# Analysis of the IcGm-2, 3 and 4 sites, Inukjuak, Nunavik.

## Northern Airport Infrastructures Improvement Project.

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**Summary**

This study, which presents the analysis results of the archaeological collections recovered from the IcGm-2, 3 and 4 sites situated in the municipality of Inukjuak, Nunavik, is an integral part of the Northern airport infrastructures improvement project started in 1984 by the Ministère des Transports du Québec. This project first comprised the archaeological potential studies carried out in eleven localities of Nouveau-Québec (Nunavik), as well as the archaeological inventories of these localities, which allowed for the registration of a large number of archaeological sites. Following the completion of the inventory, it was observed that the IcGm-2, 3 and 4 sites were located within the right-of-way of the future access road leading to the new Inukjuak airport site. Salvage excavations were carried out in 1986 to recover the archaeological data from these sites before their destruction. The analysis project of these archaeological collections is the last phase of the work that began a few years earlier.

The three archaeological sites analyzed represent three distinct periods in the human occupation of Nunavik. The IcGm-2 site was occupied mainly during the historic period, but also revealed some traces of an earlier occupation going back to the Dorset period. The archeological collection from this site includes a respectable amount of worked and unworked bones and a good quantity of manufactured implements, almost all of which were recovered from the interior of two structures. Analysis of these data indicates that the main occupation period of this site dates from the middle of the 19th century or the beginning of the 20th century.

The IcGm-3 site was occupied by groups from the Thule culture, between the 12th century A. D. and the beginning of the contact period. IcGm-3 is one of the rare Thule sites to have been the subject of an archaeological excavation in Nunavik. It is comprised of two heavy tent rings and three tent rings, indicating in the absence of semi-subterranean dwellings a certain seasonal variability in Thule construction types. Though only a small sample of lithic material was recovered, it allowed for the identification and analysis of the techniques used in the manufacturing of slate tools.

Area A of the IcGm-4 site belongs to the Middle Dorset period. This part of the site is comprised of one tent ring and an axial feature, while seven unexcavated tent rings were observed in areas B, C and D. These areas located well outside the right-of-way were not included in the salvage project. Area A is also characterized by a workshop where soapstone, chert, quartzite, metabasalt and quartz were used to manufacture a variety of tools. The analysis of this collection, which integrates the data recovered in 1979-80 by Daniel Weetaluktuk, allowed for the analysis of direct percussion and polishing manufacturing techniques. The similarity between the polishing techniques identified on the IcGm-3 and 4 sites was also noted, thus marking a certain temporal continuity in the use of this technique. Finally, specific manufacturing zones were identified using the spatial distribution of the analyzed data from area A of IcGm-4.

## 1.0 Introduction

Following recommendations presented in the archaeological inventory report of the study area of the village of Inukjuak, undertaken within the context of the northern airport infrastructures improvement project (Avataq Cultural Institute, 1987a), in 1986 the ministère des Transports du Québec gave the Avataq Cultural Institute the mandate to excavate the IcGm-2, 3 and 4 sites, in order to lessen the impact of the construction of an access road leading to the site of the future aerodrome. The recommendations stipulated that the excavations be limited to those areas of the sites situated within the right-of-way of the access road (Avataq Cultural Institute, 1987a: 142-143). It was also suggested at the end of the fieldwork that the data collected on these sites be analysed in order to increase the actual knowledge of the history of the Inuit occupation in Nunavik.

The archaeological sites analysed represent three episodes of the Palaeoeskimo and Neoeskimo cultural sequence. The earliest site, IcGm-4, was occupied by groups affiliated to the Dorset period. Traces of this period were also observed on the IcGm-2 and 3 sites, but these palaeoeskimo remains are mostly insubstantial. The IcGm-3 site was occupied during the Thule period, while the IcGm-2 site revealed significant remains pertaining to the historic Inuit occupation of the region. Accordingly, the analysis of the data recovered from these three sites fills an important gap in the somewhat unknown human occupation sequence for the Inukjuak region, and for Nunavik in general.

The IcGm-2 site collection comprises few artefacts. The Dorset occupation is represented only by a few lithic specimens, while the historic Inuit occupation remains include approximately 50 objects. However, more than 600 bones were collected. These remains are associated to two habitation structures.

The IcGm-3 site artefact collection is also poor and comprise several tools and a small number of flakes, all recovered from a single habitation structure. The four other structures, as well as the excavated inter-structural zones yielded no artefact.

Of the three sites, IcGm-4 is the richest and covers the largest surface area. It is made up of four areas, but the salvage excavation undertaken concerned only area A. Areas B, C and D, sampled in 1985 and 1986, were not within the right-of-way of the access road. Area A was also partially excavated in 1979-1980 by an Inuk researcher, Daniel Weetaluktuk (1979a; 1979b; 1979c). The several excavations carried out on this site yielded over 13,000 lithic objects, as well as one habitation structure and a single mid-passage with possible links to a habitation area.

The following study is divided into five sections. The first describes the general context of the analysis, comprising a description of all three archaeological sites, a brief survey of the palaeo-environmental data, theoretical aspects of the research, including the problematic developed and the methods and techniques used during the analysis.

The second, third and fourth sections present each site individually. First, a description of the salvage excavation results situates each site within its archaeological context. It is followed by the presentation and interpretation of the analysis results. It must be noted at this point that the results of the present study are concerned only with intra-site analyses, since the main occupations of the three sites are from three distinct cultural periods. An inter-site comparison shall have to wait until other sites representing the same occupation periods are analyzed or that the results of collections already analyzed are made available.

Appendices I to V describe the data used in the analysis. These data are presented either in descriptive form or through a series of table covering all the attributes and variables used in the tools and flakes analysis. The debitage by-products collected in areas C and D of the IcGm-4 site are described separately (Appendix V). Finally, appendices VI to VIII present the excavation and distribution plans.

## 2.0 Settings

The municipality of Inukjuak is situated on the east coast of Hudson Bay, at the northern extremity of the Hudson Arc. The IcGm-2, 3 and 4 sites are located on the western shore of *Inujjuap kuunga* (river), less than a kilometer to the northeast of the village (Figure 1).

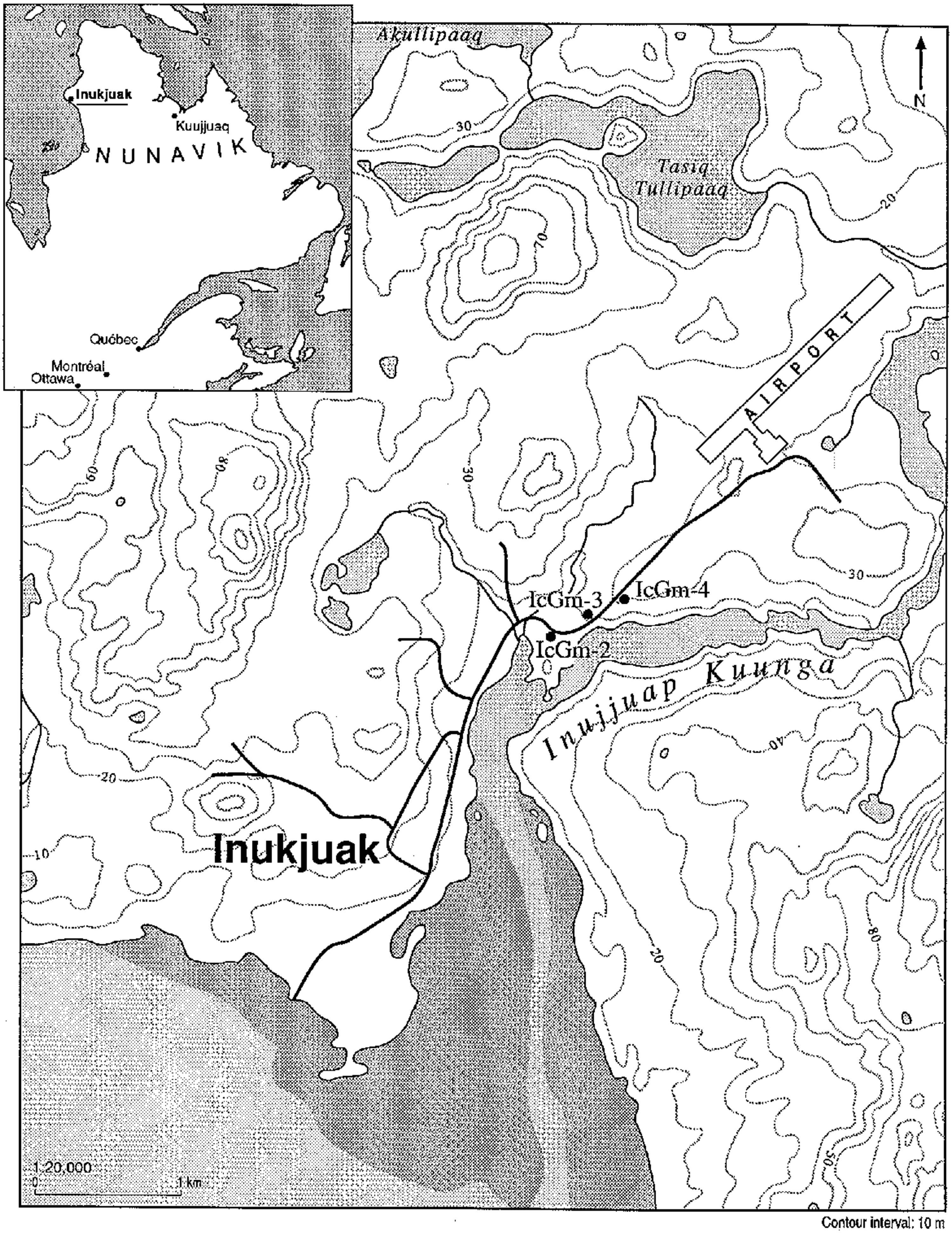
The IcGm-2 site is located 600 m to the northeast of the village and it occupies a sand and gravel terrace at 7.0 metres above sea level (m.a.s.l. below; Avataq Cultural Institute, 1987b: 11-12). The site area is delimited toward the west and the south by a borrow pit. An access road marks off its eastern limit and a slope delimits it to the north. Scattered bedrock outcrops are visible on the surface of the terrace (Appendix VI).

The IcGm-3 site is located about 100 m northeast of the IcGm-2 site and it occupies a mixed sand and gravel deposit and a boulder field. The latter is slightly inclined towards the river. Average site elevation is at 6.0 m.a.s.l. The slope of the 10 m terrace delimits the site from the north to the east; the western limits of the site correspond to the beginning of a marsh, where a stream pours out of the valley on a generally north-south axis and flows into *lnujjuap kuunga*. An access road already existed at the time of the archaeological inventory (Avataq Cultural Institute, 1987a: 43), as did the trails located in the southwest portion of the site (Appendix VI).

The IcGm-4 site is located about 100 m north-east of the IcGm-3 site. It is situated on a sand and gravel deposit of fluvial origin interspersed between bedrock outcrops of various dimensions. The site is composed of four areas (A, B, C and D), but only area A was concerned by the salvage excavation. This area occupies a terrace at 21 m.a.s.l. and is bordered to the north and south by bedrock outcrops. An access road crosses the site on an east-west axis (Appendix VI).

Area C is situated approximately 100 m southeast of area A, at an altitude of 25 m.a.s.l. and is bordered to the south by a bedrock outcrop. Area D, which is situated about 100 m west of area C and 50 m south of area A, occupies a narrow sand and gravel deposit (10 to 12 m wide) embedded in bedrock outcrops to the north and south. Area B is at the southern extremity of the site, more than 100 m south of area A. This area occupies the 17 m.a.s.l. terrace and stands against an escarpment to the north (Avataq Cultural Institute, 1987a: 50-51).

**Figure 1.** Location of the IcGm-2, 3 and 4 sites, Inukjuak, Nunavik.



## 3.0 Palaeoenvironment

### 3.1 Geomorphology

The emergence of the Tyrrell sea, along with the Iberville sea, represent one of the last great phases in the dislocation of the Laurentian Ice-sheet. This transgression, which began about 8000 years before present (B. P. below) at the southern extremity of the east coast of Hudson Bay, gradually spread to the northern latitudes during the following centuries (Hillaire-Marcel, 1979: 73). This post-glacial episode is perceptible in the variations of the maximum marine limits observed for the east of Hudson Bay. These limits reach approximately 200 m in the James Bay region and attain 315 m in the Kuujjuarapik region. The maximum limit seems to decrease gradually towards the north, reaching 167 m at Cap Wolstenholme (Hillaire-Marcel, 1979: 98). No data being available for the region between Richmond Gulf and Ivujivik, most authors (Hillaire-Marcel; 1979, B. Lauriol, 1982; Andrews and Tyler, 1977) used information from the Ottawa Islands to establish isobases in this coastal area. The maximum marine limit for these islands reached 158 m.a.s.l., but the dating used (i.e., 7430 years B. P.) was obtained from a sample taken from an altitude of 139 m (B. Lauriol, 1982, 97). Since the ice retreated from a west to east direction, the earliest land emergence at Inukjuak would have taken place several hundred years later than the Ottawa Islands (i.e., after 7500 years B. P.; B. Lauriol, 1982: 97-98, Figure 62).

The ice gradually retreated, and about 6500 years B. P., all of the coastal regions of Nouveau-Quebec were ice-free. Around 6000 years B. P., residual ice was confined to the interior land liberating the bedrock (B. Lauriol, 1982: 98-99). During this same period, the Tyrrell Sea reached 80 m at the Ottawa Islands and 137 m at Richmond Gulf. About 5000 years B. P., emersion curves situated Inukjuak between 50 m (Ottawa Islands) and 75 m (Richmond Gulf) (B.Lauriol, 1982: 122, Figures 76 and 77). The isolines traced for the subsequent periods situate the Inukjuak region between 20 m to the north and 40 m to the south at 4000 years B. P. and between 10 and 20 m around 2000 years B. P. (Andrews and Tyler, 1977: 396, Figures 7-8).

The absence of data concerning the Inukjuak region prompts to use these curves with caution. It has been established that isostatic rebound is a local phenomenon that depends on a large number of geomorphological and geophysical factors (Hillaire-Marcel, 1979: 111-113; B. Lauriol, 1982: 156). Thus, the different emersion rates calculated for the Kuujjuarapik (Plumet, 1976: 139) and Richmond Gulf (Hillaire-Marcel, 1979: 123) regions, amongst others, cannot be directly applied to the Inukjuak region.

However, as an example, the isostatic rebound rates for the Inukjuak region can be extrapolated to an average emersion rate of 2 m per century beginning 6000 years B. P. ago (Hillaire-Marcel, 1979: 123). At this rate, the present coastline would have surfaced approximately 1000 years ago. Considering a similar emersion rate for the Ottawa Islands, the present coastline must have appeared around the same period (Hillaire-Marcel, 1979: Figure 105). At Richmond Gulf, progressive isostatic rebound was apparently regular, but the present coastline emerged much more recently (Hillaire-Marcel, 1979: 113, Figure 116). By adding these findings to the isolines discussed previously, it can be assumed that at the time of the IcGm-4 site occupation, the Inukjuak coastline would have been situated between 12 and 2 m above its present level[1]. Today, the occupation traces of area A are situated between 21 and 23 m.a.s.l., or between 10 and 20 m.a.s.l. at the time of occupation. At the time IcGm-3 was occupied, sea level was the same as it is today. The same findings apply to the historical occupation of IcGm-2. Because these two sites are situated at low altitude, we have to presume that the Dorset occupation traces related to these sites reflect a recent occupation period.

The beginning of the post-glacial period and the subsequent marine transgressions and emersion movements were accompanied by climatic variations, which interacted directly with the evolution of the post-glacial environment of Nouveau-Québec. These variations had an important, but not exclusive, role during the periods of rapid isostatic rebound and relative stability which contributed to the production of certain compound shorelines, particularly in the Richmond Gulf region. The periods of stability became more frequent after 6000 years B. P. marking the slowing down of the isostatic rebound (Hillaire-Marcel, 1979: 123 and foll.).

### 3.2 Palynology, climate and human occupation

Plant growth and its evolution are also directly related to climatic factors. The Inukjuak region is part of the Arctic zone of Nouveau-Quebec. Today it is covered with shrub tundra (Richard, 1981: Figures 3, 4 and 5). The evolution of vegetation in this part of Nouveau-Québec is nevertheless relatively unknown because, contrary to the eastern part of the Ungava Peninsula, the east coast of Hudson Bay was practically ignored by palynologists. The following outline is therefore highly dictated by data collected in eastern Ungava and in the high Arctic. Just as the rebound process is not synchronic from one region to another, the generalizations, and especially the sequence of

[1] The earliest $^{14}C$ dating obtained for this site is 1670 ± 150 years B. P. and the latest date is 1130 ± 170 years B. P.

events presented below have only indicative value. In order to demonstrate the link that exists between human colonization and environmental factors, the main elements of the eastern Arctic cultural sequence are included in this discussion. Although these factors are important, they do not fully explain the overall changes perceived by in the archaeological record. Other factors, such as socio-economic pressures must be considered as motivators of change, but this aspect goes beyond the objectives of the present discussion.

The first signs of plant growth appear soon after the retreat and exundation of post-glacial seas, between 7000 and 6500 years B. P. The first phase is marked by the appearance of grass tundra corresponding to fairly cold temperatures (Richard, 1981: 117 and foll.; 135 and foll.). Even so, the vegetation was apparently richer and denser than it is today. This period was followed by a dense shrub phase that began about 6200 years B. P. and ended about 3500 years B. P. This phase corresponds to what palynologists call climatic optimum[2]. In some regions, this phase is marked by dense vegetation dominated by shrubs. It is halfway through this period that the first population movements from the western Arctic occur (Barry et al., 1977: 198). The following phase, which began about 3600 years B. P. when shrub toundra was gradually replaced by a scattered shrub and grass tundra, corresponds to global cooling and a denuding of the surface in some regions (Richard, 1981: 135-137). This period appears to be directly linked to the regionalization of early palaeoeskimo groups, although opinions vary as to the reasons for this phenomenon (Barry et al., 1977: 198)[3]. A warmer and dryer period followed between 3200 and 2800 years B. P. This period seems to correspond to the beginning of the Dorset period in some regions (Barry et al., 1977: 199). About 2100 years B. P., the Arctic zone underwent a cooling off period that lasted a few centuries, affecting the stability of caribou and seal populations. This situation led to important changes in regional settlement patterns, including the abandonment of certain regions where the ecosystem was particularly fragile (Barry et al., 1977: 199). A few hypotheses were elaborated to try to explain the dynamics of the Dorset groups during these unstable periods. The most important is undoubtedly the "core area" thesis. In brief, this theory holds that the decline of climatic conditions negatively affects means of subsistence, resulting in a major abandonment of marginal zones and a return to the core area, where it appears that the

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[2] Climatic optimum is a period when average warm temperatures exceed present average warm temperatures. For the Canadian Arctic archipelago, this phase occurred between 6500 and 4500 B.P. It is followed by a second climatic optimum between 4500 and 3000 B.P. (Barry et al., 1977: 198).

[3] This last great phase appears to have lasted until the present day. However, variations have been observed and they seem to have played an important role in the development of ancient populations. For this reason, we believe we are justified in outlining its main parametres.

stability of resources assured the continuous presence of palaeoeskimo populations (Maxwell, 1985: 81, Figure 5.1). However, Barry et al. (1977: 199) put the effects of unfavorable climatic conditions in perspective by noting that the various movements between regions during this cooling period are not synchronic. The abandonment of marginal regions could have resulted from constraints not solely related to the decline of climatic conditions. McGhee (1976), explains the disappearance of groups living in marginal zones by catastrophic decline or by simple extinction of these groups. As an example, we can point to the cultural hiatus observed on Ellesmere Island between the end of the Early Dorset period and the terminal phase of this same period, where the deterioration of climatic conditions is also invoked to explain the disappearance of Terminal Dorset groups. Schledermann explains his position by establishing a parallel between this episode and the Little Ice Age of the 17th century:

> "By using the Thule culture analogy and emphasizing that the technological abilities and hunting skills of the early Dorset hunters certainly were no better than those of the Thule Inuit, we get some insight into the limitations of cultural adaptability in regions with highly sensitive ecological conditions easily influenced by even moderate fluctuations in climatic conditions. Just as the chain of interacting ecological events reduced the economic viability of the study area for the later Thule culture Inuit, the early Dorset culture families undoubtedly responded in a similar fashion and abandoned the area." (Schledermann, 1990: 329)

Archaeological informations collected in Nunavik concerning this period is still too sketchy to corroborate any of these hypotheses. Nevertheless, some general considerations can be discussed. It is now known that the early palaeoeskimo period is relatively rich on the east coast of Hudson Bay (cf., Avataq Cultural Institute, 1993), and it appears there was a large decrease in population density in the subsequent period, but this reduction does not necessarily correspond to an absence of sites, since cultural remains related to Early and Middle Dorset phases are still present. In this perspective, the exodus of Dorset groups from the region would have occurred before the advent of cooler temperatures and would have continued during the subsequent period. Therefore, climatic modifications would not be the only factors that would have caused these groups to leave the Hudson coast.

The period from 1100 to 800 years B. P. corresponds to a rise in temperatures, which saw the expansion of the Thule groups (Barry et al., 1977: 200). The exact period of their arrival in Nunavik is uncertain, but present evidence suggests that these groups peopled Quebec territories after 800 years B. P., thus, during another cooling trend, between 800 and 400 years B. P. It was about this time that the Thule population gradually replaced their means of subsistence based mainly on whale hunting, with a more regional type of hunting based on land and marine mammals such as seals (Barry et al., 1977: 200). Between 400 and 100 years B. P., a period known as the "Little Ice Age"[4], the transition to exploiting local resources became widespread in all the eastern Arctic.

The IcGm-4 site would have been occupied during a cold climate interval that followed the disappearance of the Dorset groups in some regions, particularly in the high Arctic. Since no dates are available for the IcGm-3 site, it can only be assumed it was occupied after 800 years B. P., thus during a very cold climatic interval. The same observation applies to the IcGm-2 site, which is assumed to be approximately 100 years old.

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[4] The average summer temperatures during this period were 1.5° C lower than today (Barry et al., 1977: 200).

# 4.0 Theoretical considerations

## 4.1 Research orientation

The analysis of the archaeological collections recovered from the IcGm-2, 3 and 4 sites come to fullfill an obvious lack of anthropological knowledge concerning the human occupation in Nunavik. Although the number of known sites has increased considerably over the last few years, very few of them have been excavated and even less analysed. Reasons explaining this situation are numerous, and sometimes financial, but they also reflect the weakness in the structure of northern studies research orientations. They are nevertheless reflected in the absence of data coming from Nunavik, either in recent syntheses or comparative studies (cf., Maxwell, 1985). The present analysis is a first step aimed at filling this gap in Nunavik's history.

The objectives of this research are to be integrated into a much more complex and elaborated context. First, this whole project, from the archaeological potential studies to the present analysis, was implemented within cultural resource management policies, elaborated following the rapid development of Inuit villages, which will irreversibly modify and affect the physical environment of the communities, as well as a large number of archaeological sites. This situation is already well in progress in some regions. For this reason, field works must lead more than ever to the synthesis and diffusion of the information recovered at a local, regional and continental levels, as well as toward the scientific community. Archaeology, without this final exercise, does not have a "raison d'être". Subsequent use of analysis results for didactic or sensibilization purposes becomes primordial, because they will eventually be used in the protection of the archaeological resources.

Secondly, the specific objectives of the present study are to understand socio-economic activities during three distinct periods of Inuit history: Dorset, Thule and historic Inuit periods. In theory, the temporal diffrences of these sites should reflect changes in means of subsistence, means of acquisition and adaptations to environmental constraints. In order to begin defining these various aspects, here are some preliminary observations taken from the excavation results:

- **1:** The IcGm-2 site is mainly a late 19th century-early 20th century Inuit historic site. It is essentially a habitation site. Apart from the few objects recovered (cf., Avataq Cultural Institute, 1987b: 63), the Dorset component is not identifiable.

However, it has been suggested that the habitation structures were occupied a first time by Dorset occupants before being reoccupied during the historic period (Avataq Cultural Institute, 1987b: 62-63).

- **2:** the IcGm-3 site is essentially a short-term habitation site, used during the warmer months (spring-summer) with a possible fall occupation, particularly in Structure 2 (cf., Avataq Cultural Institute, 1987b: 63).

The five structures excavated have not revealed a large quantity of archaeological remains, thus, supporting the hypothesis of a short-term occupation. However, this hypothesis must be used with caution since part of the site lies in a boulder field. This type of deposit is unpredictable when it comes to recover occupation traces other than the structure itself. Other problems of a technical nature make this description weak; they will be discussed in the following section.

- **3:** The central zone[5] of area A of the IcGm-4 site is subdivided into activity areas where tool manufacturing was the main function (cf., Avataq Cultural Institute, 1987b: 64). The lack of visible habitation structures in this particular zone, with the exception of the axial feature (Structure 9) and the quantity, variety and dispersal of raw materials, supports this observation. D. Weetalaktuk (1979b; 1979c) considered this part of the site as a soapstone vessel production workshop (this hypothesis was formulated again in 1986; Avataq Cultural Institute, 1987b: 64). In this context, Structure 8 could be representative of the site other domestic activities, just like the habitation structures in areas C and D.

From these preliminary observations, a number of research hypotheses have been elaborated for each of the three sites.

**IcGm-2**

The problematic developed for the analysis of the IcGm-2 site concerns two aspects: 1) the Dorset occupation. Is this occupation identifiable beyond the few objects recovered from the two structures? In the affirmative, it is a question of determining what components define this occupation. The resolution of this question is rendered difficult due to the lack of precision applied to the recording of structural and stratigraphic informations.

2) Characterizing the various activities associated to the historic occupation. Certain elements suggest that both occupations were synchronic, but that the occupants of Structure 1 remained at this encampment longer. This hypothesis will be evaluated using the various remains collected in both structures. The recovery of manufactured objects will serve also to measure the impact of these new technologies on Inuit adaptation and to examine the progression of inter-cultural contact and its effect on

[5] The "central zone" designates the most intensively excavated archeological space and is located more or less at the center of area A.

Inuit settlement patterns. These artefacts will facilitate also dating the historic occupation of the site.

Historic Inuit sites have never really held the attention of archaeologists, explaining the lack of collections linked to this important period of Inuit history. Generally, the historical period is described from a document perspective (i.e., ethnohistoric), without any archaeological contribution. In this regard, the analysis of the IcGm-2 site provides an opportunity to establish a comparative basis for future research.

**IcGm-3**

The mediocrity of information recovered at the IcGm-3 site prevents the elaboration of a problematic for this site. Except for incomplete structural data, almost all the remains come from a single square metre. Nevertheless, these data allow for the exploration of two fairly unknown aspects of prehistoric Neoeskimo culture. First, archaeologists' attention has almost exclusively been turned toward the study of semi-subterranean dwellings, which, despite the fact that they reflect an important part of Thule settlement patterns, don't represent all means of adaptation for this period. Information collected on tent rings offers the possibility of examining the Thule culture from a different angle, especially since typical Thule sites (i.e., sites composed of a various number of semi-subterranean dwellings) are rather rare on the east coast of Hudson Bay. These winter sites all appear to be located on islands (Weetaluktuk, 1981). The identification of Thule tent rings on the mainland, as opposed to the winter occupation of the islands, could eventually lead to the definition of a differential seasonal adaptation among prehistoric Neoeskimo populations.

The other facet discussed is more specifically technical and is not exclusive to the prehistoric Neoeskimo period, since these elements have also been observed in the collection recovered from the IcGm-4 site. The lithic collection recovered from Structure 2 includes a number of slate objects identifying the various manufacturing stages of polished tools.

**IcGm-4**

Analysis of the IcGm-4 site lithic collection is comprised of several aspects, the most important being the examination of techniques related to direct percussion manufacture and certain special techniques employed in the manufacturing of slate and soapstone polished objects. This part of the study will attempt to define the nature of the by-products associated with these techniques from certain morpho-metric characteristics.

Certain tool categories that are represented by a sufficient number of specimens also will be discussed in a technical perspective. As for the other categories, they can't be included in the analysis as such, because of their small number. However, they are described in the appendices for eventual comparative studies. Complete or near-complete tools will be compared with other archaeological collections from the same cultural period to verify if a certain typological similarity exists between the IcGm-4 collection and the archaeological data from other known Dorset sites in Nunavik, as well as in the high Arctic.

The last objective to attain by the analysis of area A of the IcGm-4 site concerns the identification of the activity areas. By using the spatial distribution of the artefacts recovered (i.e., tools, debitage, combustion areas, etc.), it should be possible to define these zones in space and explore the interaction between them.

## 4.2 Constraints

Consultation of available documentation concerning the work carried out on the three sites, including D. Weetaluktuk's field work at the IcGm-2 and 3 sites, revealed some inconsistencies in more than one regard. The problems, technical in nature as much as conceptual, have a certain impact on the analysis procedures of the archaeological collections. Identification of these inconsistencies explains also the exclusion of some parametres from the study. However, these problems do not affect the interpretation of the analysis results.

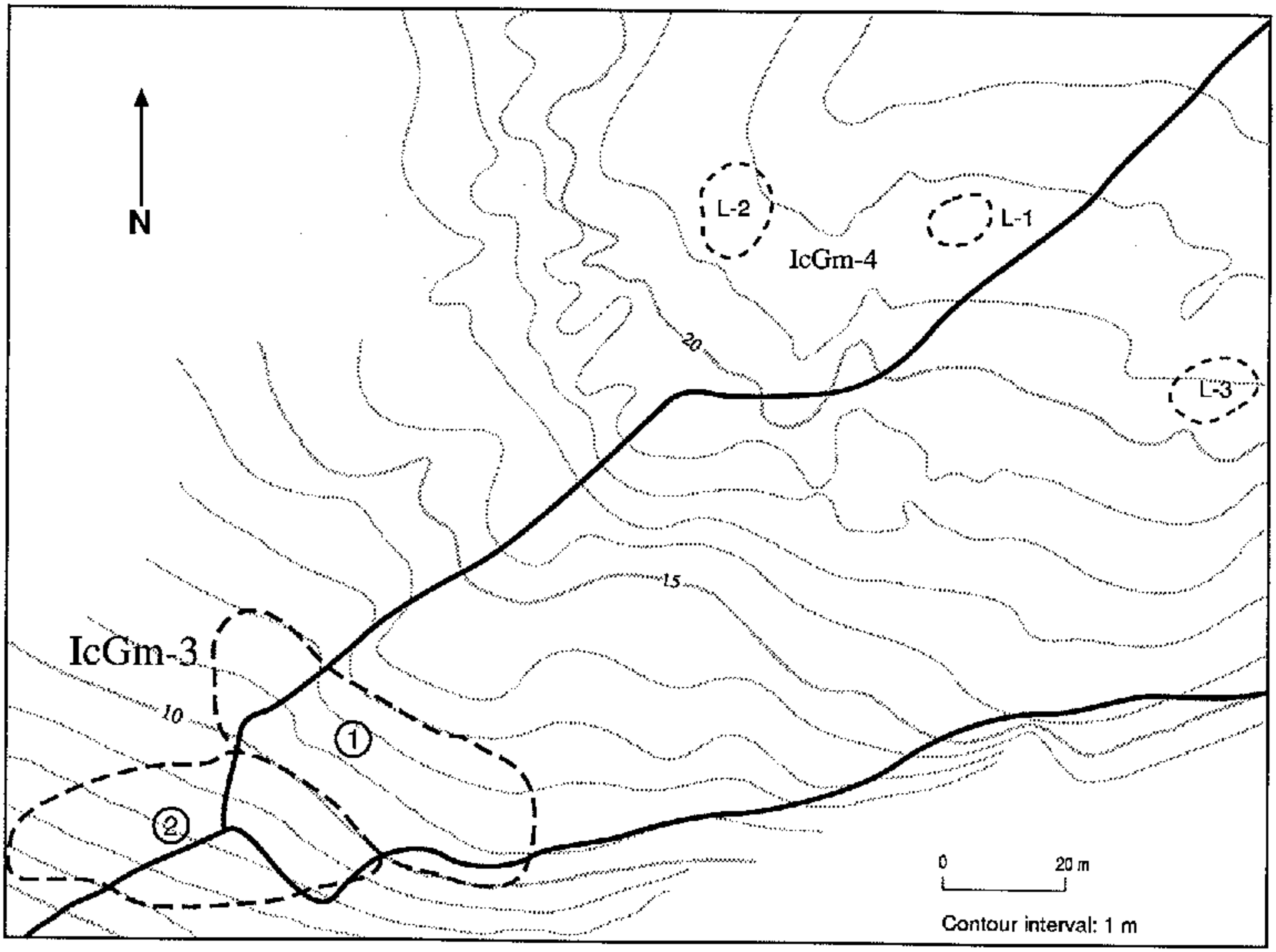
A single problem was identified for the IcGm-2 site when the excavation report was being produced (Avataq Cultural Institute, 1987b). The Structure 1 excavation plan comprised some imprecisions that had to be corrected with the help of the photographs taken in the field. These errors may affect partially the interpretation the habitation structure.

While examining the information transmitted by D. Weetaluktuk (1979c) concerning the IcGm-3 site, it was noticed that this site was not the same as the one identified in 1985 by the Avataq Cultural Institute. The IcGm-3 site observed by Weetaluktuk is situated on the 10 m.a.s.l. terrace, while the 1985 site is on the 6 m.a.s.l. terrace. Weetaluktuk observed two axial structures (mid-passages), as well as concentrations of lithic remains on the surface composed of slate flakes, several chert flakes, an end blade fragment and a microblade. The first structure is located approximately 8 m north of the existing access road, while the second structure is located 46 m further to the east. None of the six structures from 1985 correspond to this description. Figure 2 shows the location of both "IcGm-3" sites. The present analysis is concerned only with the 1985 site.

Several problems were also identified on the IcGm-4 site. First, the results of Weetaluktuk's field work were found to be lacking a large portion of the original data. All his notes on the 1979 excavation were lost (Weetaluktuk, 1979b: 1). As a result of this loss, a relatively large number of objects have no provenience information and no precise location are available for the tools. Moreover, information on the quadrants or collection levels was also lost. This greatly limits the usefulness of a large portion of these data for the present analysis, especially in the study of the artefacts' spatial distribution.

Certain decisions taken during the 1986 excavation also have a negative impact on the analysis. First, the surface collection areas defined in the central zone (cf.

**Figure 2.** Location of the IcGm-3 site (1979-80) and 1986




Delimitation of the IcGm-3 site: (1) according to D. Weetaluktuk (1979b); (2) according to Avataq (1987a; 1987b)

Delimitation of the IcGm-4 site localities (D. Weetaluktuk, 1979b)

Access road

appendices VI and VII) appear inadequate. These areas, which are covering 16 $m^2$ each (4 x 4 m), are too imprecise and they overlap the 1979-80 and 1986 excavated zones without being accompanied by any distribution plan. Also, the geographical orientation of the area excavated in 1986 don't correspond to the orientation of Weetaluktuk's excavations and must be taken into consideration since the square metres excavated in 1986 partially overlap the square metres excavated in 1979-80.(Appendix VI)[6].

Finally, the stratigraphic profiles registered in 1986 (Avataq Cultural Institute, 1987b: Appendix 5) turn out to be unsignificant, particularly the one covering the north-south axis of the central zone. It represents mostly portions already excavated in 1979-80 by Weetaluktuk. From this viewpoint, the stratigraphic data is so imprecise for the 1986 excavation and nonexistent for 1979-80, that these data were excluded from the analysis. Even so, the stratigraphic profiles will be presented for general information only in the description of the site.

These observations influence the manner in which the previously formulated hypotheses are approached, since they reveal certain inherent deficiencies in the excavation procedures employed. The impact is mostly discernable at the level of the artefacts distribution, particularly concerning the degree of perception of the activity areas.

[6] According to the 1986 field notes, Weetaluktuk didn't backfilled is trench after is two years excavation. The artefacts recovered in 1986 would be coming then from levels unexcavated in 1979-80.

## 5.0 Analysis: methods and techniques

### 5.1 Theoretical considerations

This archaeological analysis is first and foremost a study of lithic collections. It comprises two sections: the tools and the debitage flakes. Despite the fact that they are interdependent, tools and debitage by-products are very rarely treated equally. Historically, emphasis has always been placed on the tool kit, because it defines the cultural trends that sustain archaeological definitions (Burton, 1980: 131). The study of lithic tools was traditionally approached from various angles: typological, stylistic or functional. Quite often, incursions into the field of debitage studies were only aimed at finding secondary support for the cultural definitions developed from the tool kit (Burton, 1980: 131). This general tendency of placing the emphasis on tools occurs throughout the Canadian Arctic, to the detriment of the analysis of debitage by-products[7]. In addition, studies on the Arctic tend to favor a purely descriptive approach aimed at defining diagnostic traits, which facilitate integration into the known cultural sequence (Linnamae, 1975; McGhee, 1979; Schledermann, 1990).

In the present analysis, these two aspects will be examined in order to arrive at a better definition of the technical aspects[8] leading to the manufacture of tools. The present study is not concerned with the laws of mechanics that govern the results of a specific action on a stone (Speth, 1972), although the attributes and variables used most often are dependent on the physical characteristics of the raw material and the mechanical pressure exerted on it. Besides, very few studies on debitage by-products reach a level as technical as Speth's (see, among others, the volume edited by B. Hayden, 1977, where some articles are concerned with mechanics physic). Generally, studies on tool reduction sequence have mainly dwelled on the final result, that is, the tool (Crabtree, 1972; Brézillon, 1973; Flenniken, 1985 to cite just a few examples). There are some

[7] Not even a summary analysis of debitage by-products was found in a rapid survey of about 20 works on different regions of the Arctic (cf., Schledermann, 1990; Linnamae, 1975; Maxwell, 1973; McGhee, 1979). This situation is not unique to the northern regions. On the contrary, this phenomenon exists for all geographical regions. However, over the last few years, the integration of debitage analysis has become more and more important, and in some cases, has taken precedence over tools. In fact, this situation only reflects the predominance of debitage in archeological collections and the importance of including this information in order to understand means of adaptation.

[8] By definition, the use of the term "technical" is more appropriate in the context of this study. The term "technology" refers mainly to a theoretical concept. In this perspective, studying the technical changes in debitage is not necessarily the same as technological changes among palaeoeskimo groups (cf., among others, McGhee, 1980).

exceptions where an attempt is made to integrate debitage by-products and the manufactured tool (cf., Stahle and Dunn, 1984; see also Burton, 1980). Other, more numerous cases, treat the tools and the debitage separately (Henry, Haynes and Bradley, 1976; Pilon, 1982; McCaffrey, 1983). This latter approach is often dictated by the relative absence of tools on some sites (Pilon, 1982; McCaffrey, 1983).

The conceptual scope for the analysis of the lithic collections in the present study relies on a variety of methods that will help in attaining the research objectives. For the tools, the methods used are essentially descriptive and are derived from the numerous studies on High Arctic palaeoeskimo collections. The study of lithic by-products are largely inspired by the works of Wilmsen and Roberts (1978), Pilon (1982) and McCaffrey (1983). The following sections define the various attributes and variables used during the analysis, as well as their implications.

## 5.2 Tools

### 5.2.1 Attributes and variables

The data necessary for the tool analysis are of two types: qualitative characteristics (attributes) and quantitative characteristics (variables). Some attributes and variables apply to all tool classes, while others are specific to certain classes. Those particular cases are discussed separately. Thus, the attributes and variables used for the soapstone objects analysis are discussed at the end of the present section. Moreover, it must be emphasized that some tool classes don't contain enough specimens and therefore, are not directly integrated into the analysis. However, these lithic tools are described in appendices II, III and IV.

Data concerning artefacts location (i.e., $m^2$, quadrant, north and south coordinates, collection zones, etc.) are common to all tools and are used to distribute the information according to their provenience. Recording of this information also facilitates later references to these specific objects.

The first step in the study consists at identifying the tools (ex.: knife, multiple side-notched polished knife, microblade, concave base triangular point, etc.). This classification, based on common Arctic terminology, indiscriminately translates the presumed function, morphology or "manufacturing technique" of the object. This variability in tool designation reflects a total lack of systemization and strictly speaking, doesn't define a typology (Hill and Evans, 1972: 233). However, these terms are kept to facilitate future comparisons.

Identification of raw material for each tool is an integral part of its definition, since it imposes physical constraints which, up to a certain degree, determines the morpho-metric characteristics of the object. The presence of cortex, impurities or other particularities are also noted. The color of chert artefacts has been recorded, but was not taken into consideration during the analysis, because, contrary to its other components, it offers neither any clue about its origin, nor does it compromise its quality[9]. The different varieties of quartzite were noted (i.e., quartzite and coarse or local quartzite), as well as quartz (i.e., crystal, milky or hyalin). However, due to the poor representativeness of the various types of quartz, they were treated as a single family of raw material for analysis purposes.

A modification index was established to describe the technique employed in tool manufacturing: direct percussion technique, polishing technique or a combination of both. In some cases, the manufacturing technique is implied in the name of the object (i.e., polished knife or point). The index was completed by recording the degree of modification on both surfaces of the object (Table 1), excluding the lateral edges or extremities manufacturing, which are different attributes discussed separately (Table 1). Tool integrity is also evaluated as complete, incomplete or fragmentary (Table 1). The cores represent a special case since they are incomplete by definition and they are identified as two possible states: intact (complete core) and fragmentary (fragment detached from a larger mass, but exhibititing nonetheless characteristic core scars). Microblade fragments are distinguished also in terms of the remaining portion (for example, mesial fragment) or the missing portion (for example, proximally incomplete).

The characteristics[10] of the lateral edges or the distal or proximal extremities were noted whenever possible (Table 1), as well as the angle of the lateral edges and, in some cases, the angle of the distal and proximal extremities. For some types of objects, only the angle of the active edge was recorded. Also, attributes that define the edges either do not apply to all tool categories or they can't be applied in the same fashion. The longitudinal and transversal sections of some tools were recorded to complete the morphological description of the objects (Table 1).

On some tools, the presence of a residual striking platform and of a bulb percussion was noted (cf., Table 2). These attributes are normally associated with debi-

[9] Chert is a raw material that presents a great variability. Samples from the same quarry can show completely different external features. When heated, some chert also change color (cf., Lavin, 1983).

[10] These attributes are discussed in terms of their general application. The particularities associated with certain tool classes will be mentioned when they will be brought up in the discussion of the analysis results.

| Table 1. Definition of attributes and variables used for the tool analysis. | |
|---|---|
| **A. Degree of alteration** | |
| **Degree** | **Index** |
| bifacial | minimum of 75% of one face and 50% of the other face worked |
| partially bifacial | minimum of 50% of one face and from 25 to 50% of the other face worked |
| unifacial | minimum of 75% of one face and less than 25% of the other |
| partially unifacial | minimum of 50% of one face and less than 25% of the other face worked |
| unifacial tendency | less than 50% of one surface worked, the other face is unworked or worked to a negligible extent |
| (not applicable for blades, microblades, tip-flute spalls, abrader, used and retouched flakes and cores) | |
| **B. Edge retouch** | |
| - present only on face A (dorsal) | |
| - present only on face B (ventral) | |
| - bifacial retouch (visible on both surfaces of same lateral edge) | |
| - alternate retouch (visible on both surface, but on opposite edges) | |
| **C. Integrity** | |
| - complete | - |
| - incomplete | distally |
| | laterally |
| | proximally |
| | latero-distally |
| | latero-proximally |
| - fragment | distal |
| | mesial |
| | lateral |
| | proximal |
| | latero-distal |
| | latero-proximal |
| | undetermined |
| **D. Edge configuration** | |
| **Lateral edges:** | **Descriptive terms** |
| - unilaterally complete specimens | straight; convex; concave; irregular; other |
| - bilaterally complete specimens | straight; convex; concave; straight-convex; straight-concave concavo-convex; irregular |
| specify: symmetrical or asymmetrical | |
| specify: convergent, divergent ou parallel | |
| **Distal and proximal edges:** | straight; convex; concave; point; rounded; irregular |
| **E. Longitudinal and transversal sections:** | |
| - symmetrical bi-convex | |
| - asymmetrical bi-convex | |
| - concavo-convex | |
| - plano-convex | |
| - triangular | |
| - rhombic | |
| - bi-planar | |
| - irregular | |

tage flakes, but their presence on completed tools or preforms could be an indication of manufacturing techniques.

Length, width and thickness are variables that apply to all tool classes. The maximum length refers to the greatest distance between two points (platform or proximal extremity and active part or distal extremity) according to the attributed function or to the morphology of the tool. Measurement is taken perpendicular to the horizontal plane. The maximum width is taken at right angle to the length. The maximum thickness and its relative position (i.e., proximal, mesial or distal) are registered when possible. For incomplete or fragmentary tools, with the exception of blades and microblades, only the complete dimensions were retained for analysis.

Certain tools exhibited intentional modification of their hafting portion, such as basal thinning, stem or notches. Basal thinning generally takes two forms: a single thinned surface or both surfaces. Two variables are associated with this attribute: retouch length and height of lateral edge preparation, measured from the proximal extremity of the tool. Stem identification considers its shape (for example, single or double shoulder; expanded base) and its length, maximum width and maximum thickness. Notches are identified by their number and shape ("U", "V", "W" shaped or enlarged notches). Variables include height (measured from the base of the tool to the base of the notch itself), width and depth. When more than one notch is present on the same lateral edge, the height of each is measured from the base. Other elements associated with hafting can be observed: bevelled distal extremity (common in polished tool manufacture) or crushing and grinding of the hafting part (found occasionally on side blades), etc.

Specific attributes and variables are noted for three tool categories. The dimension of the working edge (i.e., the distance between the two edge extremities measured laterally) is added to the morpho-metric description of end scrapers. Microblade cores—and certain flake cores—are sometimes characterized by a specific shape (i.e., conical, cubical, tabular, wedge-shaped, etc.).

Microblade description has been standardized by various authors (Sanger, McGhee and Wyatt, 1970) and this method was applied in order to facilitate inter-site comparisons. Attributes used include the tool integrity, number of dorsal arrises, striking platform treatment, presence or absence of a bulb of percussion (added for this analysis) and the location of retouch or use wear. Variables include the total length, distinguished according to the integrity of the microblade[11], the width, normally taken under the bulb of percussion in the case of complete microblades, and the thickness, registered at the same location as the width. A thickness-width index is also calculated ($\frac{T \times 100}{W}$). This index (M. T.W.) may possibly have more value than the dimensions considered individually (McGhee, 1970). Finally, the angle formed by the platform and the dorsal surface is noted.

[11] Length is not considered as an essential variable to the understanding of manufacturing techniques (cf., McGhee, 1970).

Soapstone vessels are the last lithic objects considered in this study. Almost all are fragmentary, preventing their functional and morpho-metric identification. Nevertheless, given the importance of soapstone in the IcGm-4 site collection, it is pertinent to note certain attributes that can indicate vessel manufacturing techniques. The components of this analysis are inspired by Linnamae (1975: 151, Figure 21A), Archambault (1978, 1980) and Plumet (1985, Appendix 1). Vessels represented by various fragments were described (i.e., body, rim, body/corner fragments, etc.). Particular attention was given to manufacturing scars (end scraper marks, burinated grooves, etc.) and traces of carbonization. Only the thickness of rim fragments was recorded, the other measurements being replaced with class of dimension categories (cf., Table 2), with the exception of more or less complete lamps for which the height, width and length were measurable.

## 5.3 Debitage by-products

### 5.3.1 Attributes and variables

The attributes and variables used in the study of debitage by-products were mainly drawn from the works of Wilmsen and Roberts (1978), Pilon (1982: 21-26) and McCaffrey (1983: 59 and foll.).

Apart from the attributes that identify the flakes provenience, six attributes and two variables were defined for this analysis (Table 2). Raw material identification is the first step in the study. Meticulous observations on each flake verified the presence of additional information (i.e., cortex, lichen, patina, etc.), which could provide indications on the archaeological context of the flake (for example, lichen indicates that the flake was found on the surface; the presence of grease or carbonization may indicate an association with a combustion area, etc.) or on the origin of the nodule (cortex is associated with cobbles, while impurities may indicate a quarry exploitation).

Attributing debitage flakes to specific categories are a major problem in archaeology. This categorization is based on the principle that each step in core reduction conveys distinctive characteristics observable on the flake itself. By combining certain of these characteristics, it is possible to deduct the technical origin of the flake. Repetition of this exercise led to the creation of a classification of reducing stages. This is what Sullivan and Rozen (1985: 756) call "stage typologies". The categories used for the present study are dependant of such a typology (Table 2; Collins, 1975; see also Burton,

| Table 2. Attributes used in the analysis of the debitage by-products. | |
|---|---|
| **A. Raw material:** | |
| - raw material identification | |
| - presence or absence of cortex | |
| - presence or absence of impurity | |
| - other (i.e., lichens, patina, carbonised grease, etc.) | |
| **B. Categories:** | |
| - reducing flake | core preparation |
| - thinning flake | form preparation |
| - edge trimming flake | completion of tool manufacture |
| - bulbar flake | may belong to the 3 previous categories |
| - shatter | more than 2 surfaces |
| - waste | from 0 to 100 $mm^2$ in class of dimensions |
| - other | used mostly for slate and soapstone |
| **C. class of dimension ($mm^2$)** | |
| 1 | <50 |
| 2 | 51-100 |
| 3 | 101-200 |
| 4 | 201-300 |
| 5 | 301-400 |
| 6 | 401-600 |
| 7 | 601-800 |
| 8 | 801-1000 |
| 9 | >1000 |
| **D. Striking platform (treatment)** | |
| - plain (no modification traces visible) | |
| - transversal (scars are perpendicular to the length of the striking platform) | |
| - scaled (resulting from impact micro-fracture) | |
| - multiple (2 or more treatment visible) | |
| - crushed (striking platform is crushed under hammerstone impact) | |
| - unprepared (with possible presence of cortex) | |
| - fractured | |
| **E. Striking platform (form)** | |
| - winged | |
| - biconvex | |
| - circular | |
| - concavo-convex | |
| - sub-triangular | |
| - irregular | |
| - linear | |
| - plano-convex | |
| - point | |
| - triangular | |
| **F. Bulb of percussion** | |
| - absent (or flat) | |
| - visible | |
| - pronounced | |

1980; Sullivan and Rozen, 1985 for a discussion of alternative approaches). For the analysis, all categories are considered, with the exception of the bulbar flake, which reflects a more specific technical information rather than a reducing stage[12]. In order to

[12] All of the bulbar flakes identified belong to the reducing category.

verify the pertinence of this approach, debitage by-products are examined in an alternate way, in which the presumed categories of all flakes are left out. The results of this alternate approach are then compared to the subjective category definitions used in the compilation.

Flake length and width measurements can be a tedious exercise that does not render justice to the flake, particularly since they are not always taken at the same location (Burton, 1980: 145). In this regard, class of dimension offers an interesting alternative since it helps in defining an approximate surface area for the flakes, rather than the two dimensions normally used (Table 2)[13].

The attributes focused on describing the striking platform include the treatment and the form of the residual platform (Table 2; Wilmsen and Roberts, 1978: 83; McCaffrey, 1983: 72-75; Pilon, 1982: 23). These attributes reflect the characteristics of the original core platform. Certain modifications observed on the platform are intentional (McCaffrey, 1983: 74), while others result from the force of impact (Speth, 1972). They also indicate the percussive element used (Patterson and Sollberger, 1978). The presence of a lip was also noted, but left out of the analysis because it turned out to be insignificant (Appendix IV). This characteristic is generally associated with the thinning or edge trimming of bifacial tools (McCaffrey, 1983: 71) or to the rejuvenation of fractured tools (Pilon, 1982: 27). Other authors link the presence of a lip to the striking angle.

Two variables are added to the attributes of the striking platform: the maximum length and maximum width of the residual platform. In each case, the dimensions should diminish in the last stages of the manufacturing process (McCaffrey, 1983: 70-71). The type of percussive element used also influences the dimensions of the striking platform; a wide platform is often associated with a hard hammerstone (Burton, 1980: 144, Figure 7).

The bulb percussion (Table 2) is closely linked to breakage mechanics (Speth, 1972) and the type of percussive element used (Henry et al., 1976: 57; McCaffrey, 1983: 69). In general, prominent bulbs are associated with a hard hammerstone. However, it has been observed that the greater the force of impact, the more the bulb is pronounced (Crabtree, 1972: 6-7; see also Speth, 1972). The three categories observed for the bulb are subjective.

