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ARGILLITE QUARRIES OF THE NELSON MINERAL BELT

J. Y. Walls

Abstract

Nearly 40 quarries and lesser worked sources of "baked argillite" have been recorded or reported in the D'Urville Island - Dun Mountain mineral belt. Recent analysis by Dr A. Challis of the Geological Survey has shown that geologically this material may be metasomatised argillite, metasomatised sandstone, vitrified sandstone or rodingatised argillite all with varying proportions of mineral content. The purpose of the analyses is to enable "argillite" artifacts to be traced to their quarry sources. Only the Ohana quarries have nearby occupation layers in association with adze manufacture and these layers give every indication that this is one of the oldest sources of adze material. Favoured hammerstone materials were altered granodiorite from the Nelson Boulder Bank, rodingite and sandstone. Roughout adze types at all sites show a similarity of range although rectangular cross-sections are virtually confined to the presumed older quarries.

The material known archaeologically as "argillite" or "baked argillite" which flakes with a sub-conchoidal fracture is usually a metamorphosed mudstone which has undergone metasomatisation as a result of inclusion in a hot serpentine mass. But there are other allied rocks which flake in a similar fashion, take a high polish, ring in characteristic fashion when struck and were crafted into vast numbers of adzes. The colour ranges through the greys from palest grey to jet black while green mottling is not uncommon. To avoid undue verbosity the term argillite will be used for this rock.

It has long been known that the distinctive black and black-veined pale grey argillite adzes collected from sites all over New Zealand have their origin in the Nelson-D'Urville Island region. But until J. R. Eyles embarked, a few years ago, on a search of the back country - guided by reports from trappers, geologists, hunters and others - only a few of the more easily accessible quarries were known. H. D. Skinner (1914) and R. S. Duff (1946) have described the Rushpool and Whangamoa

sources but neither accounted for the jet black and pale grey varieties.

Since Dr A. Challis of the Geological Survey identified the source of an adze found about three years ago at Turangi as the Serpentine River in Nelson, we have inundated her with samples from over 30 exploited sources. These she is analysing in an attempt to establish positive source identification of argillite artifacts from which only a minute flake is needed. Results so far have been most promising and all that has now to be proved is chemical consistency within a quarry. This has already been established for the three Ohana quarries at the southern end of D'Urville which have been a major adze source.

The Nelson Mineral Belt with its serpentine outcrops, brown soil and stunted vegetation extends from Mt Ears at the north of D'Urville to Ohana, 24 km south-west. (D'Urville Island was known to the Maoris as Rangitoto - a scoriated place - despite its large areas of dense mixed beech and subtropical forest.) On the mainland the Mineral Belt appears sporadically for the next 160 km before disappearing in the glaciated Matakītaki Valley at Station Creek. It is in this distinctively different country, never more than a mile or two wide and ranging from sea level to nearly 1800 km high, that argillite suitable for adzes was quarried. The outcrops are usually boulders of only a few tonnes (although some are much more massive) which occur as clusters many miles apart. Much of the stone is deeply weathered so that most of the promising-looking outcrops are unsuitable for adze making. Boulders which are half-buried are usually of the best quality and in one instance, when high quality argillite was running short, a trench was dug to reach the better stone at the base of the outcrop. This was done at Heberds Quarry in the Whangamoa Valley. Many smaller boulders have been carried down by rivers and early occupation sites around Nelson contain much evidence of the use of water-rolled argillite. Flaking areas where such boulders have been worked have been found on the banks of the Lee, Maitai, Motueka and Matakītaki Rivers.

Eminently suitable rock for working the argillite is locally plentiful. Massive quartering hammers of altered granodiorite weighing up to 54 kg. are found (usually fragmented) at quarry sites. These have been carried overland or taken by canoe from the Nelson Boulder Bank which consists almost entirely of this very hard rock. Indurated sandstone from nearer rivers was, however, the most usual material used for smashing the argillite boulders. Sandstone was also the most favoured material used for flaking. Often a surprisingly soft variety was chosen for fine flaking, this seeming to give greater control. The extremely tough, heavy and hard rodingite (hydro-grossularite, hardness $7-7\frac{1}{2}$) was sometimes used as a

quartering stone. Its sharp crystalline nature rendered it ideal, too, for hammerdressing. Billiard ball sized hammers of this material are found in many D'Urville Island occupation sites, but hammerdressed adzes are rarely found at the quarry sites.

Roughly the quarries may be grouped as follows:

- (1) Major, with high intensity of flaking and great stone resources. Mt Ears, Ohana, The Rushpool.
- (2) Significant, having moderate resources well exploited. Toi Creek, Whangamoa, Askew's Hill.
- (3) Minor, with limited resources intensively exploited. Rocky Knob, Samson's Bay, Kapowai (Thomson's Quarry?), Deserter Bay.
- (4) Insignificant, with very limited resources not fully exploited. Hackett, Cat Knob, Maungatapu, Coppermine Bay, Blackbeach, Attempt Hill.
- (5) Worked boulders, either from a river or a small hillside source. Matakītaki River, Motueka River, Lee River, Long Gully, Wilson's Flat, Maitai Forks, Otarawao, Coppermine Bay Ridge, Rocks Hut, Little Starveall.

