

Anvil Boulders and Lithic Reduction on Southern Victoria Island, Northwest Territories

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ABSTRACT. This paper reports on an unusual archaeological feature discovered at the Cadfael site (NiNg-17) on southeastern Victoria Island. Two large boulders apparently served as anvil stones on which quartzite cobbles were fractured. Lithic debris remained *in situ* on and around the boulders, preserving the materials and spatial arrangements as abandoned by the last flintknappers. Analysis of one boulder and the associated artifacts demonstrates that a bipolar technology was employed to split cobbles, presumably to obtain large flakes for use as, or for making into, tools. As far as is known, no similar features have been reported in the literature on the Canadian Arctic, although potential candidates exist on Baffin Island and at Great Bear Lake. The age and cultural affiliation of the Cadfael site anvil boulders are undetermined; however an association with the Late Dorset culture, dating to about 1000 years ago, seems most likely.

Key words: arctic archaeology, lithic technology, Dorset culture, Victoria Island

RÉSUMÉ. Cette communication concerne la découverte d'un aménagement archéologique plutôt inhabituel trouvé au site Cadfael (NiNg-17), situé au sud de l'île Victoria. Deux grosses pierres y auraient apparemment servies d'enclumes où l'on aurait cassé des galets de quartzite. Les débris lithiques étaient restés *in situ* sur et autour des grosses roches, préservant ainsi le matériel et les arrangements spatiaux tels qu'abandonnés par les derniers artisans de la pierre. L'analyse d'une de ces grosses pierres et des artefacts qui y étaient associés, a démontré qu'une technique bipolaire fut utilisée pour fendre les galets afin d'obtenir de gros éclats utilisés comme d'outils ou dans la fabrication de ces derniers. Il semble que jusqu'ici aucun aménagement similaire n'a été rapporté dans la littérature concernant l'arctique canadien, bien que des candidats possibles existent sur la Terre de Baffin et au Grand Lac de l'Ours. Bien que l'âge et l'affiliation culturelle des énormes enclumes du site Cadfael soient indéterminés, une association avec la période récente de la culture dorsétienne, soit il y a environ 1000 ans avant le présent, est vraisemblable.

Mots clés: archéologie de l'Arctique, technologie lithique, culture dorsétienne, île Victoria

INTRODUCTION

Reconnaissance along portions of southeastern Victoria Island, Northwest Territories, during the summer of 1988 resulted in the recording of two unusual lithic features where reduction of quartzite cobbles took place. The features discussed here are a small component of a large archaeological site known as the Cadfael site (NiNg-17), located on southern Victoria Island, 50 km northwest of the community of Cambridge Bay (Fig. 1). The Cadfael site, first recorded by Taylor (1967), is situated on the northeastern side of Wellington Bay approximately 1 km north of the mouth of the Ekalluk River. The Ekalluk is a short, fast, 3 km long river, which drains Ferguson Lake eastward into Wellington Bay. From the mouth of the river the coastline of Wellington Bay curves northward and is composed of a series of rocky beach ridges that trend roughly north to south. The site is located on one of the lower beach ridges and extends for almost 1 km in length. Most of the cultural features lie some 200-400 m east of the present waterline.

When the Cadfael site was first discovered it was described as consisting of three large, heavy stone, rectangular tent rings (Taylor, 1967:227). Test pitting yielded but a single artifact, a chert burin-like tool said to be typical of the Dorset culture (Taylor, 1967:227). Based on more in-depth scrutiny, the Cadfael site is now known to include at least three rectangular stone structures (Taylor's original rectangular tent rings, now commonly called "longhouses"), two outside row hearths, numerous cache structures, possible tent rings, as well as a nearby caribou drive lane system ("Inukshuit").