It was decided to concentrate the analysis on the proximal part of the flake (i.e., striking platform), thus neglecting a large number of variables and descriptive

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[13] Some authors prefer to use mass (weight) and thickness to define a dimension index for the flakes (cf., McCaffrey, 1983: 70; Burton, 1980: 145).

attributes (cf., Wilmsen and Roberts, 1978; McCaffrey, 1983; Pilon, 1982), including the flake termination, intentional modification of the dorsal edge on the striking platform, dorsal scar patterns, the angle formed by the platform and the dorsal or ventral edge, and the maximum thickness and its position. This choice does not pretend to judge the value of these various attributes and variables, but it has been proven that several of these elements present certain redundancies when considered conjointly in an analysis. Data registering is altogether reduced (Wilmsen and Roberts, 1978: 70).

## 5.4 Other Remains

### 5.4.1 Manufactured implements

The only manufactured historical implements that are archaeologically significant were collected on the IcGm-2 site. These artefacts are few in numbers, and mainly comprise iron objects. Most of them are fragmentary, so no particular attention was given to them. However, they will be described in the appropriate section (cf., Appendix II).

### 5.4.2 Bone Remains and other

There are two types of bone remains and they all come from the IcGm-2 site, except for a few isolated bones recovered in Structure 3 on the IcGm-3 site. Culinary remains have been analyzed by the Ostéothèque de Montreal (report presented in Appendix I). The main objective of this study was to establish which species were present, as well as to try to determine the minimum number of individuals present in the collection and, if possible, the season during which the site was occupied.

Worked bones make up the second category. They are very few in number and most of them are fragmentary. The dimensions of these pieces were recorded, as well as a detailed description (Appendix II).

Finally, several wood fragments were recovered on the IcGm-2 site. Most of them showed no signs of modification or alteration and were not the subject of any particular study.

# 6.0 The IcGm-2 site

## 6.1 General Description

The IcGm-2 site was first observed by Daniel Weetaluktuk (1979a: 6). At that time, he identified five tent rings attributed to the Thule or historic period. During the 1985 archaeological inventory, it was observed that the northern portion of the site had been completely destroyed by the exploitation of a borrow pit. Of the five original structures, only two were spared (Avataq Cultural Institute, 1987a: 40). A dismantled cache was also visible halfway between the two structures (Appendix VI). The latter wasn't sampled, with the exception of a few excavated test pits in periphery. In 1986, excavations were concentrated on the two structures and the interstructural zones for a total of 79 $m^2$ (Figures 3 and 4; Appendix VI; Avataq Cultural Institute, 1987b: 23).

### 6.1.1 Habitation structures

Structure 1 (Figure 3) measures between 5.00 and 6.50 m in length by 4.40 m in width and is oriented north-south. The perimeter is well defined; a narrowing towards the south indicates a possible entrance passage or an alcove (Avataq Cultural Institute, 1987b: 27). A rock alignment divides the interior of the structure into two unequal portions. Two flagstone features separated by 1.50 m gap are located in the southwest and southeast sections of the tent. Structure 2 is less well defined (Figure 4). Its dimensions vary between 5.00 x 4.00 m (minimum) and 6.00 x 5.00 m (maximum). The uncertainty of the dimensions is also accentuated by an orientation problem. The data presented in the 1987 report identifies the north-south axis as the longest, while Figure 4 suggests that the east-west axis is longer.

A hearth or combustion area, associated with the southwest pavement in Structure 1, has been identified (Figure 3). This area is composed of three concentrations spread between the square metres AI 6 (SE quadrant) and AJ 6 (NW and SW quadrants). Another smaller one is found in the SW quadrant of square metre AJ 5. One of these concentrations, which appears in the east profile of square metres AJ 5 and 6, is located in the sand level (Figure 5); The depth at which the other samples were found is unknown. Two other charcoal samples were taken from square metres G 24 and 25 in Structure 2, but they didn't seem to form a clearly definable combustion area (Avataq Cultural Institute, 1987b: 34). None of these samples was submitted for dating.

Figure 3. Delimitation of the presumed Dorset structure and distribution of lithic remains.

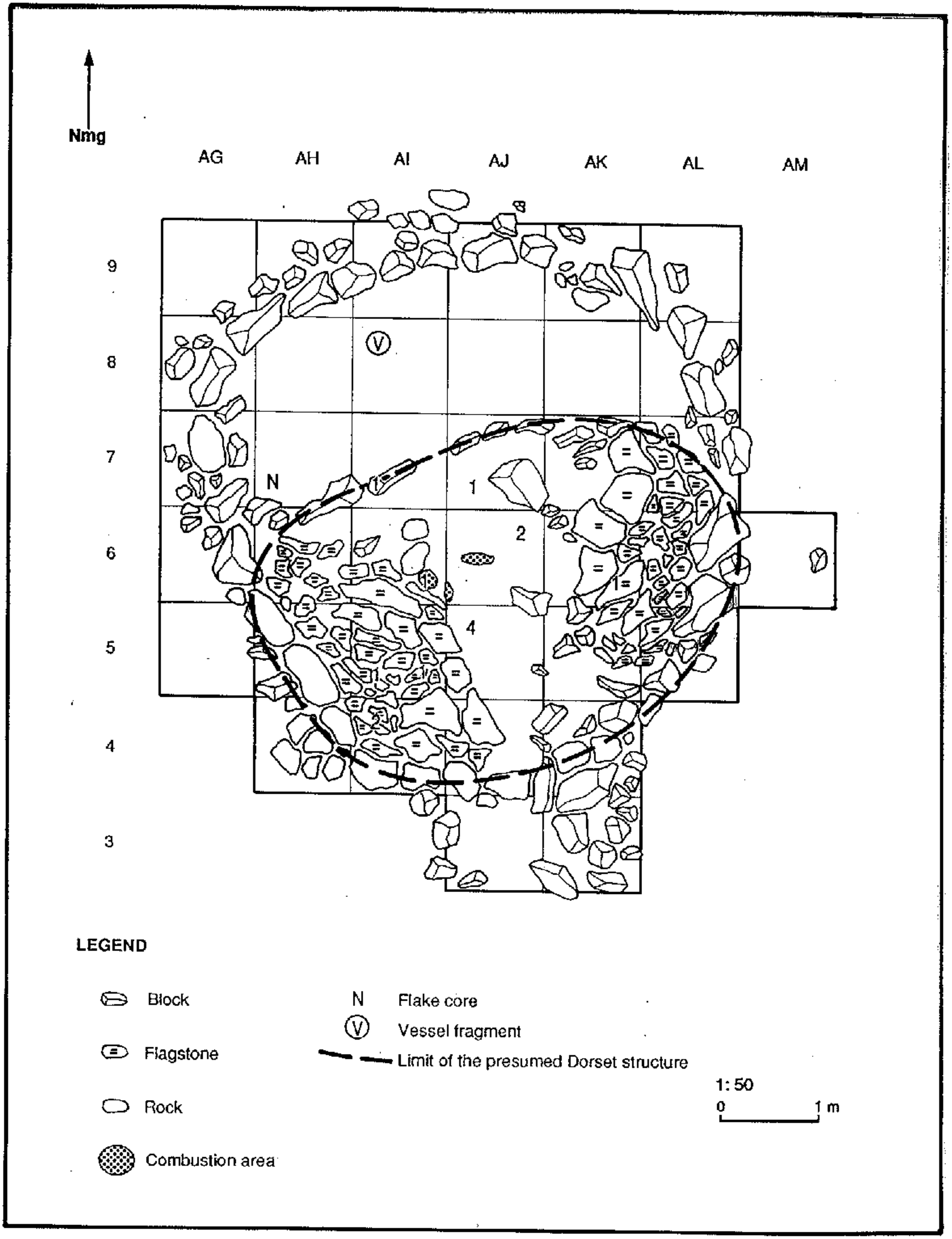
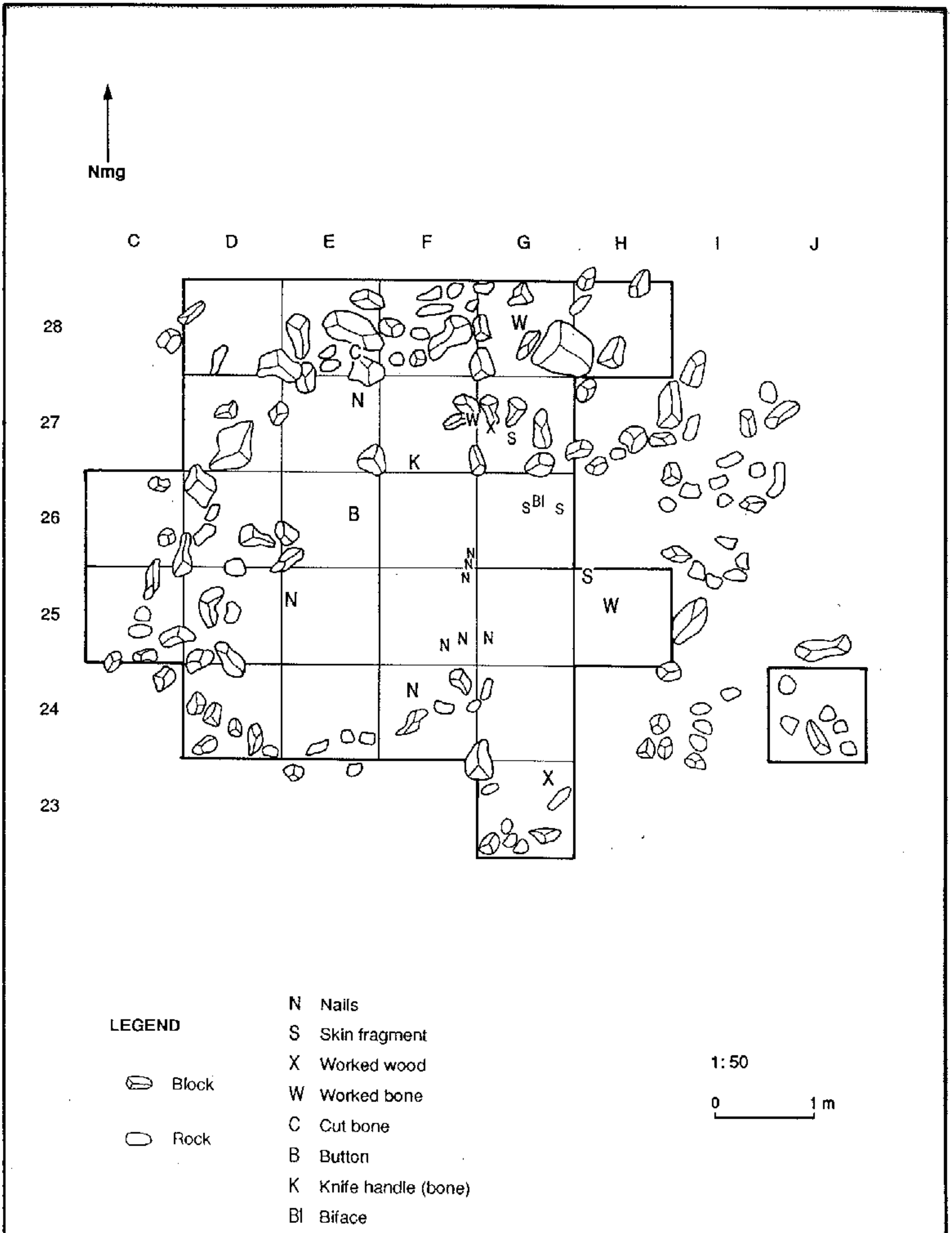


**Figure 4.** Distribution of manufactured implements and historic Inuit artefacts. Structure 2, IcGm-2.



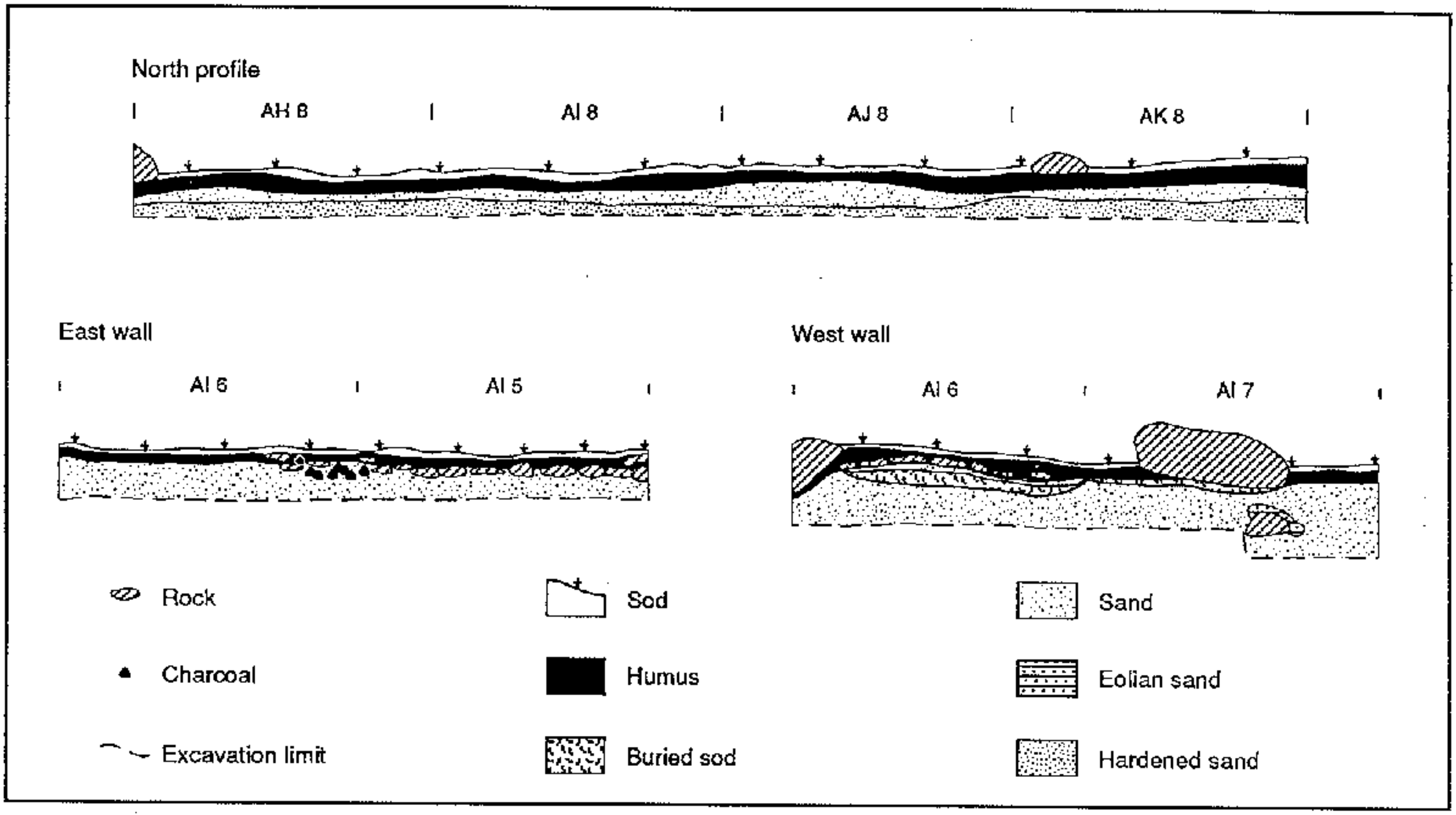



Figure 5. Stratigraphic profiles, IcGm-2.

### 6.1.2 Stratigraphy

The study of the stratigraphic profiles registered during the excavation (Figure 5; Avataq Cultural Institute, 1987b: 23-24, Appendix 5) indicates some variations within the limits of Structure 1. The east-west profile, situated in the northern half, is composed of a poorly developed moss cover followed by a humus layer averaging 5 cm in thickness, itself superimposed on a sand layer attaining no more than 10 cm in depth. The latter rests on a deposit of hardened sand. The two north-south profiles are similar, except for the disappearance of the hardened sand and the appearance, in the profile of square metres AI 6 and 7, of organic matter under the humus level. The two profiles from Structure 2 illustrate a different stratigraphic sequence. The surface is covered by an eolian sand deposit of varying thickness, which, according to J. C. Moquin, comes from the borrow pit situated in close proximity. The humus layer is discontinuous and rests on a sand and gravel deposit.

The various structural elements were not located according to level. However, the stratigraphic profiles presented in Figure 5 offer a few indications: some rocks associated with Structure 1 lie either on the surface of the humus, inside the humus or right into the sand level. Information is insufficient for Structure 2, where a single rock can be assigned to a stratigraphic level.

### 6.1.3 Artefacts and other remains

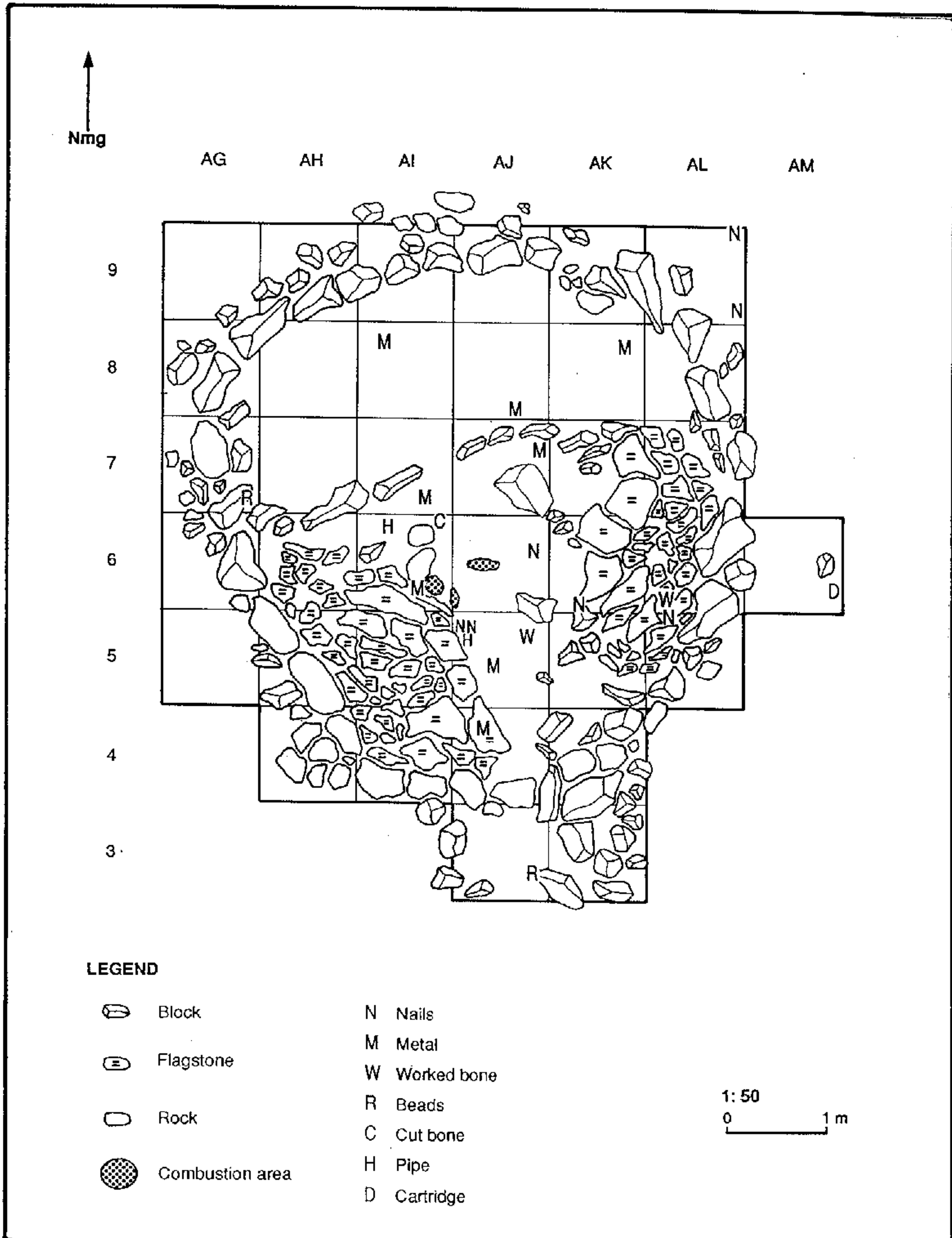
The artefacts recovered are associated with two distinct cultural periods (Appendix II). The lithic remains, comprising two tools, 18 debitage flakes and one fragment of a soapstone vessel, belong to a Dorset occupation. Most of these objects come from Structure 1 (n: 16) (Figure 3) and were recovered from the humus level (n: 17) or from the sand and gravel deposit (n: 4).

The collection of historic implements, including manufactured objects and traditional Inuit tools, is somewhat larger (Table 3; Figures 4 and 6). All of these objects come from the humus level, with the exception of two nails recovered in the sand layer and a wooden board fragment collected on the surface.

Excavation work also permitted the recovery of 637 bones[14]. The bones have been analyzed by the Ostéothèque de Montréal and the results of this study are presented in Appendix I. To summarize, this study shows that the collection is dominated by undetermined mammal bones (42.24%). It also includes caribou bones (23.39%), large

[14] Two caribou bones were transferred to the bone tools.

**Figure 6.** Distribution of manufactured implements and historic Inuit artefacts. Structure 1, IcGm-2 site.



| Table 3. Distribution of remains associated with the historic occupation of the IcGm-2 site. | | | | |
|---|---|---|---|---|
| | Structure 1 | Structure 2 | Interstructural zones | Total |
| Manufactured implements | 29 | 10 | 1 | 40 |
| Elements associated with manufactured implements (ex.: wood with nail traces) | - | 3 | - | 3 |
| Traditional Inuit implements | 4 | 6 | 1 | 11 |
| Altered bones (cut with a knife) | 6 | 3 | - | 9 |
| Skin (fragment) | - | 4 | 1 | 5 |
| Total | 39 | 26 | 3 | 68 |

mammals (22.92%) and seals (4.08%). The unidentified bone remains account for 4,08%, while the category other, which includes fish and bird bones as well as a fox, represents 3.14%. Note that 32.70% of the large mammal bones could belong to the caribou species, thus, increasing the frequency of caribou presence to 29.04% of the total. Figure 7 illustrates the distribution of the various species in both structures: more than two thirds come from Structure 1 (Figures 8 and 9). In addition, about 15 bones from the three principal categories were recovered in the interstructural zone. The bones were collected in both levels (humus and sand), but the majority of them is associated with the humus layer.

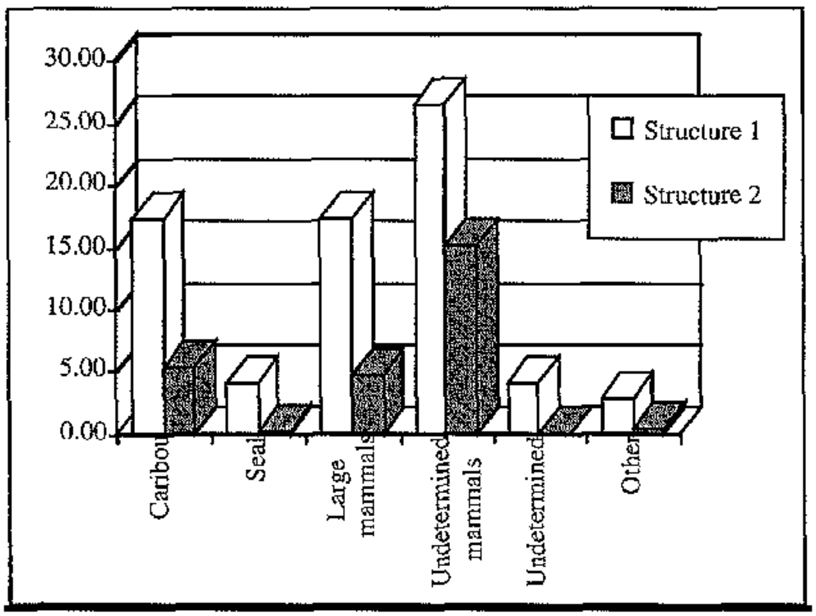



Figure 7. Frequency of bone remains by structure (the category Other includes fish, birds and small mammal, birds and marine mammals. cf., Appendix 1)

**Figure 8.** Distribution of bone remains, Structure 1, IcGm-2 site.

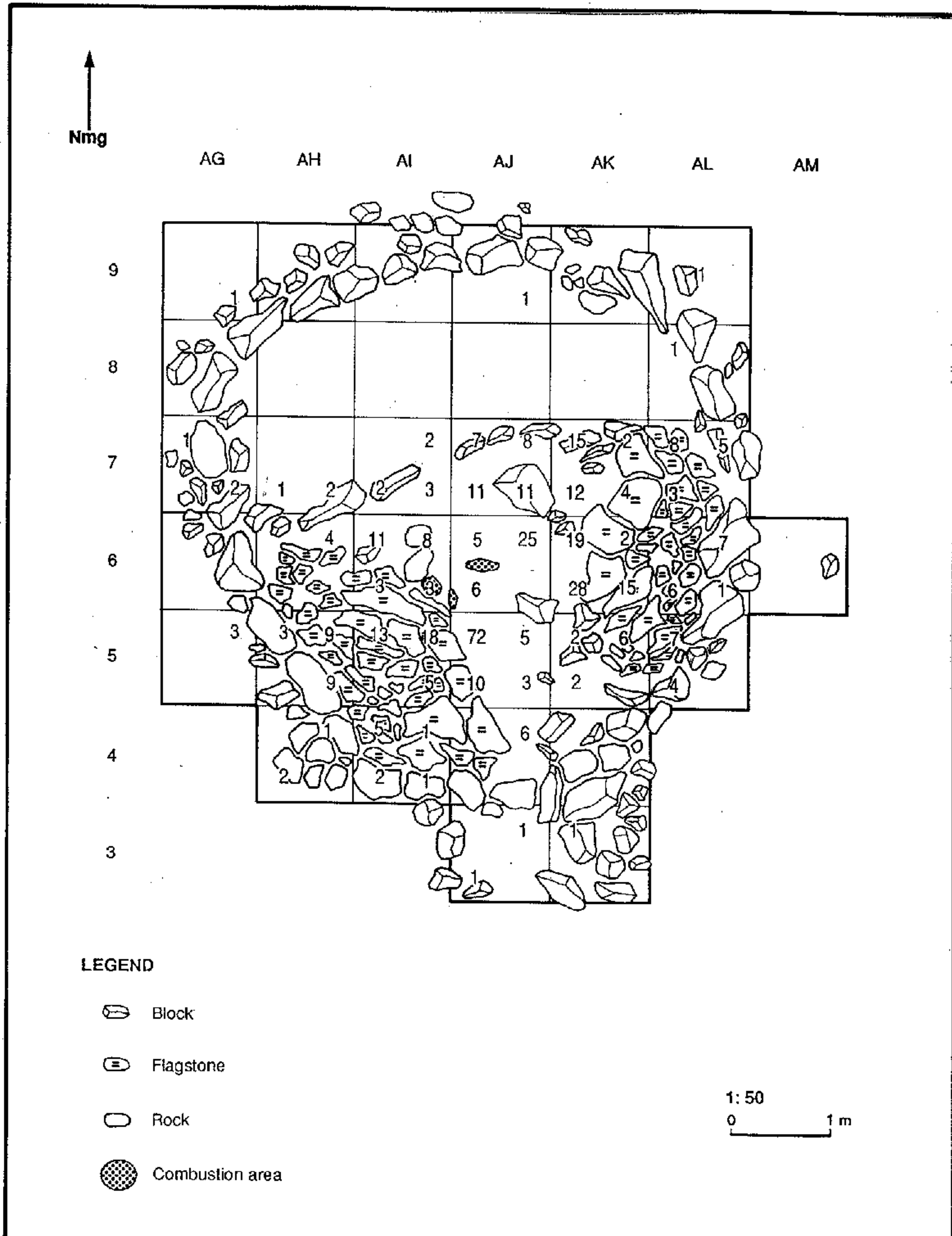
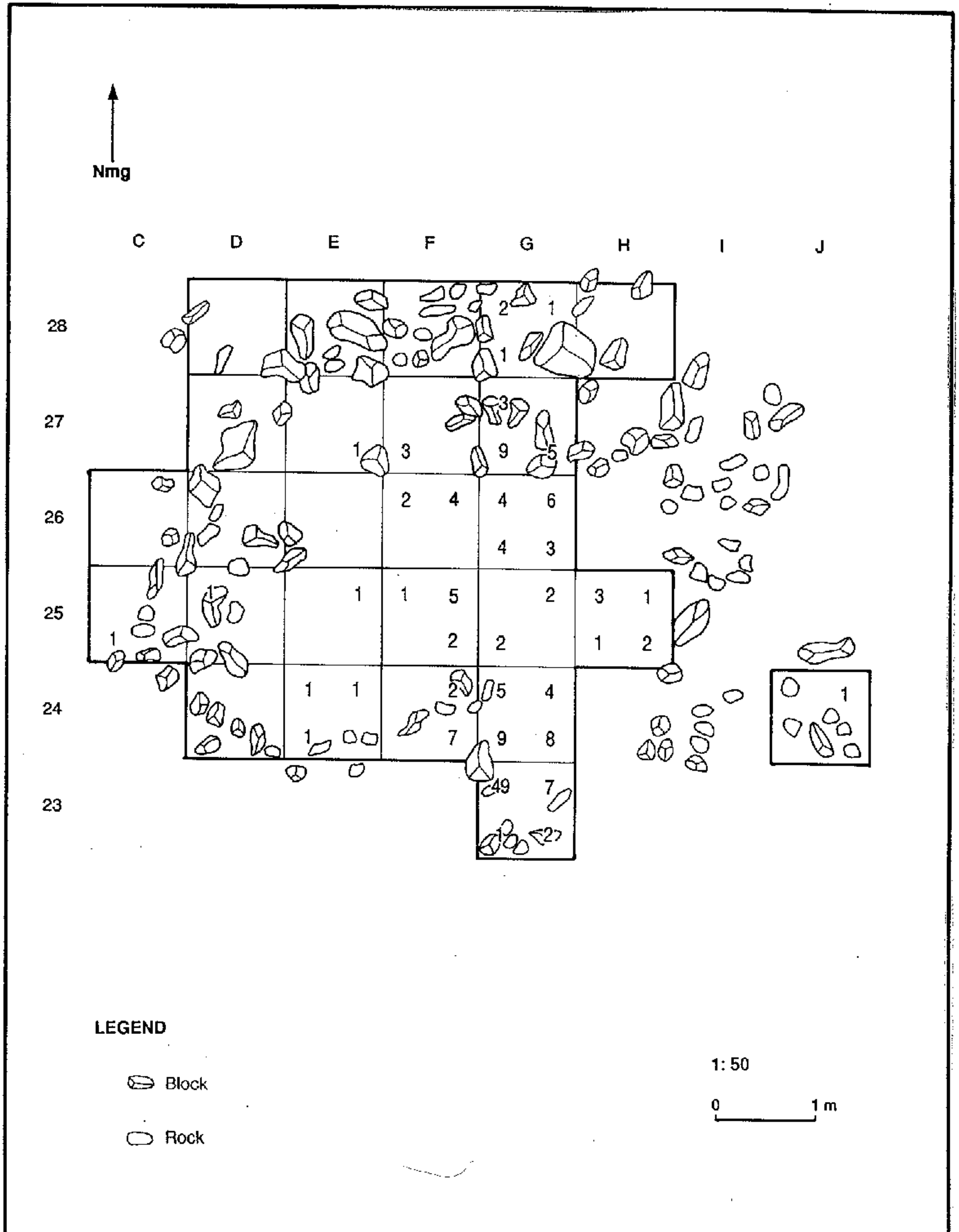


**Figure 9.** Distribution of bone remains, Structure 2, IcGm-2 site.



## 6.2 Data description and analysis

### 6.2.1 Lithic specimens

The lithic tools (Appendix II) are composed of one soapstone vessel fragment, and of one biface fragment and a flake core in quartzite. The vessel fragment was recovered from Structure 1 and is interpreted as a body fragment of limited dimension (201-300 mm) and presents a polished internal surface(?) and traces of carbonization on the external surface(?).

The biface fragment is too fragmentary and only the maximum thickness could be measured (8.10 mm). The core, equally fragmentary, has an irregular shape (length: 59.30 mm; width: 39.20 mm; thickness: 30.60 mm). Traces of impurities are visible on the principal striking platform. An undetermined portion was detached in one blow, creating a deep depression on one of the core faces.

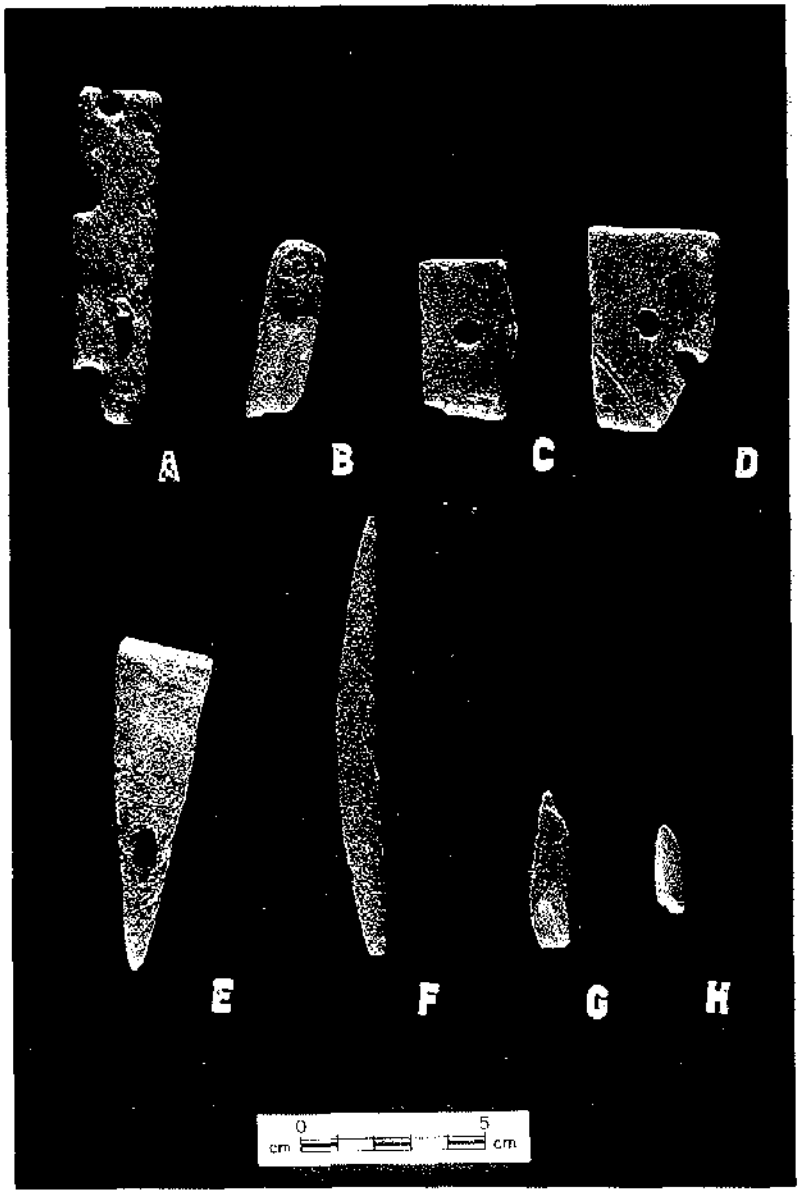
Debitage by-products comprise 17 quartzite flakes and one slate flake (Appendix II). The latter comes from square metre S 12 within proximity of the cache. It is possible that all the quartzite objects, including the biface and the two quartzite flakes found in Structure 2, were removed from the same core. Moreover, some flakes can be entirely or partially joined to the core.

### 6.2.2 Organic tools

Of the 11 bone tools recovered, (Appendix II; Figures 4 and 6) three are clearly identifiable and come from Structure 2: a knife handle (Plate 1, A), a *kilutaq*[15] (Plate 1, E; Vezinet, 1982: Figures 11 and 12) and an awl (Plate 1, F). Two other pieces have perforations. The first, because of its shape and the presence in the central hole of a bone peg, is interpreted as a hafting joint. The second object, which also has a central hole, could have played a similar role (Plate 1, C and D). The other objects are of undetermined function. The first, (Plate 1, B) is fragmentary and in poor condition. It is composed of two bones joined together by an iron peg. Of the three remaining objects, two appear to be complete (Plate 1, G and H) and possess various modification scars (G: polishing and knife cuts; H: polishing, bevel and notch).

In addition to the iron integrated into some of these objects, others show manufacturing traces directly linked to the use of manufactured tools. For example, the ho-

[15] The *kilutaq* was used to soften the hide after the animal fat was removed (T. Weetaluktuk, personal communication).




(Photo. Marc Laberge, Vidéanthrop inc.)

Plate 1. Bone tools recovered from the IcGm-2 site. A) knife handle; B) object of undetermined function; C) and D) hafting joints; E) profile view of the *kilutaq*; F) awl; G) and H) polished objects of undetermined function. The tools A, B, C and D are from Structure 1; the specimens E, F, G and H are from Structure 2.

les and notches have straight, uniform inner surface, indicating the use of a metal drill. Knife marks are also observed on the *kilutaq* and one of the object of undetermined function as well as on a certain number of unmodified bones (Appendix I).

### 6.2.3 Manufactured implements

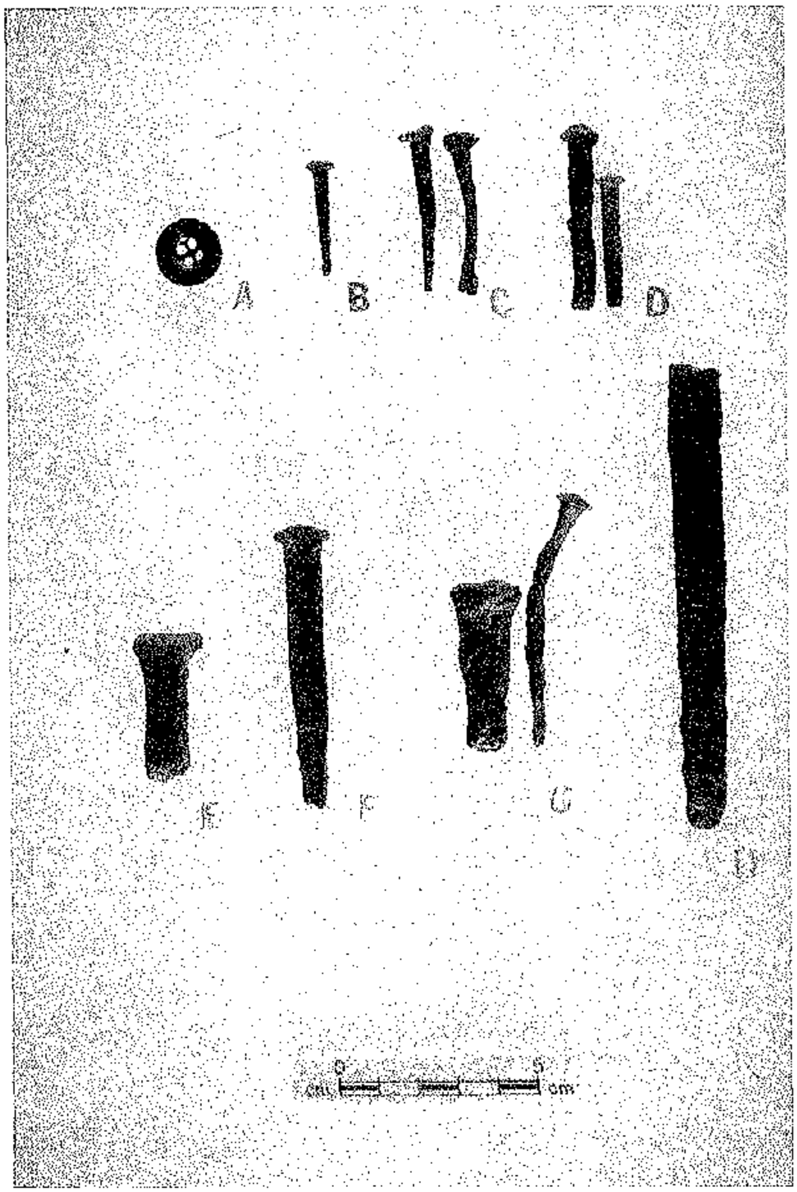
All the manufactured implements (Plate 2, A to H; Figures 4 and 6; Appendix II), with the exception of a pipe fragment (S 12), were found in the two habitation structures. This collection includes forged and cut nails, a clamp, several iron fragments of undetermined function, a tin can fragment, two beads, pipe fragments (possibly the same pipe), a cartridge and a brass button (Table 4). Almost all the iron objects are very corroded.

**Table 4. Identification and distribution of manufactured implements.**

| Object | structure 1 | structure 2 |
|---|---|---|
| Forged nails | 3 | 7 |
| Cut nails | 5 | 1 |
| Clamp | - | 1 |
| Tin (can) | 1 | - |
| Iron (undetermined) | 11 | - |
| Pipe | 7 (one pipe ?)) | - |
| Beads | 2 | - |
| Cartridge | 1 | - |
| Button | - | 1 |

The production of various types of nails, and the appearance of tin cans and .22 calibre weapons correspond to well-defined periods of time, facilitating the use of these materials to determine relative occupation dates for the historic site. The other artefacts are useless either because they are too fragmentary (fragments of pipe and undetermined iron fragments), or because their production period and origin cannot be established with any certainty (i.e., beads; Kidd and Kidd, 1972).

The production of forged nails ceased over the course of the 19th century (Dubé, 1991: 168). It was gradually replaced by the cut nail, whose production began in the first quarter of the 19th century, but stopped at the end of the 19th century with the appearance of wired nails (Dubé, 1991: 172). As for the tin cans, made of tin metal, they appeared in England at the beginning of the 19th Century, while the .22 calibre weapons were introduced in France in the middle of the 19th century (Giscard d'Estaing, 1988).




(Photo. Marc Laberge, Vidéanthrop inc.)

Plate 2. Manufactured implements recovered from the IcGm-2 site. A) brass button; B) forged nail with rounded head; C) 1 cut nail and 1 forged nail; D) 1 forged nail (rosaceous head) and 1 cut nail; E) forged nail (with uncoupling head); F) cut nail; G) 1 forged clamp or bolt and 1 forged nail (rosaceous head); H) forged undetermined object. Specimens C, D, F and H come from Structure 1; specimens A, B, E and G were recovered from Structure 2.

## 6.3 Interpretation

### 6.3.1 Dorset occupation

Dorset occupation traces at the IcGm-2 site appear, at first glance, to be limited to the 21 lithic objects, but an examination of their distribution in Structure 1 (Figure 3), along with certain indications observed in the stratigraphic profiles (figure 5), allow to suggest that part of this structure was originally occupied during the Dorset period. This hypothesis is supported by the vertical distribution of the rocks associated with the western pavement; a important proportion of them is clearly associated with the sand layer, while another portion of this same pavement is found inside the humus layer. Also, some of the rocks associated with the platform rim, which subdivides structure 1, are in the sand layer. This stratigraphic sequence of architectural elements is interpreted as representing two phases of construction. There is also a horizontal correlation between the spacial distribution of some lithic specimens and the occurrence of certain structural elements in the sand layer[16]. The zone defined by the distribution of these elements comprises square metres AH 7, AI 4-8, AJ 5-7 and AK 6. Using these data, it is possible to extrapolate the probable contour of the Dorset structure (Figure 3). This structure appears to have had an oval shape with approximate dimensions of 4.50 x 3.50 m, the northeast/southwest axis being the longest. The interior partioning of this structure would have been completely obscured by the subsequent historic occupation. Other remains recovered in this zone could belong to the Dorset occupation, especially one of the charcoal samples retrieved from the sand layer, as well as some bone remains whose presence was observed up to 20 cm deep (Avataq Cultural Institute, 1987b: 32). However, there is no way of verifying whether this sample and these bones are associated with the palaeoeskimo presence considering that their vertical position could be the result of a number of natural or anthropic factors.

The data concerning a Dorset presence previous to the historical occupation of Structure 2 are too tenuous for any further considerations. Nevertheless, the three lithic remains collected within this structure could be associated with the core recovered in Structure 1.

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[16] All lithic remains come from the humus level, except the flake core and one flake, which were recovered in the sand level.

### 6.3.2 Historic Inuit occupation

During the historic period, Structure 1 has been extended to the north. It also appears that its last occupants reused most of the architectural elements left in place by the Dorset occupation. The southeast pavement associated with the historic occupation of Structure 1 include certain flagstones presumed to belong to the Dorset habitation, while the limit of the sleeping platform incorporates rocks attributed to the contour of the same Dorset structure (figures 3 and 6). The internal subdivision observed in Structure 1 corresponds to traditional Inuit interior house plans: the sleeping platform (*illiq*) occupies the space opposite the entrance. This area is bordered by a rim or a rock alignment (*illiti*) that separates the sleeping platform from the domestic area (*uati*). A storage or domestic work area (*aki*), in this case there are two, completes the interior arrangement (Baillargeon, 1979: 45-46, Figure 2). This definition cannot be applied to Structure 2 because no interior arrangement is apparent (Figure 4). The distribution of bone remains (Figure 8) and manufactured implements (Figure 6) in Structure 1 confirms the interior subdivision previously discussed. Bones and manufactured implements are concentrated in the domestic area, while wastes are virtually absent from the sleeping platform area. Structure 2, despite the absence of any apparent interior subdivision, presents a similar distribution (Figures 4 and 9). Bones and manufactured implements are found mainly in the eastern part of the structure.

If the quantity of bone remains can be considered as indicative of the length of the occupation, then Structure 1 was inhabited for a longer period than Structure 2. The osteological analysis showed that there were a maximum of three adult caribous and a very young one (possibly a foetus), two of which, plus the young calf and two seals, were found in Structure 1. Also, there is a much greater variety of bones in Structure 1 (Figure 7). The effort invested in the interior arrangement of Structure 1 also may be considered as a factor supporting a longer occupation. As for Structure 2, its crude appearance may indicate a short-term stay.

The bone remains have also permitted to establish a season of occupation for the two structures. The presence of a caribou foetus would indicate a spring occupation, about May or June, at the time when caribou give birth. The few geese or barnacle geese bones also indicate a spring occupation, although in this case a fall occupation is also possible. Nevertheless, the spring occupation option is favored since the type of habitation used corresponds more to the warm seasons tent constructions as described in the ethnographic records (Baillargeon, 1979: 44; Turner, 1979: 63).

### 6.3.3 Chronology of the Historic Inuit occupation

The relatively important collection of manufactured implements implies some form of contact with Euro-Canadians. The first contacts on the east coast of Hudson Bay began around the mid-18th Century, first at Richmond Gulf, then at Little Whale River and finally, at Great Whale River. However, these posts had little success and were quickly closed, reopening only a century later (Saladin d'Anglure, 1984: 499-500). From 1839 onwards, a trading post opened in Fort George brought back the Inuit to trading, some of them even coming from regions north of Richmond Gulf (Trudel, 1989: 11). In 1851, the Hudson Bay Company returned to Little Whale River where, in 1859, the first Anglican mission was commissioned (Saladin d'Anglure, 1984: 500). During this period of settlement in the region, the southern Inuit were more directly involved in commercial trades with the Euro-Canadians. These Inuit then traded some of the manufactured implements acquired with Inuit living in more isolated areas (Trudel, 1989: 8). In 1909, The Revillon Frères Company settled in Inukjuak, followed 11 years later by the Hudson Bay Company (Saladin d'Anglure, 1984: 501). This brief historical survey offers a global viewpoint of the means the Inuit had to obtain certain manufactured implements. The period discussed covers 170 years.

Despite the absence of direct contact with the Inukjuak region before the beginning of the 20th century, it is possible to glimpse how the Inuit of this region integrated manufactured implements to their traditional tool kit as early as the 18th century. As the trading posts got nearer to Inukjuak, Euro-Canadian goods became easier to obtain. Inventories of the various companies are not too explicit about the goods they offered in exchange of skins and whale or seal blubber, but apart from perishable goods such as flour, tea and tobacco, firearms and iron were definitely preferred by the Inuit (Trudel, 1989: 16). Other elements such as beads and glass represented more of a welcome gift to start commercial trade (Trudel, 1989: 15).

From this information, it is possible to establish a time interval during which the IcGm-2 site may have been occupied. First, if the .22 calibre cartridge can be directly linked to the occupation of Structure 1, this would suggest an occupation posterior to 1920, since it was only at this time that repeater rifles became current in commercial trades (Saladin d'Anglure, 1984: 501). Nails seem to have been a significant implement for the Inuit. They could use them to hold down the tent's superstructure, especially to support the wooden posts, but also to hold certain parts of the skin or canvas cover. The persistence of forged nails, even after the introduction of cut nails, is not unusual (Dubé, 1991: 172). Without knowing the specific inventories of the various posts, it is difficult to verify what type of nails employees could trade in exchange of Inuit products. Nevertheless, it can be assumed that during most of the 19th century, forged and cut nails may have been part of the inventory. However, forged nails could have been obtained in other fashions, as through earlier exchanges with other Inuit or even by scavenging abandoned materials. The arrival of the Revillon Frères Company in Inukjuak in 1909 is an important factor concerning the establishment of temporary camps in close proximity to the present village location, but the evidence is too meager to link directly the arrival of this company with the occupation of the IcGm-2 site. Because of the persistent uncertainty in first contacts with the Inuit of the Inukjuak region, the reopening of a trading post in the mid-19th century at Little Whale River and the possibility of inter-band trade, the interval defined for the occupation of the IcGm-2 site is placed between the mid-19th century and the first quarter of the 20th century. This interval is somewhat important and won't be clarified unless other historic Inuit sites are excavated.

# 7.0 The IcGm-3 site

## 7.1 General description

The human occupation of the IcGm-3 site is distributed among three terrace levels: a possible Dorset occupation on the 10 m terrace represented by at least two structures with mid-passages and surface lithic concentrations, among which D. Weetaluktuk observed chert and slate flakes, as well as a microblade (Weetaluktuk, 1979a; 1979c). As previously stated, the archaeological information of this part of the site was not integrated into the 1985-86 site definition. The second occupation lies on the 6 m terrace and is comprised of five habitation structures. As for the third occupation, located at the foot of the 6 m terrace, it is represented by a single tent ring. The latter structure has not been excavated because it was situated slightly outside the impact zone and because it was somewhat similar to the two structures of the IcGm-2 site (Avataq Cultural Institute, 1987b: 36).

The three terraces are characterized by a tangle of boulders, rocks, and sand and gravel deposits covered by irregularly spaced vegetation patches, and with some marshy grounds. An access road, roughly oriented in a southwest/northeast axis, cuts the 6 m terrace into two roughly equal parts. The northern part is defined by a boulder field where Structures 1, 2 and 3 are found (Appendix VI). This same road runs near one of the two axial features on the 10 m terrace (Figure 2).

### 7.1.1 Habitation structures

Most of the excavation work were carried out in the five structures of the 6 m terrace. Of the 98 $m^2$ excavated, 77 $m^2$ covered the interior and periphery of the structures, of which 57 $m^2$ were opened in Structures 2 and 3 (Figures 10 and 11); only 17 $m^2$ are spread out through the interstructural zones, of which 7 $m^2$ covered the area east of Structures 4 and 5, towards the slope of the 10 m terrace. Four other square meters were excavated on the edge of the 10 m terrace (Avataq Cultural Institute, 1987b: 36).

There is very little to say about Structures 1, 4 and 5 (Figure 11)[17]. The areas excavated for these structures are insufficient to explore their construction and composition. In addition, no artefacts were collected. The discussion that follows is con-

[17] The shapes and dimensions of these three structures are confusing and the plans shown on Figure 11 are totally useless at this level. The data presented in the excavation report (Avataq Cultural Institute, 1987b) are practically identical to the information of the 1985 inventory (Avataq Cultural Institute, 1987a) and they don't correspond to the delimitations of the real structures when these exist for the excavated zones.

Figure 10. Distribution of lithic specimens, Structure 2, IcGm-3 site.