There are nine quarry sites which have been reported, both on D'Urville and on the mainland, which we have not yet had time to search for, and there must be many more small ones as yet unnoticed.

There is no indication of the age of the quarries, and this would be difficult to determine except in the case of Ohana where the outcrops are at sea level and close to a sheltered bay. The manufacture and trading of adzes of the well-known black-veined pale grey stone which is found at one of these three Ohana quarries would no doubt have gone on at this site from the earliest times. The Mt Ears quarries which cover many hectares of hillside seem to have been an ancient source of black argillite, while the Rushpool must have supplied vast quantities of dark grey over a long period. The absence of occupation associated with the quarries makes it necessary to fall back on adze types (and possibly techniques) to get an indication of period of use. The roughout types noted seem to be remarkably similar at all quarries and also coincide with the range found by Foss and Helen Leach at a small argillite quarry near Riverton in Southland. The possible exception seems to be rectangular

cross-sections which have been seen to occur more frequently at Mt Ears, the Rushpool and Ohana but which are virtually absent from the smaller quarries which we have examined more closely. At Rocky Knob out of 260 roughouts examined, 128 are triangular, 35 lenticular and 97 quadrangular. But none could confidently be described as rectangular. Similarly, at Cat Knob out of over 100 roughouts only one adze is approximately rectangular.

The use of fire and water at the quarry face had been suggested originally by Skinner but was discounted later by Duff. We have found no evidence of the use of fire. However the possibility of wedges having been used is suggested by a report of a D'Urville Island source where wedges are said to have been seen in place. This report is as yet unconfirmed. Flake samples have been collected from all exploited sources and are held at the Nelson Provincial Museum for the use of anyone wishing to attempt identification of quarry sources for argillite artifacts.

The table lists the known quarries from North to South. They are also shown on the sketch map which is drawn to a scale of approximately 5 k.m. to the cm. Nelson City is at the mouth of the Maitai River. The rivers shown all flow into Tasman Bay.

I would like to gratefully acknowledge the vast amount of time and work put into this project by Jim Eyles who initiated it and by Michael Hurst who also drew the map.

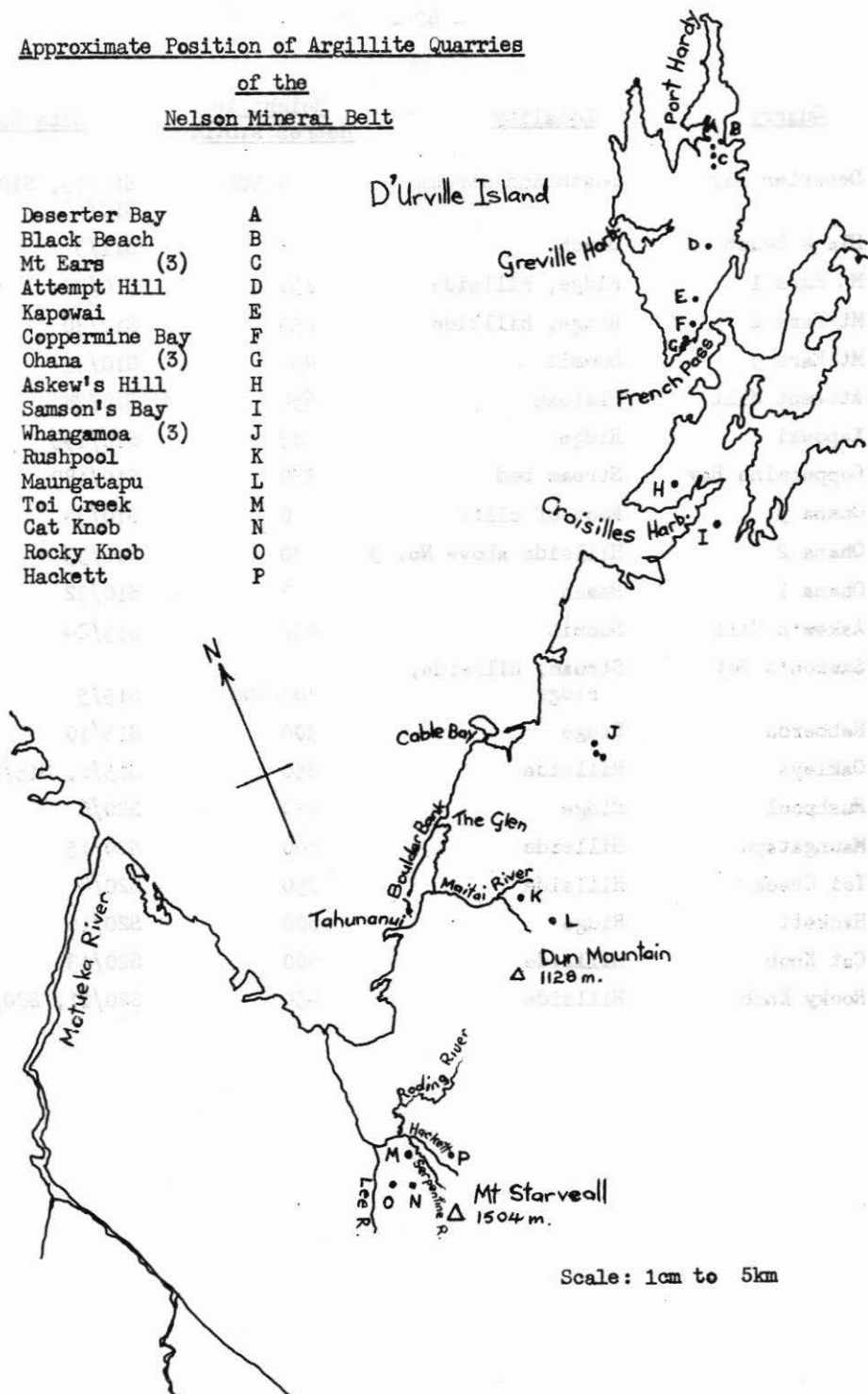
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Approximate Position of Argillite Quarries
of the
Nelson Mineral Belt