During the 1988 re-examination of the Cadfael site, Taylor observed two nearly identical localities where an intense amount of lithic workmanship had taken place. These lithic work stations, here termed "anvil boulders," are unusual in that they preserve the artifacts and their spatial arrangements as they were abandoned apparently about 1000 years ago. The anvil boulders are also of interest in that they do not appear to

be reported elsewhere in the archaeological literature on the Canadian Arctic. The purpose of this article is to describe the anvil boulders, discuss their probable function and comment on their possible temporal and cultural affiliations.

DESCRIPTION OF THE ANVIL BOULDER

Time permitted careful study of only one locality, referred to here as an anvil boulder. This consists of a large, flat-topped

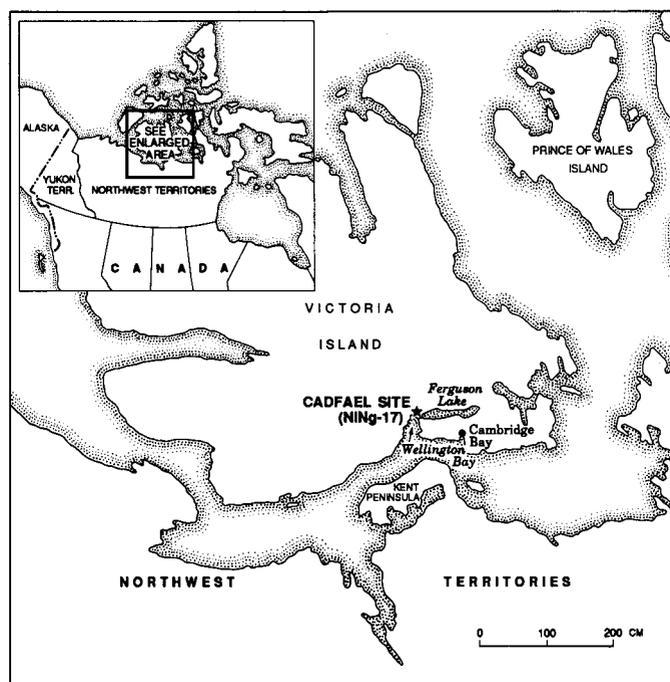


FIG. 1. Map of southern Victoria Island, N.W.T., showing location of the Cadfael site, NiNg-17.

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boulder, believed to be granite, which lies partially buried in the beach ridge rocks. The boulder is roughly rectangular in outline, some 2 m long, 1.3 m wide and about 0.5 m high, with smooth, rounded corners and somewhat waisted in the middle (Fig. 2). At the time of inspection the top of the boulder was covered with a total of 33 quartzite cobbles and fragments thereof, dozens of small flakes, and 6 flat sandstone slabs. The exposed portions of the boulder top, as well as the quartzite cobbles and flakes, were covered with a heavy coating of lichen and, between the cobbles, patches of moss, suggesting that the feature had been unmolested for a considerable period of time.

Prior to study, the arrangement of rocks on top of the boulder was photographed and sketched (Figs. 2 and 3). Each of the quartzite cobbles and sandstone slabs was then removed and examined, as was the surface of the boulder itself. All data were recorded at the site; no artifacts were collected, save a few small flakes for raw material analysis. The quick visit to the Cadfael site (one half day) precluded quantification of many attributes that would have been desirable to record; however the basic properties of the lithic work stations were noted. The results of this investigation are as follows.

The 6 sandstone slabs are pieces of the local beach ridge material that had been placed on the top of the boulder. The sandstone pieces are relatively small and flat, ranging from 7 to 15 cm in length. None shows signs of having been struck or having been used to deliver blows to other rocks, nor do they exhibit any signs of use. It will be noted (Fig. 3) that all the

sandstone pieces were situated at the two ends of the long axis of the boulder. The reason for their inclusion on top of the boulder is unknown; however the slabs may have served a role in the reduction of the other lithics on the boulder, as discussed below.