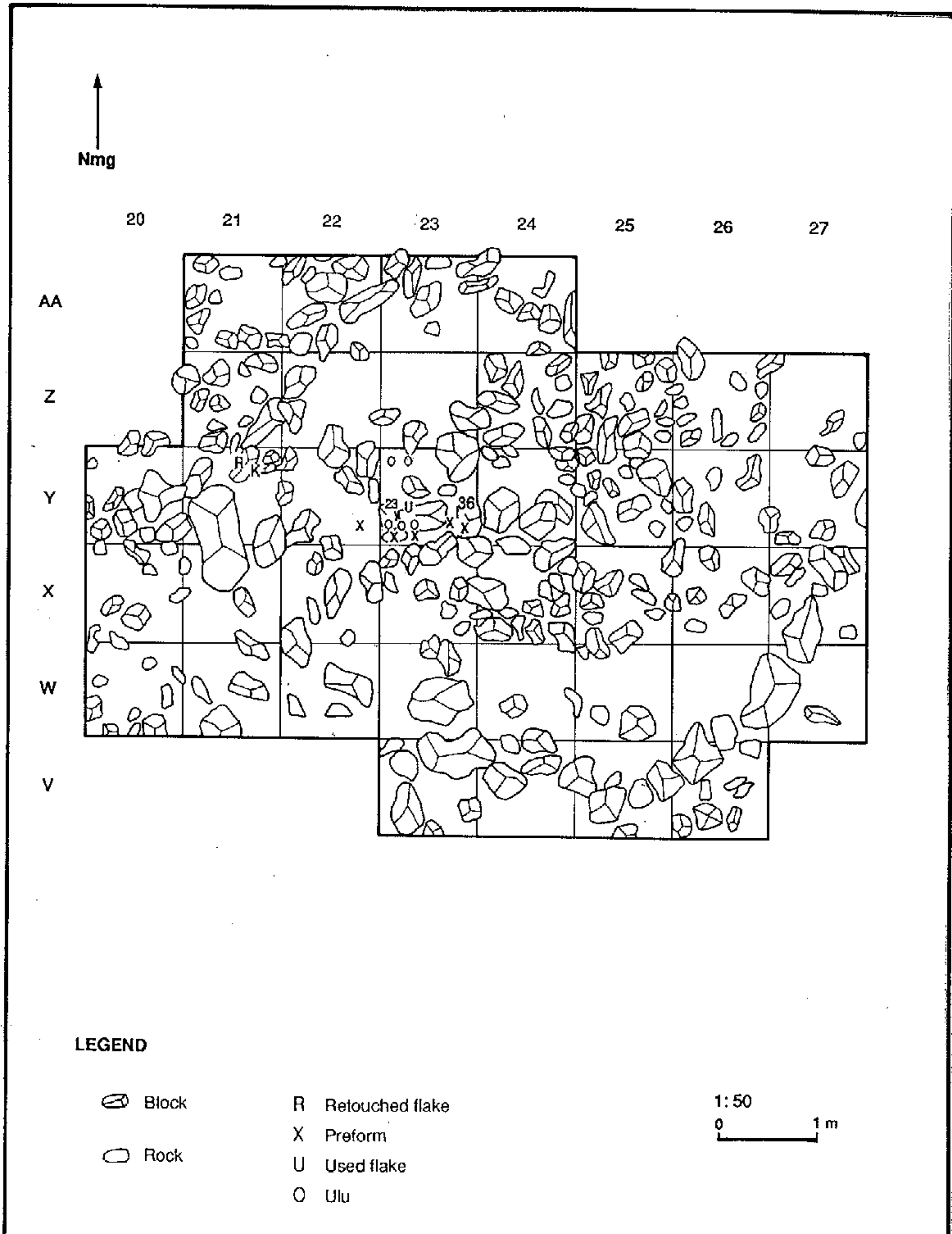
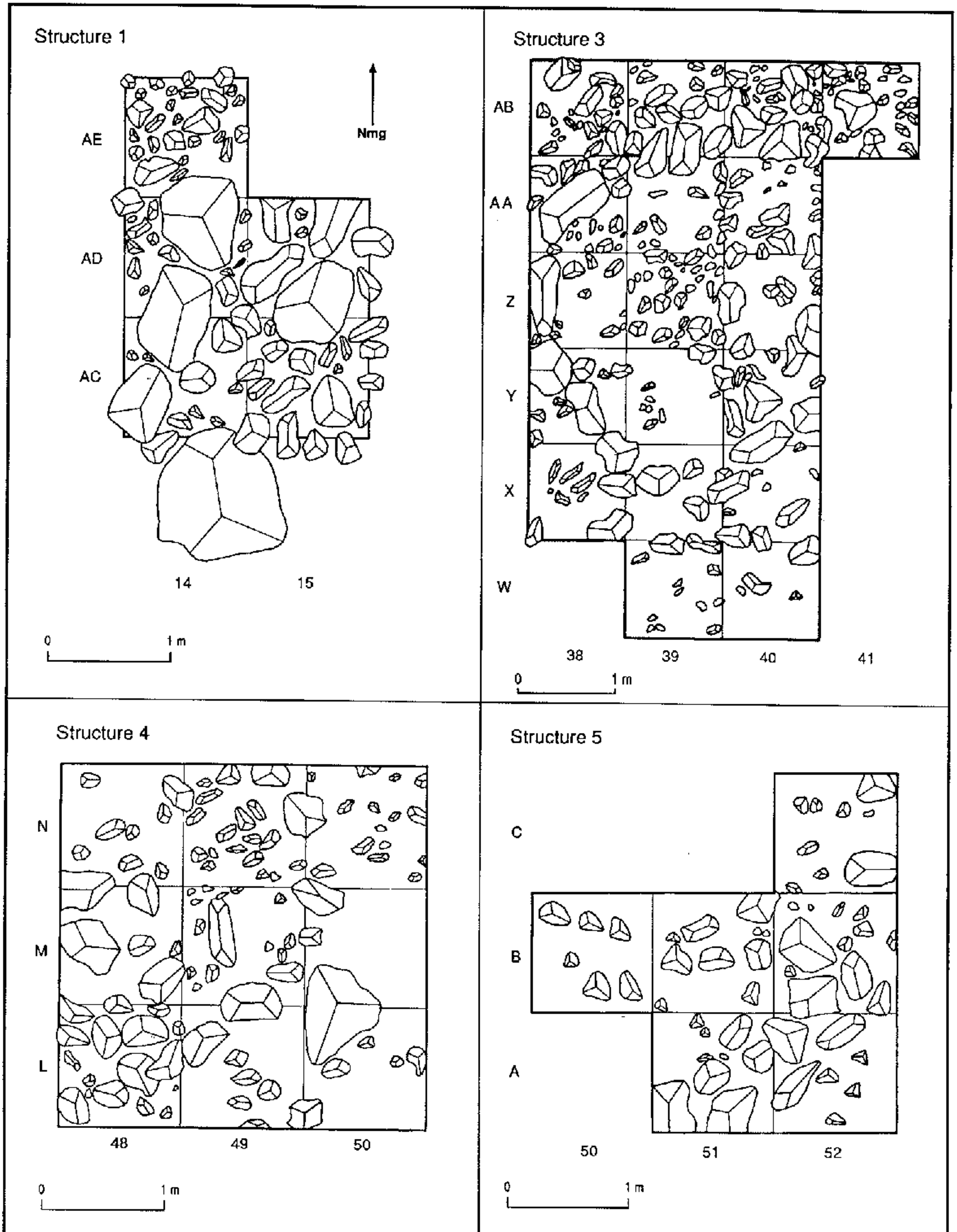


**Figure 11.** Plans of Structures 1, 3, 4 and 5, IcGm-3 site.



cerned only with Structures 2 and 3 and the small amount of data retrieved from the exploratory test pits at the eastern extremity of the 6 m terrace.

Structure 2 is located in the boulder field section of the site (Appendix VI). Its northeast/southwest axis is 6.00 m in length, while its transversal axis is between 4.00 and 5.00 m in width (Figure 10). This structure has a generally rectangular form and is rounded at the corners. The interior space is covered with boulders, but the largest ones are concentrated in the central part. These boulders probably could belong to a sleeping platform occupying the northwestern extremity of the structure and a hearth located in squares X-Y 23-24. Structure 3 (4.00 x 3.50 m) has a sub-rounded shape. Contrary to Structure 2, no indication of internal arrangement have been observed. The eastern extremity was not excavated, so the eastern limit of the structure, as indicated on the plan in Appendix VI, is arbitrary.

### 7.1.2 Stratigraphy

There are few stratigraphic profiles available for this site. One of them represents the typical profile of the northern section of the site (Y 22; Avataq Cultural Institute, 1987b: 35-36). The surface is occupied by a thin vegetation cover that lies directly on a mixed deposit composed of sand and gravel intermixed with boulders of various sizes. The second profile was recorded in O 61, approximately 10 meters east of Structure 4. The stratigraphic sequence is almost identical with the previous profile, except for the relative absence of boulders. A last profile was recorded on the 10 m terrace (K 79), where the observed layers are similar to the preceding description, but for the absence of boulders. Except for a few objects collected on the surface (O 61-63, K 79), all the artefacts (N: 86) come from the sand and gravel deposit. In addition to these artefacts, seven caribou bones were recovered (4 from Structure 3, 2 from Structure 2 and one from AB 71).

## 7.2 Analysis results

### 7.2.1 Lithic collection

All the artefacts considered in this analysis (n: 76) come from Structure 2, and they are all connected to the manufacture of slate tools. The few chert and quartzite flakes collected in the eastern part of the site are too small in number to merit any particular attention within the context of this study (Appendix III).

The slate objects recovered, comprised of tools, tool fragments, preforms and by-products, represent various manufacturing stages, which, according to all appearances, are related to two distinct but partially interdependent manufacturing techniques. These techniques have been reconstructed in part from the few remains collected (Figure 12). The first stage involves the acquisition of slate "cores" whose dimensions meet the criteria of the object to be manufactured (cf., Weetaluktuk, n.d.). The next step consists in grooving the core plate, to facilitate the breakage of the desired preform (Plate 3; Appendix III). These grooves can be bifacial or unifacial. Bifacial grooves must have facilitated breakage of unwanted parts of the core. However, certain

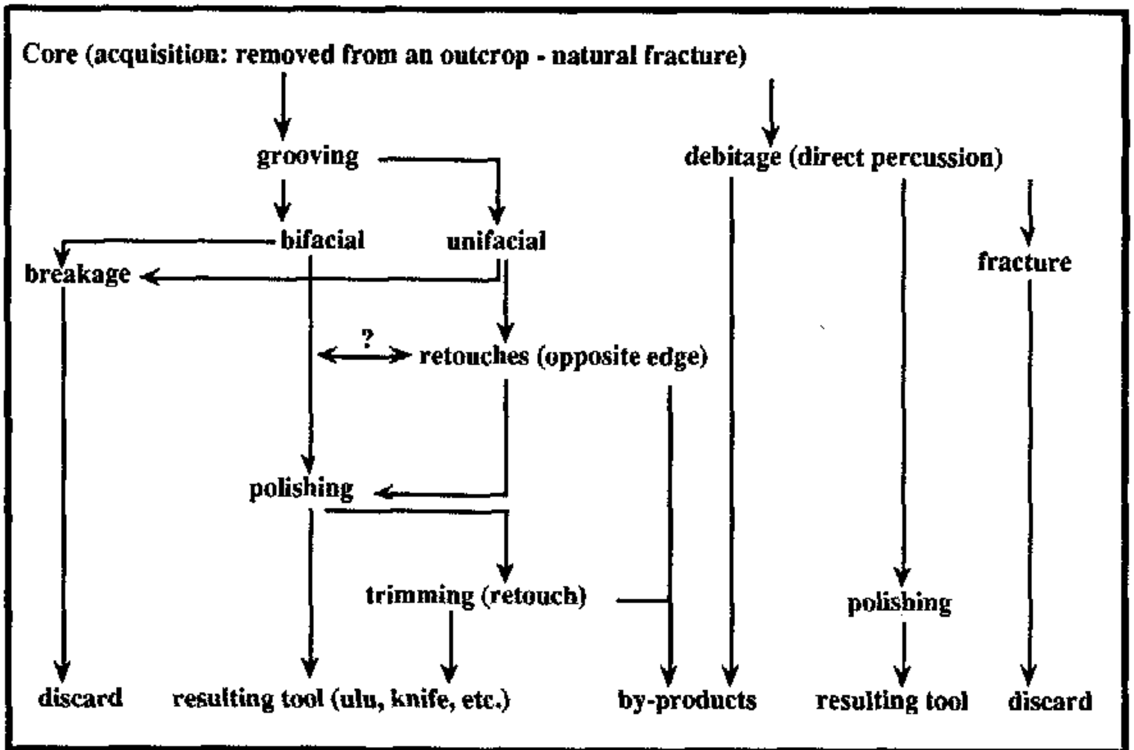
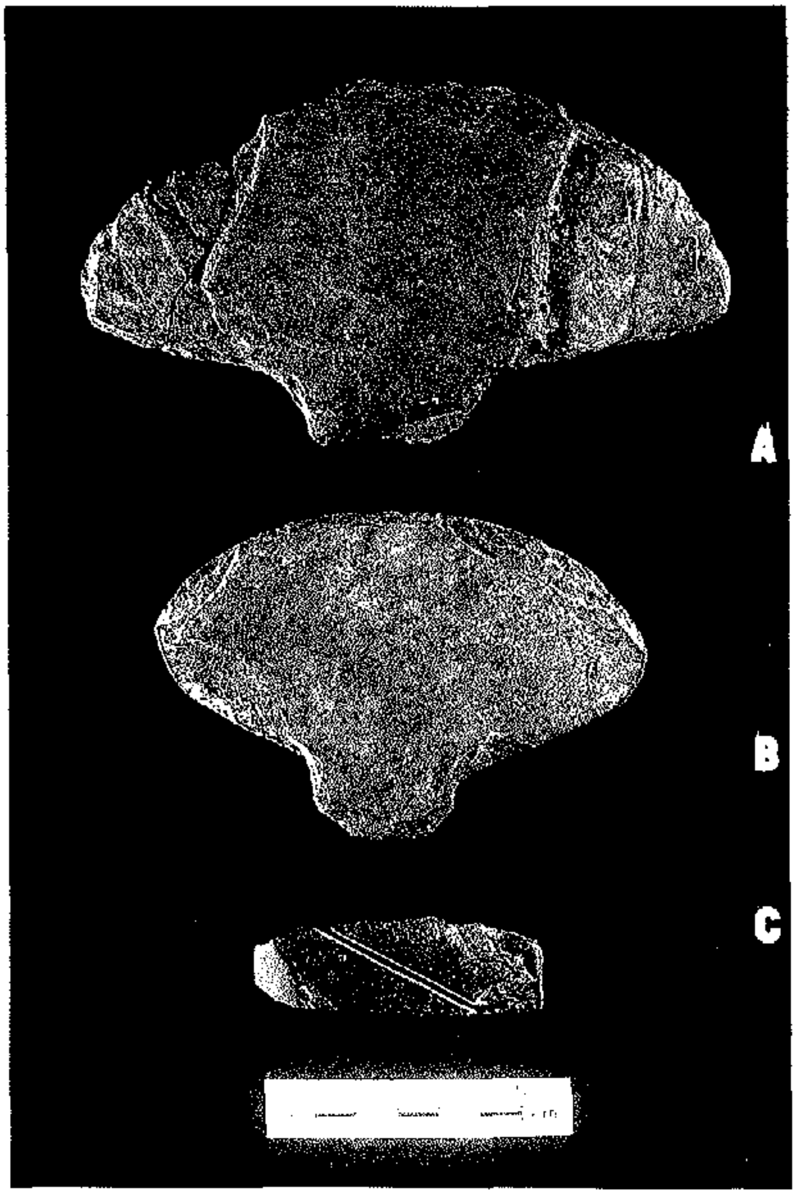


Figure 12. Outline of slate tool production (after D. Weetaluktuk, n.d. and data from the IcGm-3 collection).

specimens show that unifacial grooves worked just as well. In this latter case, the opposite face was retouched after breakage to improve the polishing angle (cf., Weetaluktuk, n.d.). At this point, it is important to distinguish between the two types of breakage that may occur: voluntary breakage and accidental breakage (i.e., fracture) and neither are easy to distinguish, even though fragments from an accidental break sometimes show complete grooves on the body of the object. These pieces are placed




(Photo. Marc Laberge, Vidéanthrop inc.)

Plate 3. IcGm-3 site: two ulus (A and B) recovered in Structure 2 and one object of undetermined function (C) collected on the 10 m terrace by D. Weetaluktuk (1979).

with the discarded fragments, though it is possible that some of them could have been reworked and used (cf., Plate 3, C and Plate 8, A, B). The resulting preform was then polished. After polishing, some objects, and in particular the ulus, could be retouched on their active edge (Rankin and Labreche, 1991: 109). The two complete ulus (Plate 3) and the other three ulu fragments show flake scars on their cutting edge. An alternate explanation also can be considered. Edge modification could be used also to thin the edges of objects that were too thick before the final polishing.

The second manufacturing technique involves a more conventional approach where the slate is flaked with a hammerstone. A single object was treated in this way (preform #27; Appendix III). This preform shows several flake and crushing scars with traces of polishing superimposed over the debitage scars on both surfaces.

Observation of slate by-products indicates that the majority of them has debitage flake scars. The relative fragility of slate explains the large number of fractured striking platform. The dimensions of these flakes vary, but it is actually impossible to link them with either of the manufacturing process, both of which involve the use of a hammerstone at some point. Three flakes are probably exceptions; one of them has a polished surface, while the other show traces of grooves and\or a polished bevel extremity. Two other retouched slate flakes are associated with discard or by-products of the groove manufacturing technique.

## 7.3 Interpretation

### 7.3.1 Habitation structures

After the 1986 excavation, the IcGm-3 site was considered to represent a Thule habitation site. A few indications also suggested a Dorset occupation (Avataq Cultural Institute, 1987b: 61). According to the description given by D. Weetaluktuk (1979a; 1979b) of the remains observed on the 10 m terrace and in particular the siltite knife, the microblade and the mid-passages, it is presumed that the Dorset occupation was concentrated on the upper terrace. J. C. Moquin seems to assume that Structures 4 and 5 are Dorset, undoubtedly due to the nearby presence of a few chert flakes (Avataq Cultural Institute, 1987b: 63). However, these raw materials are sometimes present in some Thule collections (cf., McGhee, 1974; Maxwell, 1985: 301). Thus, the hypothesis concerning the presence of a Dorset component on the 6 m terrace, which is also based on the limited dimensions of Structures 4 and 5, is at most uncertain (Avataq Cultural

Institute, 1987b: 63). This assertion conflicts with Maxwell (1985: 288), who states that the Thule tent rings measure between 2.50 and 3.50 m in diametre. However, it is important to note that the Thule tent ring has been highly neglected by archaeologists and, consequently, very little is known about this aspect of prehistoric Neoeskimo culture. The absence of data is generally invoked to explain this lack of interest (see, among others, Schledermann, 1975; McCartney, 1977; Clark, 1979). In the best of cases, they are mentioned with the secondary features and described arbitrarily, thus preventing any comparative research. D. Weetaluktuk (1981) located several Thule sites on the Ottawa Islands, some of which are characterized by tent rings, but he does not give any description.

Nevertheless, a few comments merit our attention. Clark (1979: 93) attributes heavy tent rings to the Thule period, though without giving any descriptions. During his fieldworks in the Cap Silumiut region and the Winchester Inlet at the northwestern extremity of Hudson Bay, McCartney (1977) briefly describes an undetermined number of tent rings that he divides into two categories: "strong tent rings" and "low tent rings". The first type corresponds to spring or fall habitations (used before or after the winter dwellings), generally located on bedrock or in well-drained localities (McCartney, 1977: 128 and foll.). They are characterized by walls that can reach more than one meter in height. The "low tent rings", used in summer camps, are similar to the historic tent rings and are located mostly in sand and gravel deposits (McCartney, 1977: 132). The anchor rocks are its main characteristic. The dimensions of these two types of structures vary between 2.50 x 2.50 m and 6.00 x 5.00 m. Some also show an internal partition (McCartney, 1977: 176).

The five tent rings excavated on the IcGm-3 site share some of these characteristics, particularly in the variability of their dimensions and the contrast between low tent rings (Structures 1, 4 and 5) and heavy tent rings (Structures 2 and 3), although in the latter case the maximum height does not exceed 40 cm. Structure 2 is the only one that indicates the possibility of interior partitioning (sleeping platform and combustion area ?) reminding the interior subdivision of the semi-subtarrenean dwellings (Baillargeon, 1979: 18 and foll.). The rectangular shape of this structure is rather unusual, but Weetaluktuk (1981) reports some rectangular tent rings on the Ottawa Islands. A parallel seems to exist between the structures of the IcGm-3 site and the Thule tent rings observed elsewhere, but these indications are insufficient to extrapolate on the period of occupation of this site.

### 7.3.2 The tools

The manufacturing of polished implements is well-known throughout the Arctic, among both the palaeoeskimo and neoeskimo groups (cf., Maxwell, 1985). The tool kit produced by this technique is quite varied and involves more than just slate and nephrite materials. However, in cases where these raw materials are present in a collection, there is no description of manufacturing technique accompanying the objects. Ethnographic descriptions seem to concentrate more on forms and socio-economic functions of ulus, for example, while the manufacturing process is totally neglected (Rankin and Labreche, 1991: 107-111). The same phenomenon occurs in the archaeological literature. The designation of the ulu as the "Inuit woman tool" is not disputed (Maxwell, 1985: 278; McGhee, 1974: 80-81), but the lack of a detailed description of the technical characteristics of these tools or, for this matter, of any other tool present in the archaeological collection, is surprising. A morphological comparison can be useful, especially if the specimens compared come from well-dated occupations, but the shape of an object is probably not the only indication of its technical and temporal origin (cf. McGhee, 1980). Accordingly, in the absence of a *diagnostic* tool kit and of radiocarbon-dating, it is practically impossible to extrapolate on the period of occupation of a given site.

### 7.3.3 The IcGm-3 site chronology

Concerning the IcGm-3 site definition and especially, its integration into the cultural sequence of the eastern Arctic, it is common knowledge that the Thule occupation on the Nunavik territory and adjacent islands is practically unknown, despite a relatively large number of known sites, which, unfortunately, have not been excavated (Plumet, 1979: 111; Weetaluktuk, 1981). The few data concerning this cultural period comes mostly from the HaGd-8 site (Gulf Hazard-5; Harp, 1970: 9-10) and DIANA 10 site in Diana Bay (Rankin and Labreche, 1991: 116). These sites are characterized by semi-subterranean dwellings dated between 695 ± 90 years B. P. (HaGd-8) and 810 ± 80 years B. P. (DIANA 10), thus, they belong more or less to the same time period. Other information not yet analysed (Avataq Cultural Institute, 1989a), permitted the identification of Thule components at the extreme limit of the Quebec-Labrador Peninsula (i.e., JcDe-1), but these occupation traces have not been dated. These few informations suggest that Neoeskimo groups arrived relatively early in Nunavik, not long after the initial occupation of the eastern Arctic (between 1000 and 2000 years; these dates are not accepted by everyone; Maxwell, 1985: 253; Schledermann, 1976: 42). However, these data are not very useful for attributing a specific period of occupation for the IcGm-3 site. The occupation of this site could have occurred during an interval of about 600 years, from the time of the probable arrival of the first Thule groups to the beginning of the 19th Century, when contact with Euro-Canadians started to intensify.

# 8.0 The IcGm-4 site

## 8.1 Descriptions of interventions

Few data are available concerning the first excavations of the IcGm-4 site (Weetaluktuk, 1979a; 1979b; 1979c). It is known that D. Weetaluktuk excavated 33 $m^2$ in the central zone of area A (Appendix VI) and that he knew the existence of Structure 8 and of area C (Figure 2; L.2 and L.3). Data from the excavations of the central zone are represented only by lithic remains and, in some cases, the exact provenience of these objects is unknown. To these, three $^{14}C$ dates are added: 1550 ± 110 years B. P. (430 ± 110 A.D.), collected 8 cm below the surface in square E 1; 1670 ± 150 years B. P. (310 ± 150 A.D.), sampled from square H 2 (5-10 cm in detph); and 1130 ± 170 years B. P. (850 ± 175 A.D.), recovered in square F 1, between 4 and 8 cm below the surface.

The 1985 inventory helped in redefining the space covered by the different areas of the site using the few data available from the work of D. Weetaluktuk. However, the association of locality 2 (L.2) with area C or D and locality 3 with area B are erroneous (Avataq Cultural Institute, 1987a: 50). In 1985, only the structures of areas B, C and D were observed.

The 1986 salvage excavation was concerned only with area A, even though a surface collection had been made in areas C and D in the immediate vicinity of the structures (Avataq Cultural Institute, 1987b: 56). The excavation work concerned 115 $m^2$, of which 85 $m^2$ were excavated in the central zone with a portion of this excavation overlapping with Weetaluktuk's trench (Figure 13; Appendix VI). Seventeen metre squares were opened in Structure 8 (Figure 14) and 13 $m^2$ south of the access road (Appendix VI; Avataq Cultural Institute, 1987b: 46). These last metres turned out to be sterile.

### 8.1.1 Stratigraphy

The stratigraphy observed is relatively simple (cf., Avataq Cultural Institute, 1987b: 48; Appendix 5). A thin cover of vegetation (2 to 6 cm in thickness) is superimposed over a humus horizon, which itself sits on a variety of deposits (i.e., sand, gravel or sand and gravel). The east wall profile of squares Q-W 34 intersects with Weetaluktuk's trench (between Q and V 34). On the surface, these squares are covered by a layer of eolian sand (?). Three quarters of the profile transmit no information

**Figure 13.** Plan of central zone, area A, IcGm-4 site,
Tool distribution

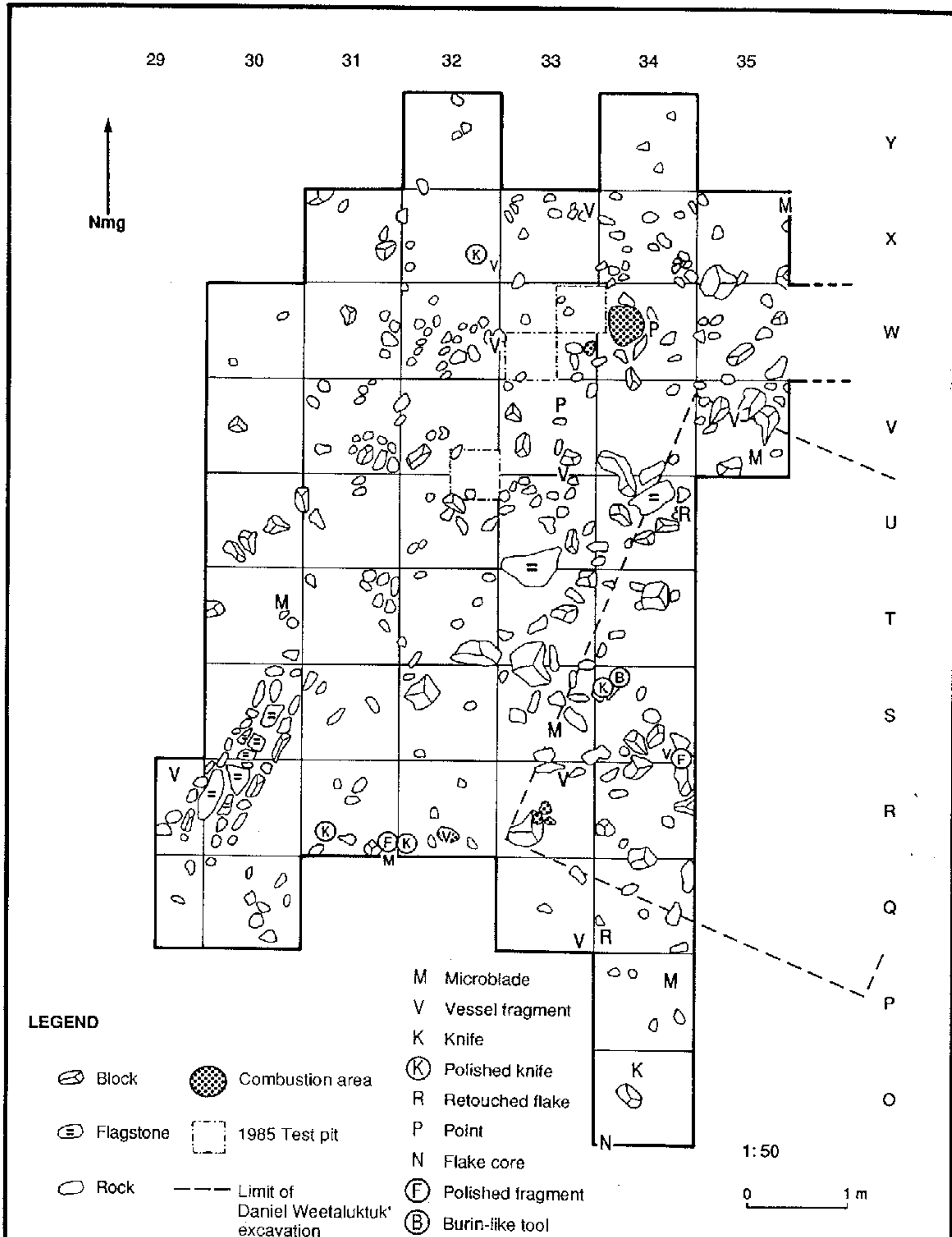
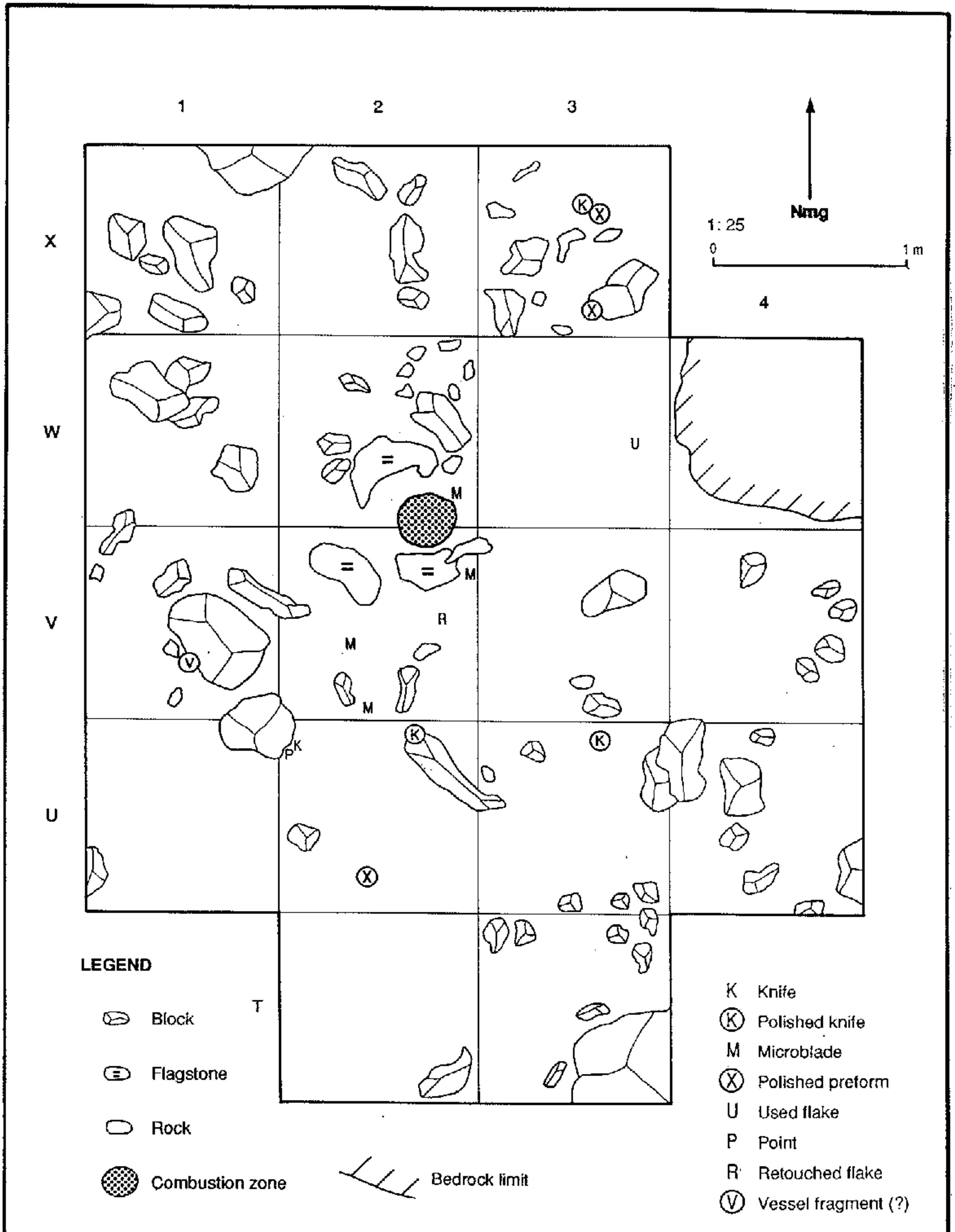


**Figure 14.** Plan of structure 8, area A, IcGm-4 site.
Tool distribution



whatsoever about the stratigraphic context of the occupation of the site, but it does confirm that this part of the site had already been excavated. The profiles of square metres W 34 (east wall) and V 2 (north wall) show the vertical locations (level III) of the two charcoal concentrations sampled in 1986 (Figure 15). In both cases, these samples seem to be associated with shallow depressions.

### 8.1.2 Habitation structures

A single habitation structure (#8) was revealed by the 1986 excavation. Other tent rings are located in areas B, C and D (Table 5)[18]. Structure 8 is very poorly defined (Figure 14) and no internal features could be identified, except for a combustion area represented mainly by the presence of charcoal and three flagstones. Another feature, called Structure 9, was excavated in squares Q-R 30 in the central zone (Figure 13). The form and dimensions of this feature are similar to the mid-passages often found in certain Pre-Dorset habitations, but more frequently in Dorset structures (Avataq Cultural Institute, 1991b; 1992b). Examination of its vicinity didn't offer any evidence that this feature was linked to a habitation structure.

**Tableau 5. Characteristics of the habitation structures, IcGm-4 site (Areas A, B, C and D).**

| Area | No. | Form | Dimensions (m) | Remarks |
|---|---|---|---|---|
| C | 1 | oval | 2.50 x 2.10 | sampled |
| | 2 | circular | 2.60 dia. | sampled |
| | 3 | square | 3.50 x 3.50 | sampled |
| D | 4 | oval | 2.40 x 2.00 | sampled |
| | 5 | oval | 2.50 x 2.00 | - |
| B | 6 | oval | 4.00 x 3.00 | - |
| | 7 | oval | 3.00 x 2.70 | - |
| A | 8 | oval (?) | 4.00 x 3.20 | - |
| | 9 | rectangular | 2.30 x 0.60 | axial feature (mid-passage) |

These different excavations permitted the recovery of 13,257 lithic specimens (i.e., tools and debitage by-products; Appendix IV), 97% of which come from area A. Other than the three dated charcoal samples from Weetaluktuk's excavations, three other samples were retrieved in 1986, but none of them were submitted for $^{14}C$ dating. At the time, it was probably believed that the dates obtain from the samples collected by Weetaluktuk were representative of the period of occupation of area A.

[18] Two other rock concentrations were observed in area D; one of them was even associated to a surface lithic concentration, but hasn't been included as a habitation structure. The structures of areas C, B and D are not included of the analysis.

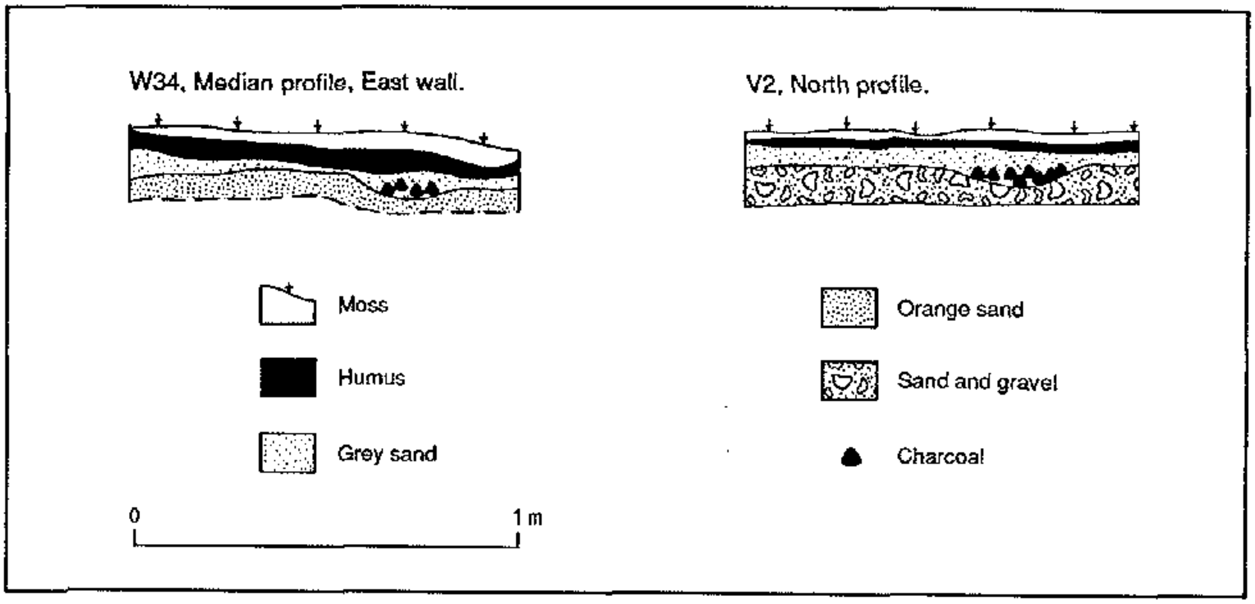



Figure 15. Stratigraphic profiles, area A, IcGm-4 site.

## 8.2 Lithic collection: description and analysis

The lithic collection is comprised of 348 complete or fragmentary tools (Table 6) and more than 13,000 manufacturing by-products (appendices IV and V)[19]. Objects manufactured by direct percussion represent 34.20% (n: 119) of the collection, while specimens in which polishing dominates account for 65.80% (n: 229). The same proportions hold for manufacturing by-products (percussion: 32.20%; polishing: 67.80%; Figure 16). The large difference between the two categories is partially explained by the larger masses used in the production of soapstone vessels and does not *a priori* reflect a more intensive production.

Among the tools, there are very few categories that have samples adequate enough to justify an exhaustive and comparative analysis. Most of the morphometric data presented in Appendix IV could eventually facilitate a typological or *stylistic* inter-site or inter-regional comparison, but from a strictly statistical point of view, they cannot not be considered, because they are underrepresented. The following discussion is divided into two parts: 1) tools and by-products where direct percussion manufacture is dominant; 2) the elements where polishing is dominant.

[19] Tools from areas A, C and D and debitage by-products from area A are described in appendix IV. Chipping by-products from areas C and D are presented in appendix V.

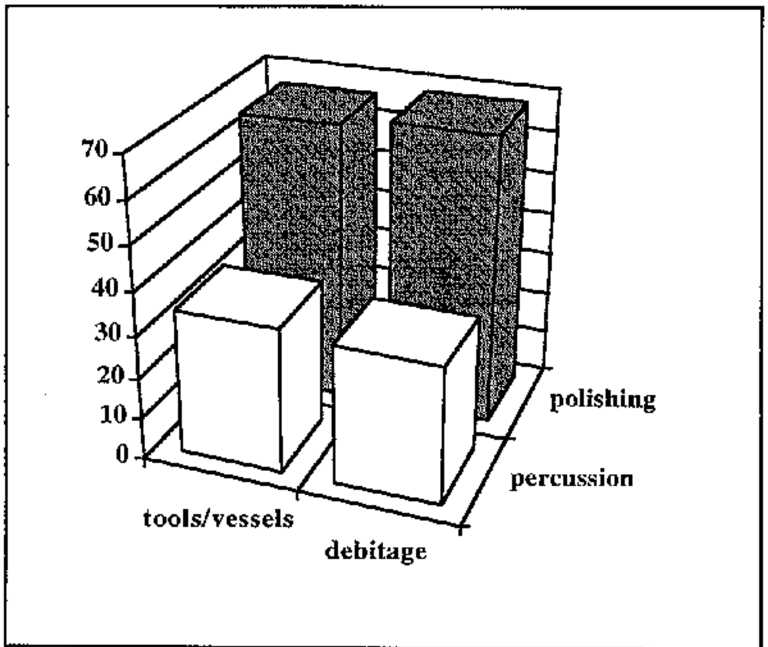



Figure 16. Frequency of lithic specimens by manufacturing techniques.

**Table 6. Tools collected in 1979-80, 1985 and 1986 (areas A, C and D).**

| Tools | chert | quartzite | metabasalt | slate | soapstone | nephrite | quartz | Total |
|---|---|---|---|---|---|---|---|---|
| Microblade | 37 (10.6) | 1 (0.3) | - | - | - | - | 10 (2.9) | 48 (13.8) |
| Blade | 2 (0.6) | - | - | - | - | - | 1 (0.3) | 3 (0.9) |
| Microblade core | 1 (0.3) | - | - | - | - | - | 4 (1.1) | 5 (1.4) |
| Chipped point | 3 (0.9) | 4 (1.1) | - | - | - | - | - | 7 (2.0) |
| Polished point | - | - | - | 2 (0.6) | - | - | - | 2 (0.6) |
| Chipped knife | 3 (0.9) | - | - | - | - | - | - | 3 (0.9) |
| Polished knife | - | - | - | 20 (5.7) | - | - | - | 20 (5.7) |
| Bifacial fragment | 4 (1.1) | 11 (3.2) | - | - | - | - | 1 (0.3) | 16 (4.6) |
| End scraper | 1 (0.3) | - | - | - | - | - | 2 (0.6) | 3 (0.9) |
| Burin spall | 2 (0.6) | - | - | - | - | - | - | 2 (0.6) |
| Tip flute spall | 3 (0.9) | - | - | - | - | - | - | 3 (0.9) |
| Burin-like tool | - | - | - | - | 1 (0.3) | 5 (1.4) | - | 6 (1.7) |
| Preform | - | - | - | 1 (0.3) | - | - | - | 1 (0.3) |
| Adze | - | - | - | - | 1 (0.3) | - | - | 1 (0.3) |
| Polished fragment | - | - | - | 45 (12.9) | - | - | - | 45 (12.9) |
| Soapstone vessel and other object | - | - | - | - | 153 (44.0) | - | - | 153 (44.0) |
| Flake core | 6 (1.7) | 2 (0.6) | 8 (2.3) | 1 (0.3) | - | - | - | 17 (4.9) |
| Retouched/used flake | 6 (1.7) | 3 (0.9) | 3 (0.9) | - | - | - | 1 (0.3) | 13 (3.7) |
| Total | 68 (19.5) | 21 (6.0) | 11 (3.2) | 69 (19.8) | 155 (44.5) | 5 (1.4) | 19 (5.5) | 348 (100) |

### 8.2.1 Direct percussion

This category, which represents 32% of the tool collection from the IcGm-4 site, but only 3% of the elements associated to this type of manufacturing, is dominated by microblades (n: 44)[20], which themselves are the result of a specialised technique. Other types of tools are rather poorly represented (Table 6), thus limiting the definition to their general characteristics (Appendix IV). As for by-products, they represent a much larger population (97% of this part of the collection), and will be discussed in detail. Chert, quartzite, metabasalt and quartz are the most frequent raw materials (Figure 17).

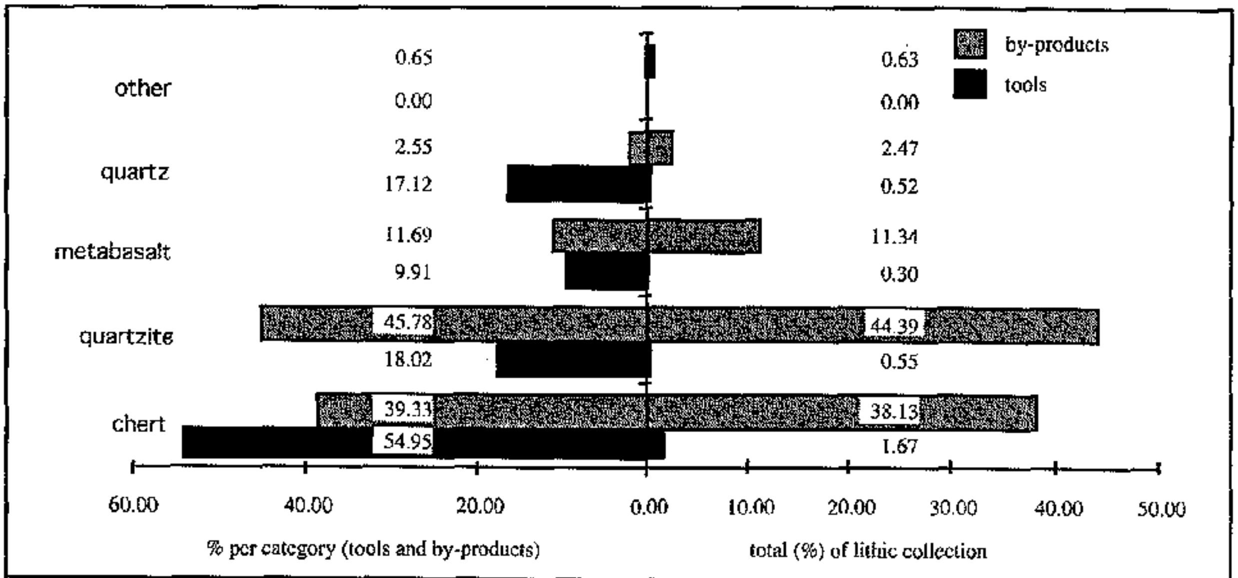



Figure 17. Frequency of raw materials (percentage by category—tools and debitage separated, left side of figure; total percentage—tools and debitage mixed, right side of figure).

Among the tools, microblades receive special attention, not because there are numerically more important, but because they are the subject of much speculation concerning their validity (generally doubted by most authors) in the cultural identification of Dorset sites (McGhee, 1970; Schledermann, 1990). The principal objective is to characterize these specimens, then compare them to those of other collection recuperated on other Dorset sites (all periods of occupation mixed).

Points and bifacial fragments will be briefly discussed. The presence of knives, end scrapers, burin spalls and tip-flute spalls is negligible and are excluded from the discussion at this point. Retouched and used flakes as well as flake cores will be the object of a brief analysis before the presentation of debitage by- products analysis results.

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[20] The totals presented in this section exclude specimens from areas C and D.

#### 8.2.1.1 Microblades

Microblades (Plate 4, A to H) are generally one of the most representative elements of palaeoeskimo collections (McGhee, 1970: 89; Schledermann, 1990: 335-336). By definition, the microblade is not *a priori* a tool, but the result of a specialised manufacturing technique. It is only when the microblade is modified or used that we can consider it to be a tool. However, by general agreement they are always considered part of the tool kit, independently of the modification or utilisation criteria.

The descriptive characteristics of microblades were developed in the early 1970's (Sanger, McGhee and Wyatt, 1970: 115-117) and have been used ever since without significant modifications (Schledermann, 1990: 338-339; Clark, 1992). These attributes and variables have been identified as reflecting the results and constraints of this manufacturing technique. The dimensions and more particularly, the width of the microblades, along with the relative frequency of dorsal arrises, are considered by some as the most easily comparable criterias (McGhee, 1970: 91 and 96), especially when they are used to define a time-space progression of the type *the older they are, the bigger they are* (Schledermann, 1990: 335-336). Regardless of this type of consideration, it appears that the variability in the dimensions, particularly in maximum width, reflect above all else, the characteristics of the core being used (dimensions and forms; Clark, 1992: 9; McGhee, 1970: 96).

The IcGm-4 site is relatively poor in terms of elements associated to microblade manufacturing (microblades: 48, 4 of which were recovered from areas C and D; blades: 3; microblade cores: 5, of which only one was really used as such). This relative absence is rather unusual for a Dorset site, but not exceptional (McGhee, 1970: 90). The discussion that follows involves essentially the chert microblades from area A (n: 32; one microblade is not considered because it is too fragmentary). Quartz crystal microblades are not included in the comparative study, nor is the only quartzite specimen, because they are excluded from the other comparison studies. Also, the constraints related to obtaining quartz microblades are directly related to the constant smallness of the cores[21] (McGhee, 1970: 89). However, it appears that there is no significant differences between chert and quartz microblades from the IcGm-4 site collection.

Table 7 summarizes the principal metric data of the chert microblades. Mesial fragments dominate this collection (24.24%), followed by complete microblades (21.21%) and proximal fragments (21.21%). Distally incomplete microblades account for

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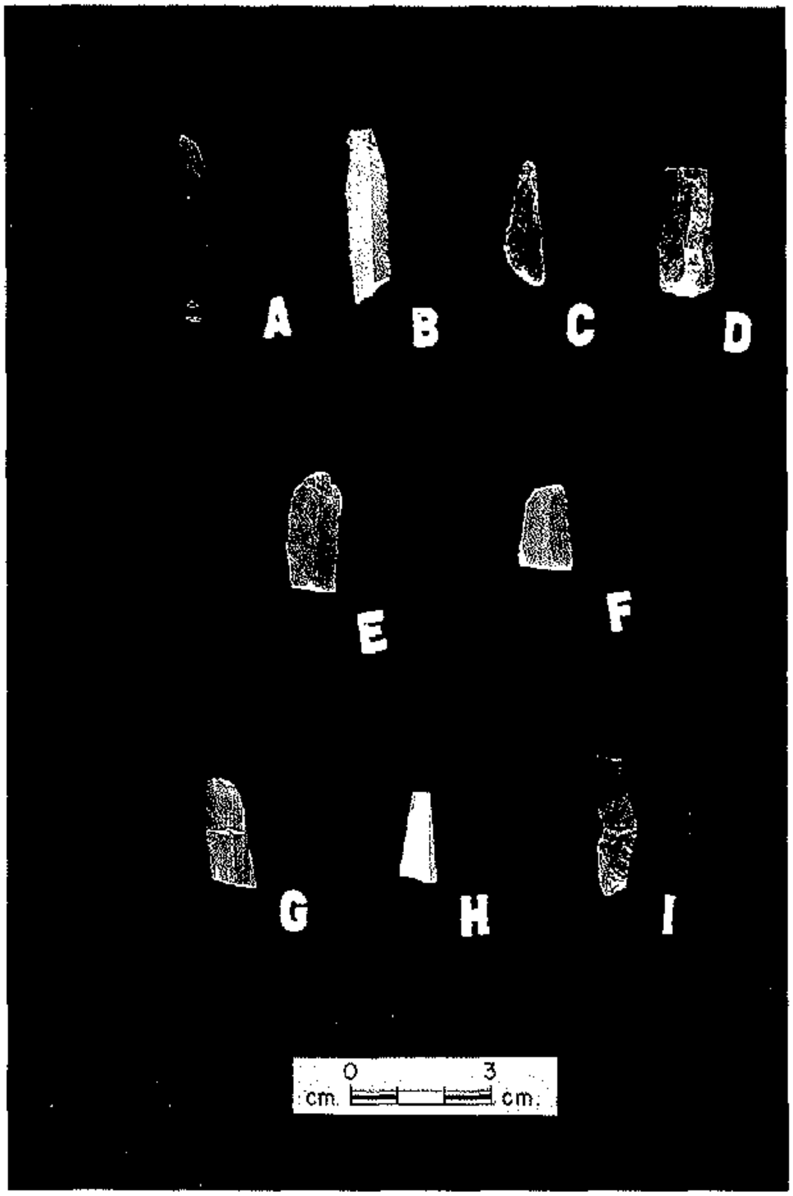
[21] Among the quartz crystal cores collected on the IcGm-4 site, only one has blade-like scars; the other four have a prepared platform, but no flaking (cf., appendix IV).




(Photo. Marc Laberge, Vidéanthrop inc.)