- | | |
|----------------|---|
| Deserter Bay | A |
| Black Beach | B |
| Mt Ears (3) | C |
| Attempt Hill | D |
| Kapowai | E |
| Coppermine Bay | F |
| Ohana (3) | G |
| Askew's Hill | H |
| Samson's Bay | I |
| Whangamoā (3) | J |
| Rushpool | K |
| Maungatapu | L |
| Toi Creek | M |
| Cat Knob | N |
| Rocky Knob | O |
| Hackett | P |

D'Urville Island



Scale: 1cm to 5km

<u>Quarry</u>	<u>Locality</u>	<u>Height in Metres A.S.L.</u>	<u>Site Number</u>
Deserter Bay	Beach and stream	0-500	S10/15, S10/59, S10/60
Black Beach	Beach	5	S11/3
Mt Ears 1	Ridge, hillside	150	S10/29
Mt Ears 2	Ridge, hillside	250	S10/30
Mt Ears 3	Summit	450	S10/31
Attempt Hill	Plateau	650	S10/28
Kapowai	Ridge	85	S10/193
Coppermine Bay	Stream bed	250	S10/180
Ohana 3	Foot of cliff	0	S10/34
Ohana 2	Hillside above No. 3	30	S10/33
Ohana 1	Beach	3	S10/32
Askew's Hill	Summit	450	S15/24
Samson's Bay	Stream, hillside, ridge	300-400	S15/5
Hobberds	Ridge	300	S15/10
Oakleys	Hillside	250	S15/2, S15/7
Rushpool	Ridge	450	S20/6
Maungatapu	Hillside	600	S20/15
Toi Creek	Hillside	250	S20/4
Hackett	Ridge	600	S20/16
Cat Knob	Hillside	600	S20/13
Rocky Knob	Hillside	450	S20/11, S20/12

<u>Site Number</u>	<u>Predominant Colour</u>	<u>Approx. Area in Square Metres</u>	<u>State</u>
S10/15, S10/59, S10/60	Light grey to black	1,000	Fossicked at beach level
S11/3	Black	5	Protected by sand
S10/29	Black	Greater than 10,000	Cut by road, eroded, fossicked
S10/30	Black	Greater than 10,000	Cut by road, eroded, fossicked
S10/31	Black	Greater than 10,000	Scrub cover, fossicked
S10/28	Dark grey, green	Small area widely separated	Untouched
S10/193	Mid-grey	1,000	Bulldozed, fossicked
S10/180	Mid-grey	500	Scrub cover, fossicked
S10/34	Pale grey, veined black	50	Sea eroded, fossicked
S10/33	Pale grey	100	Stock eroded, fossicked
S10/32	Light grey, mottled green	1,000	Sea eroded
S15/24	Black	5,000	Scrub cover
S15/5	Mid-grey	2,000 (3 areas)	Cut by road, scrub cover
S15/10	Black	500	Fenced off by Forest Service, fossicked
S15/2, S15/7	Mid-grey	400 (2 areas)	Fossicked
S20/6	Dark grey	10,000	Scrub cover, fossicked
S20/15	Light grey	5,000	Scrub cover, recently burnt, eroding
S20/4	Pale grey	8,000	Protected by owner, fossicked
S20/16	Dark grey	200	Scrub cover
S20/13	Mid-grey	500	Protected by owner, mapped
S20/11, S20/12	Dark grey	2,000	Protected by owner, partly dug, mapped, fenced