The 33 quartzite cobble specimens on the boulder top are, on average, about 15×10 cm in size. The largest specimen is a 35 cm long by 26 cm wide boulder, and the smallest are cobbles with lengths of 8-10 cm. In contrast to the sandstone slabs, all but 2 of the 33 quartzite cobbles exhibit evidence of cultural modification, including impact marks, fractures, or both (Fig. 4). The two unmodified specimens were both relatively small quartzite pebbles with a maximum dimension of about 10 cm. The raw material of all the cobbles and spalls is a fine-grained quartzite. The great majority of the quartzite is grey to beige in colour, with a few specimens exhibiting a distinct pinkish hue (this appears to be the natural colour of the rock and not a result of intentional heat treatment). In general, the quality of the material is quite good, with thin section analysis of one specimen showing a tight interlocking of recrystallized quartz grains producing a smooth and durable surface (D. Sharpe, pers. comm. 1990).

Of the 31 modified quartzite specimens, all but 4 were fractured. One of the unfractured pieces was the large, 35 cm long



FIG. 2. First anvil boulder at Cadfael site prior to removal and study of quartzite and sandstone rocks.

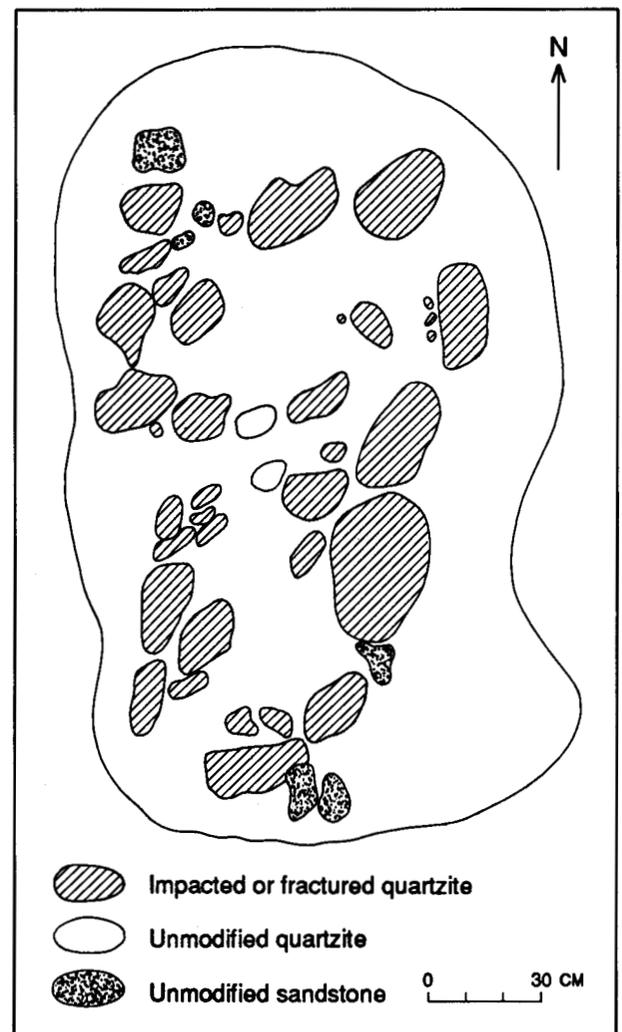


FIG. 3. Sketch of first anvil boulder showing distribution of modified quartzite and unmodified quartzite and sandstone.



FIG. 4. Specimen of battered and fractured quartzite from top of first anvil boulder.

cobble, which exhibited extensive peck marks in the centre of one surface. These marks may have been produced by the use of this rock as a hammerstone to break other cobbles, by use of the surface of the large cobble as an anvil on which smaller cobbles were broken, or through unsuccessful attempts to break this cobble. The other 3 unfractured specimens are all mid-sized cobbles, approximately 15 cm long, which exhibit surface peck marks indicative of repeated battering. Two of the rocks show fracture lines that failed to propagate.