Plate 4. Microblades (A to H) and 1 tip-flute spall (I), IcGm-4 site. The microblades A and B, E to H and the tip-flute spall are in chert. Specimens C and D are in quartz crystal.

| Tableau 7. Comparison of Microblade metric variables and arrises (IcGm-4 versus 5 Dorset sites). | IcGm-4 | JlGu-5 (Sima) | (KkFb-7) (Tyara) | KkHh-1 (T1) | PfFm-2 (Niaqungut) | NiNg-1 (Buchanan) |
|---|---|---|---|---|---|---|
| N | 33 | 100 | 100 | 107 | 100 | 24 |
| **Width:** | | | | | | |
| range | 4.1-11.3 | 4.5 - 15.1 | 5.1 - 12.1 | 5.2 - 13.5 | 3.9 - 11.8 | 4.3 - 10.1 |
| $\mu$ | 7.54 | 7.85 | 8.11 | 8.44 | 6.80 | 6.99 |
| $\sigma^2$ | 1.80 | 1.82 | 1.65 | 1.65 | 1.49 | 1.33 |
| c.v. | 23.89 | 23.00 | 20.00 | 20.00 | 22.00 | 19.00 |
| **Thickness:** | | | | | | |
| range | 0.80 - 3.80 | 0.90 - 3.70 | 1.1 - 3.8 | 1.0 - 4.4 | 0.8 - 4.3 | 1.1 - 3.7 |
| $\mu$ | 2.23 | 2.01 | 2.18 | 2.41 | 1.74 | 1.95 |
| $\sigma^2$ | 0.72 | 0.55 | 0.50 | 0.79 | 0.52 | 0.70 |
| c.v. | 32.40 | 27.00 | 23.00 | 33.00 | 30.00 | 36.00 |
| **Length (C)** | | | | | | |
| % | 21.21 | 24.00 | 2.00 | 4.67 | 6.00 | 20.83 |
| range | 12.5 - 40.0 | 23.8 - 42.2 | 34.4 - 38.7 | 24.6 - 39.3 | 19.6 - 29.8 | 22.8 - 37.9 |
| $\mu$ | 22.94 | 32.76 | 36.55 | 34.08 | 23.88 | 27.42 |
| $\sigma^2$ | 9.19 | 4.46 | - | - | - | - |
| c.v. | 40.08 | 14.00 | - | - | - | - |
| **Length (P)** | | | | | | |
| % | 21.21 | 40.00 | 50.00 | 47.66 | 48.00 | 33.33 |
| range | 12.7 - 25.2 | - | - | - | - | - |
| $\mu$ | 17.90 | 21.35 | 21.32 | 27.95 | 18.08 | 23.20 |
| $\sigma^2$ | 4.15 | 6.13 | 6.33 | 6.84 | 5.08 | - |
| c.v. | 23.20 | 29.00 | 30.00 | 24.00 | 28.00 | - |
| **Length (M)** | | | | | | |
| % | 24.24 | 27.00 | 29.00 | 23.36 | 28.00 | 70.83 |
| range | 7.7 - 23.5 | - | - | - | - | - |
| $\mu$ | 13.7 | 17.83 | 16.02 | 25.40 | 16.39 | 13.53 |
| $\sigma^2$ | 5.28 | 6.02 | 4.49 | 7.14 | 5.34 | - |
| c.v. | 38.57 | 34.00 | 28.00 | 28.00 | 33.00 | - |
| **Length (D)** | | | | | | |
| % | 9.09 | 15.00 | 19.00 | 20.00 | 18.00 | 54.00 |
| range | 9.6 - 23.5 | - | - | - | - | - |
| $\mu$ | 16.83 | 22.34 | 19.22 | 27.21 | 19.95 | 20.62 |
| $\sigma^2$ | - | 5.83 | 7.04 | 6.41 | 4.48 | 7.33 |
| c.v. | - | 26.00 | 37.00 | 24.00 | 22.00 | 36.00 |
| **MTW:** | | | | | | |
| % | 81.82 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| range | 14.8 - 65.6 | 15.0 - 47.0 | 16.0 - 47.0 | 14.0 - 54.0 | 13.0 - 50.0 | 17.0 - 45.0 |
| $\mu$ | 31.11 | 26.20 | 27.40 | 29.20 | 26.30 | 27.80 |
| $\sigma^2$ | 11.07 | 6.75 | 6.23 | 10.05 | 7.89 | 8.46 |
| c.v. | 35.57 | 26.00 | 23.00 | 34.00 | 30.00 | 30.00 |
| **Arrises** | | | | | | |
| $A_0$(%) | 6.06 | - | - | - | - | - |
| $A_1$(%) | 30.30 | 39.00 | 40.00 | 32.00 | 40.00 | 42.00 |
| $A_2$(%) | 60.61 | 57.00 | 53.00 | 61.00 | 52.00 | 54.00 |
| $A_3$(%) | 3.03 | 4.00 | 7.00 | 7.00 | 8.00 | 4.00 |

(Sima -JlGu-5: 700-100 B.C.(Mansel Island); Tyara - KkFb-7: 700-100 B.C. (Salluit); T1 - KkHh-1: 700-100 B.C. (Southampton Island); Niaqungut - PfFm-2: *ca.* 500 A.D. (Pond Inlet); Buchanan - NiNg-1: early A.D. (Victoria Island); cf., McGhee, 1970: 90, 92-93, Tables 1 and 2).

for 18.18% and distal fragments, 9.09% of the sample, which also includes a proximally incomplete specimen and one that is undetermined. Different correlation coefficients were calculated to verify if the metric variables of the microblades showed any association between them. The width and thickness, regardless of integrity, showed a moderate correlation, representative of the tendencies seen in chert microblades (Figure 18; McGhee, 1970). When the microblades are grouped together in terms of integrity, the results are somewhat slightly different. Thus, for proximal fragments, the Length/Width correlation factor is higher (R: 0.70) and the Width/Thickness ratio is inversely proportional (R: 0.28). The opposite is observed in the case of complete microblades (Length/Width: R: -0.15; Width/Thickness: R: 0.74), while the mesial fragments demonstrate a similar correlation (Length/Width: R: 0.61; Width/Thickness: 0.52). No significative correlation in the Length/Thickness relationship was observed in any of these comparisons. The variation in the results as concern the length supports the widely held opinion that this variable is insignificant in the study of microblades (McGhee, 1970: 91; Schledermann, 1990: 335). Width and thickness are more stable variables, but the results indicate that they are closely linked to the manufacturing technique and the global dimensions of the cores (cf., McGhee, 1970: 91).

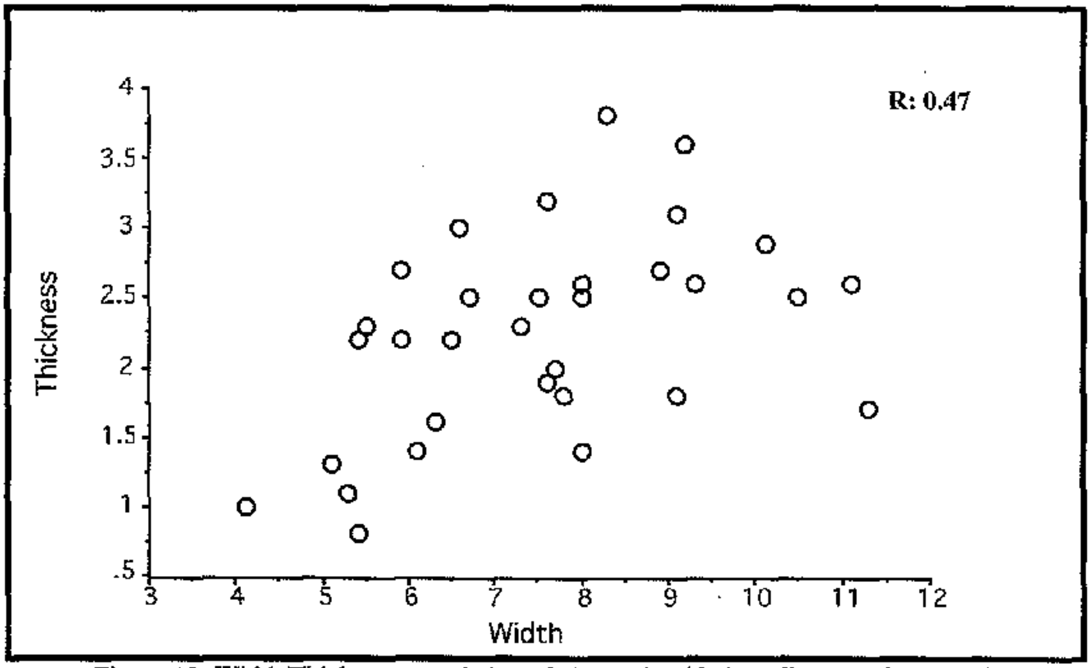


Figure 18. Width/Thickness correlation of chert microblades, all categories mixed.

These variables were compared with the same data from five other Dorset sites (Table 7). The differences observed for the width and thickness of the microblades are minimal. The variation is greater when the length and integrity of the various specimens are considered. The width/thickness ratio (M.T.W., expressed in percentage) indicates that microblades from the IcGm-4 site have a greater Width/Thickness index, undoubtedly influenced by the range in individual dimensions. The small sample does not seem to be the cause, since site KkIh-1 (n: 107) shows a similar variation. Furthermore, for each of the variables that were compared, the variation coefficients (c.v.) are relatively high, which translates into a large individual variation.

The proportions of microblade fractures observed generally correspond to Dorset microblade collections, particularly in the cases of mesial fragments (between 20 and 33% of the collections) and distal fragments (between 14 and 28%) (McGhee, 1970: 95). Proximal fragments are usually better represented (between 30 and 51% compared to 21.21% from the IcGm-4 site). It has been noted that in most collections, microblades are often fractured intentionally to eliminate the curvature of the blade in order to facilitate hafting and their use as a cutting tool by defining parallel edges (McGhee, 1970: 95; Wyatt, 1970: 103). Moreover, the observation of intentional flaking seems to indicate that their location on the object is closely related to hafting (Wyatt, 1970: 103). They are usually located at the proximal part of the microblade (or fragment); distal flaking is relatively rare (McGhee, 1970: 95). More than one third of the microblades from the IcGm-4 site (including the quartz crystal specimens) are retouched dorsally (n: 5), alternately (n: 3), bifacially (n: 3) and on the ventral surface (n: 3). In collections analyzed by McGhee, most microblades present alternate flaking.

The number of arrises is the last element retained for this comparison. The frequencies presented in Table 7 show that the global proportions are similar: two-arrises microblades are more frequent, followed by one-arris specimens; microblades with three or more arrises are rare. The IcGm-4 site is the only collection where the absence of arrises on microblades has been noted (13.95%). Regardless of this peculiarity, it is difficult to link this attribute to anything else other than a technical consequence, implying undoubtedly the form and dimensions of the cores, as well as their preparation (Clark, 1992: 7). Information concerning the striking platform must also be considered as resulting from the same constraints. The relative absence of microblade cores (only one was clearly used for this purpose) prevents any comprehensive study of these aspects for the IcGm-4 site.

Despite their large number in Palaeoeskimo collections, and particularly Dorset, microblades can't be considered as an important element in defining cultural and temporal affiliations or to facilite regional integration of a site. The various results presented above do not reflect any tendency that could eventually lead to such conclusions, save the fact that the manufacture of this type of object appears to be relatively homogenuous in the different regions in which it was observed (Sanger, 1970). The data from the six sites (Table 7) were submitted to a cluster analysis to verify if the dimensions of the microblades can permit the identification of specific clusters. The results

(Figure 19) indicate that there is no temporal clustering between the microblades. The first group (i.e., PfFm-2 and NiNg-1) is composed of a Late Dorset site and a Middle Dorset site. The second group (IcGm-4, JlGu-5, KkFb-7 and KkHh-1) is subdivided into three clusters that share certain characteristics, but also show a certain variability. Three of these sites are from the Early Dorset period and IcGm-4 is Middle Dorset. Globally, the microblades of IcGm-4 are closer in terms of dimensions to those of JlGu-5 (Mansel Island). If this analysis shows that the metric variables, considered as a whole, are not good temporal indicators and puts in perspective the importance of individual variables, particularly width, which is often considered to be the most stable variable, it could however indicate a spatial relationship in microblade manufacture. The JlGu-5, KkFb-7 and KkHh-1 sites are located in the same geographic region as the IcGm-4 site.

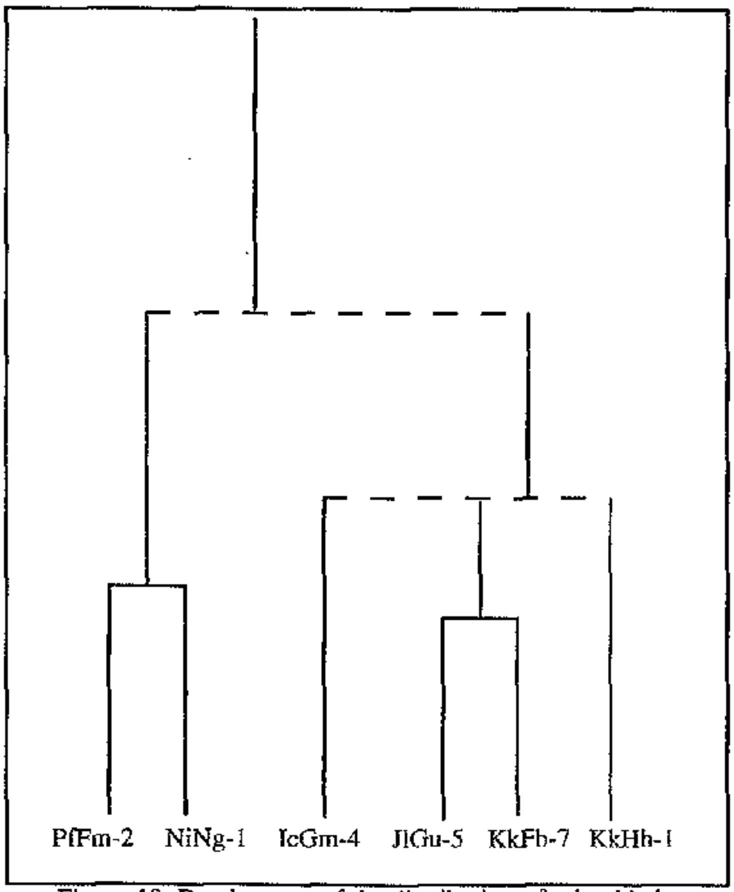



Figure 19. Dendrogram of the distribution of microblade metric variables by site (data from Table 7).

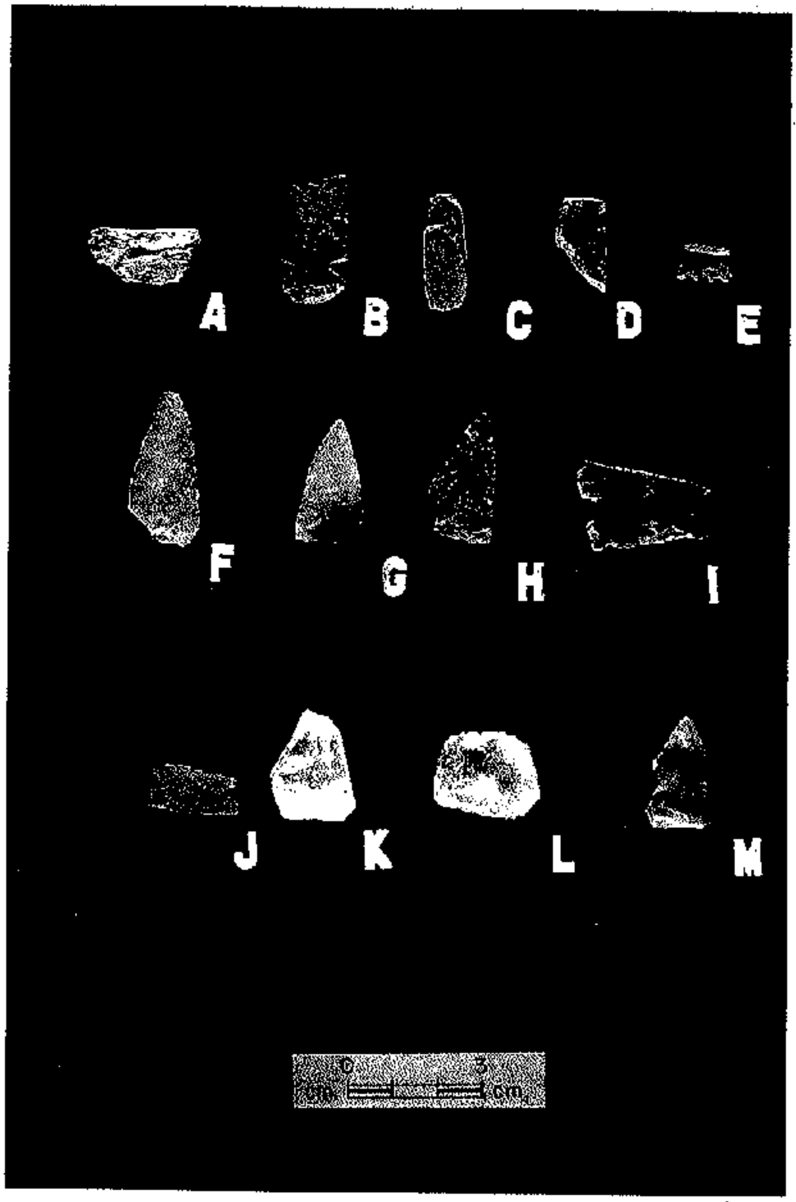
#### 8.2.1.2 Points and bifacial fragments

Points (n: 6) and bifacial fragments (n: 15) are considered together because they involve essentially the same manufacturing technique. The information available for the biface fragments is very fragmented, while the points are relatively complete.

Points (Plate 5, F to H) made from quartzite (n: 4) or chert (n: 2) have a mean length of 25.92 mm ($\sigma^2$: 7.50; c.v.: 28.95), a mean width of 13.38 mm ($\sigma^2$: 2.32; c.v.: 17.37) and a mean thickness of 4.67 mm ($\sigma^2$: 1.54; c.v.: 33.02). A correlation coefficient was calculated to determine the association between each of these variables. In each case, the correlation is high (Length/Width: 0.86; Length/Thickness: 0.84; Width/Thickness: 0.95). These results, joined with the standard deviations and variation coefficients, reveals a relatively clear picture of these points: length is the element that offers the widest individual range and this is due to the presence of two points which are almost one length shorter than the other four (range: 17.40 mm). Width shows the least variation (range: 5.60 mm) probably reflecting hafting and functional constraints. The individual variation in thickness is also relatively low, even though the percentage of variation is greater than the one observed for the length (range: 4.20 mm). It is interesting to note that the two specimens that have above mean thickness were subjected to basal thinning on both surfaces. A third specimen was also thinned, but on a single surface. Strangely, the thickness of the latter specimen is below the calculated mean (-1.37). Point #430, whose thickness is closest to the mean (-0.17), is the only specimen equipped with side-notches. Of the last two points, one of them is the thinnest (-1.97) and the other has the second lowest distance from the mean (+0.23). Except for the latter, all the others have a base modified to facilitate hafting.

Morphologically, these points are grouped into three categories: triangular with straight base (n: 4), triangular with concave base (n: 1) and side notched (n: 1). The lateral edges are all symmetrical, straight and convergent, except for the notched specimen, which has symmetrical, convex and parallel edges. The angle of the lateral edges varies between 35° and 60°. The morpho-metric description of these points corresponds to certain specimens from the Nanook site (270 B. C. to 34 A. D., Maxwell, 1985: 202-203, Table 7.3). "Type 3" points, has define by Maxwell, possess a straight to slightly concave base (Maxwell, 1973: 39).

The bifacial fragments are in quartzite (n: 10), chert (n: 4) and milky quartz (n: 1). Width is the only metric variable that could be taken from all of these pieces, with the exception of one specimen that was too fragmentary (#837). The mean of the specimens is at 4.46 mm ($\sigma^2$: 1.68; c.v.: 37.72). The quartzite bifaces are slightly thicker




(Photo. Marc Laberge, Vidéanthrop inc.)

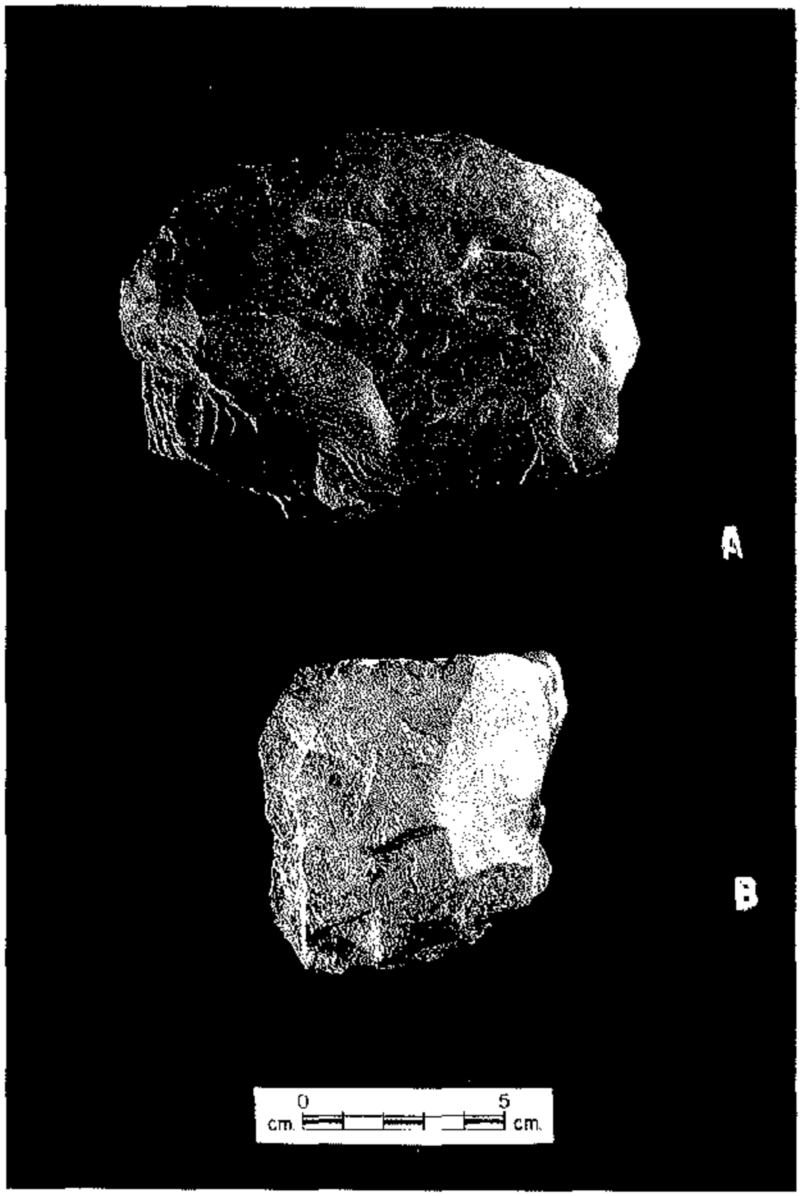
Plate 5. A sample of the tools, IcGm-4 site. A to E: burin-like tools (A, C and D nephrite; B: soapstone); F to H: points (chert); I and J polished knife fragments (slate); K to M flake cores in chert.

($\mu$: 4.26; $\sigma^2$: 1.31) than the chert specimens ($\mu$: 3.97; $\sigma^2$: 1.59), while the only milky quartz piece is the thickest (8.20 mm). Four of these fragments permitted a width measurement ($\mu$: 14.40 mm) and the length was measurable on only one (16.60 mm). With the exception of the latter, which is not representative, the mean width and mean thickness are similar to the corresponding means observed on the points. As a comparative exercise, the means of the chipped knives (n: 3) were calculated. These are wider ($\mu$: 16.20 mm) and thicker ($\mu$: 5.17 mm) than the points and biface fragments. Bifacial fragments could either represent rejects resulting from an accidental fracture during manufacture or a "bifacial" tool fractured during use. In this collection, five fragments clearly have a striking platform, which would suggest that they were fractured during manufacture. The limited number of each of these tool categories permits only to speculate on the original intentions of the makers, but by adopting the hypothesis that the fragments were fractured during manufacture, it is suggested that their goal was to produce points. The similarity between the dimensions of both the bifacial fragments and the points tends to support this suggestion.

#### 8.2.1.3 Retouched and used flakes

The retouched/used flakes (n: 10, three other were recovered from areas C and D; Appendix IV) are generally numerically more important in Dorset collections. These expedient tools (cf., Binford, 1983; Hayden, 1976) can be related to a variety of specific tasks for which more elaborate tools are not needed.

In this case, no single raw material appears to have been favored (chert: 5; metabasalt: 3; quartzite: 1; quartz crystal: 1). Also, the dimensions of these retouched/used flakes are highly influenced by the raw material used (Figure 20). Metabasalt flakes are in fact more massive (Plate 6, A), while the chert, quartzite and quartz crystal specimens are much smaller (Plate 7, F). The metabasalt and chert flakes are generally longer than wide, while the quartzite and quartz flakes are somewhat quadrangular. They are also thicker than the chert flakes. While the retouched/used flakes in chert, quartzite and quartz crystal correspond to the class of dimension identified among unmodified by-products, it is noticable that the metabasalt specimens greatly exceed the dimensions of by-products related to this raw material. One of them (# 994) has characteristics similar to the chopper tools. This specimen was flaked on both surfaces, suggesting also that it could have been used as a core. Because of their dimensions, the metabasalt specimens could correspond to what Lebel and Plumet (1991: 151-152) define as *tools on modified core* ("objets sur masse centrale travaillée"). This identification is also supported by the




(Photo. Marc Laberge, Vidéanthrop inc.)

Plate 6. One retouched flake (A) and one flake core (B) in metabasalt, IcGm-4 site.

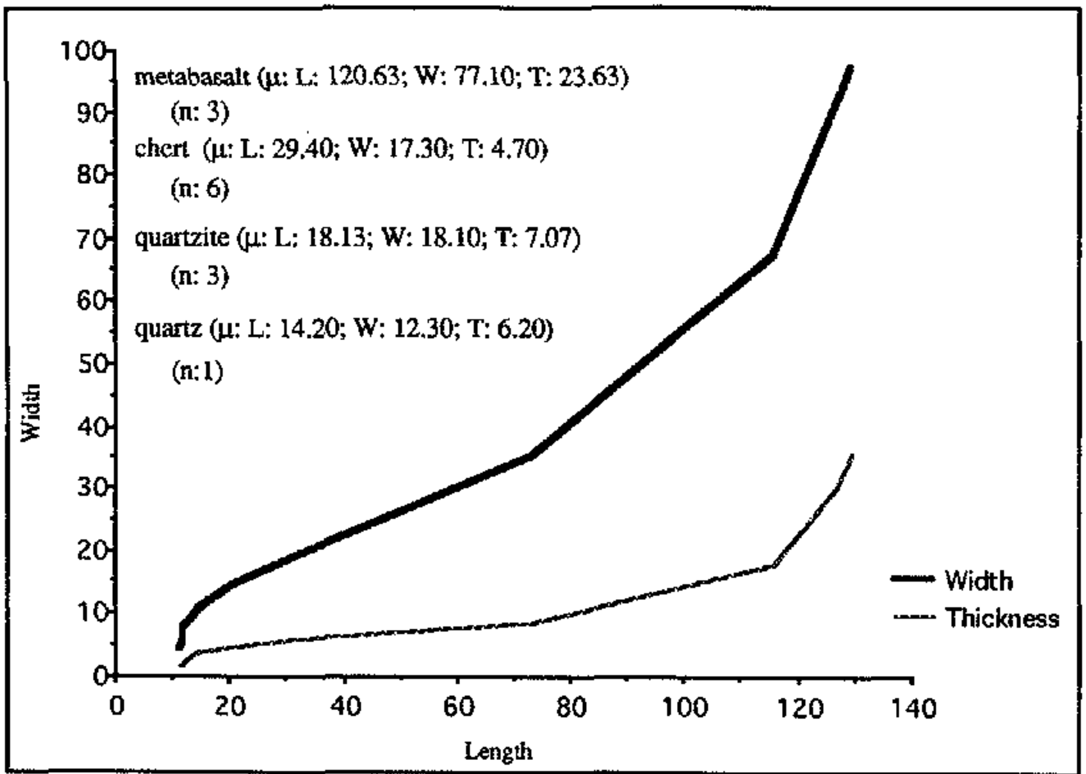


Figure 20. Comparison of Length/Width/Thickness dimensions of retouched/used flakes.

lack of a residual platform on any of these objects. Two specimens have no intentional flaking, but use scars are clearly visible. One of these two specimens (#991) also has traces of carbonized grease and possible polishing marks.

Of all the retouched/used flakes in chert, quartzite and quartz crystal, only one has an intact striking platform, the rest are all fractured. A moderate bulb of percussion is also visible on two of these objects.

#### 8.2.1.4 Flake cores

Strangely, the lithic collection from area A does not comprise many cores (chert: 6; metabasalt: 8; quartzite: 2), compared to the quantity of debitage by-products recovered. This disparity is not easily explained, but it can be assumed that access to these raw materials being rather limited, the craftsmen used at their maximum the available nodules. Conversely, it is possible that initial rough-out of the cores was done at the source and only the product of this initial work were transported back to the habitation site or workshop (Ericson, 1984: 3-4). This explanation appears more pertinent, particularly for chert and quartzite, which show a low percentage of cortex flakes. A little more than 3% of flakes from these raw materials still have cortex. For chert, the nature of the cortex suggests that the cores used were beach cobbles. The cortex present on the quartzite flakes is closer to the impurities found in a vein.

Conversely, almost 10% of the metabasalt flakes still have traces of cortex (i.e., blunted surface). According to Lebel and Plumet, metabasalt blocks were generally acquired in the form of cobbles (1991: 145). The greater proportion of objects with cortex would indicate that they were transported directly from the source to the workshop almost intact.

Of the sixteen cores, four are considered to be fragmentary (i.e., worn out, or removed from a larger core), while five of the complete cores were only slightly flaked as shown by the predominance of cortex, particularly for the metabasalt specimens (cf., Lebel and Plumet, 1991: 145; Plate 6, B). None of the latter show traces of carbonisation, which could explain their rapid abandonment as cores (Lebel and Plumet, 1991: 164). Some metabasalt specimens also show scars which could reflect their use as hammer-stones. Therefore, some of the flakes could have been accidentally produced by this use (Lebel and Plumet, 1991: 148-149). These accidental flakes could then be used as preforms or expedient tools.

The main metric characteristics of the cores are summarized as follows:

| **Raw Material:** | | **Length** (μ) | **Width** (μ) | **Thickness** (μ) | **$R_p$ (L/W)** | **$R_p$ (L/T)** |
|---|---|---|---|---|---|---|
| **metabasalt (n: 8)** | (2 fragmentary) | 85.25 | 65.49 | 42.53 | 0.30 | 0.70 |
| **chert (n: 6)** | (1 fragmentary) | 44.90 | 31.70 | 18.72 | 0.54 | 0.36 |
| **quartzite (n: 2)** | (1 fragmentary) | 32.15 | 25.25 | 12.45 | - | - |

The metabasalt cores are more massive than the chert (Plate 5, K to M) or quartzite cores. Correlation coefficients ($R_p$) calculated for chert and metabasalt show that they are inversely related: the Length/Thickness ratio is high in one case (metabasalt) and moderate to weak in another (chert) and the Length/Width ratio presents an inverse correlation (weak: metabasalt; moderate to high: chert). The same calculation, with all raw materials mixed, transmits a high correlation between each dimension (Figure 21) contrary to individual results. The difference or similarity between raw materials considered individually or in groups does not appear to be significant. The individual variations alone can explain the range within the same group. In this case, regrouping the various raw materials together appears to fill the gaps. A comparison of this type using a larger sample should clarify the following hypothesis: the reducing techniques used for raw material with conchoidal fracture are practically identical.

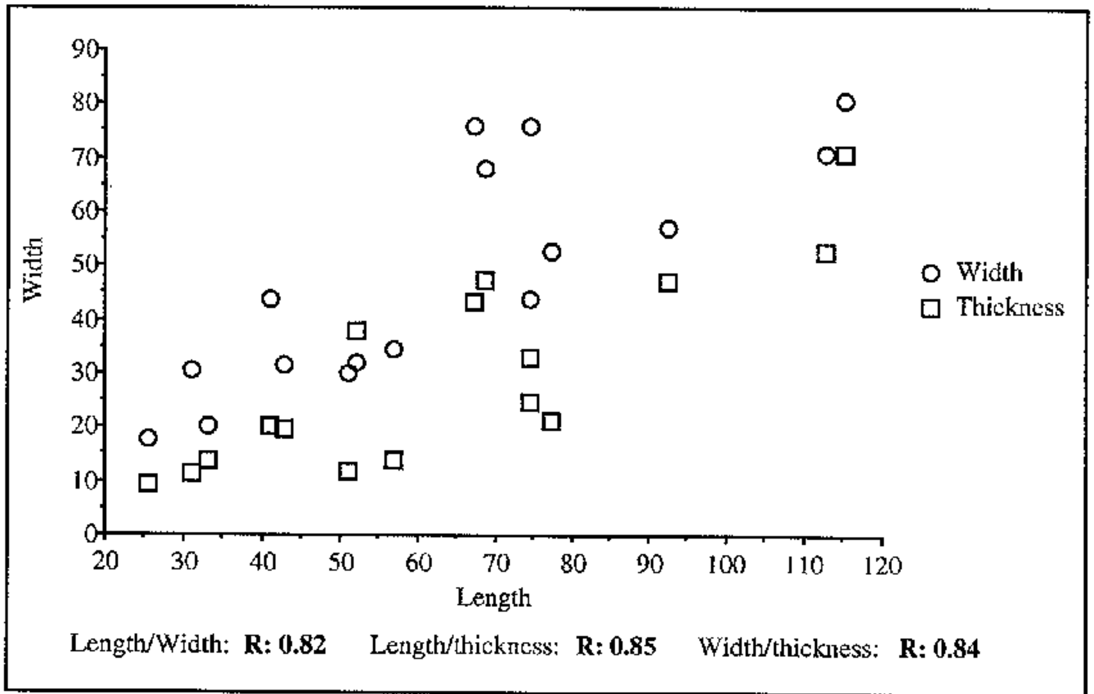



Figure 21. Flake cores correlation (Length/Width/Thickness).

### 8.2.1.5 Debitage by-products

The collection of debitage by-products was characterized according to five attributes and two variables. Attributes refer to the surface area of the flake (class of dimension) and to certain characteristics of the striking platform (treatment and form of the striking platform, bulb of percussion). Length and width of the striking platform are the only two variables considered in this study. With the help of these elements, each flake was assigned a category pertaining to a manufacturing stage (i.e., reducing, thinning, or trimming). The following results are based on all the by-products recovered from area A in 1979-80 and 1985 and 1986.

**Class of dimension**

Class of dimension reflects the surface area of the flake in $mm^2$. For the two main raw materials (i.e., chert and quartzite) and quartz, flake class distribution corresponds to expectations: the number of flakes decreases from smallest to largest. Conversely, class distribution of metabasalt flakes shows less variation between small flakes and larger flakes. In the latter case, most flakes belong to categories 3 and 4.

These data were submitted to a correlation test (Spearman) in order to verify whether the graphic correspondence of the various raw materials is due to sampling, or if there really is a correspondence in class distribution by raw material. Table 8 shows that the data reflect essentially the same correlation; the largest differences are observed when metabasalt flakes are compared to the other raw materials.

The collection shows an important lack of large dimensions flakes (i.e., 601-800 to > 1000), particularly for chert (n: 1), quartzite (n: 7) and quartz (n: 2), while large dimension metabasalt flakes are more numerous. There may be several explanations for this lack of large flake, but it is plausible to link it to the relative absence of cores for raw materials other than metabasalt. The two hypotheses brought up in the discussion on cores find an important support in the absence of large flakes.

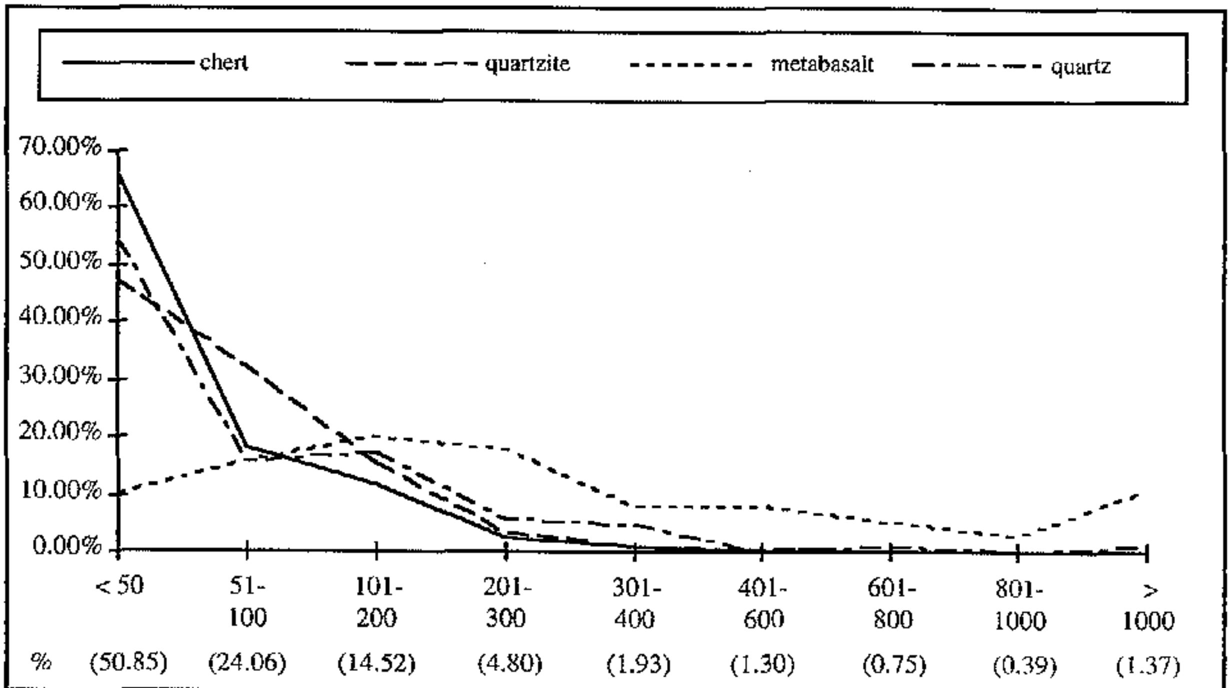


Figure 22. Distribution of class of dimension by raw material (number in () indicate the total percentage of each class of dimension).

**Tableau 8. Class of dimension: Spearman's correlation coefficients:**

| | Chert | Quartzite | Metabasalt | Quartz |
|---|---|---|---|---|
| Chert | 1.00 | | | |
| Quartzite | 0.97 | 1.00 | | |
| Metabasalt | 0.59 | 0.69 | 1.00 | |
| Quartz | 0.89 | 0.91 | 0.70 | 1.00 |

**Striking platform**

Striking platforms have been characterized according to treatment (intentional preparation or resulting from the force of impact), their residual form and their dimensions (length and width). These attributes and variables essentially indicate the nature of percussion work involved in the manufacturing of tools.

The various elements observed concerning platform treatment are subdivided into two main groups: particularities linked to the impact of percussion (i.e., fracture, scaling, crushing) and voluntary striking platform treatment (i.e., plain, transversal). Added to these two groups is the element multiple, which by definition, combines "intentional" or "accidental" characteristics of the modification process. One last element, unprepared, refers to the presence of cortex or impurities on the striking platform. Flakes exhibiting this type of striking platform are generally associated with the initial reducing stage of a core.

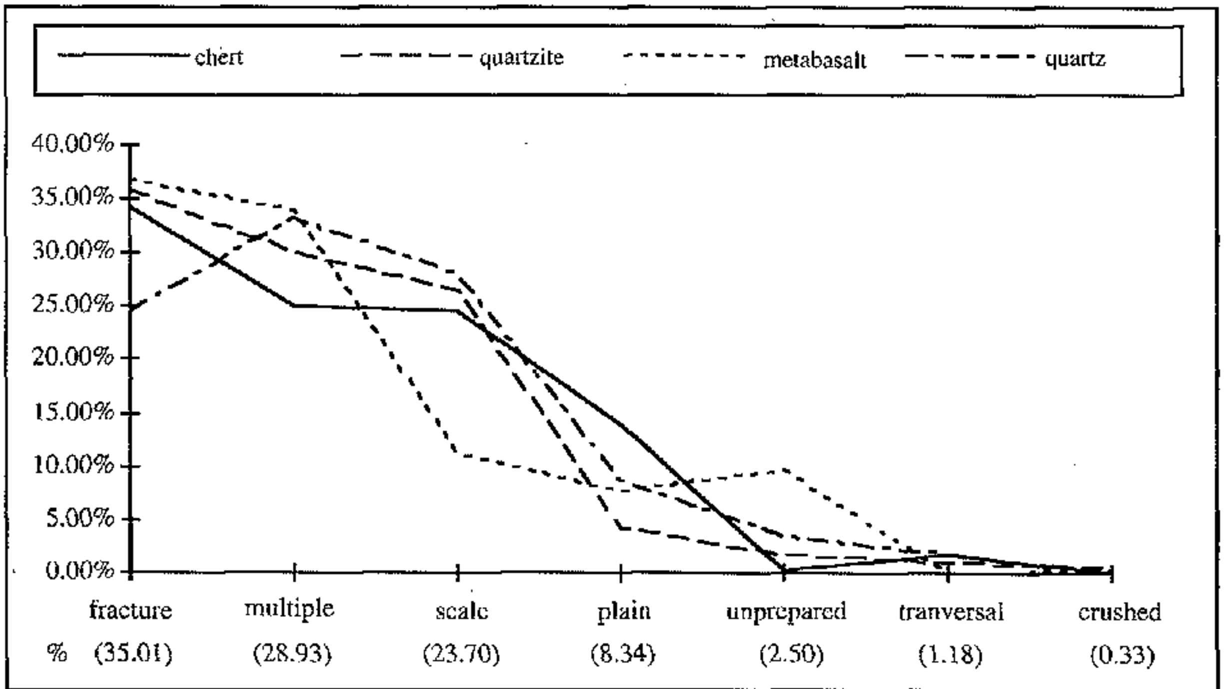



Figure 23. Distribution of striking platform treatment by raw material (number in () indicate the total percentage of each type of treatment).

Flakes from the first group are clearly predominant, while intentionally modified flakes represent less than one third of the collection (Figure 23). All raw materials, with few variations, have the same proportions concerning both types of treatment observed, with the exception of metabasalt that shows more variability, particularly in the number of flakes that have a fractured, scaled or unprepared striking platform. These differences can be attributed to the hardness of metabasalt as compared to the three other raw materials (cf., Lebel and Plumet, 1991). However, these few differences seem to be insignificant when the correlation coefficients are considered (Table 9). The few perceived variations seem to be the result of a difference in the absolute frequency of each raw material.

**Tableau 9. Striking platform treatment: Spearman's correlation coefficients:**

| | chert | quartzite | metabasalt | quartz |
|---|---|---|---|---|
| chert | 1.00 | | | |
| quartzite | 0.96 | 1.00 | | |
| metabasalt | 0.82 | 0.93 | 1.00 | |
| quartz | 0.86 | 0.89 | 0.82 | 1.00 |

As is the case for the striking platform treatment, the form of the striking platform reveals a certain similarity betwen raw materials (Figure 24). Again, metabasalt is slightly outside the observed tendency in <u>sub-triangular</u>, <u>triangular</u> and <u>irregular</u> forms compared to the other raw materials. This can be explained by the fact that metabasalt is not as malleable as the other raw materials (Lebel and Plumet, 1991: 145). Finer forms (i.e., point and circular) are practically nonexistent and are generally associated with the final manufacturing stages or to pressure-flaking. The correlation coefficients (Table 10) express a tendency to unity regardless of the raw material.

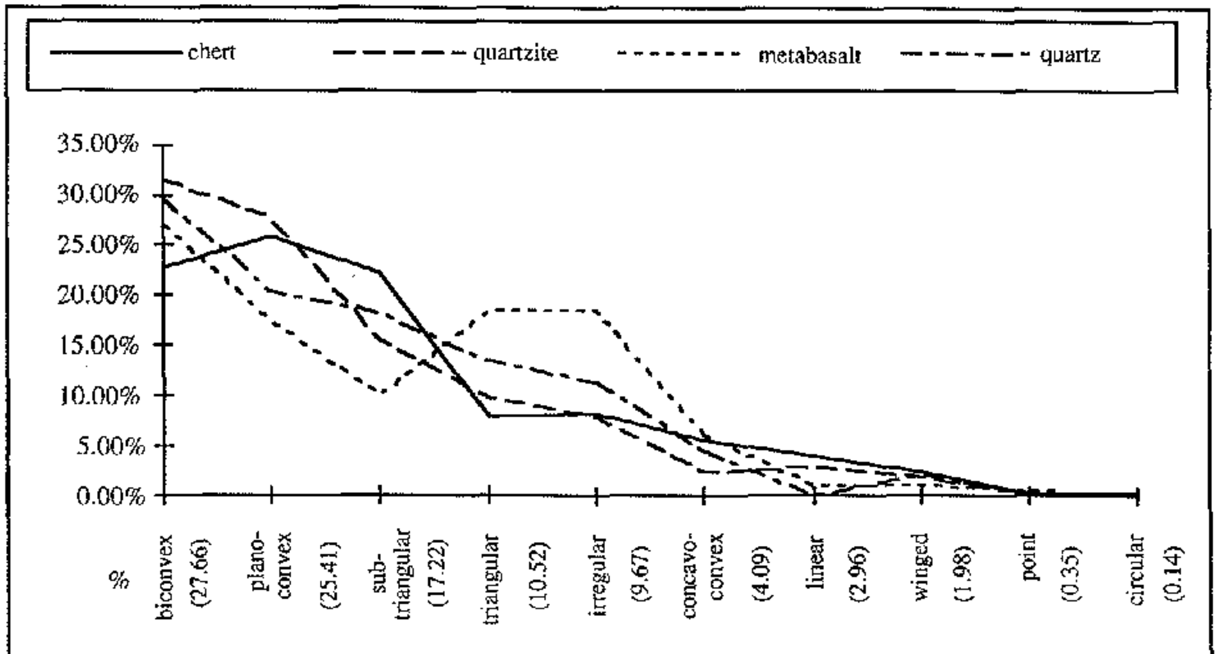


Figure 24. Distribution of striking platform form by raw material (number in () indicate the total percentage of each form encountered).

**Table 10. Striking platform form: Spearman's correlation coefficients:**

| | chert | quartzite | metabasalt | quartz |
|---|---|---|---|---|
| chert | 1.00 | | | |
| quartzite | 0.96 | 1.00 | | |
| metabasalt | 0.86 | 0.88 | 1.00 | |
| quartz | 0.94 | 0.93 | 0.88 | 1.00 |

The last two elements considered in the characterization of residual striking platforms (i.e., length and width) are generally linked to flake dimension and are often considered representative of the global dimensions of the flakes. Chert flake platforms have a mean length of 3.54 mm ($\sigma^2$: 0.79; c.v.: 53.58) and a mean width of 1.20 mm ($\sigma^2$: 0.79; c.v.: 65.99). Quartzite flakes have a slightly larger platform: mean length: 4.61 mm ($\sigma^2$: 3.39; c.v.: 73.63); mean width: 1.56 mm ($\sigma^2$: 1.38; c.v.: 89.03). Quartz flakes striking platform are closer to quartzite with a mean length of 4.32 mm ($\sigma^2$: 2.72; c.v.: 63.01) and a mean width of 1.63 ($\sigma^2$: 0.94; c.v.: 58.05). Striking platforms on the metabasalt flakes have greater dimensions: mean length: 13.46 mm ($\sigma^2$: 11.43; c.v.: 84.93); mean width: 4.91 mm ($\sigma^2$: 4.30; v.c.: 87.58). For each raw material, the correlation between length and width of the striking platform shows a tendency to unity (chert: 0.60; quartzite: 0.79; metabasalt: 0.84; quartz: 0.84) indicating interdependency between the two dimensions. This tendency probably would have been similar if the length and width of the flakes had been considered (cf., Wilmsen and Roberts: 1978).

The mean length and width of each raw material were compared to verify if the correlations observed among the various attributes were also reflected in their dimensions (Tables 11 and 12). The coefficients calculated show a moderate to high correlation in both cases. Moderate correlations are found mainly in chert and quartz flakes. This variation could be explained by the absence of large dimension chert and quartz flakes (higher than the 601-800 class), since the ratio between quartzite and metabasalt is close to unity despite the differences observed in the absolute dimensions.

**Table 11. Correlation matrix (striking platform length):**

| | chert | quartzite | metabasalt | quartz |
|---|---|---|---|---|
| chert | 1.00 | -0.47 | -0.57 | 0.59 |
| quartzite | -0.47 | 1.00 | 0.90 | -0.41 |
| metabasalt | -0.57 | 0.90 | 1.00 | -0.60 |
| quartz | 0.59 | -0.41 | -0.60 | 1.00 |

**Table 12. Correlation matrix (striking platform width):**

| | chert | quartzite | metabasalt | quartz |
|---|---|---|---|---|
| chert | 1.00 | -0.48 | -0.38 | 0.32 |
| quartzite | -0.48 | 1.00 | 0.97 | -0.62 |
| metabasalt | -0.38 | 0.97 | 1.00 | -0.64 |
| quartz | 0.32 | -0.62 | -0.64 | 1.00 |

**Bulb of percusion**

The bulb of percussion is the last element recorded for the definition of debitage flakes. Its presence is firmly associated with the force of impact (cf., Speth, 1972) and, to a certain degree, to the malleability of the raw material. The bulb of percussion was described using three intuitive degrees: the bulb is absent or flat; the bulb is visible or diffused; and the bulb is dominant (pronounced) as in the case with the bulbar flakes.

Of the four raw materials discussed in this section, metabasalt is the least malleable and this should be visible in the bulb of percussion frequency by raw material (Figure 25). The relative frequencies show a certain variability between metabasalt and the other three raw materials, but a similar proportion is noted between the absence of a bulb and the presence of a moderate bulb for metabasalt. For the other three raw materials, the proportions are practically identical for all types of bulb. Relatively speaking, the pronounced bulb is as frequent among metabasalt flakes as it is for chert and quartzite flakes. Nevertheless, it is important to note that in the case of metabasalt, prominent bulbs are found on large flakes, while for the chert and quartzite flakes, prominent bulbs are not associated with any particular class. However, the bulb of percussion formation is strictly a technical matter that goes beyond the objectives of this study. Also, contrary to the other raw materials in the collection, metabasalt has never been the object of an exhaustive technical study (cf., Lebel and Plumet, 1991). It would be difficult at this point to extrapolate about the mechanical characteristics of metabasalt flaking. However, for the purpose of this study, there does not appear to be any great difference between the treatment given to metabasalt and the other raw materials that are, by definition, more malleable.

Correlation coefficients calculated for the bulb of percussion reflect at the same time the uniformity between the so-called malleable raw materials and the dichotomy between the two raw material groups, but it also can be observed that, despite an undefined technical differentiation, coefficients measuring the degree of uniformity between metabasalt and any of the other raw material show a positive correlation of moderate importance (Table 13).

**Table 13. Bulb of percussion: Spearman's correlation coefficients:**

| | chert | quartzite | metabasalt | quartz |
|---|---|---|---|---|
| chert | 1.00 | | | |
| quartzite | 1.00 | 1.00 | | |
| metabasalt | 0.50 | 0.50 | 1.00 | |
| quartz | 1.00 | 1.00 | 0.50 | 1.00 |

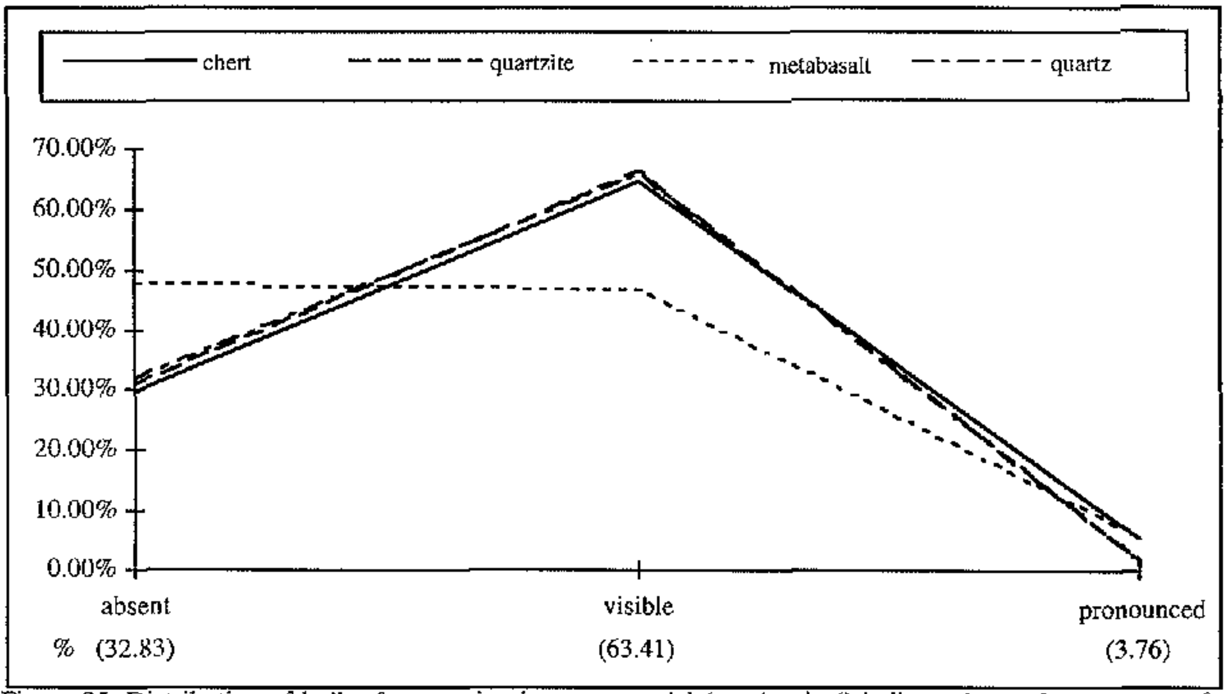



Figure 25. Distribution of bulb of percussion by raw material (number in () indicate the total percentage of each type of bulb encountered).

