of Archaeology* 11: 1–17. DOI: https://doi.org/10.7146/dja.v11i.126224

TAYLOR W. E., 1967: Summary of the archaeological field work on Banks Island and Victoria Island, Arctic Canada, 1965. *Arctic Anthropology* 4: 221–243.

THANNHEISER D., 1989: Eine landschaftsökologische Detailstudie des Bereichs der Prä-Dorset-Station Umingmak (Banks Island). *Polarforschung* 59: 61–78.

THANNHEISER D., SCHWEINGRUBER F., 1974: Floristische Untersuchungen auf Banks Island, N.W.T. *Polarforschung* 44: 27–34.

THOMSEN T., 1917: *Implements and artefacts of the North-East Greenlanders – Finds from graves and settlements.* Meddelelser om Grønland 44. C.A. Reitzel, København.

THOSTRUP C. B., 1911: *Ethnographic description of the Eskimo settlements and stone remains in North-East Greenland.* Meddelelser om Grønland 44. C. A. Reitzel, København.

TORKE W., 1977: The stone artefacts from Umingmak IA. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973.* Urgeschichtliche Materialhefte 1. Pp. 47–52. Archaeologica Venatoria, Tübingen.

TREMAYNE A. M., BROWN W. A., 2017: Mid to Late Holocene population trends, culture change and marine resource intensification in Western Alaska. *Arctic* 70: 365–380. DOI:10.14430/arctic4681

TREUDE E., 1975: Studies in settlement development and evolution of the economy in the eastern Central Canadian Arctic. *The musk-ox* 16: 53–66.

UNRATH G., 1987: The burins from Umingmak: how to use thumbnail tools. In: D. Stordeur (Ed.): *La main et l'outil – Manches et emmanchements préhistoriques.* Travaux de la Maison de l'Orient 15. Pp. 145. CNRS, Lyon.

VAHKTIN N., 2016: The Bogoras project and Yupik Eskimo linguistics in Russia. In: I. Krupnik (Ed.): *Early Inuit studies – Themes and transitions, 1850-1980s.* Pp. 193–218. Smithsonian Institution, Washington D.C.

VAN DER HEYDEN U., 2019: Afrika im Blick der akademischen Welt der DDR. Ein wissenschafts-geschichtlicher Überblick der afrikabezogenen Ethnographie. *Berichte zur Wissenschaftsgeschichte* 42: 83–105.

VANSTONE J. W., 1994: *The Noice collection of Copper Inuit material culture*. Fieldiana Anthropology 22. Field Museum of Natural History, U.S.A.

VERMEULEN H. F., 2009: Von der Empirie zur Theorie der deutschsprachigen Ethnographie und Ethnologie von Gerhard Friedrich Müller bis Adolf Bastian (1740–1881). *Zeitschrift für Ethnologie* 134: 253–266.

VON KOENIGSWALD W., 1977: The faunal material from Umingmak. H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973*. Urgeschichtliche Materialhefte 1. Pp. 72–80. Archaeologica Venatoria, Tübingen.

VON KOENIGSWALD W., KUBIAK H., 1979: Jahreszeiten-bestimmung der Moschusochsenjagd von Umingmak, einer Pre-Dorset-Station in der kanadischen Arktis. *Quartär* 29/30: 77–83.

WALLS M., 2010: Paleocarpentry in the eastern arctic: an inferential exploration of Saqqaq kayak construction. *Explorations in Anthropology* 10: 96–109.

WALLS M., 2016: Making a didactic process: situated cognition and the chaîne opératoire. *Quaternary International* 405: 21–30. DOI: https://doi.org/10.1016/j.quaint.2015.03.005

WALLS M., 2019: The bow and arrow and early human sociality: an enactive perspective on communities and technical practice in the Middle Stone Age. *Philosophical Technology* 32: 265–281. DOI: https://doi.org/10.1007/s13347-017-0300-4

WALLS M., MALAFOURIS L., 2016: Creativity as a developmental ecology. In: V.P. Glăveanu (Ed.): *The Palgrave Handbook of creativity and culture research*. Pp. 623–638. Palgrave MacMillan, London.
WAGNER F., 1977: The climatic data from the Umingmak excavations in 1970 and 1973. In: H. Müller-Beck (Ed.): *Excavations at Umingmak on Banks Island, N.W.T. 1970 and 1973.* Urgeschichtliche Materialhefte 1. Pp. 132–138. Archaeologica Venatoria, Tübingen.
WAYMAN M. L., SMITH R. R., HICKEY C. G., DUKE M. J. M., 1985: The analysis of copper artifacts of the Copper Inuit. *Journal of Archaeological Science* 12: 367–375.
WILKINSON P. F., 1975: The relevance of musk ox exploitation to the study of prehistoric animal economies. In: E. S. Higgs (Ed.): *Palaeoeconnomy*. Pp. 9–53. Cambridge University, Cambridge.
WILKINSON P. F., SHANK C. C., 1975: Archaeological observations in North Central Banks island. *Arctic Anthropology* 12: 104–112.
ZÜCHNER C., 1997: Hugo Obermaier – Leben und Wirken eines bedeutenden Prähistorikers. *Quartär* 47/48: 7–28.

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