The remaining 27 specimens are all fractured quartzite cobbles. For these artifacts the following information was recorded: 1) the number of fractures on each specimen, as deduced from counts of flake facets and impact points; 2) the number of additional impact marks that did not propagate fractures, as deduced from batter or impact marks; 3) the orientation of the fractures — that is, whether the fractures originated from the ends of the long axis (longitudinal), or whether they were initiated from the sides of the cobbles (transverse). Finally, a subjective assessment of the quality of stone was made, ranking the perceived flaking properties based on grain size and degree of cementation. In this crude assessment, artifacts were ranked on a scale of 1 to 3, with 1 being the best and 3 being the poorest quality.

As seen in Table 1, longitudinal fractures, initiated from the ends of the long axes of the cobble, were preferred for splitting the quartzite cobbles. Sixteen (nearly 60%) of the specimens were broken only in this manner. In all cases impact marks were evident on the opposing ends of the long axes. Most of the remaining artifacts (33%) show evidence of both longitudinal and transverse fracturing. For these specimens evidence of battering and crushing from impact was evident on opposing ends as well as at the centre of the sides of the cobbles. Only two specimens were broken exclusively in transverse section (impact marks on the sides of the cobbles but absent from the opposing ends).

Most of the specimens (70%) exhibited either one or two fractures (10 and 9 specimens respectively). One artifact was fractured five times, and the remaining 7 items were fractured either three or four times. All the cobbles exhibited impact marks in addition to the blow that had actually fractured the cobble. Most cobbles (15) showed evidence of having been struck once in addition to the completed fracture, while the remainder exhibited either two (7), three (4) or four (1) impact marks. In all cases, the cortex of the cobbles, at the various

points of impact, was characterized by signs of crushing and battering.

To look for a correlation between quality of material and the frequency of fractures and blows delivered to the specimens, the mean for each of the above variables was calculated for each of the three rankings of rock quality (Table 2). As might be expected, the mean number of times a cobble had been fractured increased as the quality of the material improved. However, higher quality materials did not necessarily result in more blows delivered to the specimen. Presumably, the better quality materials fractured more readily when struck, leaving fewer failed impact marks.

In addition to the cobble cores, the top of the boulder was also littered with about three dozen small quartzite flakes and pieces of shatter. A brief attempt at refitting proved that one step-fractured flake joined with a nearby core and two cortical flakes fit together, though not onto any of the cores. The presence of refitted material suggests that lithic reduction was conducted on the top of the boulder rather than already fractured cobbles having been placed there. If cobble reduction took place on the boulder, it would be expected that the ground surface around the periphery of the rock would yield additional lithic material. The ground cover of moss was pulled away to reveal

TABLE 1. Attributes of quartzite cobbles from the surface of the anvil boulder at NiNg-17, Cadfael site, Victoria Island (X=present)

Cobble number	Fracture type			No. of fractures	No. additional impacts	Quality
	Long.	Trans.	Long.+trans.			
1			X	5	3	1
2			X	2	1	1
3	X			1	1	2
4			X	2	2	2
5	X			2	1	2
6	X			2	1	1
7			X	2	2	3
8	X			2	2	2
9	X			3	1	2
10		X		2	1	2
11			X	3	3	2
12	X			2	2	2
13			X	3	3	2
14	X			3	1	1
15	X			1	1	3
16	X			1	1	3
17	X			1	1	2
18			X	1	2	2
19	X			4	1	3
20			X	4	4	2
21	X			1	2	2
22	X			1	1	1
23	X			1	1	3
24			X	2	2	2
25	X			1	1	3
26		X		3	3	2
27	X			1	1	3
Total	16(59.3%)	2(7.4%)	9(33.3%)	$\bar{x}=2.07$	$\bar{x}=1.67$	$\bar{x}=2.07$

TABLE 2. Comparison of number of impacts and fractures in three subjective categories of quartzite quality, NiNg-17

Quality type	Mean no. fractures	Mean no. impacts
1 (best)	2.60	1.40
2	2.13	2.00
3 (poorest)	1.57	1.14

a mass of flaking remains mixed in with the natural beach ridge rock. Dozens, if not hundreds (no exact count was made), of split cobbles and large flakes were observed within a few metres of the edge of the boulder.