#### 8.2.1.6 Flake typology: a definition

The attributes and variables discussed above, joined together with complementary observations (i.e., presence of cortex or impurities), served to define an intuitive typology of debitage flakes. Attribution is said to be intuitive since it presupposes a manufacturing stage based on subjective characteristics (Sullivan and Rozen, 1985: 755-756). First, the discussion will be centered on the results of this intuitive typology, and, subsequently, the veracity of this approach will be examined using chert flakes as an example.

Among the six categories identified during the analysis, the bulbar flake is the only one directly associated with the mechanics of debitage (cf., the above discussion on bulb of percussion). Additional observations showed that flakes presenting this particularity corresponded to the reducing category and have therefore been integrated to it. The waste (flakes smaller than 1 $cm^2$) and shatter (undetermined cleavage plane; more than two identifiable surfaces) categories have none of the characteristics attributed to the others, with the exception of the possible presence of cortex or impurities on shatters. For this reason, these categories are not part of the typology as elaborated, but are considered as rejects generally associated with initial core flaking (shatter) or accidental or secondary flaking (waste)[22].

The distribution of the different categories shows a predominance of thinning flakes and the relative absence of edge trimming flakes for all types of raw materials (Figure 26). Reducing flakes have a low frequency for chert, quartzite and quartz, while they comprise a large proportion of the metabasalt flakes. Chert and quartz are more frequently attributed to waste and proportionally less to shatter; the opposite holds true for quartzite and metabasalt. Table 14 shows a relatively high positive correlation between the various raw materials for each category, except for the chert/metabasalt coefficient, which shows a moderate to low correlation.

By observing the results of this typology, it is noticable that thinning is by far the predominant manufacturing stage for all raw materials. The relative absence of flakes belonging to the <u>reducing</u> category, especially for chert and quartzite flakes, corroborates the hypotheses put forward in the discussion on cores. This situation would be representative of an initial core preparation in another location. However, the presence of waste and shatter also indicates that a complete or partial reduction of cobbles or nodules would have taken place on the site, but practically no remains of these cores were recovered. The high number of reducing flakes and shatters in metabasalt are consistent with the presence of several cores of this raw material.

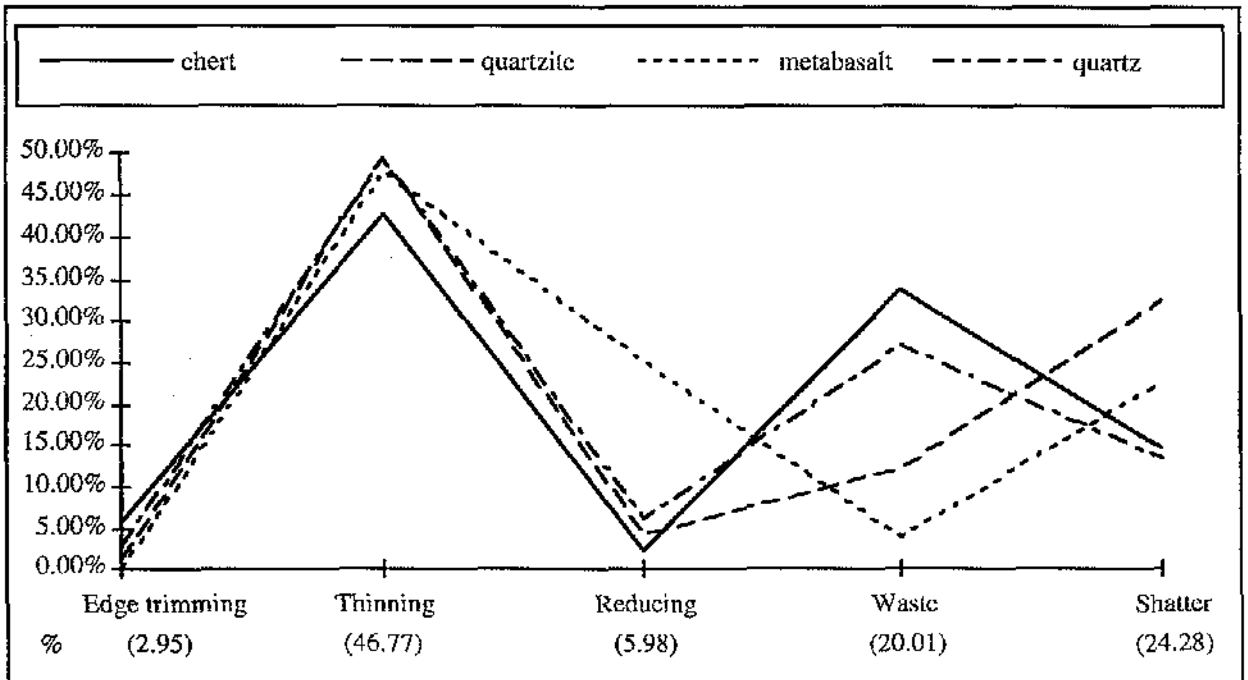



Figure 26. Distribution of flake category by raw material (number in () indicate the total percentage of each category).

22 When a flake is removed from a core, secondary flaking regularly break off of the core or flake.

**Table 14. Categories: Spearman's correlation coefficients:**

| | chert | quartzite | metabasalt | quartz |
|---|---|---|---|---|
| chert | 1.00 | | | |
| quartzite | 0.80 | 1.00 | | |
| metabasalt | 0.30 | 0.70 | 1.00 | |
| quartz | 0.90 | 0.90 | 0.60 | 1.00 |

As discussed earlier, the lithic tool kit is of little importance for both completed tools (fragmentary or not) and preforms. At the same time, edge trimming flakes are as infrequent which shows that final tool manufacturing was not an important activity for the occupants of area A at the IcGm-4 site. This aspect will be discussed in more detail in the section on activity areas.

Regardless of the tools, there is some uncertainty about the validity of flake typology. These questions being amply discussed by various authors (cf., Sullivan and Rozen, 1985), the present discussion will concentrate on verifying the validity of the typology used in this study.

The attributes and variables that served in defining the types of chert flakes have been grouped together and submitted to a cluster analysis (i.e., nearest neighbour analysis). This analysis defines groups of data based on their similarities or dissimilarities (cf., Read, 1982: 64 and foll.), in reality forming a typology based on the distance between the frequency of the various attributes and variables. Four series of clusters were obtained, but only the two levels that are considered most pertinent are presented.

The first test was done without defining a pre-established number of groups. The results show that all data clustered statistically into two groups of flakes (Table 15). Both groups incorporate elements from the four intuitive categories, including the bulbar flakes, used during data compilation (Figure 26).

**Table 15. Redistribution of categories into two groups (nearest neighbour analysis)**

| Groups | 1 (%) | 2 (%) | Total categories (%) |
|---|---|---|---|
| **Categories:** | | | |
| Edge trimming flake | 55 (10.36) | 16 (3.01) | 71 (13.37) |
| Thinning flake | 252 (47.46) | 183 (34.46) | 435 (81.92) |
| Reducing flake | 9 (1.69) | 13 (2.45) | 22 (4.14) |
| Bulbar flake | 1 (0.19) | 2 (0.38) | 3 (0.56) |
| **Total groups (%)** | 317 (59.70) | 214 (40.30) | 531 (100.00) |
| **$\chi^2$: (Pearson): 13.97** | **(df: 3)** | **dissimilarity index: 4,75** | |

For the second test, four statistic groups were pre-defined (Table 16). Again, the four groups obtained comprise elements from all four inuitive categories, without any concordance with the results presented above (Figure 26).

**Table 16. Redistribution of categories into four groups (nearest neighbour analysis)**

| Groups | 1 (%) | 2 (%) | 3 (%) | 4 (%) | Total categories (%) |
|---|---|---|---|---|---|
| **Categories:** | | | | | |
| Edge trimming flake | 56 (10.55) | 10 (1.88) | 5 (0.94) | 0 (0.00) | 71 (13.37) |
| Thinning flake | 243 (45.76) | 77 (14.50) | 90 (16.95) | 25 (4.71) | 435 (81.82) |
| Reducing flake | 9 (1.69) | 7 (1.32) | 6 (1.13) | 0 (0.00) | 22 (4.14) |
| Bulbar flake | 1 (0.19) | 0 (0.00) | 2 (0.38) | 0 (0.00) | 3 (0.56) |
| **Total groups (%)** | 309 (58.19) | 94 (17.70) | 103 (19.40) | 25 (4.71) | 531 (100.00) |
| **$\chi^2$: (Pearson): 292.68** | **(df: 16)** | **dissimilarity index: 6.16** | | | |

Some doubts arise from these preliminary results about the quality and pertinence of debitage categories used during the analysis, but at this stage, they don't entail the elaboration of new elements that could define a typology or, more generally, a less intuitive approach. This exercise would necessitate a much more detailed analysis. Nevertheless, the results show that the attribution of flakes to pre-defined debitage categories is mainly a question of intuitive perception based on the similarity or dissimilarity of certain key elements. In the present case, these elements are represented mainly by the characteristics of the striking platform. Statistical test results also show that these characteristics have a tendency to merge, thus showing the inherent weaknesses in this type of intuitive approach, where the information, once compiled, is lost in the multitude. In this context, what really defines edge trimming, thinning or reducing flakes? According to the test results, nor the striking platform and its various constituents, nor the bulb and the class of dimension are sufficient to associate the flake with a specific manufacturing stage. It's the occurrence of certain of these attributes joined with the perception of these "types" by the analyst that shape each category of flakes.

Independently of these theoretical considerations, it appears evident that the debitage of these raw materials involved only certain specific tasks in tool manufacturing, particularly the preparation of preforms, which are easier to transport than blocks of raw materials (cf., Ericson, 1984).

### 8.2.2 Specialized techniques: slate and soapstone manufacture

The treatment of slate and soapstone presents characteristics associated both with direct percussion manufacturing and with techniques clearly adapted to handling these two fragile materials. The slate tool manufacturing sequence that was elaborated above to analyse the IcGm-3 lithic collection will be applied to the slate tools and by-products of the IcGm-4 site collection. Besides, the basics of this sequence were originally applied to the slate objects recovered on this site in 1979-80 (cf., Weetaluktuk, n.d.). As for the techniques involved in the manufacture of soapstone vessels, they will be examined mostly from the perspective of the by-products that are available in large quantity (n: 8,541), but the analysis will consider also the technical information present on the complete or fragmentary soapstone objects.

The inclusion of nephrite at this stage of the analysis serves two purposes. First, the few nephrite objects in the collection are polished, thus implying essentially the same manufacturing technique used for slate tools and soapstone vessels. Secondly, almost all of these objects are burin-like tools, which are essential elements used in the manufacture of slate and soapstone objects.

#### 8.2.2.1 Manufacturing tools

Nephrite objects include an adze and five burin-like tools (Plate 5, A to E). Each of these objects is entirely polished and no flake scars have been observed. In effect, except for post-depositional fracture or use wear, the surfaces of these objects are plain. The rigor in the manufacturing of these tools is presumed to have had a functional importance, since nephrite, in its natural state, is a crude and coarse material.

The burin-like tools have a mean length of 20.58 mm ($\sigma^2$: 7.26; c.v.:35.30), a mean width of 12.58 mm ($\sigma^2$: 2.34; c.v.: 18.64) and a mean thickness of 4.50 mm ($\sigma^2$: 2.08; c.v.: 46.32). Variations observed, especially for the length, are due to one of the burin-like tools, which measures only 8.00 mm in length (Plate 5, E). One of these burin-like tools has bilateral notches, while the others exhibit no modification for hafting, with the exception of the small burin-like tool, which possess three parallel notches cut into its proximal part. The latter is apparently unique of its kind. It is plausible to assume that this modification of the proximal extremity must have facilitated hafting.

A sixth burin-like tool is part of the lithic collection. Oddly, this tool was made in a soapstone flake, even though the friability of this raw material does not seem to be appropriate to the function of this type of tool. Its dimensions (26.70 x 16.10 x 5.60 mm) are similar to the dimensions of the nephrite burin-like tools. It also has bilateral notches. Its distal extremity is fractured, but it is impossible to determine whether this fracture occurred during manufacture, use or if it was post-depositional.

Within the context of the IcGm-4 site, burin-like tools were used for specific tasks, such as grooving to prepare the slate preforms (Weetaluktuk, n.d.) and hollowing-out soapstone vessel preforms (Plumet, 1985: 383, Appendix 1). The adze and the end scrapers could be used also for the vessel preparation. End scrapers could have been used also for thinning the external surface of the vessels (Plumet, 1985: 383, Appendix 1).

The final polishing of soapstone vessels seems to have involved the use of an abrasive material such as sand, rather than an abrader as demonstrated by the striations observed on some fragments (cf., Linnamae, 1975: 165). The same principle could have been applied to slate tool finishing, although in this case, there are no striations indicating that an abrasive was used.

#### 8.2.2.2 Slate: debitage by-products

The main characteristics of slate flakes are presented in Figure 27. The majority of these flakes is of small dimensions, 82% of them belonging to the <u>≤50</u>, <u>51-100</u> and <u>101-200</u> classes (Figure 27A). In fact, the proportions observed in the classes of dimension are similar to those of chert, quartzite, metabasalt and quartz by-products.

Remains of the striking platform treatment is visible on 44% of the slate flakes (Figure 27B). The majority of these platforms is generally fractured (n: 160; 74.42%), followed by striking platforms with multiple treatment (n: 27; 12.56%). Other types of treatment are rather marginal. Two flakes have polished platforms.

The form of the striking platform (n: 56; 11.57% of total flakes) is variable, but biconvex (n: 21; 37.50%) and irregular (n: 15; 26.79%) striking platforms are largely dominant (Figure 27C). Only a few slate flakes (n: 15; 6.98%) have a bulb of percussion. The observation of this technical characteristic on slate flakes is remarkable considering the nature of this raw material.

The identification of these different characteristics associated with direct percussion led to the elaboration of debitage categories (Figure 27D). With the exception of a new category (<u>other</u>), which incorporates essentially the same characteristics as polished fragments, but on a smaller scale, the terminology defined here is identical to the one used for raw materials where direct percussion dominates. Among these categories, shatters (n: 179; 36.98%) dominate, followed by thinning flakes[23] (n: 159; 32.85%),wastes

[23] This term is more or less adequate in the present context since it isn't, strictly speaking, thinning. However, this term is kept since a more appropriate one is lacking.

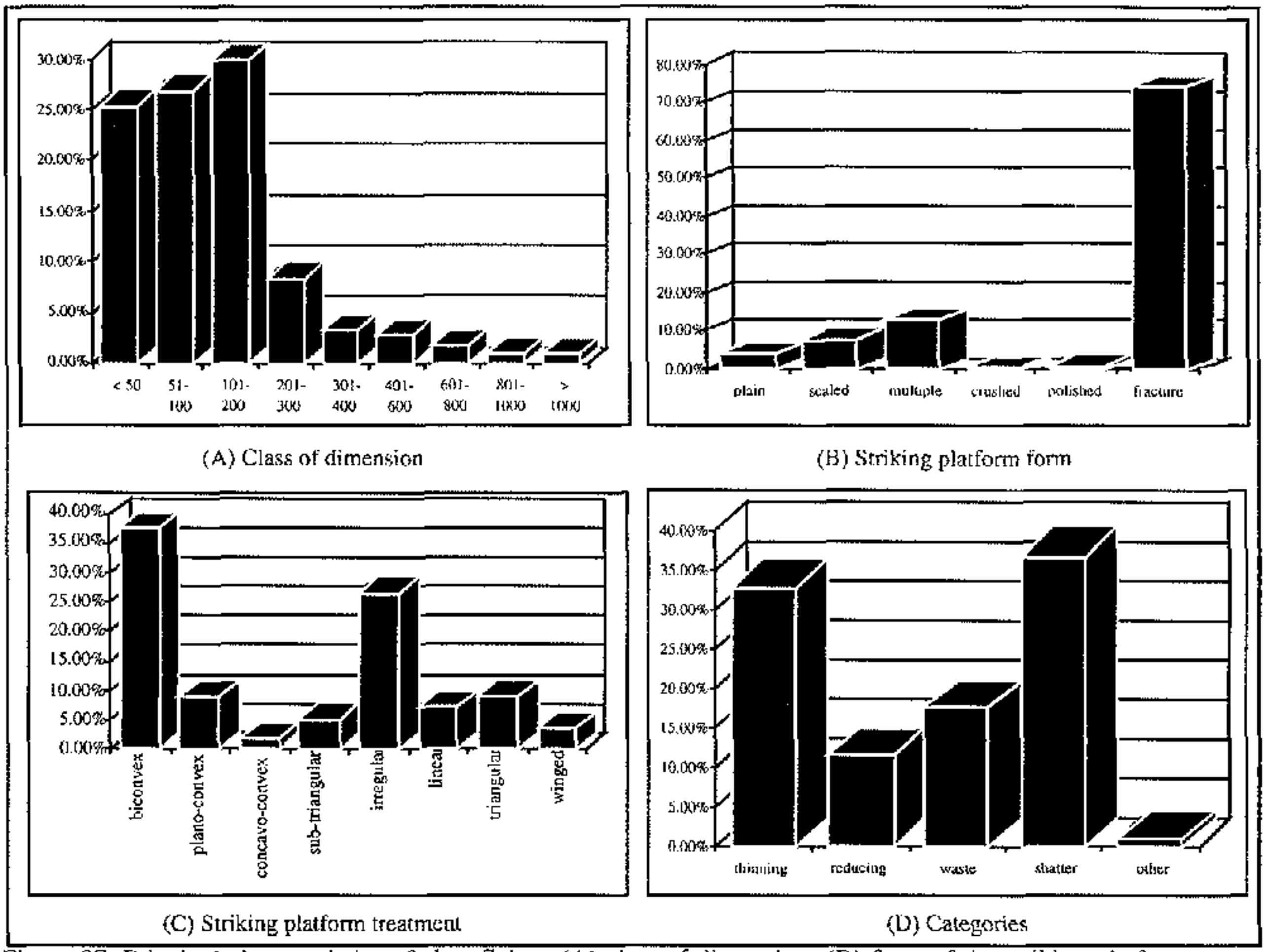


Figure 27. Principal characteristics of slate flakes: (A) class of dimension; (B) form of the striking platform; (C) striking platform treatment; (D) Debitage categories.

(n: 85; 17.56%), reducing flakes (n: 56; 11.57%) and the category <u>other</u> (n: 5; 1.03%).

Considering the high number of striking platform fractures, only 12.64% (n: 55) of slate flakes could be measured. These platforms have a mean length of 8.01 mm ($\sigma^2$: 5.49; c.v.: 68.51) and a mean width of 2.02 mm ($\sigma^2$: 1.88; c.v.: 93.04). A coefficient of $R_p$: 0.71 was calculated for the length-width ratio.

The majority of these flakes is clearly associated with the preparation of slate cores, prior to cutting the preform (i.e., shatter, waste, reducing flakes and possibly a part of the trimming flakes) or to lateral edge modifications once the preform is removed from the core (cf., Figure 12). In general, it is difficult to distinguish precisely the manufacturing stages from most of these flakes, since this technique is known only from what can be infered from the remains collected on the IcGm-4 and 3 sites, and, of course, from the comments made by Daniel Weetaluktuk (n.d.). This technique needs to be experimented in order to understand all its implications. However, some flakes show traces of modification not related to flaking, which indicate clearly the use of direct percussion even after polishing was started. A part of these flakes (n: 20) has polishing marks on their dorsal surface (n: 17) as well as on the striking platform (n: 2). Three others also have a groove visible on the dorsal surface. The five flakes in the category other are in fact polished fragments of small dimension and have no indications of a striking platform.

#### 8.2.2.3 Slate tools

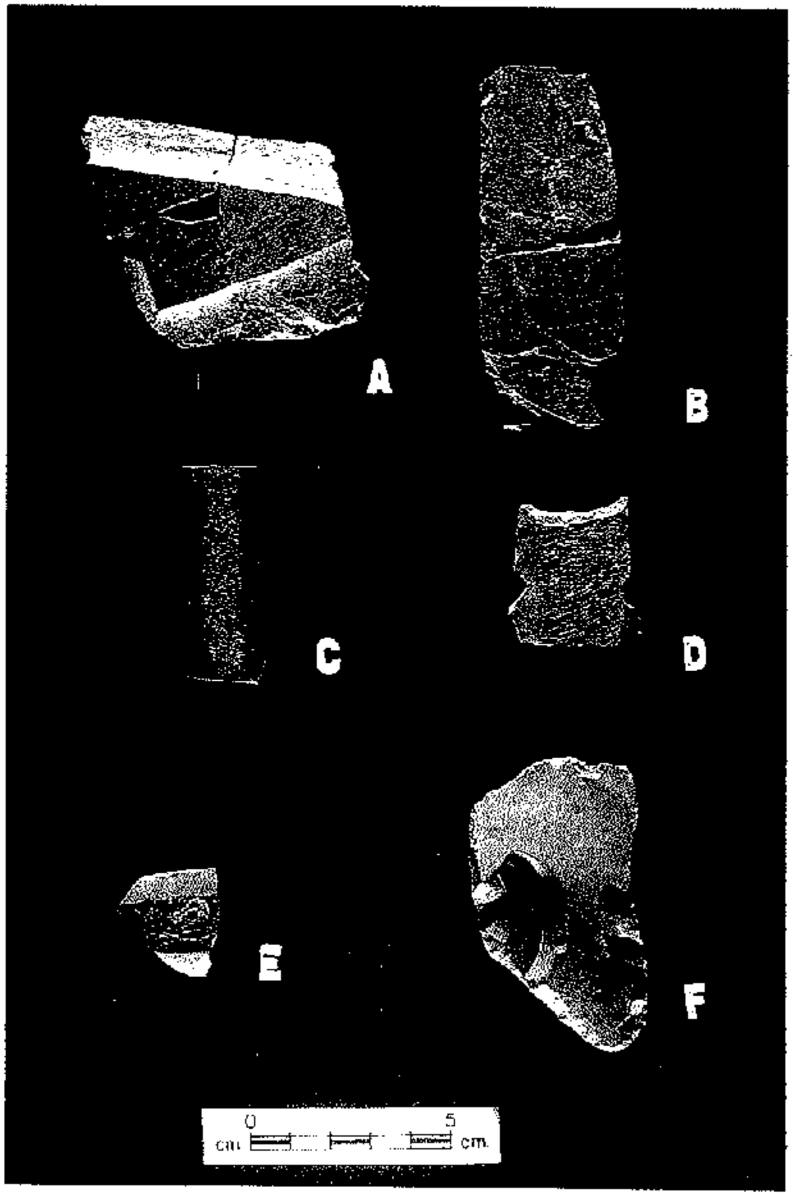
A total of 66 polished slate tools were recovered, comprising 19 knives representing various stages of manufacture, a knife preform (?), two points, two objects of undetermined function, forty-two polished fragments and one core (Plate 8, A). Most of these objects are fragmentary, but traces of manufacturing (i.e., groove, polishing marks, etc.) have been observed on some specimens, thus facilitating the study of the technical procedures used by the craftsmen.

Of the 19 polished knives recovered, only two are considered to be complete, seventeen have varying degrees of fractures and one is too fragmentary to be included in this analysis (Plate 5, I and J; Plate 7, B to E; Plate 8, B to D). Given the condition of this sample, our discussion is essentially limited to the metric variables (i.e., length and width) and to a few general considerations about the technical process associated with some of these specimens (i.e., hafting and lateral edge modifications and the general morphology).

The knives have a mean width of 21.53 mm. The standard deviation (8.97) and the coefficient of variation (41.67) indicate great individual variation. The mean thickness is 4.16 mm with a standard deviation of 1.57 and coefficient of variation of 37.78. The standard deviation indicates that there is no great deviation in the thickness of these knives, but the coefficient of variation indicates significant individual variation, although in this case it is easily explained by the limited number of objects considered[24]. A correlation coefficient ($R_p$: 0.52), calculated for the Width/Thickness ratio, indicates a moderate association between these two variables, although this is probably due to the smallness of the sample.

More than two thirds (68.42%) of these specimens do not have a proximal extremity. Of the remaining objects, only four exhibit a particular modification of the base.

[24] This observation will become more obvious in the presentation of polished fragments.




(Photo. Marc Laberge, Vidéanthrop inc.)

Plate 7. Preform (A) and polished knife fragments in slate (B to E) and one retouched flake, IcGm-4 site.

These modifications are side-notched (n: 3) or corner-notched (n: 1). Their location notwithstanding, these notches are all U-shaped and are wider than deep. For the side-notched, height (in relation to the base) varies between 6.50 mm and 22.80 mm.

The lateral edges observed on the knive fragments are generally symmetrical, straight and parallel. Exceptions are a few asymmetrical specimens with convex or irregular edges and with convergent or divergent configurations. Edge angles vary between 25° and 45°. When present, the distal extremity is concave or straight, while the proximal extremity is straight.

Some specimens possess traces of manufacturing and two of them exhibit grooving: in one case, the grooves are located on the lateral edges (preform ?); the other has a groove across its dorsal surface. A last specimen has a residual striking platform. More than half the knives (n: 10; 52.63%) are polished bifacially, three (15.79%) are partially bifacial, two (10.53%) have a unifacial treatment and three (15.79%), have polishing dispersed over both surfaces. Lateral edge flaking is relatively unimportant, although it is marginally present on some specimens, but intensive in only one case. The latter, and possibly a few others, could represent various stages in knife manufacturing.

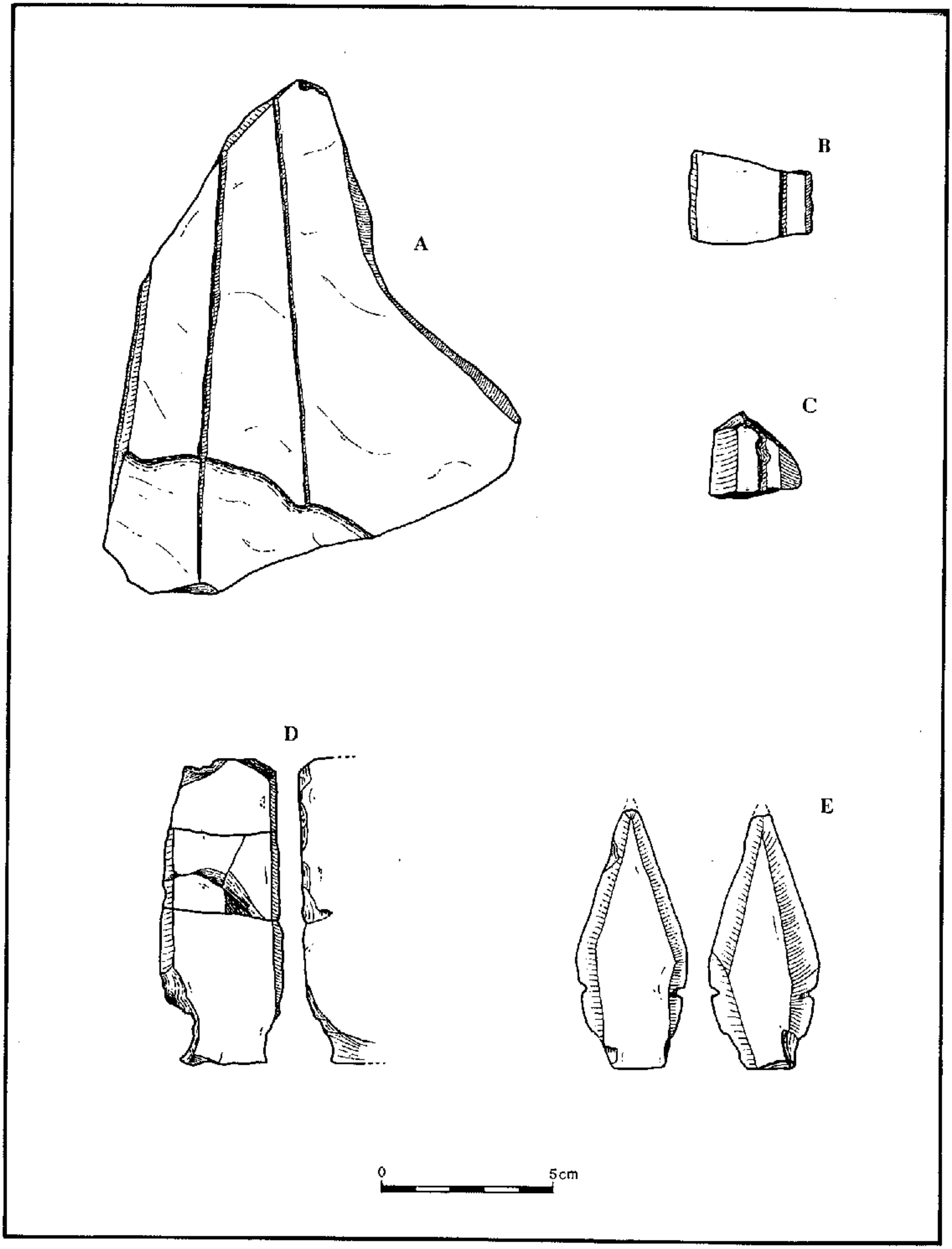
Both points present in the collection are complete and one of them has bilateral notches (Plate 8, E). However, none of these objects exhibit traces of manufacturing other than the notches and the final bifacial polishing of the edges and of the extremities.

The two objects of undetermined function were treated the same way as the knives and points. In the first case, the object is complete and polished bifacially. Its lateral edges are at 90°, and, according to its general morphology, it has been suggested that it could be a burin-like tool, but its thickness (3.40 mm) and the absence of a burinated edge does not really support this hypothesis. The second object is a distally incomplete fragment with two bilateral notches. It could be a point or a knife abandoned during manufacture.

The preform recovered (Plate 7, A) clearly illustrates the slate tool manufacturing technique. This object is a mesial fragment polished on a single surface, whose two edges were burinated (?) and polished thus forming two large concavities diverging from the center of the piece. The core (Plate 8, A) is also revealing as concerns the manufacturing techniques. Two more or less parallel grooves have been burinated delineating a preform.

The polished fragments (n: 42) constitute a rather difficult category to define, but can only be linked to the manufacturing of slate tools. More than two thirds of these fragments are unifacially polished, the others being polished bifacially or partially bi-

Plate 8. (A) "Core", (B, C and D) polished knives and (E) polished point, IcGm-4 site.



facial. Considering the intrinsic characteristics of these fragments and of the raw material itself, the identification of the worked surface on unifacial fragments is rendered difficult given the absence of specific elements that would permit to distinguish the dorsal from the ventral surface (i.e., absence or presence of a bulb of percussion, percussion waves, flake scars, etc.). However, in cases where some of these elements are visible, 47.62% (n: 20) of the unifacial fragments appear to have been polished on the dorsal surface. Moreover, one of these fragments has a groove cut into this same surface.

Save for the thickness, the dimensions are insignificant since the origin of all fragments is unknown, with one exception. The latter is a fragment removed from a bifacial tool. Figure 28 shows the mean thickness associated with each variant of polishing. These observations demonstrate that the unifacial fragments are slightly thinner than the bifacially polished fragments. This tendency may be significative. With a mean of 1.93 mm, the unifacial fragments are statistically closer to the slate flakes (2.02 mm), while the bifacially polished fragments are slightly thicker (2.40 mm), but still inferior to the mean thickness of the various slate tools in the collection. The predominance of unifacial polishing is a good indication of their origin. Since some flakes show similar characteristics, it is suggested that these fragments were either intentionally or accidently removed during the initial polishing of the preforms. Despite their relative thinness, the bifacial fragments could represent a later stage of manufacturing, when the preform has more or less reached its definitive form. In this case, the fracture is probably accidental and the preform was abandoned.

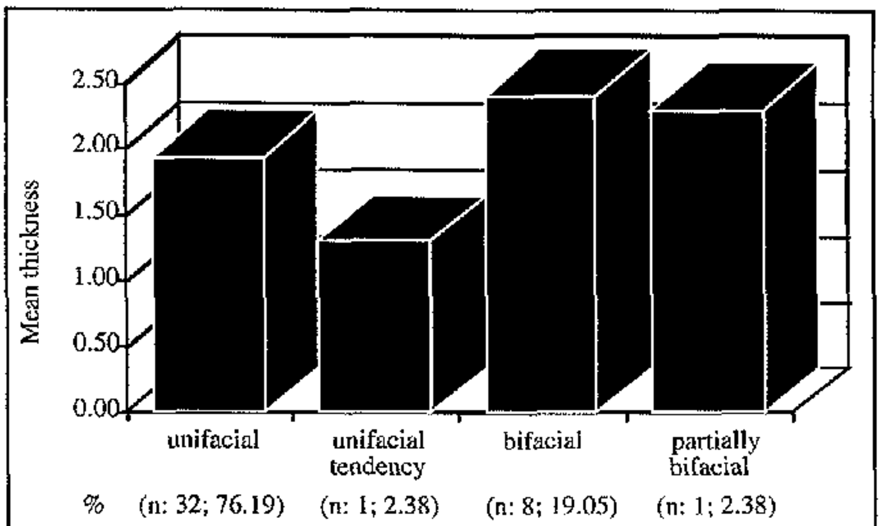


Figure 28. Mean thickness frequency distribution of polished fragments.

The various stages identified in the manufacturing of slate objects complete the data recovered in Structure 2 of the IcGm-3 site. The important similarity between the techniques also implies a certain continuity between the Dorset and Thule periods as concerns the manufacturing of polished tools. However, many questions still remain, particularly concerning the polishing technique and the breakage of objects during polishing. The manufacturing stages illustrated in Figure 12 are general and have a few gaps that will be resolved only with the addition of supplementary.

#### 8.2.2.4 Soapstone

The collection of soapstone objects from the IcGm-4 site is comprised mainly of vessel fragments (n: 136), a few lamp preforms (n: 5), completed, but fragmentary lamps (n: 5), a bowl fragment, two wound plugs, a boot creaser, a polished fragment of undetermined function and four fragments of the same bowl belonging to the historic period. The latter is not included in the analysis, but is described in detail in Appendix IV. The collection is completed by 8541 by-products.

#### 8.2.2.5 Debitage by-products

Contrary to slate, soapstone manufacturing has been the object of some technical studies, especially as concern the final stages of manufacture (Linnamae, 1975; Archambault, 1979; 1980; Plumet, 1985: Appendix 1), but the by-products associated with this raw material have never been discussed in detail. The collection from area A of the IcGm-4 site offers an excellent opportunity to explore this facet of soapstone object manufacturing. Figure 29 summarizes the characteristics of these flakes. It must be noted that for all of these attributes, with the exception of categories, only a small percentage of flakes possesses striking platforms or other elements related to manufacture.

Flakes with indication of direct percussion count for 19% of the collection. Figure 29A shows that most of them are of small dimensions. The striking platform has various forms, but is generally biconvex or irregular (Figure 29B). Often, the striking platform is unprepared or belong to the <u>multiple</u> category (intentional and/or accidental). The large proportion of fractured platforms is undoubtedly the result of the fragility of the raw material (Figure 29C). As was the case with slate, bulbs of percussion have been observed on some soapstone flakes (Figure 29D). They are visible (n: 81; 27.55%) or pronounced (n: 14; 4.76%). In general, the platforms are almost three times longer ($\mu$: 11.15; $\sigma^2$: 7.42; c.v.: 66.60) than wide ($\mu$: 4.65; $\sigma^2$: 3.84; c.v.: 82.48).

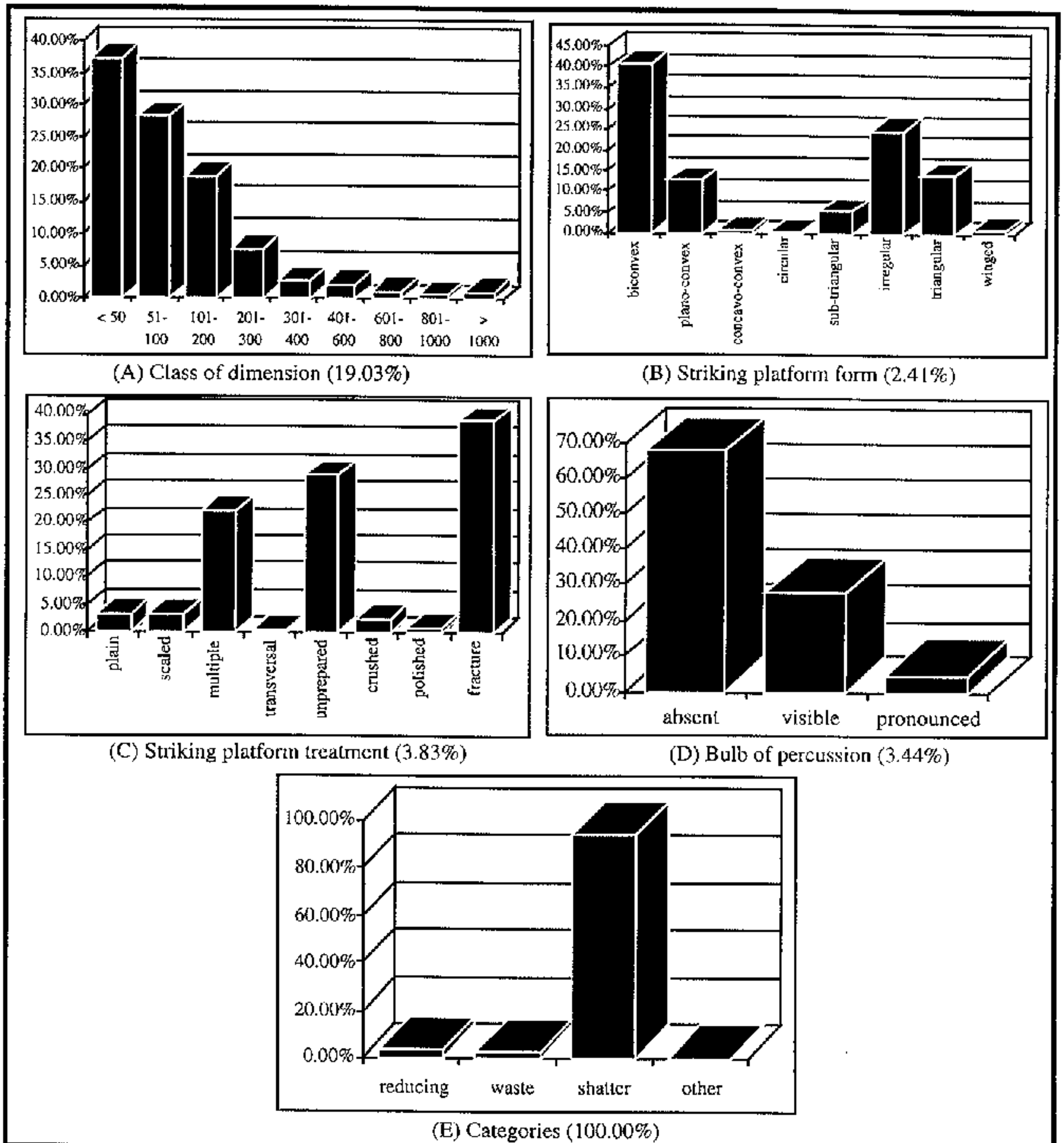



Figure 29. Principal characteristics of soapstone flakes. (A) Dimension Classes; (B) Striking Platform Shape; (C) Striking Platform Processing; (D) Percussion Bulb; (E) Categories (the numbers in parentheses indicate the percentage of the soapstone flake collection on which these attributes could be seen).

The various characteristics considered, allowed the definition of three flake categories and an <u>other</u> category (Figure 29E). Shatter (n: 8034; 94.07%) and waste (n: 175; 2.05%) are associated to core pulverization or to secondary flaking of the worked surface. However, their production does not only reflect the initial reducing stage. Some of them could result from the hollowing out of a vessel in the making (Archambault, 1985: 383-384), but there is no way to determine the origin of shatter and waste to one manufacturing stage or another.

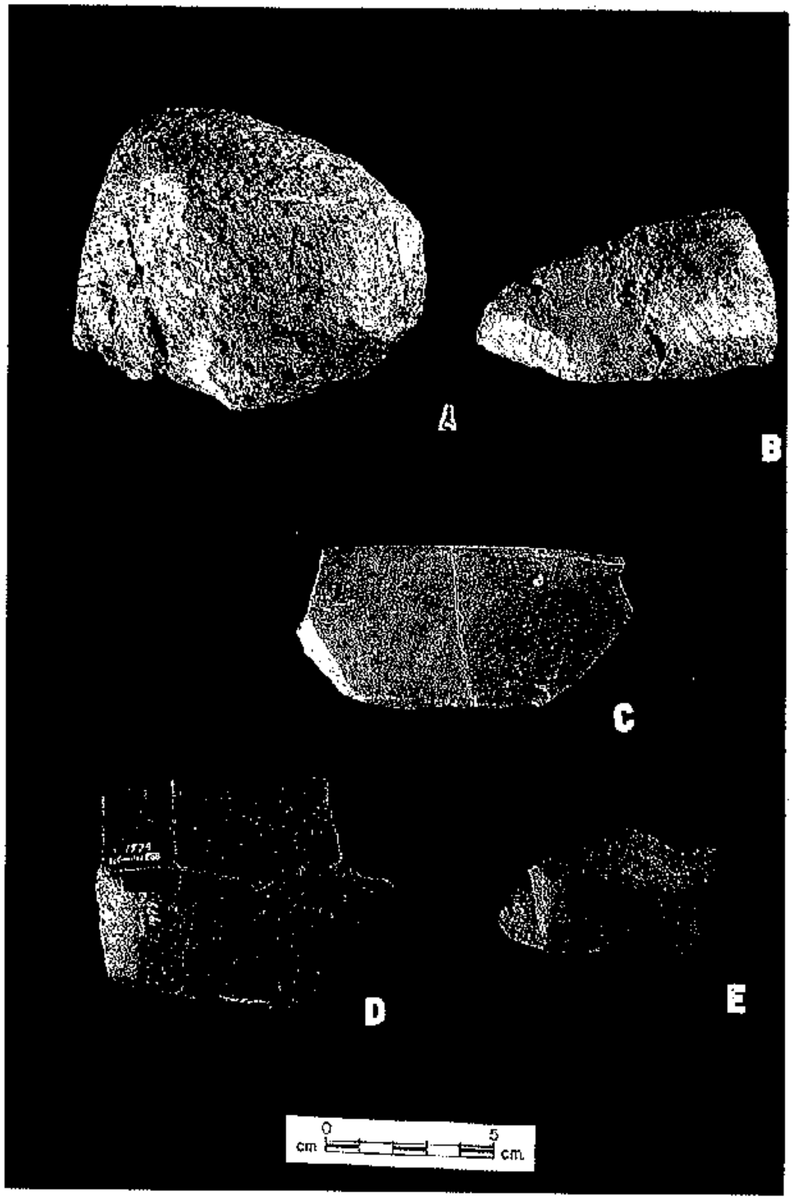
Reducing flakes (3.83%) are associated with the initial manufacture of soapstone cores and with the shaping of the external surfaces of the vessel. The large proportion of fractured or unprepared platforms indicates that this activity did not require any special attention. Other types of treatment visible on the striking platform are linked essentially to accidental occurrences (i.e., scaling, crushing or multiple). The few indications of intentional preparation (i.e., plain, polished or multiple) are not really significant, except for platforms exhibiting traces of polishing. The latter (n: 3), as well as the presence of polishing traces on some flakes (n: 39) and traces of end scraper used in thinning the dorsal surface (n: 11), suggest that flaking by direct percussion was used after the initial polishing of the external surfaces when the craftsman was not satisfied with the results. The category other is comprised exclusively of polished fragments (vessels?) too small to provide any morphological or technical information.

#### 8.2.2.6 Soapstone vessels and other objects

There are very few finished soapstone objects. The collection is mostly made up of vessel preform fragments (Plate 9). The few complete, or presumably completed but fragmentary objects are described in Appendix IV. In general, most of these objects or fragments are related to manufacturing rejects. Exceptions include eleven vessel fragments (lamps?) and one corner fragment of a lamp that show traces of carbonized grease on the external and/or internal surfaces. In the cases where the provenience of these fragments is more or less well known, it appears that they were recovered near a combustion area.

Vessel fragments are dominated by body fragments, followed by rim fragments (Figure 30). The other types of fragments are somewhat marginal and comprise corner/body fragments or undetermined fragments. Most of these fragments have a surface area greater than 1000 $mm^2$ (Appendix IV).

Almost half the body fragments (48.45%) exhibit manufacturing scars; the others have a crude appearance, which undoubtedly indicates a less advanced stage of manufacturing. Manufacturing scars are mostly represented by polishing marks (n: 47) on the external surface (n: 11), on the internal surface (n: 4) or on both surfaces (n: 32). Grooves were also observed on four fragments (two dorsal and two ventral). Four other




(Photo. Marc Laberge, Vidéanthrop inc.)

Plate 9. Soapstone lamp and vessel fragments (A to E), IcGm-4 site.

fragments show end scraper marks underlying the polishing. Only one of the corner/body fragments and two of the undetermined fragments show polishing marks.

More than half the rim fragments have polishing marks on both surfaces, except for one specimen that was polished on the external surface only. Two of these fragments were also grooved immediately underneath the rim; in one case it is external, and the other is internal. Two large fragments also have end scraper marks. These rim fragments are of three types: bevel, flat or rounded. The bevels are external (n: 5) or external and internal (n: 9); the flat rims are (n: 11) are polished at right angles with

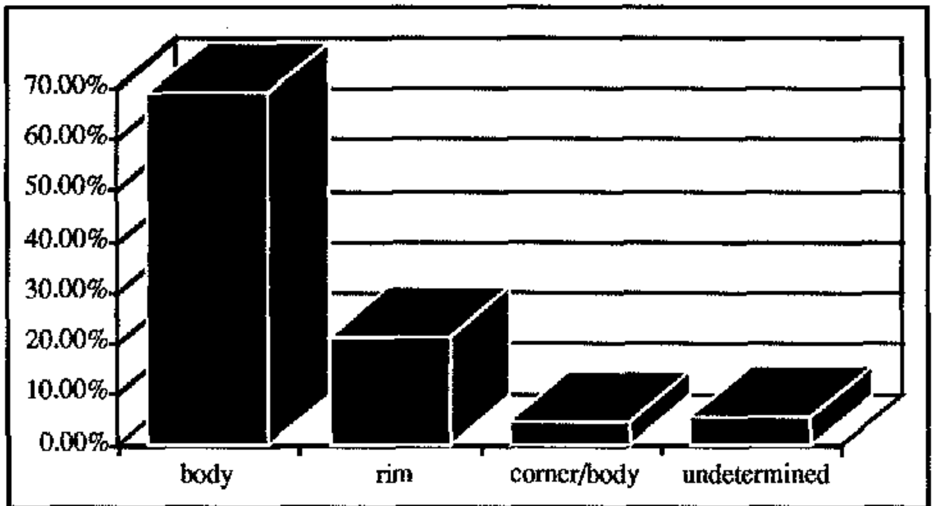


Figure 30. Frequency of various soapstone vessel fragments.

the body, except for one fragment that was bevelled on the external surface just underneath the rim; four other fragments are rounded, including, possibly, a miniature lamp fragment. The rim thickness varies from 2.40 mm to 10.50 mm ($\mu$: 6.87 mm; $\sigma^2$: 2.10). Thin sides (i.e., equal or inferior to 1 cm) are generally associated with lamps (Plumet, 1985: 382, Appendix I).

By considering all fragments along with the "completed" lamps, it appears that the angular form (rectangular tendency) is predominant. This constant is also suggested by the two preforms, which were barely worked (Plate 10). In fact, only one lamp has an ovoid shape.

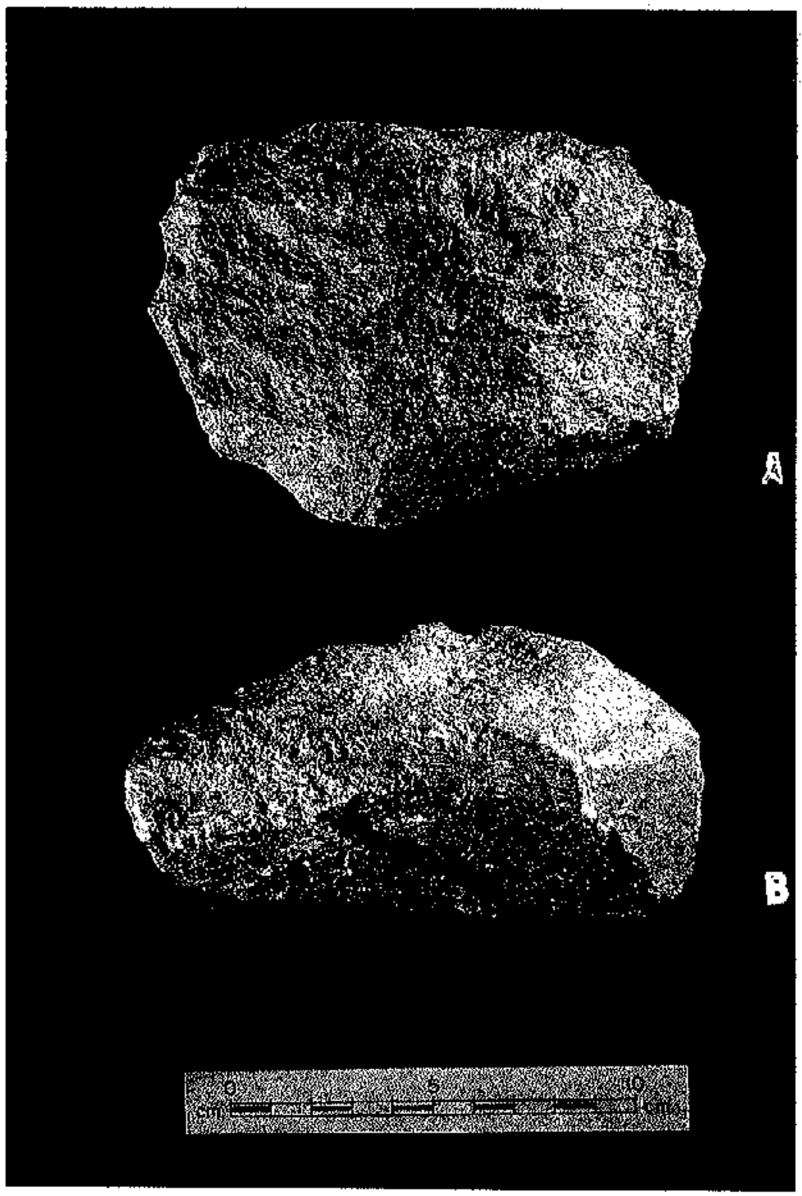
Several elements of this collection reveal the procedure used in the manufacture of soapstone vessels. First, the presence of a workshop for soapstone vessels manufacture in area A of the IcGm-4 site, leads to believe that the source or sources for this raw material had to be situated at proximity. Secondly, the absence of large blocks or of shattered blocks suggests that the cores transported onto the site had been already reduced and fashioned into preforms.

A few soapstone quarries are known in the immediate vicinity of the site. The closest is situated to the northeast a few hundred metres upstream (T. Weetaluktuk, personal communication). However, this quarry was probably unavailable at the time of the occupation, since it is situated at an altitude of about 5 m. The isostatic rebound rate being unknown for the Inukjuak region, it is possible that future research in this direction may lead to a different conclusion. Two other quarries are located on the eastern shore of the river, close to Inussualuk hill, a little more than a kilometer from the site. They were intensively exploited after the permanent installation of the village and are exhausted today. Linking the soapstone from the IcGm-4 site to these two sources would require a petrographic analysis, but since the latter is lacking, it can only be presumed that the quarry exploited at the time of the occupation had to be located close by.

The two complete preforms (Plate 10) could be representative of the shape and dimensions of blocks transported from the quarry. The upper surfaces are cut at right angles, without any other trace of modification (cf., Plumet, 1985: 399, Appendix 1, Plate 61, photos. 115-156 to compare the shape and treatment of the blocks). Conversely, scraper marks can be observed on the exterior walls and on the bottom of the vessels, hence their outer shape is perceivable. Other examples of this type of preform show that work was done on the external surface prior to the hollowing out the interior (Plumet, 1985: 383, Appendix 1), suggesting that the shaping of the exterior walls is done before the interior. Most debitage flakes are linked to either of these tasks. First, the exterior walls are crudely shaped by direct percussion and, afterwards, the walls are regularized with an end scraper or an object of similar function. Some flakes with polishing traces or end scraper marks show that it was also possible to make adjustments on the external surface by direct percussion. The internal surfaces of many fragments seem to indicate that a burin-like tool was used in the preparation of the concavity (Plumet, 1985: 383-384, Appendix 1), but no immediately identifiable evidence of its use could be found amongst the pulverization shatter. The force of the pressure applied for shattering could explain the absence of such marks.

Vessel polishing generally begins on the exterior walls, followed by the rim and the interior surface (Plumet, 1985: 383-384, Appendix 1). However, the IcGm-4 site collection comprises a few exceptions to this sequence of manufacture. Some crude external wall fragments show the beginning of a polished rim; other fragments are polished on the rim and internal surface, but not on the external walls. There does not appear to be then any specific "model" applied to vessel manufacture.

The few vessels considered completed, as well as most rim fragments, have generally uniform polished surfaces. Conversely, many fragments have barely rough-




(Photo. Marc Laberge, Vidéanthrop inc.)

Plate 10. Lamp preforms (A and B), IcGm-4 site.

hewn internal and/or external surfaces. This difference in the intensity of work on the various pieces of the collection indicates that a large number of preforms were fractured during an early stage of manufacture. Furthermore, fragments showing a more "complete" aspect were not necessarily used before the fracture occurred. As mentioned earlier, very few of these so-called "completed" objects exhibit traces of carbonization.

## 8.3 The IcGm-4 site (Area A): activity areas

Area A of the IcGm-4 site is poor in structural elements, which comprise only one tent ring (Structure 8) and one axial feature (called Structure 9). Nevertheless, the distribution of the lithic specimens and hearths allowed for the identification of other activity areas related to raw material workshops. The data available on the stratigraphic context being of little significance, the components of these various activity areas are considered to represent a synchronic occupation of the site. Radiocarbon-dating obtained from the charcoal sample collected in F 1 is the only element that could permit to make a temporal distinction of the occupations, but the proximity of this sample to the one recovered in E 1 and the similarity between the latter date and the one from H 2, suggest, with reservations, that the sample from F 1 was probably contaminated.

Five combustion areas or hearths were identified in area A of the IcGm-4 site. The first is associated with Structure 8 (V-W 2; Figure 14); one other is indirectly linked to Structure 9 ( 32-33; Figure 13). A third was observed in the NW and SW quadrants of W 34 (Figure 13). Square metres E-F 1 and H 2 from Weetaluktuk's excavation revealed the last two concentrations. These occupation traces appear to be very significant in the identification of the various activity areas since, with few exceptions, they correspond to the concentrations of the lithic by-products.

Structure 8 (Figure 14) is relatively poor in terms of lithic specimens. All are concentrated in the immediate perimeter of the combustion area. Chert, quartz, metabasalt and slate flakes are rare (less than 20 specimens in all). Soapstone flakes (n: 90) are located almost exclusively in the two square metres adjacent to the combustion area, and, with few exceptions, all these flakes are shatters. The few tools recovered come also from the center of the structure (Figure 14), and include a fragmentary lamp with traces of combustion and a body fragment. The other tool categories represented comprise microblades, knives and polished fragments, a preform fragment, one chipped point and one used flake. These data suggest a short-term occupation where tool manufacturing appears unimportant, except for soapstone, which is, despite all, marginal and possibly limited to the manufacture of one vessel preform. Given the proximity of this structure to the central zone, a direct association between both occupations is suggested; Structure 8 would then represent a domestic area where few manufacturing activities were carried out.

The definition of activity areas in the central zone is mainly based on by-product frequencies by raw material according to quadrant subdivision (1986) and to excavated square metres (1979-80), but the tools were also integrated in the totals. This distribution allowed for the identification of seven workshop areas, five of them associated with the combustion areas or with Structure 9; the other two are isolated. Figure 31 illustrates the relative tool frequencies per workshop area. Among the seven zones identified, only one is composed exclusively of soapstone; the others have a variety of polished and chipped tools.

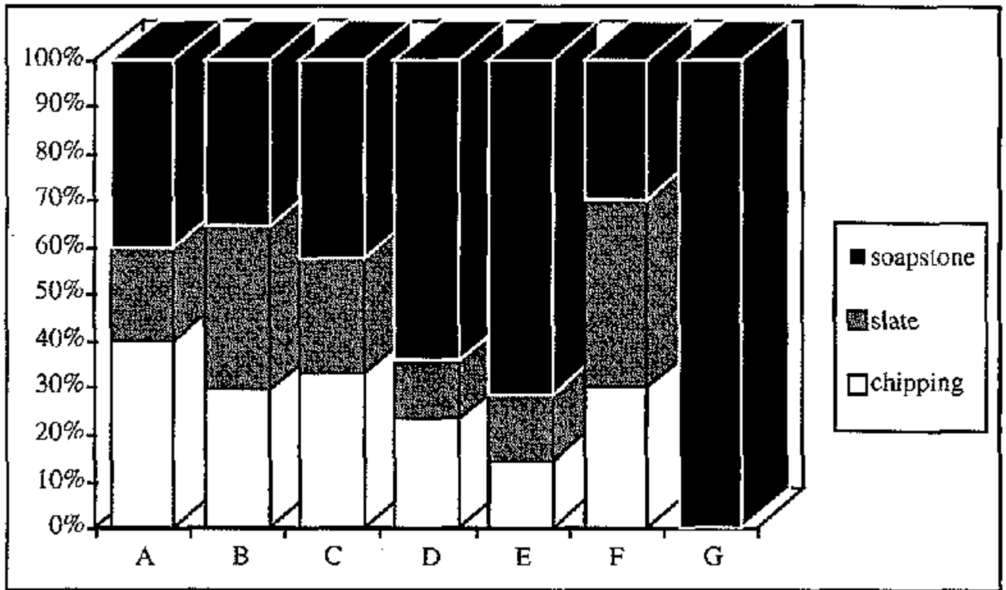
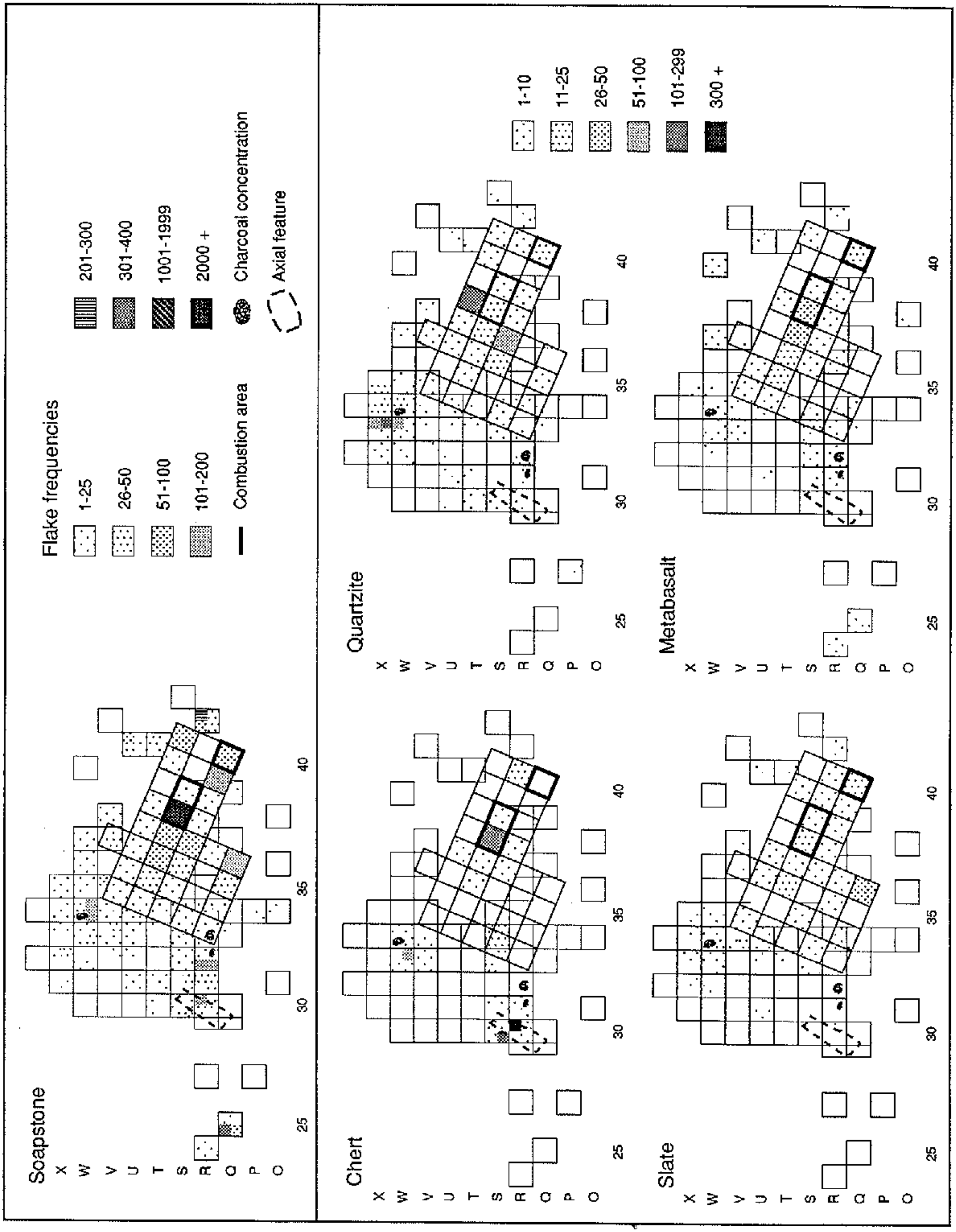



Figure 31. Relative frequency of tool categories by activity area
(**A**: Structure 9; **B**: R 32-33; **C**: W 34; **D**: E-F 1; **E**: H 2; **F**: D 4; **G**: Q 25).

Most chert by-products are found in two places: around Structure 9 and E 1. A smaller concentration is also associated with combustion area W 34 (Figure 32). In each case, a center of activity is surrounded by decreasing concentration in the neighbouring square metres. Quartzite is also concentrated in three main zones, although they are not as localized (Figure 32). The first concentration is situated in proximity to the combustion areas in R 32-33, more than one metre west of Structure 9. The second is located within the W 34 combustion area where it is found in larger concentration than chert. The last concentration is centered on E 1a.

Soapstone is dominant in practically all workshop areas (Figure 32). Soapstone by-products are present within the Structure 9 zone and in the R 32-33 combustion areas. A similar concentration is observed around W 34, but the largest concentrations are found in the perimeter of combustion areas E-F 1 and H 2. Two small and highly localized soapstone concentrations found in Q 25 and D 4 define the F and G workshop zones.

**Figure 32.** Activity Areas: distribution of debitage by-products, area A, IcGm-4 site.



Slate is mostly found in the perimeter of W 34 and to the east of E 1 (Figure 32), but in both cases, the smallness of the concentrations seem to translate into a somewhat limited slate tool production.

Unlike the previous raw materials, metabasalt does not present itself in highly localized concentrations (Figure 32). Metabasalt by-products are generally found in small numbers in most of the workshops, thus suggesting that metabasalt blocks were used for specific tasks, such as percussive elements.

The distribution of quartz is not graphically represented because of its low frequency. However, it is sufficient to note that quartz objects are associated first with Structure 9 and next with workshop zones B and C.

These informations allow to define the activities of each workshop zone with a certain amount of precision. Because of their proximity, Structure 9 and the combustion areas R 32-33 have been joined together as one single workshop. This workshop area is clearly dominated by chert and soapstone objects manufacture. Quartzite is also present, although in lesser quantity. Chert is strongly associated with the axial feature and quartzite is well-contained within the combustion areas sub-zone, while soapstone is an important raw material in both of these sub-zones. The tools are rare and dominated by vessel fragments, but they also include two cores, one in chert and one in quartzite. The relative absence of slate by-products is somewhat surprising considering the polished slate fragments and the few slate tools recovered in this zone. However, their presence can be linked to workshop F (cf., see below). Metabasalt is rare in these sub-zones, but is at least represented by one retouched flake and one core, which permit to suggest that they could have been used as hammerstones or, more generally, as manufacturing tools; the presence of metabasalt by-products would be the result of this use (cf., Lebel and Plumet, 1991). Among these production tools, a burin-like tool is also noted.

The third concentration (W 34) is dominated by quartzite and soapstone, but chert is also relatively well represented. Slate by-products are rare, but some polished slate tools are nonetheless present. Metabasalt by-products are minimal despite the presence of three possible cores and a chopper, thus supporting the hypothesis that these objects would in fact be hammerstones or manufacturing tools. The tool kit is comprised of soapstone fragments, a few chipped objects, a quartzite core and a burin-like tool.

The fourth zone (E-F 1) is dominated mainly by soapstone by-products and the elements produced (i.e., completed, but fragmentary lamps, some of which may have been used, vessel fragments, wound plugs, etc.). There is also an important quantity of chert by-products accompanied by a core. Quartzite flakes are also present in good quantity. Contrary to the previous zones, metabasalt by-products are more concentrated in this area. In this case, the presence of two metabasalt cores would support their use as true cores instead of hammerstones (at least for one of the two objects). No burin-like tools can be formally linked to this zone. However, four of these objects recovered during the 1979-80 excavation, which have no provenience information, could be associated with this zone (or the other two workshops of this part of the site). Finally, a quartz crystal end scraper was recovered from E 1 (the other two end scrapers were recovered by Weetaluktuk, but their exact provenience is unknown).

One other important concentration of soapstone by-products is associated with the combustion area in H 2, which contains also a small amount of chert, quartzite, metabasalt and slate by-products. Save for the by-products, this zone revealed practically no manufactured tools, except a few vessel fragments (n: 5), one knife and one microblade.

Workshop zone F (D 4) is also dominated by soapstone, although the by-products are in smaller quantity than in the two previous zones. As for slate, it is more frequent in this zone. Furthermore, chert, quartzite and metabasalt by-products are practically absent. Tools are present in zone F, but in moderate quantity (i.e., microblades, vessel fragments, polished fragments, one polished knife). The single slate "core" was collected in this area.

The last workshop zone (Q 25) was only partially excavated. Soapstone is again the predominant raw material represented by an important quantity of by-products and a few vessel fragments. Save for metabasalt, which account for approximately 50 by-product flakes and one core, all other raw materials are absent from this zone.

Following this discussion, it appears that most of these zones are not reserved for specific manufacturing tasks. However, the analysis clearly demonstrates that in each of these activity areas, including Structure 8, soapstone work was one of the main activities, if not the most important. The zones where chert and quartzite objects were manufactured are more contained and spatially distinct despite some overlap, particularly in zones C and D. In most cases, the importance of metabasalt seems to be linked to the working of other raw materials, while slate tools manufacture is highly localized. Given the special manufacturing technique of slate tools, it is not surprising to find object or preform fragments made from this raw material without associated by-products. The technique described previously, even though it may involve to some extent the use of a hammerstone or other percussive element, implies above all grooving and polishing. Edge retouch should normally leave behind small flakes that were not necessarily recovered during the excavation.

In the absence of more precise distribution plans, extrapolation concerning the number of individual that were involved in the manufacturing activities proves to be difficult. Theoretically, each zone could reflect the production of at least one craftsman who, according to needs, would have worked with various raw materials. The information gathered on the chipping by-products and tool fragments, seem to suggest a variety of tasks, the most important one being the manufacturing of preforms rather than tool finishing. Regardless of the warning made earlier concerning flake typology, edge trimming flakes in chert are mainly concentrated around Structure 9, and secondly, in the perimeter of R 32-33. No concentration of this type is suggested for the distribution of quartzite flakes. Conversely, by-products associated with the production of soapstone vessels and slate tools imply the whole manufacturing process, from core reduction to tool finishing. Even though production was mainly oriented towards the manufacturing of vessels, the collection of soapstone objects also includes two wound plugs and an object of undetermined function that show a certain variety in the production.

## 8.4 Areas C and D: an overview

Occupation traces in areas C and D, which are situated about 100 m to the south, can theoretically be linked to the workshop in area A. As for Structure 8, these structures could represent a domestic area. However, the lack of an exhaustive sampling, prevents any form of extrapolation other than a general survey of the data recovered.

The form and dimensions of the structures observed in these areas (Table 5) are not enlightening, since, once they are excavated, the surface observations are most often modified. The tools recovered in area C are in small quantity and comprise a blade, three microblades, a burin spall and a point, all in chert. A biface fragment and two retouched flakes in quartzite and a chert microblade come from area D (Appendix IV). Debitage by-products (Appendix V) are relatively varied, but few in number for area C. Chert (n: 96) and quartzite (n: 49), dominate this collection that also includes fifteen metabasalt flakes, three slate flakes and one soapstone flake. Area D is almost exclusively represented by quartzite flakes (n: 247; there are also two slate flakes and one soapstone flake). Almost all by-products from both areas have been identified as thinning flakes and shatters. The data gathered on the debitage by-products indicate a certain parallel with area A in lithic manufacturing activities.

The few available data from these two areas, although most unrevealing, allow at least to note the apparent specialization in raw material use. However, these data, in their present state, can't be used to establish a direct link with the occupation of area A. This question will be resolved only by the addition of new data.

## 8.5 IcGm-4: cultural affiliation

The Middle Dorset Period (~300 B.C. to 500 A.D.) is defined essentially by the disappearance of the Slice-socket harpoon head and the appearance at the late period of the Double-line hole harpoon head type (Maxwell, 1985: 198). These two markers correspond relatively well to the $^{14}C$ dates obtained and to the general observations made by various reseachers working in the core area (cf., p. 7) of the prehistoric populations of the eastern Arctic. At the beginning of the Middle phase, the tools show few technical and stylistic variations, compared to the Early Dorset phase. Changes appeared gradually and were more pronounced in outlying regions like Labrador, particularly as concern settlement patterns (Maxwell, 1985: 198). The Middle phase is closely linked to a major drop in mean temperatures, which resulted in a population decline in the core area and in the complete disappearance of Dorset groups from the high Arctic for several centuries (Schledermann, 1990). Conversely, for the same period, the Dorset population seems to have grown on the Labrador coast (Fitzhugh, 1976a).

Before the Avataq Cultural Institute recent fieldworks in the Inukjuak, Witch Bay and Kuujjuarapik regions, Hudson Bay was perceived as a marginal zone visited sporadically during the duration of the palaeoeskimo period (Fitzhugh, 1976b: 140-141). It is now known that certain regions of eastern Hudson Bay saw an intensive occupation during the Pre-Dorset period (Avataq Cultural Institute, 1991b; 1992b; 1992c; 1992d). The intensity of this occupation is such that there is no correspondence with the other eastern Arctic regions (Maxwell, 1985: 98). For example, the IdGo-51 site, located in the Witch Bay region, shows an occupation that spans from 75 to 35 m.a.s.l. and is represented by 226 habitation structures, the great majority of them being semi-subterranean dwellings (Avataq Cultural Institute, 1992c). Only in the immediate vicinities of Inukjuak and Witch Bay, more than 50 sites belonging to the Pre-Dorset period are known. Conversely, Hudson Bay does not appear to have known any major occupations during the Dorset period. Sites formally affiliated to the Early Dorset phase are presently limited to a few sites in Hudson Strait and one at Inukjuak (Taylor, 1968; Fitzhugh, 1976b; Avataq Cultural Institute, 1987c; 1989b). Dated Middle phase sites are also few in number (Avataq Cultural Institute, 1991a; 1992a); the same applies to the recent phase (Harp, 1970). During the archaeological inventories carried out between Inukjuak and Akulivik, a few sites identified as Dorset were observed on the Hudson Bay coast, but these sites are generally small and poor in terms of structural and lithic remains, thus preventing their affiliation to any particular phase of the Late Palaeoeskimo period. The impression that emerges from this sequence recalls the situation observed for the core area, particularly for the more recent periods. However, local population decline seems to occur a few centuries earlier than in the northernmost regions. This apparent dichotomy suggests that the causes of this decline does not seem to be firmly linked to the degradation of climatic conditions, but the data available are at present insufficient to allow for any extrapolation.

Analysis results from the IcGm-4 site contribute to the knowledge of the Late Palaeoeskimo period. The chronology obtained (1550 ± 110 years B. P. (E 1); 1670 ± 150 years B. P. (H 2); 1130 ± 170 years B. P.) indicates two possible occupation episodes. However, some arguments milit in favour of the first two datings. The site is thus considered to reflect an occupation of the end of the Middle Dorset phase, between the 4th and 5th centuries A. D., or, at the limit, to the beginning of the Late phase (i.e., the beginning of the 6th century A. D.; Taillon and Barré, 1987: 406; Maxwell, 1985: 198). The third date would place the occupation between the 7th and 11th centuries A. D.. None of the elements recovered on the site either favour or expressly refute the acceptation of this date. However, its probable association with the sample from E 1 supports the contamination hypothesis[25]. A $\chi^2$ test (cf., Kumar, 1981) incorporating these three dates, resulted in the identification of a significant variation (6.24 for $\alpha$: 0.05), which is the consequence of the noticeable difference between the third date and the other two. The same test applied on the first two samples indicates no significant difference (0.42 for $\alpha$: 0.05); these two dates are statistically linked[26].

As concern the structural informations, the axial feature (Structure 9) is the only element that reflects any relationship with Dorset structures. Its dimensions (2.30 x 0.60 m) and its form are identical with a similar structure observed at the GhGk-63 site in Kuujjuarapik (Avataq Cultural Institute, 1992a: 8). This site, dated between 50 B.C. and 240 A.D., is also affiliated with the Middle Dorset phase. In this case, the mid-passage is clearly associated with two lobes that form the habitation structure. This type of construction is present during all the Palaeoeskimo period, although its form and components vary a great deal from one period to another and from one region to another (Maxwell, 1985: 153-157). Mid-passages were observed also on the Pre-Dorset GhGk-4 site (Gendron, 1991; Plumet, 1976) and on many sites from this period in the Inukjuak region (Avataq Cultural Institute, 1991d; 1992c; 1992d). In most cases, these mid-passages are composed of two parallel rock alignments with a central hearth, itself

[25] This determination is even more probable since three other samples recovered from E-F 1 yielded totally erroneous dates, including one of more than 7000 years B. P. (cf., Taillon and Barré, 1987).
[26] The results of this statistical test must be considered with caution given the number of dates considered.

delimited by rocks perpendicular to the alignments. Pre-Dorset sites in the Inukjuak and Kuujjarapik regions do not comprise flagstones.

In general, the tools recovered at the IcGm-4 site are similar to those found at the GhGk-63 site (Avataq Cultural Institute, 1991a; 1992a) and to other Middle Dorset sites in the eastern Arctic (Maxwell, 1985: 198 and foll.), although the IcGm-4 site collection has less variety and is mainly composed of fragments. However, it must be noted that this site is interpreted essentially as a workshop, while the others represent habitation sites.

Among the artefacts recovered, very few are actually diagnostic. The triangular points are the only elements that can be compared with collections from various sites of the same period located on Baffin Island (Maxwell, 1973: 39) or with the GhGk-63 site (cf., Avataq Cultural Institute, 1992a). Maxwell identifies a continuous progression between straight-based triangular points, which appear on some Early Dorset sites, and strong concave-based points from the Late Dorset phase. Specimens associated with Middle Dorset can either be straight or slightly concave.

Burin-like tools are relatively frequent at this period and they are often made from cryptocrystalline raw materials (i.e., chert and chalcedony) and are characterized by a combination of direct percussion and polishing techniques (cf., Avataq Cultural Institute, 1992a; Maxwell, 1973). The burin-like tools from IcGm-4 are only polished and manufactured from nephrite or soapstone. Nephrite was also used in the manufacturing of burin-like tools at JgEj-3, a Groswater phase site (Gendron, 1990). Although the forms and dimensions are close to specimens collected elsewhere, it is impossible to link these characteristics to a particular phase.

Knives and polished points morphology are similar to specimens from other Middle Dorset sites, but these tools are seldom used to identify the specific cultural affiliation of a site. A formal "typology" doesn't exist for this category of tools, nor for any category of tools present in Palaeoeskimo assemblages, rendering difficult any comparisons.

The shape of lamps allows sometimes to link these with specific periods. Thus, angular lamps (i.e., square or rectangular) are well represented during Early Dorset and tend to be oval or round during Late Dorset (Maxwell, 1985: 149). The lamps and most vessel fragments from the IcGm-4 site are generally angular in shape reflecting a certain continuity between Early and Middle Dorset. Only one specimen is actually oval in shape. These informations, although most unrevealing, seem to indicate a preference for rectangular or square shapes without excluding other shapes.

These observations, though helpful in establishing similarities between the IcGm-4 site and the Middle Dorset sites in the core area, also transmit some uncertainties in the parameters used to compare various assemblages. The definition of this particular period on the basis of harpoon heads is tenuous, even if it is partially corroborated by radiocarbon dating. Because of the generally unfavorable conditions for the preservation of organic material, these types of remains are infrequent in Nunavik. It would then be preferable to rely on a better definition of the various components of the tool kit, which, in the absence of radiocarbon dating, are the only comparable elements. The inclusion of manufacturing by-products analyses would improved also the understanding of the Palaeoeskimo occupation.

# 9.0 Conclusion

## 9.1 IcGm-2 site

Analysis of the archaeological data recovered from IcGm-2 has revealed that the location has been occupied over the course of the Dorset and historic periods, despite the fact that there was few quantitative information, especially as concerns the Palaeoeskimo period.

The Dorset occupation on this site was traced mainly to the interior of Structure 1 where the distribution of a few artefacts and structural remains presumed to be Palaeoeskimo in origin defined the probable contour of the Dorset habitation, which, subsequently, was almost completely hidden by the historic occupation. Some indications also suggest another Dorset presence within the space defined by Structure 2, but the data turned out to be too imprecise and too small in number to allow for a more precise identification. Considering this information, it seems that the Dorset presence on this site was short-term and involved only a few individuals. The meager lithic evidence recovered, suggests that the occupants were involved also in the manufacturing of some tools.

On the other hand, the study of the historic remains facilitated identification of the various activities related to the historic occupations of the two habitation structures. These data include a few traditional bone tools manufactured with metal objects and a few manufactured goods comprised, amongst others, of nails, beads and a few pipe fragments. Several bone remains also were recovered, most of which are caribou bones, but there were also seal, bird and a relatively large number of unidentified mammal bones. The presence of a caribou foetus or a very young caribou, as well as the recovery of a few barnacle goose bones suggest that this site was occupied in the spring when the caribou gives birth and when the barnacle geese migrates to the northern latitudes.

The season of occupation is also partially confirmed by the type of construction of Structure 1, which is similar to spring habitations described in ethnographic documents. The rear part of Structure 1 is occupied by a sleeping platform, while the front part encompasses the domestic areas where a hearth and two flagstone storage areas are found on each side of the entrance. The distribution of artifacts and bone remains also confirms this interior subdivision since almost all remains were recovered within the space identified as the domestic area. Despite the fact that the interior of Structure 2 is not as well defined in its structural components, the distribution of bone remains and artefacts suggests an internal subdivision similar to the preceding structure, where the rear is free of waste, while the domestic area situated towards the front of the structure is covered with bones.

The absolute frequencies of the various categories of remains recovered from each of the two structures has been interpreted as reflecting the duration of the occupations. Thus, the occupants of Structure 1, which is notably richer in terms of bone remains, would have stayed in this habitation longer, while the occupants of Structure 2 would have had a shorter stay. This hypothesis is partially supported by the attention given to the interior layout of Structure 1, which is practically nonexistent for Structure 2.

The analysis of manufactured goods and the consultation of available ethnohistoric documentation also identified an occupation period for both structures of IcGm-2. However, the time interval defined for this occupation (*circa* 1860-1920) is relatively large due to the lack of available data concerning the archeological sites associated with this late period of Inuit history. This absence of data is largely due to a lack of interest by researchers concerning archeological sites representing the recent history of the human occupation of Nunavik. According to available ethnohistoric documents, the previously identified interval corresponds to the beginning of the intensification of contact between Euro-Canadians and the Inuit in southern Nouveau-Quebec on the east coast of Hudson Bay about the middle of the 19th century and to the installation of the first trading posts at Port Harrison (now Inukjuak) at the beginning of the 20th century.

Independently of the gaps concerning the chronology of the historic occupation of the site, the information recovered concerning the latter represent the first step towards understanding the changes in adaptation modes and traditional settlement patterns occasioned by more frequent contact with Euro-Canadians and the impact of these changes on socio-economic and cultural aspects of the Inuit population. However, other historic sites will have to be excavated to improve the knowledge of this critical period of Inuit history. Also, all archeological research projects concerned with this period should include an ethnohistoric aspect.

## 9.2 IcGm-3 site

Characterization of the human occupation of the IcGm-3 site was rendered difficult by the small quantity of data recovered during the 1986 salvage excavation, which was carried out exclusively on the structural components of the the 6 m.a.s.l. terrace, since the Dorset habitation structures observed in 1979 by Daniel Weetaluktuk on the 10 m.a.s.l. terrace were not found during the 1985 archeological inventory or the 1986 salvage excavation. Despite this fact, a few indications recovered in 1986 suggested that the 10 m terrace Dorset component was also present at the foot of this terrace in proximity to Structures 4 and 5, where several specimens of possible Palaeoeskimo origin were collected on the surface. However, excavation of the five habitation structures on the 6 m.a.s.l. terrace did not confirm this affiliation. The few lithic specimens, which come exclusively from Structure 2, only allowed for the identification of an occupation related to the Thule period.

Confirmation of a Thule affiliation for the tent rings and heavy tent rings allowed for the exploration of a poorly known facet of this period, notably the settlement patterns and construction methods associated with non-winter occupations. The Thule period is known mainly by remains associated with winter occupations, of which the semi-subterranean dwellings are the most representative elements. The few mentions of Thule tent rings and heavy tent rings found in the archaeological literature are, more often than not, limited to brief descriptions and, in most cases, these structures have never been the subject of an exhaustive or even partial sampling. Nevertheless, from the little information available for the west coast of Hudson Bay (McCartney, 1977), it has been suggested that heavy tent rings, characterized by walls reaching up to one metre in height, reflected a fall or spring occupation. This type of habitation is represented on the IcGm-3 site by Structures 1 and 2. The tent rings, represented by Structures 3, 4 and 5 at IcGm-3, were used during the summer season.

Despite the small amount of data concerning the Thule occupation on the east coast of Hudson Bay, they suggest that the geographic location of habitation sites varies according to season. First, it appears that the winter occupation was concentrated almost exclusively on the islands, thus reflecting a seasonal adaptation focused mainly on the exploitation of marine resources. Conversely, the sites inhabited between spring and fall are generally located on the mainland, indicating a preference for the exploitation of land resources. The discovery of a few caribou bones in Structures 2 and 3 of the IcGm-3 site confirms partially this hypothesis. However, the latter will have to be verified on a broader archaeological base, since none of the Thule sites located on the islands on the east coast of Hudson Bay has been the object of an archeological research project. The same holds true for almost all Thule sites located on the mainland.

Analysis of the lithic collection from Structure 2 allowed for the initial study of techniques related to the manufacturing of polished slate tools. It has been observed through this analysis that one of these techniques involved mainly the preparation of a "core" by bifacial or unifacial groovings, which facilitated detachment of the preform from the initial mass. Some objects analyzed also revealed that the artisans used direct percussion as soon as the desired piece was detached from the mass, either to facilitate polishing of the edges and extremities, or to make adjustments during the manufacturing process. Another technique was observed also on the slate tool fragments: the object was first chipped by direct percussion before polishing to attain its definitive shape. The identification of these same techniques in the lithic collection from the IcGm-4 site shows a certain continuity in the manufacturing of polished tools between the Dorset period and the Thule period. However, the present data is not sufficient to determine what this continuity implies.

### 9.3 IcGm-4 site

Analysis of archaeological data from area A of the IcGm-4 site, which apart from the 1986 data, also included the lithic collection recovered by Daniel Weetaluktuk (1979-80), and data collected during the 1985 archaeological survey, has been centered mainly on the identification and study of manufacturing techniques present in the lithic collection and the definition of the various activity areas based on the spatial distribution of artefacts and structural remains.

The cultural affiliation of the site to the Middle Dorset period was already established by $^{14}C$ dating obtained from charcoal samples from the 1979-80 excavations and was partially confirmed by the comparison of some tools from the IcGm-4 collection with the *diagnostic* tools recovered from other Nunavik and high Arctic sites, which are also associated with Middle Dorset. However, some reservations were brought up about the validity of these comparisons, due to a lack of uniformity and standardization in describing and analyzing Arctic archaeological collections.

The study of tools and debitage by-products allowed for the exploration of two distinct manufacturing techniques. The first involves the chipping of raw materials such as chert, quartzite, quartz and metabasalt by direct percussion to manufacture a variety of tools dominated by microblades, but which also include bifacial fragments, a few points, knives, end scrapers, etc. The analysis results concerning the tool and their by-products obtained by this technique have shown that the artisans concentrated their efforts mainly on the manufacturing of preforms and not necessarily on final tool production. It has also been noted that chert, quartzite and quartz were worked essentially in the same manner, although chert seems to have been favored over other raw materials in the manufacturing of most tool categories identified in this collection. Metabasalt is a special case. Even though the metabasalt flakes recovered show scars generally associated with direct percussion chipping, relatively large variations were observed in the nature of debitage by-products when they were compared to by-products of other raw materials. This is true for all the attributes and variables considered during the analysis. This observation, added to the fact that the majority of metabasalt blocks in the collection have characteristic markings generally associated with hammerstones, suggest that a good part of the metabasalt by-products are the result of accidental flaking resulting from their use as hammerstones rather than voluntary debitage of the metabasalt blocks (cf., Lebel and Plumet, 1991). This hypothesis does not however exclude the possibility that these blocks could have been used for other purposes, such as expedient tools, in carrying out specific tasks unrelated to percussion.

The second manufacturing technique identified concerns the work applied to the production of soapstone and slate objects, which are raw materials generally associated with the polishing technique. However, in both cases, it has been observed that direct percussion technique intervened at some point during the polished slate tool or soapstone vessel manufacturing process.

The slate tool manufacturing technique, as mentioned previously, is practically identical with the technique described for the IcGm-3 Thule site tool collection, indicating a certain temporal continuity in the manufacturing of slate objects. Grooves were engraved into the body of the core to define its shape. These grooves, which could be bifacial or unifacial, facilitated detachment of the preform by snapping off the unused portions of the core. The edges and extremities of the preform were then polished. Retouching by direct percussion could occasionally be applied to the object to correct the edges and extremities in order to provide a better angle for polishing. However, in most of the cases observed, direct percussion seems to have been used mostly on unifacially grooved preforms. The characteristics associated with these two manufacturing techniques are visible on several knife and polished fragments, as well as on some of the debitage by-products present in the collection.

The finishing of vessels and other soapstone objects mainly involved polishing of the various surfaces using an abrasive, but a large part of the soapstone manufacturing by-products showed that direct percussion was involved in the preparation of vessel preforms. These percussion scars appear on the debitage flakes as striking platform remnants. Some flakes also have a dorsal surface and polished platform, indicating that direct percussion was also used to correct the preform during the manufacturing process. However, the great majority of by-products analyzed are represented by shatter associated with the pulverization and hollowing out of vessel preforms.

The spatial distribution of archaeological remains in the central zone of area A allowed for the definition of seven activity areas related to the working of the various raw materials identified in the collection. It has also been observed that the horizontal distribution of raw materials reflected a certain specialization of the workshop areas. Despite the fact that the manufacturing of soapstone objects appeared to be an important activity in each area, the distribution of the other raw materials shows that their transformation was clearly associated with specific areas. For example, the manufacturing of chert tools was important in the axial feature area and around the combustion area in E 1, but negligible or absent in the other sectors. The same observation applies to the other raw materials, which are found in large numbers only in specific areas.

Except for the axial feature, none of these work areas are associated with structural elements, confirming the hypothesis that the central zone in area A was used mainly as a workshop. However, the presence of an axial feature at the periphery of the workshop could suggest a domestic occupation, though none of the data recovered in this zone supports this hypothesis. On the contrary, all data coming from this feature and its periphery tend to confirm a similar function as for the other chipping areas. There is also the possibility that this feature represents the remains of a previous occupation, but the available data are insufficient to verify this hypothesis. In this context, Structure 8 is the only sector identified as reflecting a domestic area, whose occupation could be considered synchronic with the workshop. It has also been suggested that habitation structures of areas C and D could have played a similar role, but the data available were judged insufficient to corroborate this hypothesis.

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# *Appendix I*

***IcGm-2***
***Osteological Analysis***

## Zooarcheological Identification of Bone Remains from the IcGm-2 Site[1]

### Introduction

The faunal remains submitted for study come from IcGm-2, Nouveau-Québec, east coast of Hudson Bay. The study is aimed at identifying the bone fragments as precisely as possible and drawing up a table recapitulating the various taxons identified, as well as their respective numbers. A few comments on the collection under study follows the presentation of the table.

Table 1 presents a list of taxons identified in the collection. Their zoological identification code, used for a card identification index (IDZQ), latin and corresponding common names, their number (N) and percentages (%) are found on this table. More detailed identification appears on the identification cards, accompanied by a list of the codes used.

Recently fractured bone remains (at the time of excavation or from other handling), were not mended, but they were however, counted as representing one fragment and not several. Anatomically related bone elements were counted separately (for example, a distinct, but anatomically related epiphysis and diaphysis count as two bones, while two recently fractured long bone fragments which fit together count only as one fragment).

### Faunal Remains

In general, the bone fragments were well-preserved, although fragile in some cases, such as the specimens of young individuals whose cortex is less resistant than that of older individuals. Few alterations were noted, except for cases of weathering. This type of bone alteration results from bad weather on surface deposits. These specimens have been bleached, some have a greenish or bluish tint and are cracked on the surface. Sometimes they may be confused with bones calcined by fire. In the IcGm-2 collection, there were very few bleached by heat. The only specimens that were came from square metres AH 6, AJ 6, AJ 5 and F 24, and are all unidentified mammal bones. Buried bones were generally brown/black and softer than the eroded specimens.

The fauna collection from IcGm-2 is composed of 639 bone fragments from three vertebrate classes: Fish (N=5; 0.78%), Birds (N=3; 0.47%) and Mammals (N=598; 93.58%).

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[1] The identification of bone remains was carried out by Evelyn Cossette and Michelle Courtemanche, using the reference collection at the Ostéothèque de Montréal Inc. The report was written by Evelyn Cossette (report # 114, 1992).

No Reptiles or Amphibians were identified. Most bone vestiges could be identified with at least one animal class (94.83%), but a few fragments (N=33; 5.17%) could not be identified as belonging to any particular class. These were very fragmented, small bone shatter, devoid of any particular characteristics. However, a special category was created for these small, long bone fragments which could be either Birds or small Mammals such as the hare (Iopm). There are very few of these remains on this site (N=7; 1.10%).

**Mammals**

The Mammal Class makes up a major part of this collection. There are a few unidentified marine Mammal remains (N=4), but the collection is mainly composed of the remains of land Mammals. There is a very large number of long bone diaphyses fragments from large Mammals (code Mgr). They are from land mammals, probably caribou.

In this animal class, 178 specimens were identified with a more precise taxa, at least on a genus level. The taxons identified in the collection are the Caribou (*Rangifer tarandus*), Seal (*Phoca* sp.) and a species of Fox (*Vulpes vulpes* or *Alopex lagopus*).

**Seals**

Osteologically it is very difficult to distinguish between the various species of Seal, and it was impossible to identify with certainty, any of the species found in the IcGm-2 collection. However, it seems that the bone specimens identified with the genus *Phoca* sp. belong to either the harbour seal (*Phoca vitulina*), or the ringed seal (*Phoca hispida*), the two smallest species present in the waters of Hudson Bay. In effect, Seal bones from this site were small and could possibly even represent young individuals of these species. There are at least two small seals in this collection because we found two complete left ulnas, one in AK 6 and the other in AK 7.

Seals are represented by axial skeletal elements (ribs and vertebra), but mainly by elements of the appendicular skeleton, particularly the extremities (phalanges and metapodes). There are no cranial elements. The thoracic limb is represented by scapula and ulna fragments, but there are no humerus or metacarpus present. The pelvic limb is represented by tibia, fibula, and metatarsal fragments, but no femur.

**Caribou**

The caribou is the most common species and the most widely dispersed in the site's excavation. It appears that there are at least four individual caribou in the collection, of which one could be a foetus or a very young caribou of less than a month in age. This very young individual is mainly present in square metre AJ 6. It is represented by a few bone fragments including a left mandible fragment, a left carpus bone and various phalanges. A minimum of three individuals, (apart from the very young one/foetus) were calculated on the basis of three 2+3 right carpi present in the collection. These other three caribou seem to be of various ages. One individual would have been at least 6 years old according to the dentition of an almost whole left maxillary which had very worn teeth. There would have also been at least one sub-adult if we rely on the presence of numerous long bones that were not combined.

In general, the long caribou bones are very fragmented, undoubtedly intentional. We have noticed several tool scars on long bones, but in general it was difficult to confirm if these fractures were caused by knives or if they were natural. We have noted however two caribou bone fragments which were modified.

One of them is a metatarsal fragment which appears to have been fashioned into an awl, found in AH 5. There was also a complete metacarpus accessory, finely worked to a point on its proximal part, from G 23. The degree of fracture of Caribou bones, as well as the presence of finely worked bones and an antler cut at the base suggests that manufacturing activities were important.

Caribou is represented by a diversity of anatomical elements but we noted a net over-representation of appendicular skeleton elements, especially the extremities (phalanges and metapodes). There are very few cranial elements in this collection except for a maxillary fragment, a premolar and three hyoid bones. In F 26 we noted the presence of a posterior cranium fragment (occipital+parietal+temporal+frontal) with the antler base still in place. The antlers had been cut and it is interesting to note that in F 24, there was a proximally cut antler fragment, possibly related anatomically to the cranium fragment situated within proximity.

There were also very few vertebra and ribs, which are the most numerous elements in the skeleton, and very few scapular and pelvic girdles remains.

**<u>Other Taxons Identified</u>**

The only other taxons identified in the collection are a red Fox or Arctic Fox (Fox sp.), a Goose or a Barnacle Goose (*Anserinae*), as well as a species of Cod (*Gadidae*). It could be a Greenland Cod (*Gadus ogac*), an Arctic Cod (*Boreogadus saida*), or even an Atlantic Cod (*Gadus morhua*).

This fish is represented by only three bone elements, those being a cranial skeleton element, a left operculum (in square metre AJ 5) and two elements of the pectoral fin, a left cleithrum and a right cleithrum (in square metre AJ 6). These elements probably all come from the same fish.

The Arctic Cod and the Greenland Cod are circumpolar marine species that live, among other places, in the cold waters of Hudson Bay. The Atlantic Cod, on the contrary, is an Atlantic Coast marine species that does not live in the waters of Hudson Bay. It has been the object of large commercial fishing for a long time and was frequently found in local markets in the south of the province during the 18th century. We don't know when it could have been transported to Nouveau-Québec. It is highly probable that the bone specimens from IcGm-2 represent one of the two species indigenous to this region and could have been fished from the coastal waters of Hudson Bay.

N.B.: We also found fragments of non-carbonized wood in square metres H 25 and AI 6.

## Conclusions

The bone collection from IcGm-2 is essentially made up of Caribou and Seal bones. In the case of the caribou specimens, we have noticed a great degree of fragmentation of the long bones, making positive and precise identification of anatomical elements, and even the species, difficult. The collection offers evidence of a possible bone industry, as do the numerous long bone fragments of Caribou and large mammals, the cut antlers and the two tool fragments made from bone. The bone collection also gave a few indications as to the occupation season of the site. The presence of an anserinae suggests an occupation between the end of spring, when Geese and/or Barnacle Geese return from their winter refuge in order to nest, and the beginning of autumn, when they leave their nesting grounds to migrate south. The Canada Goose (*Branta canadensis*) nests on the east coast of the Hudson Bay region, while the Snow Goose (*Chen caerulecens*) nests a little further north, in the Povungnituk region. The presence of a caribou foetus suggests a late spring occupation since the caribou does not generally give birth until June.

The few Gadidae elements suggest fishing in the waters of Hudson Bay, but the time of year is impossible to determine. Both indigenous species spawn under the winter ice, probably between December and March, but it is possible to catch them at any time of year.

Thus the occupation of the site is situated between the end of spring, about May/June (birth of Caribou calves and the arrival of Geese/Barnacle Geese) and autumn, about the month of October (departure of Geese/Barnacle Geese).

## List of taxons identified in the faunal remains at the IcGm-2 site

| Code | Taxon | Common Name | N | % |
|---|---|---|---|---|
| Mi | - | Undetermined mammals | 270 | 42,25 |
| Mm | - | Marine mammals | 4 | 0,62 |
| Mgr | - | Large mammals | 146 | 22,85 |
| Rt | *Rangifer tarandus* | Caribou | 151 | 23,63 |
| Ph | *Phoca* sp. | Seals | 26 | 4,07 |
| Ren | Renard sp. | Foxes | 1 | 0,16 |
| Omy | - | Birds | 1 | 0,16 |
| Ansm | *Anserinae* | Geese/Barnacle Geese | 2 | 0,31 |
| Ip | - | Fish (undetermined) | 2 | 0,31 |
| Sal | *Gadidae* | Cods | 3 | 0,47 |
| I | - | Undetermined classes | 26 | 4,07 |
| Iopm | - | Birds/Small Mammals | 7 | 1,10 |
| **Total** | | | **639** | **100,00** |

# *Appendix II*

*IcGm-2*
*Description of Archaeological Data*

## Description of traditional implements

**Knife handle** (#37; plate 1, A): the distal part is characterized by a narrowing of almost half of the width of the handle, the right edge has a large notch cut into it. A second notch is visible close to the base of the handle. A leather strap fragment is still attached by a straight-edged hole on the distal part. A second hole is visible close to the proximal extremity. This one is straight and polished like both surfaces of the handle. The edges show traces of modification, but they are not as apparent. (length: 90.50 mm; width: 22.20 mm; thickness: 7.40 mm).

**Kilutaq** (#22; plate 1, E): the *kilutaq* is fashioned in a long caribou bone, cut with a knife at its proximal extremity. Traces of polishing are visible on this extremity and the active part. This softener measures 88.80 mm long; its maximal length (41.40 mm) as well as its maximal thickness (25.10 mm) occur at the proximal extremity. No modification of this portion of the tool is visiblefor hafting purposes. The inner curve part is concave (length: 54.10 mm; width: 19.70 mm; depth: 9.80 mm) (cf., Schledermann, 1976: 213, plate 37: a, g and h for comparison). Knife marks were observed on the external surface.

**Awl** (#20; plate 1, F): this object, fashioned in a caribou rib(?) measures 118.80 mm in length. The maximal thickness (laterally to the length), 7.70 mm, and maximal width, 10.60, are found at the center. One extremity is sharpened to a point, the other equally thinned, appears to be blunted (use ?).

**Hafting Joints(?)** (#25, 34; plate 1, G and H): these two objects are interpreted as pieces which served for hafting; they are probably fragmentary. Each fragment is fitted with a hole situated in the center of the object. Specimen 25 also has a second perforation opening onto one of the edges. A small groove diagonally cuts the superior part of the object (55.10 x 36.00 x 7.60(x) mm). The perforation on the second specimen (43.30 x 26.50(x) x 8.80 mm) is filled in by a bone peg. Traces of carbonization are also visible on one of the surfaces.

**Undetermined Objects** (#20, 26, 29, 35; plate 1, B G and H): These objects show traces of polishing. One of them is a possible fragment (#35; 51-100 mm). Specimen #20 (42.90 x 11.00 x 4.60 mm) was partially polished distally on its external surface(?). The proximal part is shaped like a hinge where a knife cut (accidental?) is visible. Specimen #29 (awl (?); 201-300 mm) has a distally polished bevelled extremity; a notch was cut into the proximal extremity (for hafting ?). The last object (#26) is enigmatic and probably the least well preserved. Two bone fragments (rib fragments ?) are joined together by a corroded metal rivet. A second perforation is noticeable near the distal edge of one of the fractured bone.

## Lithic Collection

The lithic collection from IcGm-2 is composed of two tools, a vessel fragment and 17 debitage flakes (cf., table below). The quartzite biface is represented by a distal fragment (thickness: 8.10 mm). The flake core, equally fragmentary, has an irregular shape (59.30 x 39.20 x 30.60 mm). Traces of impurities are visible on the main striking platform. An undetermined portion has been detached creating a deep depression on of the faces of the core.

**Characteristics of quartzite flakes, IcGm-2.**

| Category | | Striking Platform (form) | | Striking Platform (treatment) | | Bulb of percussion | |
|---|---|---|---|---|---|---|---|
| - edge trimming: | 2 (11,8%) | - biconvex: | 5 (35,7%) | - scaled: | 2 (14,3%) | - absent: | 6 (46,2%) |
| - thinning: | 12 (70,6%) | - concavo-convex: | 1 (7,1%) | - multiple: | 6 (42,9%) | - visible: | 7 (53,8%) |
| - shatter: | 3 (17,6%) | - crushed: | 1 (7,1%) | - unprepared: | 2 (14,3%) | - pronounced: | 0 |
| | | - linear: | 2 (14,3%) | - fractured: | 4 (28,6%) | | |
| | | - plano-convex: | 1 (7,1%) | | | | |
| | | - point: | 1 (7,1%) | | | | |
| | | - triangular: | 3 (21,4%) | | | | |

**Length and thickness of striking platform (mm)**

| | | $\mu$ | $\sigma^2$ | Coef. var. | Min.-Max. |
|---|---|---|---|---|---|
| **Length:** | (n: 14) | 8,36 | 4,07 | 48,69 | 2,00 - 17,00 |
| **Width:** | (n: 14) | 3,36 | 2,02 | 60,27 | 1,00 - 9,00 |

| Length | n | $\mu$ | $\sigma^2$ | Standard Error |
|---|---|---|---|---|
| **< 50** | 3 | 7,33 | 3,21 | 1,86 |
| **51-100** | 4 | 5,75 | 4,11 | 2,06 |
| **101-200** | 2 | 6,00 | 1,41 | 1,00 |
| **201-300** | 3 | 10,67 | 1,15 | 0,67 |
| **301-400** | 2 | 14,00 | 4,24 | 3,00 |

| Width | n | $\mu$ | $\sigma^2$ | Standard Error |
|---|---|---|---|---|
| **< 50** | 3 | 2,67 | 2,08 | 1,20 |
| **51-100** | 4 | 2,75 | 0,96 | 0,48 |
| **101-200** | 2 | 2,50 | 0,71 | 0,50 |
| **201-300** | 3 | 3,67 | 1,53 | 0,88 |
| **301-400** | 2 | 6,00 | 4,24 | 3,00 |

A slate flake was recovered also in the interstructural zone close to the cache feature. It is shatter from the 601-800 class.

The soapstone vessel fragment comes from Structure 1. It is a body fragment (201-300 mm) with a polished internal (?) surface with traces of carbonization on the external surface (?).

## Manufactured objects

| No. | Item | Provenience | | | Description |
|---|---|---|---|---|---|
| 18 | pipe | AJ 5 | NW | II | stem fragment (same pipe ? as 42) |
| 21 | bead | AG 7 | SE | II | roled type, clear glass (WIc5 (amber); oval shape Length:14.1 mm; width: 6.4 mm (cf. Kidd et Kidd, 1972: 86) |
| 33 | nail | E 27 | NE | II | forged; head with coupling (plate 2E) |
| 38 | cartridge | AM 6 | SE | II | brass; .22 calibre; inscription: "Dominion Hornet" |
| 39 | pipe | S 12 | NE | II | bowl fragment |
| 40 | button | E 26 | NE | II | brass; 4 holes with inscription: "Do(u)ble (ring)-double symb. (same except reversed)- (E)dge" double symb. 17.1 mm diametre. Similar to type 32 of S. South (cf. Hume, 1980: 88-93) (plate 2A) |
| 41 | bead | AJ 3 | SE | II | opaque elongated (IIa41 Robin's egg blue; annular shape; thick..: 1.3 mm; width.: 2.8 mm (cf. Kidd et Kidd, 1972: 86) |
| 42 | pipe | AI 6 | NW | II | 6 fragments (no inscription): 3 frag. of talon; 1 bowl frag.; 1 stem frag.; 1 und. frag. (same pipe ?; *idem* 18) |
| 44 | 2 nails | AI 6 | NE | II | iron; 1 cut nail; 1 forged nail with rosaceous head. Corroded (plate 2D) |
| 45 | nail | AJ 6 | NE | II | Iron; cut (corroded) |
| 46 | nail | AL 5 | NW | II | Iron; forged (corroded) |
| 48 | nail | F 25 | NE | III | Iron; forged with rounded head |
| 49 | nail | E 25 | NW | II | Iron; forged with rounded head (plate 2B) |
| 50 | 2 nails | F 26 | SE | II | Iron; 1st cut (4 fragments.) corroded (collected in one piece); 2nd forged with rounded head (corroded) |
| 51 | 2 nails | AJ 5 | NW | II | Iron; 1st forged; 2nd cut (plate 2C) |
| 52 | nail | AH 8 | NE | II | cut (plate 2F) |
| 53 | nail | AK 6 | SW | II | Iron; cut ? (corroded) |
| 54 | nail | G 25 | SW | III | forged; corroded |
| 55 | 2 nails | F 25 | SE | II | Iron; the first is a nail (forged with rosaceous head); the second (fragmentary) ressembles more a clamp or a forged bolt (plate 2G) |
| 56 | clamp ? | F 24 | NW | II | forged (possibly a large nail) |
| 57 | undetermined | AK 8 | NE | II | forged; the fragment is rangy; one surface is flat, while the other as 2 vertical lips (plate 2H) |
| 58 | undetermined | AI 6 | SE | II | Iron; corroded |
| 59 | undetermined | AL 7 | NW | II | Iron; corroded |
| 60 | 2 undetermined | AJ 8 | SE | II | Iron; corroded. One tin fragment; 2nd undetermined |
| 61 | undetermined | AI 8 | NW | II | Iron; corroded |
| 62 | undetermined | AJ 4 | NW | II | Iron; corroded |
| 63 | undetermined | AJ 7 | NE | II | Iron; corroded (in 3 fragments.) |
| 64 | undetermined | AI 7 | NW | II | Iron; corroded |
| 65 | 2 undetermined | AJ 5 | SW | II | Iron; corroded |

The collection also includes several wood fragments, some of which have traces of corrosion and circular holes (nails?) and a cork plug, apparently worked.