If, as suspected, the large boulder had served as a work station for the reduction of quartzite cobbles, it would be reasonable to suspect that there would be evidence of this function on the boulder itself. With this in mind, the boulder top was swept clean of all moss and flaking debris. Once exposed it was apparent that the central region of the boulder had indeed been modified. At the very centre of the boulder top was a circular cavity about 1 cm deep, 5 cm in diameter, with flared edges (Fig. 5). It is tempting to suggest that the cavity was intentionally pecked to help stabilize cobbles during the reduction process. It is equally possible, however, that the depression was simply produced through continuous use of the same spot on the boulder. Whatever the case, there seems little doubt that this space served as a place to anchor and stabilize the cobbles during fracturing. Other rocks, including perhaps the sandstone slabs noted above, may have been placed against the sides of the cobbles to hold them upright during fracturing.

ANVIL BOULDER TECHNOLOGY

Data collected during this study strongly suggest that the large boulder served as a giant anvil on which the reduction of quartzite cobbles took place. Cobbles were placed in the centre of the boulder, planted firmly in a cavity in the rock, which may have been specially prepared for this purpose, perhaps supported around the edges with additional rocks, and struck with a hammerstone. Hammerstones may have been dropped or thrown from above or, for fracturing the smaller specimens, hand held. As a result of this vigorous activity, a dense scatter of lithic remains covers an area of many metres around the base of the boulder.

The reduction method employed at the Cadfael anvil boulder was essentially a bipolar technology. Used by many stone-working cultures (see Hayden, 1980, and Le Blanc, 1984: 183-184, for a review), the essence of the technique involves placement of a target stone on an anvil and delivering a blow with an impactor (Binford and Quimby, 1963; Forsman, 1976; MacDonald, 1968; Le Blanc, 1984:183). As force is applied to

one end of the target with the hammerstone, it is likewise returned from contact between the anvil and the other end of the target. This produces a series of characteristic attributes that may be observed on the core, the detached flakes, or both. Most important are the presence of two points of impact (platforms) located at opposite ends from each other, evidence of battering and crushing on the striking platforms, and flakes that typically extend the full length of the core (Binford and Quimby, 1963; Forsman, 1976; Hayden, 1980). As Hayden (1980:4) notes, bipolar technology typically produces large amounts of broken, relatively useless chunks of material, as was the case at Cadfael. Hayden (1980:4) also states that use of the bipolar technique often results in the production of pits on the surface of the anvil where the target was struck. This is consistent with the pitting observed on the Cadfael anvil boulder. Considering all the features observed on the Cadfael quartzite specimens and on the anvil top, there seems little doubt that the cobbles were reduced by means of the bipolar technique.

As the Cadfael site has not been excavated, it is difficult to know the desired end product of the lithic activity. The presence of numerous split cobbles and large spalls abandoned on and around the anvil stone suggests that one function of this workshop was to test the quality of various cobbles in search of prime flaking material. Once this was achieved, the flake spalls may have been used as is or further reduced into more finely crafted tools. No formed tools were recovered near the anvil boulder, and there was no evidence that further reduction of the split cobbles into finer forms occurred at this locale. Certainly, large quartzite spalls could have been used as multi-purpose tools with little or no further modification. But it is equally possible that spalls were removed from the boulder and fashioned into formed tools.

The few lithic tools recovered from surface inspection and test pitting at the Cadfael site were made of high quality, locally available chert (Taylor, 1967, 1972). Relatively coarse stone such as quartzite could indeed be fashioned into fine tools, as is noted, for example, at the Lagoon site on Banks Island (Arnold, 1980). Research by Taylor in the Ekalluk region suggests that readily available cherts were employed for the most delicate tool types and quartzites were used in the manufacture of larger, coarser tools. Thus, it seems most reasonable to posit that the production of large quartzite flakes, perhaps to be used as multi-purpose tools, may have been the desired end product of the lithic activity carried out at the anvil.

While time permitted a detailed study of only one anvil boulder, a second nearly identical feature was noted at the Cadfael site. Located some 100 m north of the first boulder was a second large, flat-topped rock, the surface of which was littered with quartzite cobbles and a few pebbles (Fig. 6). A quick inspection revealed that these cobbles had also been battered and split, most likely with the boulder top again serving as the anvil platform. The ground surface surrounding the boulder was also covered with abandoned cores and flaking debris. In order to allow for future study, under less time restriction, none of the material on or around the second anvil was collected or disturbed.

As to the origin of the quartzite cobbles reduced at these features, from the geological literature for this region it is clear that sandstone makes up the primary component of the extensive beach ridges of the east side of Wellington Bay (Thorsteinsson and Tozer, 1962). Mixed with these sandstones is a quartz-pebble conglomerate that is exposed along the

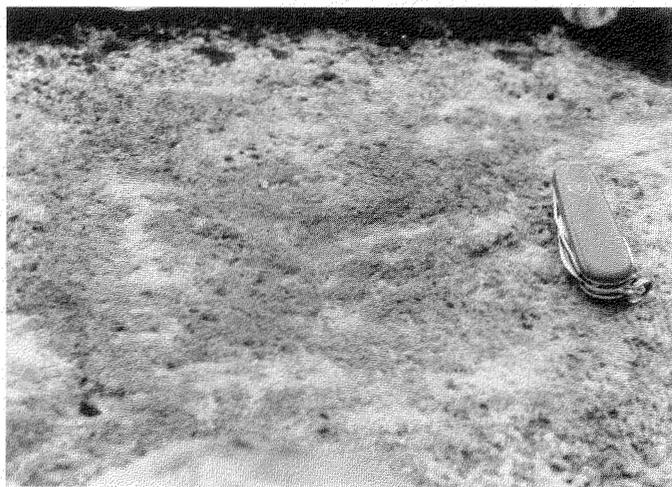


FIG. 5. Pecked cavity in centre of first anvil boulder, believed to have been used to "seat" the cobbles prior to reduction.



FIG. 6. The second anvil boulder, as found, at the Cadfael site.

south coast of Victoria Island and probably on the east side of Wellington Bay. Rounded cobbles of quartzite would occur within this quartz-pebble conglomerate, making this the likely source of the cobbles used at the Cadfael site (D. Sharpe, pers. comm. 1990). In addition, a plentiful supply of quartzite pebbles and cobbles would have been available in the valley of the Ekalluk River to the south of the site. Thus, the lithic materials are essentially local and would probably be found in large numbers in the immediate vicinity of the site.

TEMPORAL AND CULTURAL CONSIDERATIONS

Assessing the age and cultural affiliation of the anvil boulders poses considerable difficulties. Aside from the lichen and moss cover, which argues for a long period of neglect, the appearance of the two boulders is as if the lithic craftsman had recently walked away. The use of the anvils could be of any age or of several ages. Although the anvils themselves cannot be dated, examination of other aspects of both the Cadfael site and of the archaeology of the region may shed light on the age and cultural affiliation of the anvil boulders.

The presence of longhouses — rectangular boulder arrangements — at the Cadfael site, especially those associated with outside row hearths, is considered to be indicative of Late Dorset occupation (Maxwell, 1985:157; McGhee, 1978:68-69; Schledermann, 1990:330). One excavated longhouse on the Knud Peninsula, Ellesmere Island, produced “a fine assemblage of Late Dorset artifacts,” although some mixing of earlier elements was apparent (Schledermann, 1990:216). At the same site a series of radiocarbon dates were obtained from the nearby row hearths yielding an average age of about 1100 B.P., or A.D. 800 (Schledermann, 1990:229-230). Excavated longhouses in Ungava have been assigned an approximate age of about A.D. 1000 (Plumet, 1982:262; 1985:355). Damkjar (1990) reviews radiocarbon dates for longhouse sites, dismisses many questionable dates, and concludes that well-dated longhouse structures cluster between 1100 and 1200 B.P. Although there is some evidence for roots in the Middle Dorset period (Damkjar, 1990), there seems to be a consensus that these distinctive structures are primarily a phenomenon of the Late Dorset period (Damkjar, 1990; Schledermann, 1990:330).