# *Appendix III*

*IcGm-3*
*Description of Archaeological Data*

## Artifacts description

### Ulus

Five ulus or ulu fragments were recovered from IcGm-3. Two are complete: specimens 3 and 4 (plate 3, A and B; length: 155.00 and 119.20 mm; width: 86.70 and 79.40 mm; thickness: 11.30 and 6.50 mm). In each case, the distal part (active) and the proximal part (hafting) were chipped on both surfaces. Specimen #3 still shows traces of a groove and polishing on the dorsal surface. The other three specimens represent undetermined blade fragments (active part) of varying dimensions. Specimen #6 is relatively large (length: 120.40 mm; width: 76.80 mm; thickness: 5.70 mm), bringing it close to complete ulu #3. The distal extremity is chipped bifacially and traces of polishing are visible on one of the surfaces proximal to the retouches. Specimen #7 is slightly smaller (85.20 x 73.50 x 5.70 mm), but it has the same type of modifications as the preceding specimen, except that both surfaces were polished proximally to the retouches. The last specimen (#24) is a fragment of the active part of the blade (55.10 x 33.30 x 3.20 mm). Only one edge was retouched and no traces of polishing were observed. Observation of the breaks suggests that these latter three fragments were probably fractured during manufacture.

### Knives

Strictly speaking, there are only two knives in the collection and both come from the surface collection carried out in 1979 by D. Weetaluktuk on the 10 m terrace. Specimen #30 is a slate fragment fractured distally and proximally. Its dimensions are: length: 99.50(x) mm; width: 55.90 mm; thickness: 4.40 mm. Both surfaces are polished; one completely, the other partially. One edge is bevelled on almost half of the fragment's length and retouched proximally on both surfaces. A narrowing of the proximal part created by the crushing of the edges suggests a stem.

Specimen #31 is a complete siltite knife (two fragments mended together) (106.10 x 41.70 x 7.00 mm) with bifacial retouches. Its lateral edges are convex-convergent and the distal and proximal extremities are irregular in shape. Longitudinally, the knife shows an irregular profile, and transversally, it is asymmetrical-biconvex.

Specimen #5 (4 mended fragments) is interpreted as being an abandoned knife preform (172.00 x 76.00 x 6.50 mm). This piece shows various stages in slate tool manufacturing (figure 12). The right lateral edge has a groove, probably bifacial, to facilitate removal of the preform from the core. The opposite edge was retouched on practically its whole length. The left edge also has a partial groove, but the break is not as clear. The proximal extremity of this edge has been markedly crushed. Another knife fragment (?) (# 25) illustrates an identical manufacturing procedure. The right lateral edge shows the vestige of a dorsal groove chipped on the reverse side.

## Preforms(?)

Of the three preforms present in this collection, two cannot be associated with the production of particular tools (#8 and 9). It is highly probable that specimen #8 is a slate core fragment detached from a larger core, as demonstrated by the crushing and flaking of the residual platform. This piece was undoubtedly rejected because it did not correspond to the required dimensions of the tool being manufactured. Object #9 is possibly a manufacturing reject. No particular shape nor treatment were detected, except for a retouched groove on one of the reverse edges. A third preform (#27) was recovered from Y 23. It is a distal fragment of a bifacial object (thickness: 6.50 mm), possibly a knife. It illustrates the use of two manufacturing techniques. First the biface was chipped, then polished over the retouched right lateral edge and on both surfaces.

## Undetermined object

Specimen #28 was recovered by D. Weetaluktuk on the 10 m terrace (plate 3, C). It is a rangy slate object (69.80 x 23.00 x 9.40 mm) whose distal extremity was polished on both surfaces. A groove cuts diagonally across the object's body. Its function remains undetermined.

## "Core"

A single flake core was recovered from this site (Q 65; no 11). It is a metabasalt block (88.60 x 88.00 x 58.90 mm). Most of the surface is rounded. A single flake scar is visible on the external surface, while only a few are identifiable on the internal surface. It could be a hammerstone (cf., Lebel and Plumet, 1991).

## Retouched and used flakes

This category is made up of six objects. Four of them were collected in square metres O 61 and 63. The other two were recovered from Structure 2. Specimens #12, 13, 15 and 19 are chert flakes. Their dimensions vary between 25.70 and 59.80 mm (length), 15.00 and 37.80 mm (width), 4.40 and 7.70 mm (thickness). The striking platform for each of these flakes is fractured, with the exception of specimen #19 which has multiple treatment on a biconvex striking platform (length: 2.80 mm; width: 1.00 mm). Retouches or use wear are exclusively located at the distal extremity or on the left lateral edge of these flakes.

Both retouched slate flakes have different characteristics explained undoubtedly by differences in quality of the raw material used. Specimen #10 was taken from a slate block denser than the rest of the slate collection. The dorsal proximal edge of this flake shows the effort invested in the preparation of a striking platform. The ventral face is also flaked, showing the force of impact. The dorsal surface was slightly polished from the center to the right edge. A few retouches are visible on the first proximal third of this edge. Other retouches are visible on the left edge. In both cases, the retouches are ventral. The last retouched flake (#26) is similar to the slate objects prepared for the manufacturing of an ulu. The flake is laterally fractured and its distal extremity corresponds to the extremity of the slate core; use wear is located on this extremity.

## Debitage by-products

A total of 69 debitage flakes were recovered at IcGm-3. Most of them (n: 59, 85.51%) are of slate and come from the southeast and southwest quadrants of Y 23. The other flakes were recovered from O 61 and on the surface of O 63 and K 79. These flakes are of chert (n: 7, 9.86%) and quartzite (n: 3, 4.23%). The table which follows summarizes their main characteristics.

| Flake characteristics, IcGm-3 site | | |
|---|---|---|
| **Category:** | | |
| - thinning: | | |
| slate | 41 (80.39 %) | (69.49 %) |
| chert | 7 (13.73%) | |
| quartzite | 3 (5.88 %) | |
| - waste: | | |
| slate | 18 (30.51 %) | |
| **Class of dimension:** | | |
| < 50 | slate: 15 (21.74 %) | |
| | quartzite: 3 (4.35 %) | |
| 51-100 | slate: 3 (4,35 %) | |
| 101-200 | slate: 16 (23.19 %) | |
| 201-300 | slate: 5 (7.25%) | |
| | chert: 3 (4.35 %) | |
| 301-400 | slate: 5 (7.25 %) | |
| | chert: 2 (2.90 %) | |
| 401-600 | slate: 8 (11.59 %) | |
| | chert: 2 (2.90 %) | |
| 601-800 | slate: 2 (2.90 %) | |
| 801-1000 | slate: 5 (7.25 %) | |
| **Striking Platform (treatment):** | | |
| - multiple | chert: 1 (1.45 %) | |
| - scaled | chert: 2 (2.90 %) | |
| - plain | slate: 2 (2.90 %) | |
| - transversal | chert: 2 (2.90 %) | |
| - fractured | slate: 39 (56.52 %) | |
| | quartzite: 3 (4.35 %) | |
| | chert: 2 (2.90 %) | |
| - N/A (waste) | slate: 18 (26.09 %) | |
| **Striking Platform (form):** (chert only) | | |
| - biconvex | 1 (14.29 %) | |
| - plano-convex | 1 (14.29 %) | |
| - sub-triangular | 4 (57.14 %) | |
| - irregular | 1 (14.29 %) | |
| **Bulb of percussion:** (excluding waste) | | |
| - absent | slate: 26 (50.98 %) | |
| | quartzite: 3 (5.88 %) | |
| | chert: 3 (5.88 %) | |
| - visible | slate: 1 (1.96 %) | |
| | chert: 3 (5.88 %) | |
| - undetermined (fractured ?) | slate: 14 (27.45 %) | |
| | chert: 1 (1.96 %) | |

**Striking Platform (dimensions)** (chert)

| | | | | |
|---|---|---|---|---|
| length: μ: 3.56 mm | $\sigma^2$: 3.46 | St. error.: 1.31 | coef. var.: 97.14 | n: 7 |
| min.: 1.40 mm max.: 9.00 mm | | | | |
| width: μ: 1.70 mm | $\sigma^2$: 1.35 | St. error.: 0.51 | coef. var.: 79.57 | n: 7 |
| min.: 1.40 mm max.: 3.00 mm | | | | |

# *Appendix IV*

*IcGm-4*
*Description of Archaeological Data*

## Tool descriptions[1]

### Microblades (plate 4, A to H)

The work carried out on IcGm-4 allowed for the collection of 48 microblades: area A (n: 43), chert (n:33, 76.74%), quartz crystal (n: 9, 20.93%) and quartzite (n: 1, 2.33%; Areas C and D: chert (n: 4), crystal quartz (n: 1). Also, 3 blades (2 chert and 1 quartz crystal) come from area A (n: 2, chert and quartz crystal) and area C (n: 1, chert). The table on the following page summarizes the main characteristics retained for the analysis.

### Points (plate 5, F to H)

Seven chipped points were recovered from area A (quartzite: 4; chert: 3). Only two are complete (#430 and #954). Among the others, one is laterally incomplete (#953), one is latero-proximally incomplete (#955), one is distally incomplete (#956), another one is distally and latero-proximally incomplete (#298) and one is a distal fragment (#893). The following two tables summarize the main characteristics of the chipped points.

| No. | R.M. | Type | L. (mm) | W. (mm) | T. (mm) | Lat.Edge. | Dist.Ext. | Pro. Ext. |
|---|---|---|---|---|---|---|---|---|
| 298 | quartzite | triangular | 17.30 | 10.90 | 2.70 | sym. straight convergent | point | concave |
| 430 | chert | notched | 32.20 | 12.90 | 4.50 | sym. straight convex parallel | point | straight |
| 893 | chert | - | (x) | 11.80 | 3.30 | - | - | - |
| 953 | quartzite | triangular straight base | 33.30 | 16.10 | 6.90 | sym. straight convergent | straight | concave |
| 954 | quartzite | triangular concave base | 27.90 | 15.00 | 5.70 | sym. straight convergent | point | concave |
| 955 | quartzite | triangular straight base | 28.90 | 14.90 | 4.90 | sym. straight convergent | point | straight |
| 956 | chert | triangular straight base | 15.90 | 10.50 | 3.30 | sym. straight convergent | - | straight |

(sym.: symetrical; asym.: asymetrical; bif.: bifacial; uni.: unifacial)

| No. | *L*°, left edge. | *L*°, right edge | Long. section | trans. section | Hafting |
|---|---|---|---|---|---|
| 298 | 40° | 35° | sym. biconvex | sym. biconvex | - |
| 430 | - | - | plano-convex | plano-convex | bilateral (2 notches) |
| 893 | - | - | - | - | - |
| 953 | 60° | 60° | asym. biconvex | plano-convex | bifacial thinning |
| 954 | 50° | 50° | sym. biconvex | sym. biconvex | bifacial thinning |
| 955 | 55° | 60° | asym. biconvex | asym. biconvex | - |
| 956 | 40° | 30° | plano-convex | triangular | unifacial thinning |

[1] The description of the tools from the IcGm-4 site includes the objects recovered in areas C and D, but they are excluded from the analysis itself.

## Characteristics of the microblade collection, IcGm-4 site.

| Prov. | raw mat. | Int. | L | W | T | M T W | Arris | Ret./use | T PF | ∠°PF | Bulb | ∠° left | ∠° right | Reamrks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area A | | | | | | | | | | | | | | |
| - | chert | C | 12,50 | 4,10 | 1,00 | 24,4 | 1 | | FE | | visible | 25° | 20° | |
| - | chert | C | 22,10 | 9,20 | 3,60 | 39,1 | 2 | | FO | 80° | | 55° | 40° | cortex |
| - | chert | C | 24,50 | 6,50 | 2,20 | 33,8 | 1 | | FO | 80° | absent | 30° | 40° | stem |
| - | chert | I | 0,00 | 0,00 | 0,00 | - | 0 | | | | | | | recent fracture |
| - | chert | Di | 30,20 | 10,10 | 2,90 | 29,2 | 2 | √ | FO | 85° | | | | |
| - | chert | Di | 29,20 | 7,50 | 2,50 | 33,5 | 2 | | FO | 85° | | | | |
| - | chert | P | 16,20 | 9,30 | 2,60 | 27,9 | 2 | √ | CB | | visible | 45° | 25° | |
| - | chert | P | 18,80 | 11,30 | 1,70 | 15 | 2 | | FO | 80° | visible | | | |
| - | chert | D | 17,40 | 7,70 | 2,00 | - | 2 | √ | | | | | | |
| B 1 | chert | M. | 12,80 | 5,90 | 2,20 | 37,3 | 2 | √ | | | | 30° | 25° | |
| C 1 | chert | C | 26,80 | 5,90 | 2,70 | 45 | 2 | √ | FO | 90° | visible | | | |
| C 1 | chert | Di | 23,00 | 7,30 | 2,30 | 31,5 | 1 | √ | FO | 70° | visible | | | |
| C 1a | chert | M | 7,70 | 7,60 | 3,20 | - | 3 | | | | | | | |
| C 1a | chert | Di-Pi | 18,50 | 7,70 | 1,80 | - | 2 | | | | | | | |
| D 2 | chert | C | 13,70 | 7,80 | 1,80 | 23,1 | 2 | √ | FC | 60° | | 35° | 30° | |
| D 2 | chert | M | 15,00 | 8,30 | 3,80 | - | 2 | | | | | | | |
| D 2 | chert | Pi | 23,00 | 7,60 | 1,90 | 25 | 2 | | | | | | | |
| D 3 | chert | Di | 23,60 | 5,50 | 2,30 | 41,8 | 1 | | FC | 85° | visible | | | cortex |
| E 1 | chert | C | 21,00 | 9,10 | 3,10 | 34,1 | 1 | | FC | 100° | visible | 50° | 40° | |
| H 1 | chert | M | 21,80 | 8,00 | 2,60 | 32,3 | 2 | √ | | | | | | |
| P 34 | chert | Di | 13,40 | 5,10 | 1,30 | 25,5 | 1 | √ | FO | 70° | visible | 25° | 25° | |
| R 31 | chert | M | 10,60 | 5,40 | 0,80 | 14,8 | 2 | √ | | | | 30° | 25° | |
| R 39 | chert | M | 10,10 | 6,70 | 2,50 | 37,3 | 0 | | | | | 30° | 40° | |
| T 30 | chert | C | 40,00 | 5,40 | 2,20 | 40,7 | 2 | √ | FO | 70° | absent | 30° | 30° | |
| T 41 | chert | M | 13,60 | 6,30 | 1,60 | 25,4 | 2 | | | | | 25° | 20° | |
| U 31 | chert | P | 12,70 | 8,00 | 2,50 | - | 0 | | | | visible | | | |
| V 2 | chert | P | 14,20 | 6,10 | 1,40 | 65,6 | 1 | | FO | 90° | visible | 15° | 15° | |
| V 2 | chert | Di | 36,70 | 6,60 | 3,00 | 45,5 | 1 | | | | | | 35° | |
| V 2 | chert | D | 23,50 | 9,10 | 1,80 | 19,8 | 2 | | | | | 15° | 25° | |
| V 35 | chert | P | 25,20 | 10,50 | 2,50 | 23,8 | 2 | √ | FO | 65° | visible | 20° | 30° | |
| W2 | chert | D | 9,60 | 8,00 | 1,40 | 17,5 | 2 | | | | | 30° | | |
| W 36 | chert | M | 8,60 | 5,30 | 1,10 | 20,75 | 1 | √ | | | | 15° | 10° | |
| X 35 | chert | P | 17,90 | 8,90 | 2,70 | 30,3 | 1 | | FO | 75° | absent | 20° | 25° | |
| - | crystal | C | 16,90 | 6,40 | 1,70 | 26,6 | 1 | | FO | 120° | absent | | | |
| - | crystal | C | 16,40 | 7,10 | 2,90 | - | 0 | | | | | | | cortex |
| - | crystal | P | 12,20 | 8,00 | 3,00 | - | 0 | √ | | | | | | cortex |
| - | crystal | C | 20,50 | 7,40 | 1,90 | 25,6 | 2 | | CB | 80° | absent | 60° | 35° | |
| - | crystal | Pi | 20,40 | 8,50 | 2,70 | 31,7 | 1 | √ | | | | 30° | 30° | |
| - | crystal | M | 14,50 | 9,00 | 3,00 | - | 1 | √ | | | | 30° | 30° | |
| C 1a | crystal | I | 12,00 | 5,10 | 3,00 | - | 0 | √ | | | | | | |
| S 33 | crystal | M | 9,40 | 5,70 | 1,30 | 22,8 | 1 | | | | | 15° | 15° | |
| V 33 | crystal | P | 15,80 | 8,60 | 1,60 | 18,6 | 2 | √ | FO | 70° | visible | 20° | 20° | stem (?) |
| - | quartzite | Di | 20,60 | 9,30 | 3,60 | - | 0 | | | | visible | | | |
| Areas | C & D | | | | | | | | | | | | | |
| Str. 2 | chert | I | 5,70 | 8,70 | 2,00 | - | 1 | | | | | 25° | | |
| Str. 3 | chert | Di | 18,70 | 7,90 | 2,80 | 35,4 | 2 | | CB | 75° | visible | 55° | 25° | |
| Str. 3 | chert | LDI | 19,40 | 8,90 | 2,40 | 27 | 1 | √ | FO | 80° | visible | 15° | 20° | |
| Str. 4 | chert | M | 8,80 | 6,80 | 2,00 | 29,4 | 2 | | | | | 25° | 30° | |
| - | crystal | C | 26,70 | 8,40 | 3,60 | 42,8 | 1 | | FO | 100° | | 50° | 55° | cortex |

One of these points (#430) has enlarged notches measuring 3.70 mm (width), 6.10 mm (height) and 1.20 mm (depth). Striking platform remnants were observed on two of these points (#953 and 954):

| | | | |
|---|---|---|---|
| #953: plano-convex | multiple | Length: 5,10 mm | Width: 2,20 mm |
| #954: biconvex | plain | Length: 2,50 mm | Width: 1,10 mm |

Two complete polished slate points also make up part of this collection (#850 and 971). Specimen # 850 (23.70 x 10.90 x 1.90 mm) is lanceolate in shape with symmetrical-convex and convergent edges (*L*° g.: 35°, *L*° d.: 40°); the distal extremity is pointed, while the proximal extremity is straight (*L*°: 35°). The longitudinal and transversal profiles are respectively symmetrical and biconvex.

Point #971 (36.90 x 33.40 x 4.90 mm) has two lateral notches (left: U-shaped, 8.40 x 3.40 x 9.00 mm; right: W-shaped, 9.40 x 7.80 x 2.60 mm). Its lateral edges are symmetrical, parallel and straight (*L*° g.: 90°, *L*° d.: 90°).

**Knives** (plate 5, I to J, plate 7, B to E; plate 8, B to D)

The lithic collection from IcGm-4 is made up of 19 polished slate knives and 3 chipped knives (2 in chert and 1 in quartzite). The table that follows summarizes the characteristics of these objects. These knives are of various forms and dimensions, including two complete slate preforms. Three polished knives have notches (two lateral: #961, 963, one cornered: #227). Two of the chert knives have a thinned base (#959, 960).

Three slate knives (#181, 278, 970) still have manufacturing traces, particularly grooves and retouches on the reverse side. Another (#1753) has a remnant striking platform, as does one of the chert knives (#981).

One last object (#972; plate 7, A) is described with the knives, even though it is probably an abandoned preform. This object (62.40(x) x 55.10 x 10.10 mm) has two large unifacial depressions on each of its lateral edges, which start at the center and define the edges. This feature is similar in nature to the preform (#5) recovered at IcGm-3.

**Knives characteristics:**

| No. | P/T | Type | L (mm) | W. (mm) | T. (mm) | Int. | Lat. Edges | P.Ext. | D.Ext. |
|---|---|---|---|---|---|---|---|---|---|
| 75 | p | - | (x) | 22.30 | 5.60 | Di | asym. d. paral. | - | concave |
| 145 | p | notched | 75.20 | 31.40 | 6.90 | C | asym. ir. div. | straight | - |
| 155 | p | - | (x) | 24.10 | 2.90 | M | - | - | - |
| 181 | p | preform | 90.80 | 36.90 | 2.80 | LDi-LPi | - | - | - |
| 227 | p | corner-notched | (x) | 13.10 | 3.90 | Di | - | - | - |
| 242 | p | triangular sym. | (x) | 30.10 | 6.10 | Pi | sym. cx. conv. | - | - |
| 278 | p | - | (x) | 25.00 | 5.40 | M | - | - | - |
| 333 | p | - | (x) | 19.60 | 6.00 | M | sym. d. paral. | - | - |
| 345 | p | - | (x) | 21.20 | 3.30 | D | - | - | - |
| 409 | p | - | (x) | (x) | 3.40 | D | - | - | - |
| 961 | p | side-notched | (x) | 21.10 | 3.20 | P | - | straight | - |
| 963 | p | side-notched | (x) | 30.70 | 4.20 | P | - | straight | - |
| 964 | p | lanceolate | (x) | 23.50 | 4.20 | Pi | sym. cv. conv. | - | rounded |
| 965 | p | - | 32.00 | 8.80 | 1.80 | LD | - | - | - |
| 969 | p | - | (x) | 21.50 | 3.60 | M | - | - | - |
| 970 | p | - | (x) | 22.80 | 4.30 | M | sym. d. paral. | - | - |
| 977 | p | - | (x) | 10.20 | 2.60 | D | - | - | - |
| 1753 | p | preform | 57.70 | 30.30 | 6.90 | C | - | - | - |
| 1784 | p | - | (x) | 16.40 | 2.00 | I | - | - | - |
| 959 | t | - | 25.40 | 17.70 | 5.90 | P | sym. d. paral. | straight | - |
| 960 | t | triangular asym. | 30.20 | 21.20 | 5.80 | LPi | asym. cx. conv. | straight | rounded |
| 981 | t | oval | 19.10 | 9.70 | 3.80 | Di | sym. d. paral. | - | straight |

| No. | ∠°, Lat. Edge Left | Longitudinal section | Transversal section | Hafting | Remarks |
|---|---|---|---|---|---|
| 75 | - | bi-planar | bi-planar | bilateral (2 notches) | |
| 145 | - | asym. biconvex | sym. biconvexe | bilateral (2 notches) | |
| 155 | - | - | - | - | |
| 181 | - | - | - | - | grooves (face A)<br>retouched (face B) |
| 227 | - | - | - | - | |
| 242 | - | - | plano-convex | - | |
| 278 | - | - | - | - | grooves (face A) |
| 333 | - | - | asym. biconvex | - | |
| 345 | - | - | - | - | |
| 409 | - | - | - | - | |
| 961 | - | - | - | bilateral (2 notches) | |
| 963 | - | - | - | bilateral (2 notches) | |
| 964 | 25° | plano-convex | plano-convex | - | |
| 965 | - | - | - | - | |
| 969 | 40° | triangular | triangular | - | |
| 970 | 40° | triangular | triangular | - | grooves (face A) |
| 977 | 25° | triangular | asym. biconvex | - | carbonised grease |
| 1753 | - | - | - | - | |
| 1784 | - | - | - | - | |
| 959 | 40° | concavo-convex | plano-convex | unifacial thinning | |
| 960 | 55° | sym. biconvex | sym. biconvex | bifacial thinning | |
| 981 | 40° | concavo-convex | triangular | - | |

(P/T: polished or chipped; Int.: integrity; lat.: lateral; P: proximal; D: distal; asym.: asymetrical; sym.: symetrical; paral.: parallel; d.: straight; ir.: irregular; div.: divergent; conv.: convergent; cx: convex; cv: concave; Di: distally incomplete; Pi: proximally incomplete; C: complete; LDi: latero-distally incomplete; LPi: latero-proximally incomplete; M: mesial fragment; D: distal fragment; P: proximal fragment; LD: latero-distal fragment; I: undetermined).

## Bifacial fragments

The various excavations at IcGm-4 allowed for the recovery of 16 bifacial fragments (cf., following table). Most of them are of quartzite (n: 11), followed by chert (n: 4) and milky quartz (n: 1). All of these objects are fragmentary, although some have striking platform remnants, suggesting that these tools were fractured during manufacturing.

| No. | R.M. | L (mm) | W. (mm) | T. (mm) | Int. | Long Sect | Trans Sect | PF F | PF T | Bulb |
|---|---|---|---|---|---|---|---|---|---|---|
| 809 | quartzite | (x) | 14.70 | 3.50 | P | - | - | - | - | - |
| 837 | quartzite | (x) | (x) | (x) | I | - | - | - | - | - |
| 870 | chert | (x) | (x) | 3.70 | I | - | - | - | - | - |
| 896 | quartzite | (x) | 21.90 | 5.40 | P | - | - | biconvex | multiple | absent |
| 982 | quartzite | (x) | (x) | 4.70 | P | asym. biconvex | triangular | biconvex | fractured | visible |
| 984 | chert | 16.60 | (x) | 3.10 | L | sym. biconvex | asym. biconvex | - | - | - |
| 985 | chert | (x) | (x) | 2,80 | LP | concavo-convex | asym. biconvex | biconvex | scaled | visible |
| 1291 | quartzite | (x) | (x) | 3.00 | I | - | - | - | - | - |
| 1488 | milky quartz | (x) | (x) | 8.20 | I | - | - | - | - | - |
| 1657 | quartzite | (x) | (x) | 6.90 | I | - | - | - | - | - |
| 1679 | quartzite | (x) | (x) | 4.10 | I | - | - | - | - | - |
| 1680 | chert | (x) | (x) | 6.30 | I | - | - | - | - | - |
| 1694 | quartzite | (x) | 8.70 | 4.60 | P | - | - | biconvex | multiple | visible |
| 1699 | quartzite | (x) | (x) | 3.30 | I | - | - | - | - | - |
| 894* | quartzite | (x) | 12.30 | 3.40 | P | - | - | biconvex | multiple | visible |
| 986Δ | quartzite | (x) | (x) | 2.80 | I | asym. biconvex | sym. biconvex | - | - | - |

(* : area D; Δ: north backdirt (D. Weetaluktuk); PF F: striking platform (form); PF T: striking platform (treatment); sym.: symetrical; asym.: asymetrical; P: proximal fragment; L: lateral fragment; LP: latero-proximal fragment; I; undetermined).

## End scrapers

Three end scrapers were recovered in 1979-80. The first (#365), made from crystal quartz, was manufactured on a flake (23.50 x 18.50 x 8.60), thus it has a relatively uneven facies. The angle of the distal working edge is 80°. The second end scraper (#432) is made from chert (31.10 x 16.10 x 7.30 mm) and has a rounded triangular shape. The angle of the distal working edge is 30°. The last one (#867) is made from milky quartz (30.10 x 18.30 x 7.10 mm) and is quadrangular in shape. These last two end scrapers also have a stem at their proximal end: #432 is single shouldered (L: 23.50, W: 14.10; T: 7.30) and #867 is double shouldered (L: 22.60; W: 16.90; T: 6.80).

## Burin-like tools (plate 5, A to E)

Six burin-like tools were recovered, all made from nephrite (#194, 866, 958, 979, 980) except for one soapstone specimen (cf., following table). Two burin-like tools have notches: #958 (2.30 and 2.90 mm in height; 4.60 and 4.10 mm in width; 1.40 and 1.10 mm in depth) and # 978 (5.00 and 3.50 mm in height; 5.30 and 5.10 mm in width; 3.70 and 4.60 mm in depth). Specimen #958 also has three notches on its proximal extremity (width: 1.90, 2.70 and 2.30 mm; depth: 1.00, 1.20 and 1.00 mm) (plate 5, E). This addition must have improved hafting between the tool and the handle.

| No. | R.M. | L (mm) | W. (mm) | T. (mm) | Int. | Lateral Edges | ∠° left edge | ∠° right edge | Hafting |
|---|---|---|---|---|---|---|---|---|---|
| 866 | nephrite | 20.90 | 11.50 | 3.50 | LPi | - | 90° | 60° | - |
| 194 | nephrite | 23.50 | 16.40 | 5.80 | LDi | - | - | - | - |
| 980 | nephrite | 24.70 | 12.30 | 7.50 | C | sym. straight parallel | 85° | - | - |
| 958* | nephrite | 8.00 | 12.60 | 2.50 | P | - | - | - | bilateral (2 notches) |
| 978 | soapstone | 26.70 | 16.10 | 5.60 | Di | sym. straight parallel | 60° | 90° | bilateral(2 notches) |
| 979 | nephrite | 25.80 | 10.10 | 3.20 | C | asym. straight divergent | 75° | 80° | - |

(LPi: latero-proximally incomplete; LDi: latero-distally incomplete; C: complete; P: proximal fragment; Di: distally incomplete; sym.: symetrical; asym.: asymetrical).

## Tip-flute spalls (plate 4, I)

Three complete tip-flute spalls in chert were recovered at IcGm-4 (#892: 29.50 x 8.30 x 2.30 mm; #1642: 19.60 x 7.00 x 1.60 mm; #1795: 20.00 x 8.80 x 2.90 mm). Specimen #892 and 1642 have striking platform remnants.

## Burin spalls

Two complete burin spalls in chert were recovered. The first (#949), which comes from Structure 3 (area C), has probably been used (21.70 x 4.40 x 1.80 mm). The second spall was recovered from square metre W 33 (10.20 x 4.30 x 3.00 mm).

## Adze

A single nephrite adze (#431) comes from the 1979-80 excavations. It measures 30.00 x 31.20 x 7.70 mm and is entirely polished. Laterally, its edges are symmetrical, straight and parallel. The distal and proximal extremities are straight. Longitudinally, it is rhomboic in shape, while its transversal profile is plano-convex. There are no visible modifications of the proximal extremity for hafting.

**Retouched and used flakes** (plate 6, A, plate 7, F)

Ten retouched flakes and three used flakes make up part of the collection from IcGm-4 (cf., following table). Two of them come from area D (#897 and 899) and one from area C (#898). These flakes have relatively large dimensions. Specimen #994 is interpreted as being a chopper, but it may have been used also as a core. Specimen #975 could be an end scraper preform.

| No. | Type | R.M. | L (mm) | W. (mm) | T. (mm) | PF T | PF F | Bulb | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 872 | r | chert | 15.40 | 4.10 | 1.70 | fractured | - | - | retouched. before or after fracture ? |
| 873 | r | chert | 25.90 | 9.30 | 3.50 | fractured | - | - | |
| 877 | u | chert | 38.30 | 21.50 | 5.30 | - | - | - | used (50% right edge and 50% left ventral edge |
| 895 | r | chert | 12.10 | 16.90 | 4.00 | fractured | - | - | |
| 975 | u | crystal | 14.20 | 12.30 | 6.20 | - | - | - | end scraper preform (?) |
| 991 | u | metabasalt | 129,70 | 49,10 | 10,40 | - | - | - | carbonised grease; polishing traces (face A) |
| 994 | r | metabasalt | 124.20 | 96.90 | 25.00 | fractured | - | visible | cortex; "chopper" |
| 1705 | r | chert | 11.20 | 8.40 | 1.80 | fractured | - | visible | |
| 1273 | r | metabasalt | 108.00 | 85.30 | 35.50 | fractured | - | - | |
| 1612 | r | quartzite | 12.00 | 6.70 | 2.50 | fractured | - | - | |
| 897* | r | quartzite | 30.00 | 34.20 | 15.60 | fractured | - | - | |
| 898Δ | r | chert | 73.50 | 43.60 | 11.90 | multiple | ST | absent | |
| 899* | r | quartzite | 12.40 | 13.40 | 3.10 | fractured | - | visible | |

(r: retouched flake; u: used flake; PF T: striking platform (treatment); PF F: striking platform (form); ST: subtriangular. Δ area C; * area D.

**Cores** (plate 5, K to M, plate 6, B)

Two microblade cores were identified in this collection. Specimen #1697 is in chert and has an irregular shape (22.30 x 20.00 x 11.80 mm). The second core (#1814), in crystal quartz (26.50 x 19.80 x 14.90 mm), presents two crushed extremities giving it a wedge-like shape ("pièce esquillée").

Three other crystals (#1815, 1816, 1817) were recovered in 1979-80. They all have a prepared striking platform, but no flake scars other than platform preparation are visible. It appears that these pieces were considered unsuitable for production of microblades of acceptable dimensions. Their maximal dimensions (#1815: 26.20 x 7.60 mm; # 1816: 24.40 x 8.70 mm; #1817: 24.20 x 9.70 mm) would support that hypothesis.

The collection also includes 16 flake cores (cf.,table below). Most of them are in metabasalt (n: 8), followed by chert (n: 6), while only 2 are in quartzite. Only 4 of them are considered worn out.

Specimen #148 is particular (plate 8, A). It is a sheet of slate on which two V-shaped grooves have been gouged. This technique, described by Weetaluktuk (n.d.), represents one of the two methods of manufacturing slate objects (see figure 12).

| No. | Raw Material | L (mm) | W. (mm) | T. (mm) | Remarks |
|---|---|---|---|---|---|
| 68 | quartzite | 31.10 | 30.50 | 11.20 | |
| 429 | chert | 42.60 | 31.70 | 19.60 | |
| 871 | chert | 51.20 | 30.20 | 11.60 | |
| 878 | chert | 52.10 | 32.20 | 37.70 | |
| 879 | chert | 41.10 | 44.00 | 20.20 | flake scars mainly on one face |
| 987 | metabasalt | 67.10 | 75.60 | 43.40 | cortex; prepared striking platform on one edge; also used as hammerstone (?) |
| 988 | metabasalt | 92.30 | 57.10 | 47.20 | cortex; prepared striking platform on one edge |
| 990 | metabasalt | 74.50 | 75.70 | 32.80 | cortex |
| 1326 | quartzite | 33.20 | 20.00 | 13.70 | |
| 1350 | chert | 56.80 | 34.60 | 13.80 | |
| 1462 | metabasalt | 74.50 | 43.60 | 24.80 | |
| 1506 | metabasalt | 77.30 | 52.60 | 21.00 | |
| 1550 | metabasalt | 112.60 | 70.70 | 52.60 | cortex |
| 1641 | metabasalt | 115.00 | 80.50 | 71.00 | |
| 1743 | metabasalt | 68.70 | 68.10 | 47.40 | prepared striking platform |
| 1819 | chert | 25.60 | 17.50 | 9.40 | |
| 148 | slate | 0.00 | 0.00 | 4.10 | slate "core" with 2 V-shaped grooves (Preform preparation) |

## Polished fragments

Among the polished fragments, there is one with laterally cut double notches (#865). These notches, 5.00 and 4.30 mm wide and 2.50 and 3.00 mm deep respectively, are U-shaped and have been thinned by bifacial retouches. This fragment could have been part of a knife or point.

Specimen #841 shows traces of polishing on the ventral surface and on the right lateral edge, but does not have any particular shape. According to all appearances, it is a flake exhibiting traces of polishing. However, these polishing marks are posterior to its detachment.

The collection also includes 42 polished slate fragments and one of an undetermined raw material (#976). These fragments are of various sizes (mean length: 23.99(x) mm; mean width: 17.76(x) mm; mean thickness: 2.00 mm—min.: 1.10 mm, max: 4.90 mm; $\sigma^2$: 0.81). More than two thirds (70%) are polished on one side, presumably the dorsal surface. Only 9 (21%) have traces of polishing on both faces. Two specimens (#334 and 1665) have a groove on their dorsal surface; two others are retouched (#90, bifacially; #1728, dorsal surface only). Another specimen (#957) has a U-shaped notch. Finally, fragment #199 is possibly a knife fragment.

Some of the characteristics presented here are also found on a certain number of slate flakes. Accordingly, some of the slate flakes classified in the category other are polished fragments. However, it was decided to leave these small fragments with the by-products because they are not as informative on the manufacturing technique as their larger counterparts. These polished fragments, as well as the polished small flakes, are associated with the manufacturing of polished tools by the grooving and snapping off technique.

**Vessels and other soapstone objects** (plates 9 and 10)

The lithic collection from IcGm-4 includes 123 soapstone vessel fragments, most of them body fragments (cf., opposite tables). Some of these pieces show traces of manufacturing (i.e., end scraper marks, grooves and polishing traces), others indicate modification of the rim section (i.e., bevelled, plain, rounded). All of these fragments are listed by class of dimension. One of these fragments (#1020) probably belonged to a miniature lamp. Only 9 of the fragments show traces of carbonization.

The collection also includes 5 lamp preforms. Two of them are complete and measure 138.00 x 45.30 x 71.50 mm and 132.20 x 39.90 x 92.40 mm respectively (plate 10). On both preform, the exterior has been worked, but the inside has not been hollowed out. They compare well with the preforms presented in Plumet (1985: 399, appendix 1). A third complete preform (?) (#1560) is somewhat smaller in dimensions (95.00 x 30.40 x 75.60 mm).

| Characteristics of the soapstone vessel fragments. | | | | | |
|---|---|---|---|---|---|
| **Fragment:** | **Class of dimension** | | **Manufacture** | | |
| | | | (scraped) | (gouged) | (polished) |
| **body (und. vessel)** | 51-100 | (n: 3) | | | |
| **(n: 96)** | 101-200 | (n: 7) | | 1 d. | 1 d., 1 v.; 3 v./d. |
| | 201-300 | (n: 15) | 1 | | 1 d. ; 1 v./d. |
| | 301-400 | (n: 11) | | | 2 d., 1 v.; 4 v./d. |
| | 401-600 | (n: 14) | 1 | 2 v. | 2 d.; 7 v./d. |
| | 601-800 | (n: 8) | | | 2 d., 1 v.; 4 v./d. |
| | 801-1000 | (n: 5) | | | 1 v./d. |
| | > 1000 | (n: 29) | 2 | 1 d. | 3 d., 1 v.; 11 v./d. |
| | undetermined | (n: 4) | | | 1 d. |
| **body (bowl) (n: 1)** | > 1000 | (n: 1) | | | 1 v./d. |
| **rim (n: 30)** | 101-200 | (n: 2) | | | 1 v./d. |
| | 201-300 | (n: 3) | | | 1 v./d. |
| | 301-400 | (n: 4) | | | 2 v./d. |
| | 401-600 | (n: 6) | | 1 v. | 1 d.; 1 v./d. |
| | 601-800 | (n: 2) | | | |
| | 801-1000 | (n: 3) | | | 1 v./d. |
| | > 1000 | (n: 10) | 2 | 1 d. | 10 v./d. |
| **corner/body (n: 6)** | > 1000 | (n: 5) | 1 | | 1 v./d. |
| **with rim (n: 1)** | > 1000 | (n: 1) | | | |
| **undetermined (n: 8)** | 51-100 | (n: 1) | | | |
| **(incl. preform frag.)** | > 1000 | (n: 6) | | | 2 d.; 1 v./d. |
| | undetermined | (n: 1) | | | |

(d.: dorsal; v.: ventral; v./d.: ventral and dorsal).

| Characteristics of the rim fragments. | | | | | | |
|---|---|---|---|---|---|---|
| **Class of dimension** | **bevelled** | | **plain** | **rounded** | **Thichness (µ)** | |
| | **ext.** | **ext./int.** | | | | |
| **101-200** | 1 | - | 1 | 2 | 4.50 | (n: 2) |
| **201-300** | - | - | 1 | - | 5.70 | (n: 2) |
| **301-400** | 2 | - | 2 | - | 7.02 | (n: 4) |
| **401-600** | 1 | - | 2* | 1** | 6.67 | (n: 6) |
| **601-800** | 1 | 2 | - | - | 7.50 | (n: 3) |
| **801-1000** | - | 1 | - | 1 | 7.15 | (n: 2) |
| **> 1000** | - | 6 | 5 | - | 7.34 | (n: 11) |
| **µ : 6.87 mm** | | **σ2: 2.10** | **min.: 2.40 mm** | | **max.: 10.50 mm** | |

(* externally bevelled; ** miniature lamp fragment)

Its external walls are roughly defined (one face is slightly polished), but no further modifications, save the initial rough-hewing on the upper surface, are visible on the preform. The other two preforms are fragments which have been barely cut (#28 and 150).

Five lamps also are part of this collection. Specimen #268 is represented by half of a rectangular lamp (Height: 12.90 mm; width: 62.70 mm). Lamp #320 is the most complete, only a few fragments of the base and walls are missing. It measures 114.30 x 9.00 x 81.10 mm and is oval in shape. Two-thirds of lamp #289 could be reconstructed. It has a rectangular shape (height: 11.80 mm; width: 101.20 mm; length: 128.20 mm). Specimen #1032 is also fragmentary, but its height (46.90 mm) suggests another possible function or a lamp which goes far beyond the dimensions of the other lamps identified. The last specimen (#1037) is defined by a corner fragment incorporating part of the base and part of the walls. The dimensions of this fragment (i.e. 80.60 x 20.50 x 68.60 mm) bring it closer to the preceding specimen than the other fragments.

Four bowl fragments (#880) are associated with the historic period. Three of these fragments belong clearly to the same bowl, while the fourth fragment is suspected to be another portion of that bowl although no physical links could be determined with the former fragments. The first three fragments were joined together by two metal plaques, one of which is still present; the second is suggested by oxidization of a well-defined rectangular depressions on two of these fragments. Save for the fact that it was recovered at IcGm-4, no provenience information are available for these fragments.

The IcGm-4 site also revealed 4 other soapstone artifacts. Two are identified as being wound plugs (#20 and 140). These objects measure 60.80 x 13.10 x 6.70 mm and 40.40(X) x 10.00 x 5.30 mm respectively. In the latter case, the distal extremity is broken. They are completely polished, and each of them also has an enlarged notch (#20: 5.30 x 9.70 x 0.80 mm; #140: 6.70 x 11.10 x 1.40 mm). Specimen #20 has a second notch situated 29.10 mm from the base (width: 7.90 mm).

Two other soapstone objects were recovered. The first (#193) is a boot creaser (?) (54.00 x 12.70 x 43.60 mm). Both surfaces show uneven traces of polishing; grinding is also visible on the ventral surface. Parallel stria perpendicular to the object occupy a major part of both surfaces. The distal extremity was polished in such a way as to achieve an almost straight angle. The proximal extremity has not been worked. The left lateral edge is polished on the first distal third, while a shallow and roughly developed enlarged notch (27.20 mm) covers the remaining two-thirds. The distal half of the right lateral edge is also polished, while the proximal part shows crushing marks. The last object (#1041) is of undetermined function. It is an entirely polished object measuring 29.40 x 9.40 x 17.40 mm.

## Debitage

The following tables present all the data used in the analysis of the debitage collection of Area A. Areas C and D are presented in appendix V.

### 1. Raw Materials

| Year | chert | metabasalt | quartzite | soapstone | slate | quartz crystal | milky/ hyalin | local quartzite | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1979-80 | 416 | 186 | 543 | 3 966 | 153 | 9 | 20 | - | 5 293 |
| 1985: | | | | | | | | | |
| Area A | 52 | 7 | 221 | 7 | 2 | 3 | 3 | - | 295 |
| Area C | 96 | 15 | 49 | 1 | 3 | - | - | - | 164 |
| Area D | - | - | 247 | 1 | 2 | - | - | - | 250 |
| 1986 | 973 | 227 | 1 074 | 4 568 | 329 | 40 | 21 | 19 | 7 251 |
| Total | 1 537 | 435 | 2 134 | 8 543† | 489 | 52 | 44 | 19 | 13 253* |

(† 42 flakes are represented by a silicified soapstone; * 3 flakes are undetermined and 1 is of granite).

### Class of dimension vs category (CHERT)

| Class of dimension | Trimming | Thinning | Reducing | Bulb | Waste | Shatter | Total |
|---|---|---|---|---|---|---|---|
| < 50† | 66 | 260 | 3 | 1 | 480 | 104 | 914 |
| 51-100† | 17 | 192 | 11 | 1 | 9 | 26 | 256 |
| 101-200† | 2 | 116 | 10 | 2 | - | 31 | 161 |
| 201-300† | - | 33 | 2 | - | - | 1 | 36 |
| 301-400 | - | 13 | 2 | 1 | - | - | 16 |
| 401-600 | - | 3 | 1 | - | - | - | 4 |
| 601-800 | - | 1 | - | - | - | - | 1 |
| 801-1000 | - | - | - | - | - | - | - |
| > 1000 | - | - | - | - | - | - | - |
| n/a† | - | - | - | - | - | 53 | 53 |
| Total | 85 | 618 | 29 | 5 | 489 | 215 | 1 441 |

(†45 flakes have cortex).

### Class of dimension vs category (QUARTZITE)

| Class of dimension | Trimming | Thinning | Reducing | Bulb | Waste | Shatter | Total |
|---|---|---|---|---|---|---|---|
| < 50† | 19 | 311 | 7 | - | 215 | 131 | 683 |
| 51-100† | 5 | 363 | 26 | 1 | 12 | 58 | 465 |
| 101-200† | - | 186 | 23 | 1 | - | 17 | 227 |
| 201-300† | - | 34 | 12 | - | - | 3 | 49 |
| 301-400† | - | 8 | 4 | - | - | 1 | 13 |
| 401-600 | - | 4 | 3 | - | - | 1 | 8 |
| 601-800† | - | 1 | 1 | - | - | - | 2 |
| 801-1000 | - | - | 1 | - | - | - | 1 |
| > 1000 | - | 1 | 2 | - | - | 1 | 4 |
| n/a | - | - | - | - | - | 386 | 386 |
| Total | 24 | 908 | 79 | 2 | 227 | 598 | 1 838 |

(†64 flakes have cortex).

## Class of dimension vs category (METABASALT)

| Class of dimension | Trimming | Thinning | Reducing | Bulb | Waste | Shatter | Total |
|---|---|---|---|---|---|---|---|
| < 50 | - | 16 | 1 | - | 12 | 11 | 40 |
| 51-100† | - | 37 | 2 | - | 5 | 18 | 62 |
| 101-200† | - | 47 | 16 | 3 | - | 12 | 78 |
| 201-300† | - | 37 | 18 | 1 | - | 13 | 69 |
| 301-400† | - | 19 | 9 | 1 | - | 2 | 31 |
| 401-600† | - | 17 | 13 | - | - | 1 | 31 |
| 601-800† | - | 16 | 4 | - | - | 1 | 21 |
| 801-1000† | - | 5 | 6 | - | - | 1 | 12 |
| > 1000† | - | 7 | 31 | 1 | - | 2 | 41 |
| n/a† | - | - | - | - | - | 34 | 34 |
| Total | 0 | 201 | 100 | 6 | 17 | 95 | 419 |

(†40 flakes have cortex;one unmodified nodule > 1000)

## Class of dimension vs category (SLATE)

| Class of dimension | Trimming | Thinning | Reducing | Bulb | Waste | Shatter | Total |
|---|---|---|---|---|---|---|---|
| < 50 | - | 10 | - | 67 | 33 | - | 110 |
| 51-100† | - | 46 | 14 | 18 | 38 | 1 | 117 |
| 101-200† | - | 57 | 24 | - | 46 | 3 | 130 |
| 201-300† | - | 23 | 6 | - | 6 | 1 | 36 |
| 301-400† | - | 6 | 7 | - | 1 | - | 14 |
| 401-600† | - | 6 | 1 | - | 5 | - | 12 |
| 601-800 | - | 6 | 2 | - | - | - | 8 |
| 801-1000 | - | 3 | 1 | - | - | - | 4 |
| > 1000 | - | 2 | 1 | - | 1 | - | 4 |
| n/a | - | - | - | - | 49 | - | 49 |
| Total | 0 | 159 | 56 | 85 | 179 | 5 | 484 |

(†17 flakes showtraces of polishing or grooves (n: 3)).

## Class of dimension vs category (SOAPSTONE)

| Class of dimension | Thinning | Reducing | Bulb | Waste | Shatter | Other | Total |
|---|---|---|---|---|---|---|---|
| < 50 | - | 3 | - | 69 | 535 | - | 607 |
| 51-100 | - | 41 | - | 106 | 313 | - | 460 |
| 101-200† | - | 116 | - | - | 188 | 3 | 307 |
| 201-300† | - | 79 | - | - | 47 | - | 126 |
| 301-400† | - | 29 | 1 | - | 16 | - | 46 |
| 401-600† | - | 25 | - | - | 9 | - | 34 |
| 601-800† | - | 14 | - | - | 2 | - | 16 |
| 801-1000 | - | 7 | - | - | 3 | - | 10 |
| > 1000† | - | 12 | - | - | 7 | - | 19 |
| n/a† | - | - | - | - | 6 914 | 1 | 6 915 |
| Total | 0 | 326 | 1 | 175 | 8 034 | 4 | 8 540 |

(†39 flakes show traces of polishing; 11 show end scraper marks).

### Class of dimension vs bulb of percussion (CHERT)

| Bulb | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| absent | 100 | 66 | 34 | 10 | 8 | - | - | - | - | 218 |
| visible | 215 | 146 | 82 | 22 | 5 | 4 | - | - | - | 474 |
| pronounced | 12 | 8 | 13 | 3 | 2 | - | 1 | - | - | 39 |
| Total | 327 | 220 | 129 | 35 | 15 | 4 | 1 | 0 | 0 | 731 |

### Class of dimension vs bulb of percussion (QUARTZITE)

| Bulb | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| absent | 109 | 109 | 47 | 18 | 5 | 3 | 1 | 1 | 2 | 295 |
| visible | 216 | 242 | 138 | 27 | 5 | 3 | 1 | - | 1 | 633 |
| pronounced | 6 | 8 | 5 | - | 1 | - | - | - | - | 20 |
| Total | 331 | 359 | 190 | 45 | 11 | 6 | 2 | 1 | 3 | 948 |

### Class of dimension vs bulb of percussion (METABASALT)

| Bulb | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| absent | 7 | 13 | 29 | 23 | 10 | 14 | 10 | 3 | 16 | 125 |
| visible | 9 | 20 | 22 | 22 | 12 | 8 | 8 | 5 | 17 | 123 |
| pronounced | - | 1 | 4 | 3 | 1 | 2 | 1 | - | 3 | 15 |
| Total | 16 | 34 | 55 | 48 | 23 | 24 | 19 | 8 | 36 | 263 |

### Class of dimension vs bulb of percussion (SLATE)

| Bulb | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| absent | 9 | 57 | 76 | 27 | 12 | 6 | 6 | 4 | 3 | 200 |
| visible | 1 | 3 | 5 | 2 | 1 | 1 | 2 | - | - | 15 |
| Total | 10 | 60 | 81 | 29 | 13 | 7 | 8 | 4 | 3 | 215 |

### Class of dimension vs bulb of percussion (SOAPSTONE)

| Bulb | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| absent | 2 | 24 | 80 | 47 | 16 | 16 | 7 | 2 | 5 | 199 |
| visible | 1 | 10 | 24 | 19 | 10 | 8 | 3 | 4 | 2 | 81 |
| pronounced | - | 2 | 3 | 3 | 3 | - | - | 1 | 2 | 14 |
| Total | 3 | 36 | 107 | 69 | 29 | 24 | 10 | 7 | 9 | 294 |

### Class of dimension vs striking platform treatment (CHERT)

| Treatment | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| plain | 53 | 28 | 17 | 3 | 2 | - | - | - | - | 103 |
| scaled | 83 | 53 | 35 | 6 | 2 | - | 1 | - | - | 180 |
| multiple | 86 | 58 | 27 | 9 | 3 | 1 | - | - | - | 184 |
| transversal | 4 | 6 | 2 | - | 1 | - | - | - | - | 13 |
| unprepared | - | - | 2 | - | - | - | - | - | - | 2 |
| crushed | - | - | 1 | - | - | - | - | - | - | 1 |
| fractured | 103 | 76 | 45 | 17 | 7 | 3 | - | - | - | 251 |
| Total | 329 | 221 | 129† | 35† | 15† | 4 | 1 | 0 | 0 | 734 |

(† 4 flakes possess a lip)

## Class of dimension vs striking platform treatment (QUARTZITE)

| treatment | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| plain | 12 | 18 | 8 | 5 | - | - | - | 1 | 1 | 45 |
| scaled | 96 | 98 | 53 | 21 | 2 | 2 | - | - | 1 | 273 |
| multiple | 114 | 127 | 42 | 17 | 3 | 1 | 2 | - | 1 | 307 |
| transversal | 2 | 6 | 3 | - | - | - | - | - | - | 11 |
| unprepared | 1 | 8 | 7 | 1 | 1 | 1 | - | - | - | 19 |
| crushed | 1 | 2 | 2 | - | | - | - | - | - | 5 |
| fractured | 111 | 136 | 93 | 17 | 6 | 3 | | - | - | 366 |
| Total | 337† | 395 | 208† | 61 | 12 | 7 | 2 | 1 | 3 | 1 026 |

(† 3 flakes possess a lip).