Test pits excavated at the Cadfael site support the association between longhouses and the Late Dorset culture. A single

harpoon head was recovered and identified as typical of Late Dorset styles (J. Helmer, pers. comm. 1989). In addition, a radiocarbon date was obtained from a sample of bone collected from a test pit located outside one of the rectangular house structures. The date of 1080 ± 125 (S-3039) B.P. is in agreement with the postulated Late Dorset occupation. Finally, no artifacts or structural features were noted that are associated with any other cultural or temporal period.

Thus, at least some components of the Cadfael site can be securely assigned to the Late Dorset period dating to about 1000 years ago. As there is no necessary association between the quartzite work stations and other cultural structures at the Cadfael site, other than spatial proximity, it cannot be assumed that the use of the anvil boulders also dates exclusively to the Late Dorset period. Cultural affiliation of the features can be addressed, however, through ancillary lines of evidence that concern the regional prehistory.

Other sites in the Ekalluk River, Wellington Bay, Ferguson Lake region have been partially excavated and provide a basis for comparison. Looking first at other sites known or considered to be of Late Dorset age, we might expect that sites of similar age in close proximity would exhibit evidence of some of the quartzite from the Cadfael site, or perhaps of a similar type of lithic reduction industry. Taylor (1967:225) reports that Late Dorset occupations within the Ekalluk region are generally rare. However, within a radius of a few kilometres of Cadfael, evidence of Late Dorset occupation at three sites has been noted: the Bell site (NiNg-2), located at the outlet of Ferguson Lake on the south bank of the Ekalluk River; NiNg-8, located on a small knoll overlooking the mouth of the Ekalluk River at Wellington Bay; and a single harpoon head surface collected from the otherwise predominantly Pre-Dorset site of Buchanan on the south bank of the Ekalluk River (Taylor, 1964, 1967, 1972).

Dismissing the latter isolated find, one of the remaining two Late Dorset sites, the Bell site, contains quartzite artifacts. Though not mentioned in the publication (Taylor, 1967), inspection of the collections reveals that grey quartzites present at the Bell site are generally similar in colour and texture to materials observed at the Cadfael anvil boulders. Also collected from the Bell site were several fractured quartzite pebbles, two of which exhibit evidence of use as hammerstones. The colour and texture of one of these pebbles is again similar to the items observed at Cadfael. Thus, there appears to be evidence for the use of quartzite at the Bell site located some 2 km southeast of the Cadfael site. Worth noting, however, is the fact that the Bell site yielded artifacts of both early and late Dorset as well as Thule material, and not always in proper stratigraphic relationship (Taylor, 1967:223). The cultural affiliation of the quartzite artifacts from the Bell site remains, therefore, suggestive but inconclusive.

Within the same geographic region quartzite is known to be common to, and perhaps indicative of, a number of Pre-Dorset sites. Arnold (1980:412) notes that the dependence on quartzite along the Ekalluk River is a distinctive feature of sites in that region, differing from Pre-Dorset in areas such as Foxe Basin-Hudson Strait. Relatively large numbers of quartzite tools and debitage have been recovered from the above-mentioned Buchanan site (NiNg-1), the Menez site (NiNg-10), situated on high ground some 400 m back from the Ekalluk River, and the Wellington Bay site (NiNg-7), also situated on high ground about 1 km south of the Ekalluk River. Large, ovate, bifacially chipped quartzite tools form an important part

of the lithic assemblages at these sites, along with the expected items of chert. The quartzite bifaces had been unexpected and following the 1965 season led Taylor (1967:221) to state, "These quartzite tool forms had not been reported previously in Pre-Dorset or the larger archaeological unit, the Arctic Small Tool tradition. . . . The large quartzite bifaces occurred consistently in association with the typical, Pre-Dorset, chipped, chert tools." Radiocarbon dates for Pre-Dorset sites in the Ekalluk region range between approximately 2800 and 3200 B.P. (Wilmeth, 1978:12-30).