## Class of dimension vs striking platform treatment (METABASALT)

| treatment | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| plain | 2 | - | 9 | 4 | 1 | 2 | 1 | 1 | 4 | 24 |
| scaled | 4 | 6 | 12 | 3 | 1 | 2 | 3 | - | 3 | 34 |
| multiple | 8 | 17 | 22 | 22 | 9 | 7 | 7 | 3 | 9 | 104 |
| unprepared | - | 1 | 3 | 4 | 3 | 4 | 1 | 3 | 11 | 30 |
| crushed | - | - | - | - | - | 1 | - | - | - | 1 |
| fractured | 3 | 15 | 20 | 23 | 15 | 14 | 7 | 4 | 11 | 112 |
| Total | 17 | 39 | 66 | 56 | 29 | 30 | 19 | 11 | 38 | 305 |

## Class of dimension vs striking platform treatment (SLATE)

| treatment | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| plain | - | 3 | 4 | - | - | - | 1 | 1 | - | 9 |
| scaled | 1 | 5 | 5 | 4 | - | - | 1 | - | - | 16 |
| multiple | 4 | 7 | 8 | 4 | 2 | 2 | - | - | - | 27 |
| crushed | - | - | 1 | - | - | - | - | - | - | 1 |
| polished | - | - | - | 1 | 1 | - | - | - | - | 2 |
| fractured | 5 | 45 | 63 | 20 | 10 | 5 | 6 | 3 | 3 | 160 |
| Total | 10 | 60 | 81 | 29 | 13 | 7 | 8 | 4 | 3 | 215 |

## Class of dimension vs striking platform treatment (SOAPSTONE)

| treatment | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| plain | - | 1 | 4 | - | 1 | 5 | - | - | - | 11 |
| scaled | - | 1 | 3 | - | 3 | 2 | - | 2 | - | 11 |
| multiple | - | 14 | 28 | 14 | 4 | 7 | 1 | - | 4 | 72 |
| transversal | - | - | - | 1 | - | - | - | - | - | 1 |
| unprepared | - | 9 | 33 | 27 | 9 | 4 | 5 | 3 | 4 | 94 |
| crushed | - | - | 2 | 3 | - | - | 2 | 1 | - | 8 |
| polished | - | - | 1 | - | - | - | 1 | 1 | - | 3 |
| fractured | 3 | 16 | 45 | 34 | 13 | 7 | 5 | - | 4 | 127 |
| Total | 3 | 41 | 116 | 79 | 30 | 25 | 14 | 7 | 12 | 327 |

## Class of dimension vs striking platform form (CHERT)

| Form | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| biconvex | 47 | 31 | 25 | 5 | 4 | - | - | - | - | 112 |
| plano-convex | 48 | 42 | 28 | 7 | 3 | - | - | - | - | 128 |
| con.-convex | 16 | 8 | 3 | - | - | - | - | - | - | 27 |
| circular | - | - | 2 | - | - | - | - | - | - | 2 |
| sub-triangular | 54 | 35 | 16 | 3 | - | 1 | 1 | - | - | 110 |
| irregular | 23 | 12 | 5 | 1 | - | - | - | - | - | 41 |
| linear | 10 | 6 | 3 | 1 | - | - | - | - | - | 20 |
| triangular | 24 | 9 | 7 | - | - | - | - | - | - | 40 |
| winged | 6 | 5 | - | - | 1 | - | - | - | - | 12 |
| point | 1 | 1 | - | - | - | - | - | - | - | 2 |
| Total | 229 | 149 | 89 | 17 | 8 | 1 | 1 | 0 | 0 | 494 |

## Class of dimension vs striking platform form (QUARTZITE)

| Form | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| biconvex | 74 | 81 | 43 | 10 | 1 | 1 | 1 | - | 2 | 213 |
| plano-convex | 55 | 88 | 31 | 14 | - | - | - | - | - | 188 |
| con.-convex | 6 | 5 | 5 | 1 | - | - | - | - | - | 17 |
| sub-triangular | 45 | 33 | 23 | 1 | 3 | 1 | - | - | - | 106 |
| irregular | 13 | 23 | 11 | 4 | 1 | 1 | 1 | - | - | 54 |
| linear | 13 | 3 | 4 | - | - | - | - | - | - | 20 |
| triangular | 19 | 27 | 11 | 5 | 1 | 1 | - | 1 | 1 | 66 |
| winged | 7 | 4 | 2 | - | - | - | - | - | - | 13 |
| point | - | - | 2 | - | - | - | - | - | - | 2 |
| Total | 232 | 264 | 132 | 35 | 6 | 4 | 2 | 1 | 3 | 679 |

## Class of dimension vs striking platform form (METABASALT)

| Form | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| biconvex | 4 | 7 | 11 | 9 | 4 | 4 | 4 | 3 | 8 | 54 |
| plano-convex | 1 | 6 | 12 | 7 | 4 | 1 | 4 | - | - | 35 |
| con.-convex | - | - | 2 | 5 | - | - | 2 | - | 3 | 12 |
| sub-triangular | 1 | 5 | 4 | 2 | 3 | 2 | - | 2 | 1 | 20 |
| irregular | 3 | - | 9 | 5 | 4 | 5 | 2 | 2 | 7 | 37 |
| linear | 1 | - | - | - | - | 1 | - | - | - | 2 |
| triangular | 4 | 5 | 8 | 7 | 1 | 3 | 1 | - | 8 | 37 |
| winged | - | - | 1 | - | - | - | - | - | 1 | 2 |
| point | - | - | - | - | - | 1 | - | - | - | 1 |
| Total | 14 | 23 | 47 | 35 | 16 | 17 | 13 | 7 | 28 | 200 |

## Class of dimension vs striking platform form (SLATE)

| Form | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| biconvex | 1 | 7 | 7 | 5 | - | 1 | - | - | - | 21 |
| plano-convex | 2 | 1 | 1 | 1 | - | - | - | - | - | 5 |
| con. -convex | - | - | - | - | - | - | 1 | - |  | 1 |
| sub-triangular | - | - | 3 | - | - | - | - | - | - | 3 |
| irregular | 1 | 4 | 6 | - | 2 | 1 | - | 1 | - | 15 |
| linear | - | 1 | - | 3 | - | - | - | - | - | 4 |
| triangular | 1 | 1 | 1 | - | 1 | 1 | - | - | - | 5 |
| winged | - | 1 | - | - | - | - | 1 | - | - | 2 |
| Total | 5 | 15 | 18 | 9 | 3 | 3 | 2 | 1 | 0 | 56 |

## Class of dimension vs striking platform form (SOAPSTONE)

| Form | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| biconvex | - | 14 | 27 | 21 | 8 | 9 | 1 | 3 | 1 | 84 |
| plano-convex | - | 7 | 5 | 4 | 4 | 2 | 2 | - | 2 | 26 |
| con.-convex | - | - | 1 | 1 | - | - | - | - | - | 2 |
| circular | - | - | 1 | - | - | - | - | - | - | 1 |
| sub-triangular | - | - | 3 | 4 | - | - | 2 | 1 | 1 | 11 |
| irregular | - | 3 | 18 | 10 | 5 | 5 | 4 | 2 | 4 | 51 |
| triangular | - | 3 | 16 | 5 | 2 | 2 | 1 | - | - | 29 |
| winged | - | - | 2 | - | - | - | - | - | - | 2 |
| Total | 0 | 27 | 73 | 45 | 19 | 18 | 10 | 6 | 8 | 206 |

## IcGm-4: débitage (variable tables: length and thickness of striking platform)

### 1986 (surface) CHERT

| | | | Length | | | | Thickness | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Category** | **Class** | **Nb** | **μ** | **min.** | **max.** | **$\sigma^2$** | **μ** | **min.** | **max.** | **$\sigma^2$** |
| trimming | < 50 | 9 | 2.74 | 1.60 | 4.80 | 0.90 | 0.97 | 0.60 | 1.40 | 0.34 |
| | 51-100 | 1 | - | - | 2.50 | - | - | - | 0.80 | - |
| Total | | 10 | | | | | | | | |
| bulb | < 50 | 1 | - | - | 2.30 | - | - | - | 1.30 | - |
| Total | | 1 | | | | | | | | |
| thinning | < 50 | 91 | 3.03 | 0.25 | 8.90 | 1.28 | 1.19 | 0.08 | 8.00 | 1.11 |
| | 51-100 | 35 | 4.59 | 2.00 | 9.60 | 1.89 | 1.50 | 0.10 | 5.00 | 0.79 |
| | 101-200 | 16 | 5.39 | 1.60 | 16.00 | 3.48 | 1.59 | 0.80 | 2.60 | 0.51 |
| | 201-300 | 3 | 5.50 | 3.70 | 8.00 | 2.23 | 1.67 | 1.40 | 2.00 | 0.31 |
| | 301-400 | 1 | - | - | 5.00 | - | - | - | 2.00 | - |
| Total | | 146 | | | | | | | | |

### 1986 (excavation) CHERT

| | | | Length | | | | Thickness | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Category** | **Class** | **Nb** | **μ** | **min.** | **max.** | **$\sigma^2$** | **μ** | **min.** | **max.** | **$\sigma^2$** |
| trimming | < 50 | 34 | 2.46 | 1.10 | 5.30 | 0.81 | 0.76 | 0.40 | 1.60 | 0.26 |
| | 51-100 | 7 | 3.64 | 2.20 | 4.60 | 0.92 | 1.07 | 0.50 | 2.10 | 0.53 |
| | 101-200 | 1 | - | - | 2.60 | - | - | - | 0.90 | - |
| Total | | 8 | | | | | | | | |
| thinning | < 50 | 32 | 2.60 | 1.20 | 6.00 | 1.07 | 0.87 | 0.20 | 2.20 | 0.44 |
| | 51-100 | 43 | 3.90 | 1.20 | 9.60 | 1.60 | 1.24 | 0.50 | 3.50 | 0.53 |
| | 101-200 | 31 | 4.04 | 2.30 | 9.20 | 1.35 | 1.43 | 0.60 | 3.00 | 0.51 |
| | 201-300 | 4 | 5.03 | 1.50 | 7.40 | 2.75 | 1.73 | 0.80 | 2.30 | 0.69 |
| | 301-400 | 2 | 8.00 | 6.00 | 10,00 | - | 2.85 | 2.10 | 3.60 | - |
| Total | | 112 | | | | | | | | |
| reducing | 51-100 | 1 | - | - | 5.50 | - | - | - | 2.30 | - |
| | 101-200 | 1 | - | - | 5.60 | - | - | - | 3.00 | - |
| Total | | 2 | | | | | | | | |

### 1985 (Area A) CHERT

| | | | Length | | | | Thickness | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Category** | **Class** | **Nb** | **μ** | **min.** | **max.** | **$\sigma^2$** | **μ** | **min.** | **max.** | **$\sigma^2$** |
| thinning | < 50 | 7 | 3.41 | 1.50 | 5.00 | 1.22 | 0.90 | 0.30 | 1.60 | 0.45 |
| | 51-100 | 5 | 2.40 | 1.20 | 3.10 | 0.74 | 1.14 | 0.60 | 1.70 | 0.43 |
| | 101-200 | 4 | 4.05 | 2.60 | 6.50 | 1.72 | 1.35 | 1.10 | 1.80 | 0.31 |
| | 201-300 | 1 | - | - | 1.40 | - | - | - | 0.70 | - |
| Total | | 17 | | | | | | | | |

## IcGm-4: débitage (variable tables: length and thickness of striking platform)

### 1979-80 CHERT

| Category | Class | Nb | Length μ | Length min. | Length max. | Length $\sigma^2$ | Thickness μ | Thickness min. | Thickness max. | Thickness $\sigma^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| trimming | <50 | 6 | 2,15 | 1,20 | 3,00 | 0,66 | 0,83 | 0,50 | 1,60 | 0,41 |
| | 51-100 | 4 | 3,15 | 2,50 | 4,60 | 0,98 | 1,13 | 0,70 | 1,80 | 0,48 |
| | 101-200 | 1 | - | - | 3,50 | - | - | - | 1,00 | - |
| Total | | 11 | | | | | | | | |
| thinning | <50 | 42 | 2,22 | 1,00 | 4,80 | 0,94 | 0,71 | 0,30 | 2,20 | 0,49 |
| | 51-100 | 36 | 3,54 | 1,00 | 6,60 | 1,50 | 1,06 | 0,30 | 2,70 | 0,52 |
| | 101-200 | 23 | 4,82 | 1,40 | 10,60 | 2,78 | 1,54 | 0,40 | 4,20 | 0,82 |
| | 201-300 | 9 | 4,91 | 2,40 | 10,80 | 2,59 | 1,71 | 0,80 | 2,60 | 0,62 |
| | 301-400 | 5 | 5,10 | 3,60 | 6,40 | 1,23 | 1,52 | 0,90 | 2,70 | 0,80 |
| | 401-600 | 1 | - | - | 7,40 | - | - | - | 2,00 | - |
| | 601-800 | 1 | - | - | 7,10 | - | - | - | 3,40 | - |
| Total | | 117 | | | | | | | | |
| Reducing | <50 | 3 | 2,87 | 1,70 | 4,20 | 1,26 | 1,00 | 0,80 | 1,10 | 0,17 |
| | 51-100 | 10 | 4,17 | 1,60 | 7,30 | 1,99 | 1,36 | 0,60 | 2,20 | 0,46 |
| | 101-200 | 7 | 4,44 | 1,30 | 7,40 | 2,68 | 1,43 | 0,30 | 2,20 | 0,70 |
| | 201-300 | 1 | - | - | 11,50 | - | - | - | 6,20 | - |
| Total | | 21 | | | | | | | | |

### 1986 (surface) QUARTZITE

| Category | Class | Nb | Length μ | Length min. | Length max. | Length $\sigma^2$ | Thickness μ | Thickness min. | Thickness max. | Thickness $\sigma^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| trimming | <50 | 4 | 3,25 | 1,80 | 4,00 | 0,99 | 0,93 | 0,60 | 1,30 | 0,30 |
| Total | | 4 | | | | | | | | |
| thinning | <50 | 32 | 3,48 | 1,60 | 6,30 | 1,07 | 1,17 | 0,50 | 2,00 | 0,44 |
| | 51-100 | 25 | 5,16 | 2,50 | 10,00 | 2,15 | 1,74 | 0,60 | 3,00 | 0,59 |
| | 101-200 | 12 | 6,40 | 4,40 | 10,00 | 1,78 | 2,15 | 1,70 | 2,90 | 0,30 |
| Total | | 69 | | | | | | | | |

### 1986 (excavation) QUARTZITE

| Category | Class | Nb | Length μ | Length min. | Length max. | Length $\sigma^2$ | Thickness μ | Thickness min. | Thickness max. | Thickness $\sigma^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| trimming | <50 | 5 | 3,32 | 2,20 | 4,80 | 1,16 | 1,10 | 0,70 | 1,70 | 0,38 |
| | 51-100 | 1 | - | - | 4,60 | - | - | - | 1,00 | - |
| Total | | 1 | | | | | | | | |
| thinning | <50 | 81 | 3,37 | 0,90 | 9,00 | 1,55 | 0,98 | 0,20 | 2,10 | 0,44 |
| | 51-100 | 99 | 4,08 | 1,20 | 8,30 | 1,55 | 1,36 | 0,30 | 3,00 | 0,49 |
| | 101-200 | 39 | 4,75 | 0,90 | 9,00 | 1,66 | 1,63 | 0,10 | 2,90 | 0,62 |
| | 201-300 | 11 | 5,19 | 1,04 | 9,30 | 2,51 | 1,65 | 0,19 | 2,70 | 0,77 |
| | 301-400 | 2 | 36,80 | 21,30 | 52,30 | - | 9,65 | 4,30 | 15,00 | - |
| | 401-600 | 1 | - | - | 20,80 | - | - | - | 6,30 | - |
| | >1000 | 1 | - | - | 19,50 | - | - | - | 8,30 | - |
| Total | | 234 | | | | | | | | |
| reducing | 101-200 | 1 | - | - | 4,60 | - | - | - | 0,70 | - |
| Total | | 1 | | | | | | | | |

## IcGm-4: débitage (variable tables: length and thickness of striking platform)

### 1985 (Area A) QUARTZITE

| Category | Class | Nb | Length μ | Length min. | Length max. | Length σ² | Thickness μ | Thickness min. | Thickness max. | Thickness σ² |
|---|---|---|---|---|---|---|---|---|---|---|
| thinning | < 50 | 34 | 2,91 | 0,60 | 9,00 | 1,89 | 0,80 | 0,10 | 2,80 | 0,58 |
| | 51-100 | 45 | 3,94 | 0,80 | 8,20 | 1,73 | 1,23 | 0,40 | 2,80 | 0,60 |
| | 101-200 | 24 | 5,03 | 0,50 | 10,40 | 2,38 | 1,45 | 0,40 | 2,70 | 0,58 |
| | 201-300 | 9 | 7,10 | 2,30 | 15,00 | 4,01 | 2,03 | 1,00 | 3,40 | 0,76 |
| | 301-400 | 1 | - | - | 5,30 | - | - | - | 1,80 | - |
| Total | | 113 | | | | | | | | |
| bulb | 51-100 | 1 | - | - | 2,60 | - | - | - | 9,00 | - |
| Total | | 1 | | | | | | | | |

### 1979-80 QUARTZITE

| Category | Class | Nb | Length μ | Length min. | Length max. | Length σ² | Thickness μ | Thickness min. | Thickness max. | Thickness σ² |
|---|---|---|---|---|---|---|---|---|---|---|
| trimming | < 50 | 6 | 3,28 | 1,40 | 5,80 | 1,70 | 1,20 | 0,80 | 2,00 | 0,42 |
| | 51-100 | 2 | 4,15 | 3,50 | 4,80 | - | 0,95 | 0,70 | 1,20 | - |
| Total | | 8 | | | | | | | | |
| thinning | < 50 | 62 | 3,21 | 0,60 | 8,20 | 1,58 | 0,94 | 0,20 | 2,40 | 0,51 |
| | 51-100 | 67 | 4,34 | 1,20 | 10,00 | 2,06 | 1,49 | 0,40 | 3,10 | 0,59 |
| | 101-200 | 34 | 5,83 | 1,60 | 15,10 | 3,41 | 1,89 | 1,00 | 7,80 | 1,36 |
| | 201-300 | 6 | 7,17 | 2,90 | 12,10 | 3,69 | 2,55 | 1,30 | 5,40 | 1,56 |
| | 301-400 | 2 | 3,15 | 3,00 | 3,30 | - | 1,35 | 0,70 | 2,00 | - |
| | 401-600 | 2 | 12,40 | 8,20 | 16,60 | - | 4,15 | 3,90 | 4,40 | - |
| Total | | 173 | | | | | | | | |
| reducing | < 50 | 6 | 1,95 | 1,20 | 3,20 | 0,75 | 0,87 | 0,40 | 1,40 | 0,44 |
| | 51-100 | 19 | 6,10 | 2,60 | 13,00 | 2,79 | 2,13 | 0,70 | 3,10 | 0,68 |
| | 101-200 | 17 | 7,66 | 3,30 | 16,70 | 3,37 | 3,16 | 1,30 | 6,10 | 1,59 |
| | 201-300 | 8 | 9,20 | 3,30 | 12,80 | 2,93 | 3,55 | 1,30 | 6,50 | 1,73 |
| | 301-400 | 2 | 13,10 | 12,70 | 13,50 | - | 8,30 | 6,40 | 10,20 | - |
| | 401-600 | 2 | 4,00 | 4,00 | 4,00 | - | 3,45 | 2,30 | 4,60 | - |
| | 601-800 | 1 | - | - | 11,10 | - | - | - | 5,50 | - |
| | 801-1000 | 1 | - | - | 22,70 | - | - | - | 10,20 | - |
| | > 1000 | 1 | - | - | 21,30 | - | - | - | 17,70 | - |
| Total | | 57 | | | | | | | | |

### 1986 (surface) METABASALT

| Category | Class | Nb | Length μ | Length min. | Length max. | Length σ² | Thickness μ | Thickness min. | Thickness max. | Thickness σ² |
|---|---|---|---|---|---|---|---|---|---|---|
| thinning | < 50 | 3 | 3,27 | 2,20 | 4,00 | 0,95 | 1,30 | 1,10 | 1,40 | 0,17 |
| | 51-100 | 2 | 7,40 | 6,20 | 8,60 | - | 2,15 | 1,60 | 2,70 | - |
| | 101-200 | 2 | 7,85 | 6,30 | 9,40 | - | 5,90 | 2,80 | 9,00 | - |
| | 201-300 | 5 | 9,52 | 7,50 | 11,90 | 1,93 | 3,32 | 2,10 | 4,70 | 1,03 |
| | 301-400 | 1 | - | - | 6,60 | - | - | - | 2,60 | - |
| | 401-600 | 1 | - | - | 23,60 | - | - | - | 5,70 | - |
| | > 1000 | 1 | - | - | 39,30 | - | - | - | 12,30 | - |
| Total | | 15 | | | | | | | | |
| reducing | > 1000 | 1 | - | - | 40,90 | - | - | - | 12,20 | - |
| Total | | 1 | | | | | | | | |

## IcGm-4: débitage (variable tables: length and thickness of striking platform)

### 1986 (excavation) METABASALT

| | | | Length | | | | Thickness | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Class | Nb | μ | min. | max. | $\sigma^2$ | μ | min. | max. | $\sigma^2$ |
| thinning | < 50 | 1 | - | - | 5,00 | - | - | - | 1,80 | - |
| | 51-100 | 8 | 5,63 | 3,80 | 8,50 | 1,61 | 1,58 | 0,80 | 2,30 | 0,49 |
| | 101-200 | 7 | 6,31 | 4,10 | 8,90 | 1,94 | 2,04 | 1,40 | 3,90 | 0,93 |
| | 201-300 | 11 | 8,10 | 3,20 | 12,10 | 2,97 | 2,68 | 0,90 | 4,30 | 1,13 |
| | 301-400 | 8 | 10,50 | 7,10 | 16,60 | 3,54 | 3,55 | 2,00 | 6,10 | 1,23 |
| | 401-600 | 4 | 11,68 | 9,10 | 14,20 | 2,09 | 5,30 | 3,90 | 6,40 | 1,20 |
| | 601-800 | 6 | 16,93 | 6,20 | 31,60 | 8,95 | 5,13 | 3,30 | 7,60 | 1,81 |
| | 801-1000 | 2 | 24,45 | 17,30 | 31,60 | - | 7,60 | 5,10 | 10,10 | - |
| | > 1000 | 3 | 25,07 | 23,00 | 27,30 | 2,15 | 6,87 | 4,30 | 9,50 | 2,60 |
| Total | | 50 | | | | | | | | |
| reducing | > 1000 | 2 | 14,50 | 9,80 | 19,20 | - | 4,45 | 3,60 | 5,30 | - |
| Total | | 2 | | | | | | | | |
| bulb | 101-200 | 1 | - | - | 9,80 | - | - | - | 2,00 | - |
| Total | | 1 | | | | | | | | |

### 1985 (Area A) METABASALT

| | | | Length | | | | Thickness | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Class | Nb | μ | min. | max. | $\sigma^2$ | μ | min. | max. | $\sigma^2$ |
| reducing | > 1000 | 2 | 33,30 | 32,60 | 34,00 | - | 11,55 | 9,10 | 14,00 | - |
| Total | | 2 | | | | | | | | |

## IcGm-4: débitage (variable tables: length and thickness of striking platform)

**1979-80 METABASALT**

| Category | Class | Nb | Length µ | Length min. | Length max. | Length $\sigma^2$ | Thickness µ | Thickness min. | Thickness max. | Thickness $\sigma^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| thinning | < 50 | 9 | 4,30 | 2,20 | 7,20 | 1,64 | 1,37 | 0,60 | 2,60 | 0,69 |
| | 51-100 | 10 | 6,82 | 3,00 | 9,60 | 2,05 | 2,96 | 1,50 | 5,20 | 1,24 |
| | 201-300 | 7 | 7,30 | 2,10 | 18,80 | 5,98 | 2,71 | 0,80 | 7,70 | 2,38 |
| | 301-400 | 2 | 13,45 | 11,40 | 15,50 | - | 4,65 | 2,90 | 6,40 | - |
| | 401-600 | 3 | 8,70 | 2,40 | 14,30 | 5,98 | 4,50 | 2,40 | 6,00 | 1,87 |
| | 601-800 | 4 | 12,58 | 5,90 | 17,40 | 5,40 | 8,48 | 2,30 | 11,40 | 4,30 |
| Total | | 35 | | | | | | | | |
| reducing | < 50 | 1 | - | - | 5,90 | - | - | - | 4,10 | - |
| | 51-100 | 2 | 3,75 | 3,50 | 4,00 | - | 1,60 | 1,50 | 1,70 | - |
| | 101-200 | 7 | 9,09 | 5,60 | 14,50 | 3,15 | 2,90 | 1,40 | 4,60 | 1,01 |
| | 201-300 | 10 | 10,14 | 5,20 | 19,10 | 4,51 | 4,05 | 1,80 | 8,60 | 1,96 |
| | 301-400 | 4 | 15,68 | 7,40 | 22,90 | 6,63 | 4,45 | 2,90 | 6,70 | 1,61 |
| | 401-600 | 9 | 13,42 | 3,50 | 32,00 | 8,24 | 5,50 | 2,10 | 8,30 | 2,05 |
| | 601-800 | 3 | 14,47 | 11,20 | 19,40 | 4,35 | 5,23 | 3,20 | 7,50 | 2,16 |
| | 801-1000 | 4 | 23,78 | 13,70 | 28,30 | 6,92 | 8,20 | 5,90 | 9,30 | 1,59 |
| | > 1000 | 18 | 33,43 | 11,30 | 67,10 | 16,66 | 12,68 | 4,90 | 31,10 | 6,74 |
| Total | | 58 | | | | | | | | |
| bulb | 101-200 | 1 | - | - | 14,10 | - | - | - | 3,50 | - |
| | 201-300 | 1 | - | - | 17,60 | - | - | - | 3,90 | - |
| | 301-400 | 1 | - | - | 9,10 | - | - | - | 5,00 | - |
| Total | | 3 | | | | | | | | |

**1986 (surface) SLATE**

| Category | Class | Nb | Length µ | Length min. | Length max. | Length $\sigma^2$ | Thickness µ | Thickness min. | Thickness max. | Thickness $\sigma^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| thinning | < 50 | 1 | - | - | 2,60 | - | - | - | 1,10 | - |
| | | 1 | - | - | 2,90 | - | - | - | 0,90 | - |
| | | 1 | - | - | 5,50 | - | - | - | 1,10 | - |
| | | 1 | - | - | 8,50 | - | - | - | 1,20 | - |
| Total | | 4 | | | | | | | | |

**1986 (excavation) SLATE**

| Category | Class | Nb | Length µ | Length min. | Length max. | Length $\sigma^2$ | Thickness µ | Thickness min. | Thickness max. | Thickness $\sigma^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| thinning | < 50 | 3 | 3,40 | 2,70 | 3,90 | 0,62 | 1,10 | 0,80 | 1,40 | 0,30 |
| | 51-100 | 6 | 4,77 | 2,00 | 6,40 | 1,58 | 1,03 | 0,70 | 1,40 | 0,28 |
| | 101-200 | 7 | 5,07 | 4,10 | 6,70 | 0,90 | 1,43 | 1,00 | 2,70 | 0,60 |
| | 201-300 | 2 | 8,65 | 8,50 | 8,80 | - | 2,30 | 2,00 | 2,60 | - |
| | 401-600 | 1 | - | - | 7,30 | - | - | - | 2,10 | - |
| Total | | 19 | | | | | | | | |

## IcGm-4: débitage (variable tables: length and thickness of striking platform)

**1985 (Area A)** **SLATE**

| Category | Class | Nb | Length μ | Length min. | Length max. | Length $\sigma^2$ | Thickness μ | Thickness min. | Thickness max. | Thickness $\sigma^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| thinning | 51-100 | 1 | - | - | 10,60 | - | - | - | 2,10 | - |
| Total | | 1 | | | | | | | | |

**1979-80** **SLATE**

| Category | Class | Nb | Length μ | Length min. | Length max. | Length $\sigma^2$ | Thickness μ | Thickness min. | Thickness max. | Thickness $\sigma^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| thinning | <50 | 1 | - | - | 1,30 | - | - | - | 0,30 | - |
| | 51-100 | 4 | 6,83 | 3,60 | 11,70 | 3,60 | 1,70 | 1,20 | 2,40 | 0,50 |
| | 101-200 | 3 | 5,10 | 0,60 | 10,60 | 5,07 | 1,23 | 0,30 | 2,40 | 1,07 |
| | 201-300 | 4 | 14,88 | 10,30 | 20,70 | 4,68 | 2,40 | 1,10 | 3,20 | 0,91 |
| | 301-400 | 3 | 13,70 | 3,80 | 18,80 | 7,63 | 4,70 | 0,90 | 10,00 | 4,57 |
| | 601-800 | 1 | - | - | 5,80 | - | - | - | 1,20 | - |
| | 801-1000 | 1 | - | - | 12,90 | - | - | - | 4,50 | - |
| Total | | 17 | | | | | | | | |
| reducing | 51-100 | 3 | 7,43 | 4,70 | 10,20 | 2,75 | 2,53 | 2,30 | 2,70 | 0,21 |
| | 101-200 | 7 | 8,06 | 3,40 | 14,80 | 4,67 | 1,87 | 1,60 | 2,20 | 0,21 |
| | 201-300 | 2 | 13,00 | 8,60 | 17,40 | - | 2,25 | 1,40 | 3,10 | - |
| | 401-600 | 1 | - | - | 17,30 | - | - | - | 2,00 | - |
| | 601-800 | 1 | - | - | 26,30 | - | - | - | 11,20 | - |
| Total | | 14 | | | | | | | | |

**1986 (excavation)** **SOAPSTONE**

| Category | Class | Nb | Length μ | Length min. | Length max. | Length $\sigma^2$ | Thickness μ | Thickness min. | Thickness max. | Thickness $\sigma^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| reducing | 51-100 | 14 | 5,44 | 3,10 | 7,90 | 1,17 | 2,11 | 1,10 | 3,00 | 0,46 |
| | 101-200 | 21 | 6,35 | 2,50 | 10,20 | 2,33 | 2,31 | 1,10 | 4,20 | 0,73 |
| | 201-300 | 10 | 9,11 | 4,80 | 14,20 | 3,13 | 3,38 | 1,80 | 6,20 | 1,25 |
| | 301-400 | 3 | 9,23 | 5,00 | 13,50 | 4,25 | 2,90 | 2,40 | 3,30 | 0,46 |
| | 401-600 | 3 | 11,77 | 7,20 | 15,80 | 4,32 | 4,77 | 3,50 | 6,60 | 1,63 |
| | 601-800 | 1 | - | - | 17,90 | - | - | - | 7,30 | - |
| Total | | 52 | | | | | | | | |

**1979-80** **SOAPSTONE**

| Category | Class | Nb | Length μ | Length min. | Length max. | Length $\sigma^2$ | Thickness μ | Thickness min. | Thickness max. | Thickness $\sigma^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| reducing | 51-100 | 11 | 8,24 | 4,00 | 15,30 | 2,91 | 3,18 | 1,80 | 4,70 | 0,96 |
| | 101-200 | 51 | 8,38 | 2,40 | 16,80 | 3,35 | 3,71 | 1,10 | 9,90 | 1,73 |
| | 201-300 | 35 | 11,18 | 4,10 | 22,30 | 3,81 | 4,53 | 1,80 | 8,20 | 1,82 |
| | 301-400 | 15 | 13,77 | 3,70 | 27,20 | 6,18 | 5,48 | 2,00 | 13,50 | 2,82 |
| | 401-600 | 15 | 14,01 | 6,60 | 25,70 | 5,35 | 6,44 | 2,00 | 12,60 | 3,04 |
| | 601-800 | 9 | 20,82 | 10,40 | 28,20 | 6,36 | 7,74 | 2,70 | 14,40 | 3,74 |
| | 801-1000 | 6 | 15,22 | 5,30 | 23,50 | 6,60 | 6,92 | 3,70 | 10,00 | 2,00 |
| | > 1000 | 8 | 33,65 | 14,90 | 50,80 | 14,54 | 15,88 | 3,50 | 33,70 | 10,66 |
| Total | | 150 | | | | | | | | |
| bulb | 301-400 | 1 | - | - | 7,40 | - | - | - | 1,80 | - |
| Total | | 1 | | | | | | | | |

## Quartz and local quartzite flakes

The collection from IcGm-4 also includes 52 quartz crystal flakes, 38 milky quartz flakes, 5 hyalin flakes and one undetermined quartz. Mixed, these by-products are represented by 47 thinning flakes, 6 reducing flakes, 3 trimming flakes, 26 waste and 14 shatter.

The majority of these flakes are associated with the class of dimension ≤ 50 (n: 47). Fourteen belong to the 51-100 class, 15 to the 101-200, 5 to the 201-300, 4 to the 301-400, 2 to the 401-600, 1 to the 601-800, and 1 to the ≥1000 class. The residual platforms are multiple (n: 18), scaled (n: 16), fractured (n: 14), plain (n: 5), unprepared (n: 2), and transversal (n: 1). The forms of these platforms are biconvex (n: 12), plano-convex (n: 9), sub-triangular (n: 8), triangular (n: 6), irregular (n: 5), concavo-convex (n: 2) and winged (n: 1). The bulb of percussion is mostly visible (n: 34) and very rarely pronounced (n: 1). The other flakes, with the exception of the shatter and waste, do not have noticeable bulbs. The mean length of the striking platform is 4.32 mm ($\sigma^2$: 2.72; c.v.: 63.01) and 1.63 mm in mean width ($\sigma^2$: 0.94; c.v.: 58.05) (table below).

| Class of dimension | N | Mean length | Mean width |
|---|---|---|---|
| <50 | 12 | 2,78 | 1,03 |
| 51-100 | 13 | 3,62 | 1,38 |
| 101-200 | 11 | 4,57 | 1,84 |
| 201-300 | 4 | 7,10 | 2,85 |
| 301-400 | 3 | 7,53 | 2,33 |
| 401-600 | 2 | 6,35 | 2,15 |
| 601-800 | 1 | (shatter) | (shatter) |
| > 1000 | 1 | (shatter) | (shatter) |

Nineteen flakes of local quartzite were also recovered on the surface of collection area G (cf., appendix VII). These by-products are mostly associated with the thinning category (n:12); 4 are shatter and 2 are waste; the last one is a reducing flake (cortex). Most of the by-products belong to the 201-300 category (n: 11), 3 to the 101-200, 2 to the 51-100, and 1 to the ≥ 1000 class. The striking platforms are scaled (n: 8) or fractured (n: 5). They are biconvex (n: 5), sub-triangular (n: 2) or concavo-convex (n: 1). The bulb of percussion is visible (n: 9) or absent (n: 4). The mean length of the striking platform is 5.65 mm ($\sigma^2$: 4.96; v.c.: 87.69) and mean width, 2.14 mm ($\sigma^2$: 2.14; v.c.: 100.10). These by-products are not integrated into the analysis because of their small number and their origin (i.e., surface).

# *Appendix V*

*IcGm-4: Areas C and D*
*Description of archaeological data*

## Description of debitage by-products

This section presents the main characteristics of the debitage by-products recovered in areas C and D. Given their origin, these data have not been integrated into the analysis. Comparison of this information with the artifacts from area A is also relatively hazardous since the former only represent a tiny portion of the potential data from these areas. All references to these data in the text must be considered solely as indication of similarity or dissimilarity. A more exhaustive sampling of these areas would be necessary before proceeding with an intra-site comparison.

The data recovered in these areas are dominated by quartzite, especially for area D and chert for area C. Other raw materials (i.e., metabasalt, soapstone, slate and quartz) are also present, but in small quantities. The large majority of flakes come from the surface collection.

## Class of dimension vs category (CHERT) - Area C

| class of dimension | Trimming | Thinning | Reducing | Bulb | Waste | Shatter | Total |
|---|---|---|---|---|---|---|---|
| < 50† | - | 21 | 1 | - | - | 7 | 29 |
| 51-100† | - | 23 | 1 | - | - | 2 | 26 |
| 101-200† | - | 26 | 1 | - | - | 1 | 28 |
| 201-300† | - | 12 | - | - | - | - | 12 |
| 301-400 | - | - | - | - | - | - | - |
| 401-600 | - | - | - | - | - | - | - |
| 601-800† | - | - | 1 | - | - | - | 1 |
| 801-1000 | - | - | - | - | - | - | - |
| > 1000 | - | - | - | - | - | - | - |
| n/a | - | - | - | - | - | - | - |
| Total | - | 82 | 4 | - | - | 10 | 96 |

(†6 flakes possess cortex).

## Class of dimension vs category (QUARTZITE) - Area C

| class of dimension | Trimming | Thinning | Reducing | Bulb | Waste | Shatter | Total |
|---|---|---|---|---|---|---|---|
| < 50 | - | 11 | - | - | - | 14 | 25 |
| 51-100 | - | 8 | - | - | - | - | 8 |
| 101-200 | - | 16 | - | - | - | - | 16 |
| 201-300 | - | - | - | - | - | - | - |
| 301-400 | - | - | - | - | - | - | - |
| 401-600 | - | - | - | - | - | - | - |
| 601-800 | - | - | - | - | - | - | - |
| 801-1000 | - | - | - | - | - | - | - |
| > 1000 | - | - | - | - | - | - | - |
| n/a | - | - | - | - | - | - | - |
| Total | 0 | 35 | 0 | 0 | 0 | 14 | 49 |

## Class of dimension vs category (QUARTZITE) - Area D

| class of dimension | Trimming | Thinning | Reducing | Bulb | Waste | Shatter | Total |
|---|---|---|---|---|---|---|---|
| < 50† | - | 77 | 1 | - | 3 | 26 | 107 |
| 51-100 | - | 75 | - | - | - | 19 | 94 |
| 101-200† | - | 30 | - | - | - | 3 | 33 |
| 201-300† | - | 7 | - | - | - | - | 7 |
| 301-400 | - | 4 | - | - | - | - | 4 |
| 401-600 | - | 1 | - | - | - | - | 1 |
| 601-800 | - | 1 | - | - | - | - | 1 |
| 801-1000 | - | - | - | - | - | - | - |
| > 1000 | - | - | - | - | - | - | - |
| n/a | - | - | - | - | - | - | - |
| Total | 0 | 195 | 1 | 0 | 3 | 48 | 247 |

(†4 flakes possess cortex).

## Class of dimension vs category (METABASALT) - Area C

| class of dimension | Trimming | Thinning | Reducing | Bulb | Waste | Shatter | Total |
|---|---|---|---|---|---|---|---|
| < 50 | - | 1 | - | - | - | - | 1 |
| 51-100 | - | - | - | - | - | - | - |
| 101-200 | - | 2 | - | - | - | - | 2 |
| 201-300 | - | 2 | - | - | - | - | 2 |
| 301-400 | - | 2 | - | - | - | - | 2 |
| 401-600 | - | 1 | - | - | - | - | 1 |
| 601-800 | - | 2 | 1 | - | - | - | 3 |
| 801-1000 | - | - | - | - | - | - | - |
| > 1000 | - | 2 | 2 | - | - | - | 4 |
| n/a | - | - | - | - | - | - | - |
| Total | 0 | 12 | 3 | 0 | 0 | 0 | 15 |

## Class of dimension vs category (SLATE) - Areas C and D

| class of dimension | Trimming | Thinning | Reducing | Bulb | Waste | Shatter | Total |
|---|---|---|---|---|---|---|---|
| < 50 | - | - | - | - | 2 | - | 2 |
| 51-100 | - | - | - | - | 2 | - | 2 |
| 101-200 | - | - | - | - | 1 | - | 1 |
| 201-300 | - | - | - | - | - | - | - |
| 301-400 | - | - | - | - | - | - | - |
| 401-600 | - | - | - | - | - | - | - |
| 601-800 | - | - | - | - | - | - | - |
| 801-1000 | - | - | - | - | - | - | - |
| > 1000 | - | - | - | - | - | - | - |
| n/a | - | - | - | - | - | - | - |
| Total | 0 | 0 | 0 | 0 | 5 | 0 | 5 |

## Class of dimension vs category (SOAPSTONE) - Areas C and D

| Class of dimension | Waste | Shatter | Total |
|---|---|---|---|
| < 50 | - | - | - |
| 51-100 | - | - | - |
| 101-200 | 1 | 1 | 2 |
| 201-300 | - | - | - |
| 301-400 | - | - | - |
| 401-600 | - | - | - |
| 601-800 | - | - | - |
| 801-1000 | - | - | - |
| > 1000 | - | - | - |
| n/a | - | - | - |
| Total | 1 | 1 | 2 |

## Class of dimension vs bulb of percussion (CHERT)
## - Area C

| Bulb | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| absent | 3 | 7 | 7 | 2 | - | - | 1 | - | - | 20 |
| visible | 20 | 17 | 21 | 10 | 1 | - | - | - | - | 69 |
| pronounced | - | - | - | - | - | - | - | - | - | 0 |
| Total | 23 | 24 | 28 | 12 | 1 | 0 | 1 | 0 | 0 | 89 |

## Class of dimension vs bulb of percussion (QUARTZITE)
## - Area C

| Bulb | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| absent | 3 | - | - | - | - | - | - | - | - | 3 |
| visible | 8 | 8 | 3 | - | - | - | - | - | - | 19 |
| pronounced | - | - | - | - | - | - | - | - | - | 0 |
| Total | 11 | 8 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |

## - Area D

| Bulb | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| absent | 19 | 11 | 1 | - | - | 1 | - | - | - | 32 |
| visible | 59 | 64 | 28 | 7 | 4 | - | 1 | - | - | 163 |
| pronounced | - | - | 1 | - | - | - | - | - | - | 1 |
| Total | 78 | 75 | 30 | 7 | 4 | 1 | 1 | 0 | 0 | 196 |

## Class of dimension vs bulb of percussion (METABASALT)
## - Area C

| Bulb | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| absent | 1 | - | - | - | 1 | - | 2 | - | - | 4 |
| visible | - | - | 2 | 2 | 1 | 1 | 1 | - | 3 | 10 |
| pronounced | - | - | - | - | - | - | - | - | 1 | 1 |
| Total | 1 | 0 | 2 | 2 | 2 | 1 | 3 | 0 | 4 | 15 |

## Class of dimension vs striking platform (treatment) (CHERT)
## - Area C

| Treatment | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| scaled | 9 | 8 | 7 | 2 | - | - | - | - | - | 26 |
| multiple | 4 | 2 | 7 | 2 | - | - | - | - | - | 15 |
| transversal | 1 | - | - | - | - | - | - | - | - | 1 |
| unprepared | - | - | 4 | 1 | - | - | - | - | - | 5 |
| fractured | 9 | 14 | 10 | 7 | 1 | - | 1 | - | - | 42 |
| Total | 23 | 24 | 28 | 12 | 1 | 0 | 1 | 0 | 0 | 89 |

## Class of dimension vs striking platform (treatment) (QUARTZITE)
## - Area C

| Treatment | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| scaled | 8 | 2 | 1 | - | - | - | - | - | - | 11 |
| multiple | 2 | 3 | 1 | - | - | - | - | - | - | 6 |
| fractured | 1 | 3 | 1 | - | - | - | - | - | - | 5 |
| Total | 11 | 8 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |

## - Area D

| Treatment | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| scaled | 31 | 28 | 10 | - | 1 | - | - | - | - | 70 |
| multiple | 30 | 20 | 12 | 3 | 3 | - | 1 | - | - | 69 |
| transversal | - | 1 | 1 | - | - | - | - | - | - | 2 |
| unprepared | - | 3 | - | 1 | - | - | - | - | - | 4 |
| fractured | 17 | 23 | 7 | 3 | - | 1 | - | - | - | 11 |
| Total | 78 | 75 | 30 | 7 | 4 | 1 | 1 | 0 | 0 | 196 |

## Class of dimension vs striking platform (treatment) (METABASALT)
## - Area C

| Treatment | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| multiple | 1 | - | 2 | 1 | 1 | 1 | 1 | - | 3 | 10 |
| fractured | - | - | - | 1 | 1 | - | 2 | - | 1 | 5 |
| Total | 1 | 0 | 2 | 2 | 2 | 1 | 3 | 0 | 4 | 15 |

## Class of dimension vs striking platform (form) (CHERT)
## - Area C

| Form | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| biconvex | 3 | 3 | 4 | 1 | - | - | - | - | - | 11 |
| plano-convex | 1 | 2 | 3 | 1 | - | - | - | - | - | 7 |
| con.-convex | - | - | - | 1 | - | - | - | - | - | 1 |
| sub-triangular | 8 | 1 | 6 | 3 | - | - | - | - | - | 18 |
| irregular | - | - | 1 | - | - | - | - | - | - | 1 |
| linear | - | 1 | 1 | - | - | - | - | - | - | 2 |
| triangular | 2 | 2 | 3 | 1 | - | - | - | - | - | 8 |
| winged | - | 1 | 2 | - | - | - | - | - | - | 3 |
| Total | 14 | 10 | 20 | 7 | 0 | 0 | 0 | 0 | 0 | 51 |

## Class of dimension vs striking platform (form) (QUARTZITE) - Area C

| Form | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| biconvex | 1 | - | - | - | - | - | - | - | - | 1 |
| plano-convex | 1 | 1 | - | - | - | - | - | - | - | 2 |
| con.-convex | 1 | 1 | - | - | - | - | - | - | - | 2 |
| circular | 1 | - | - | - | - | - | - | - | - | 1 |
| sub-triangular | 1 | 2 | 1 | - | - | - | - | - | - | 4 |
| irregular | - | - | 1 | - | - | - | - | - | - | 1 |
| linear | 2 | - | - | - | - | - | - | - | - | 2 |
| triangular | 2 | 1 | - | - | - | - | - | - | - | 3 |
| winged | 1 | - | - | - | - | - | - | - | - | 1 |
| Total | 10 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |

## Area D

| Form | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| biconvex | 18 | 16 | 5 | - | - | - | 1 | - | - | 40 |
| plano-convex | 13 | 12 | 10 | 2 | - | - | - | - | - | 37 |
| con.-convex | 2 | 4 | 1 | - | 1 | - | - | - | - | 8 |
| circular | 1 | - | - | - | - | - | - | - | - | 1 |
| sub-triangular | 13 | 17 | 6 | 1 | 3 | - | - | - | - | 40 |
| irregular | 3 | - | - | - | - | - | - | - | - | 3 |
| linear | 3 | 2 | - | - | - | - | - | - | - | 5 |
| triangular | 9 | 2 | 2 | - | - | 1 | - | - | - | 14 |
| winged | 2 | 2 | 2 | 1 | - | - | - | - | - | 7 |
| Total | 64 | 55 | 26 | 4 | 4 | 1 | 1 | 0 | 0 | 155 |

## Class of dimension vs striking platform (form) (METABASALT) Area C

| Form | < 50 | 51-100 | 101-200 | 201-300 | 301-400 | 401-600 | 601-800 | 801-1000 | > 1000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| biconvex | - | - | 1 | 1 | - | 1 | 1 | - | 2 | 6 |
| plano-convex | - | - | 1 | - | - | - | - | - | 1 | 2 |
| con.-convex | - | - | - | - | - | - | - | - | 1 | 1 |
| sub-triangular | 1 | - | - | - | - | - | - | - | - | 1 |
| irregular | - | - | - | - | - | - | - | - | - | - |
| triangular | - | - | - | - | 1 | - | - | - | - | 1 |
| Total | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 0 | 4 | 11 |

## IcGm-4: débitage (variable tables: length and thickness of striking platform)

- 1985 (Areas C and D) CHERT

| | | | Length | | | | Thickness | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Class | Nb | μ | min. | max. | $\sigma^2$ | μ | min. | max. | $\sigma^2$ |
| thinning | < 50 | 13 | 2,42 | 0,90 | 5,60 | 1,28 | 0,60 | 0,40 | 0,80 | 0,12 |
| (area C) | 51-100 | 9 | 4,37 | 1,60 | 8,20 | 2,45 | 0,91 | 0,60 | 1,50 | 0,27 |
| | 101-200 | 17 | 4,15 | 2,10 | 8,10 | 1,53 | 1,39 | 0,80 | 2,70 | 0,57 |
| | 201-300 | 6 | 4,45 | 2,30 | 7,20 | 1,98 | 1,63 | 0,70 | 3,00 | 0,95 |
| Total | | 45 | | | | | | | | |
| reducing | < 50 | 1 | - | - | 4,00 | - | - | - | 1,00 | - |
| (area C) | 51-100 | 1 | - | - | 4,70 | - | - | - | 1,60 | - |
| | 101-200 | 1 | - | - | 10,50 | - | - | - | 2,70 | - |
| Total | | 3 | | | | | | | | |

- 1985 (Area C) QUARTZITE

| | | | Length | | | | Thickness | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Class | Nb | μ | min. | max. | $\sigma^2$ | μ | min. | max. | $\sigma^2$ |
| thinning | < 50 | 10 | 3,38 | 1,00 | 6,40 | 1,83 | 0,95 | 0,30 | 1,60 | 0,44 |
| | 51-100 | 5 | 4,36 | 1,90 | 8,80 | 2,71 | 1,00 | 0,40 | 2,00 | 0,74 |
| | 101-200 | 2 | 4,85 | 4,30 | 5,40 | - | 1,40 | 1,00 | 1,80 | - |
| Total | | 17 | | | | | | | | |

1985 (Area D) QUARTZITE

| | | | Length | | | | Thickness | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Class | Nb | μ | min. | max. | $\sigma^2$ | μ | min. | max. | $\sigma^2$ |
| thinning | < 50 | 58 | 3,30 | 1,00 | 9,40 | 1,80 | 0,98 | 0,30 | 2,60 | 0,46 |
| | 51-100 | 52 | 3,93 | 1,10 | 9,00 | 1,78 | 1,28 | 0,40 | 7,00 | 0,96 |
| | 101-200 | 24 | 4,98 | 1,90 | 13,10 | 2,89 | 1,77 | 0,40 | 5,00 | 1,07 |
| | 201-300 | 4 | 6,25 | 3,60 | 13,10 | 2,89 | 1,90 | 1,20 | 5,00 | 1,07 |
| | 301-400 | 4 | 6,80 | 4,90 | 9,00 | 1,68 | 2,18 | 1,40 | 2,60 | 0,53 |
| | 401-600 | 1 | - | - | 13,00 | - | - | - | 2,20 | - |
| | 601-800 | 1 | - | - | 19,50 | - | - | - | 6,60 | - |
| Total | | 34 | | | | | | | | |
| reducing | < 50 | 1 | - | - | 10,00 | - | - | - | 4,10 | - |
| Total | | 1 | | | | | | | | |

1985 (Area C) METABASALT

| | | | Length | | | | Thickness | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Class | Nb | μ | min. | max. | $\sigma^2$ | μ | min. | max. | $\sigma^2$ |
| thinning | < 50 | 1 | - | - | 2,50 | - | - | - | 1,40 | - |
| | 201-300 | 1 | - | - | 10,50 | - | - | - | 4,10 | - |
| | 301-400 | 1 | - | - | 12,40 | - | - | - | 11,50 | - |
| | 401-600 | 1 | - | - | 15,10 | - | - | - | 5,30 | - |
| | > 1000 | 2 | 17,35 | 8,40 | 26,30 | - | 5,55 | 3,30 | 7,80 | - |
| Total | | 6 | | | | | | | | |
| reducing | 601-800 | 1 | - | - | 22,20 | - | - | - | 5,30 | - |
| | > 1000 | 1 | - | - | 12,60 | - | - | - | 5,50 | - |
| Total | | 2 | | | | | | | | |

# *Appendices VI, VII and VIII*

*Appendix VI: Excavation plans, IcGm-2, 3 and 4*

*Appendix VII: Distribution plans, IcGm-4 (1986)*

*Appendix VIII: Distribution plans, IcGm-4 (1979-80)*