Inspection of the Ekalluk Pre-Dorset collections indicates that the quartzites employed are of two types: a distinctive salmon-orange-coloured material and a whitish grey to beige quartzite that sometimes has a slight pinkish hue. Taylor (1972:64) reports that both types of quartzite are local to the Ekalluk region. The dominant type of quartzite in the Pre-Dorset assemblages is the salmon-orange material, a type wholly unlike the quartzites associated with the Cadfael anvil boulders. The beige to grey quartzite is more similar to the Cadfael material, though it still appears to differ somewhat in colour and texture.

Thus, the Cadfael anvil boulders share the common trait of the use of quartzite with nearby Pre-Dorset sites. On the other hand, one Late Dorset site, the Bell site, contains both quartzite cores and flakes similar in both raw material type and technological stage to the Cadfael material. Although there is mixing of several cultural components at the Bell site, the combined evidence of a clear Late Dorset affiliation for the habitation structures at the Cadfael site and the presence of at least some Late Dorset occupation at the Bell site suggests that the Cadfael anvil boulders are associated with the Late Dorset period. It is entirely possible, however, that the anvil boulders were in use more than 1000 years before Late Dorset peoples occupied the Cadfael site.

CONCLUSION

As best as can be determined, the anvil boulders and quartzite cobble reduction technology observed at the Cadfael site have not been previously reported in the literature on Canadian arctic archaeology. Arundale (1980) reports on three lithic scatters in the Cape Dorset region of Baffin Island. Two of the sites appear to be typical chipping stations, with no indication of the use of anvil boulders. The third site, the Kingait Chipping site, is described as a boulder-strewn field with concentrations of flakes, cores and chipping debris, all of a single quartz material. The sample Arundale collected for analysis is said to have come from a concentration of debitage centred around a large boulder (Arundale, 1980:466). Arundale makes no mention of whether or not cobbles were actually observed on top of the boulder or, more generally, whether or not the boulder may have played a role in the lithic reduction activities. As at Cadfael, determining the age and affiliation of the Kingait site is hampered by a lack of datable materials and a paucity of diagnostic tools. However, based primarily on site elevation, Arundale (1980:469) believes that the site relates to Paleoeskimo occupation in the Cape Dorset region.

During archaeological reconnaissance on the western side of Great Bear Lake, Northwest Territories, Clark noted three large, flat-topped boulders (D. Clark, pers. comm. 1990). Around the base of each of these were concentrations of flakes and shatter, primarily of a single lithic source. Clark did not observe any cores or flakes on the tops of the boulders, but he

notes that, had such materials been present, they may have been overlooked. Clark (pers. comm. 1990) is of the opinion that the boulders functioned as anvils on which the raw material was reduced. I suspect Clark is correct, but without inspection of the boulders the site, while suggestive, remains unproven as another anvil boulder locality. No age or affiliation is proposed for this site.

The two features at the Cadfael site appear to have remained untouched since the last time these anvils were used, preserving the integrity of an assemblage and an arrangement of material that presumably reflects the actions of the final craftsman. While the age of the use of the anvil boulders cannot be determined, converging lines of evidence suggest a Late Dorset affiliation dating to about 1000 years ago. How the anvil boulders functioned in the larger scheme of the lithic industry at the Cadfael site and in the Ekalluk region remains undetermined. Further research in the still largely unexplored Canadian Arctic will likely result in the documentation of additional examples of this aspect of northern lithic technology and may help resolve issues regarding age and cultural affiliation.

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