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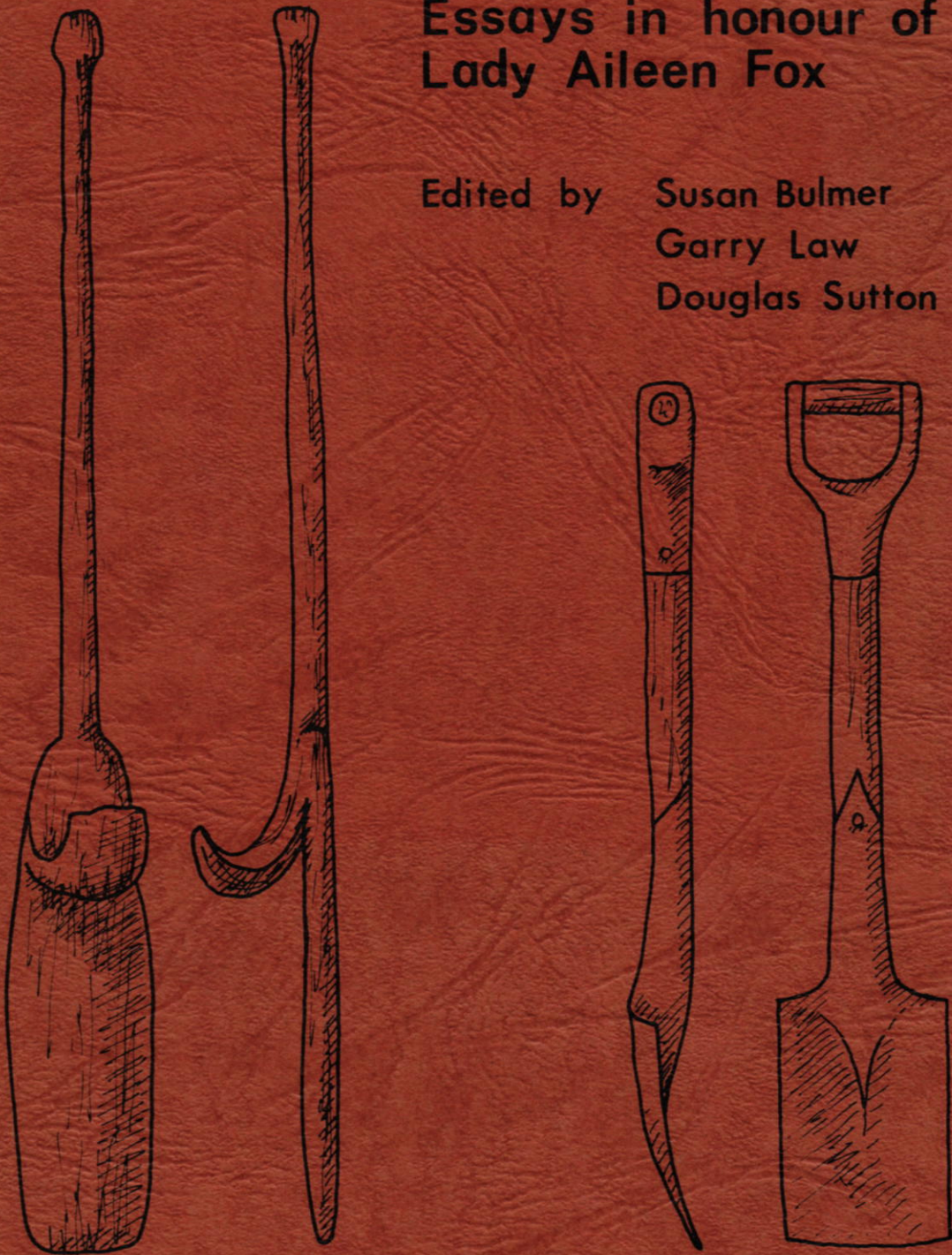
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# A LOT OF SPADEWORK TO BE DONE

Essays in honour of  
Lady Aileen Fox

Edited by Susan Bulmer  
Garry Law  
Douglas Sutton



# HISTORICAL EVIDENCE OF THE USE OF UNMODIFIED SHELL TOOLS IN NEW ZEALAND

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Molluscan shell was an abundant and readily obtainable artefactual resource in pre-European New Zealand and the rest of the Pacific. Its quality and usefulness as a raw material for artefact manufacture are well attested by the large number of shell fish-hooks and ornaments found in Pacific archaeological contexts. In New Zealand (as the rest of the Pacific) the early historic and ethnographic literature indicates that unmodified shells were also commonly used as tools. Accounts of shells being employed as simple scrapers and cutters are frequent; indeed, Shawcross and Terrell (1966) go so far as to say "...early accounts from up north suggest that shell was as commonly used as obsidian, if not more so". Nonetheless, shell artefacts are seldom identified from New Zealand archaeological deposits.

A perusal of the archaeological literature suggests that many of the unmodified shell artefacts which have been found in New Zealand were identified as such because the context in which they were found was unusual. Of the 398 individual bivalves found

at the inland site of Whakamoenga Cave, Taupo, 198 were marine species (Leahy 1976) thus indicating their transportation over a considerable distance. Since most unmodified shell artefacts are made of shell from soft shore species, they are more conspicuous in middens composed largely of rocky shore species than in middens of the same or similar soft shore species. The one shell artefact, for instance, found at the Black Rocks midden on the rocky shore of Palliser Bay, was a pipi (Paphies australe), (A. Anderson, pers. comm. 1978). Others are more conspicuous because of their association with other midden components. For example, a pipi, found at Station Bay Settlement No. 1, Motupatu Island was filled with fish scales (J. Davidson, pers. comm. 1977).

Other finds of utilised shells appear to have been rather fortuitous. When Shawcross and Terrell (1966) recovered several used pipi from Paterangi Pa on the Hauraki Plains, it was the "...repetition of a notch on the ventral margins of some pipi shells thrown up in the excavation spoil" which caught the attention of the excavators. They comment:

"...as the site consists of vast quantities of shell it was impossible to gain a satisfactory idea of the number of such utilised shells present in the deposits." (Shawcross and Terrell 1966)

Problems of excavation techniques and midden analysis aside, it would seem that the reason why unmodified shell artefacts go unnoticed is because very little attention has been given to the pre-European utilisation of unmodified shell tools. In 1967 Terrell pointed to the need for experimental studies to establish "empirical criteria" by which use damage could be distinguished from accidental abrasion. Ten years later, while a graduate student at the University of Auckland, I attempted to do this and explored

the possibility of defining the functions of unmodified shell tools from an analysis of their use damage patterns (Harsant 1978).

As a preliminary to the experimental studies, a survey of historically known Maori shell-using tasks was carried out. The following summary of the pre-European uses of unmodified shell tools is based on a review of accounts of the Maori way of life by early explorers, travellers and missionaries as well as later ethnographers. Although it is not an exhaustive review; not all sources have been consulted, it demonstrates once again the richness of the information contained in the historic and ethnographic literature and its value to archaeologists. It seems appropriate to present this paper in a volume dedicated to Aileen Fox, since she herself has made such good use of historical sources in the study of settlements in general and fortifications in particular.

#### Historically Known uses of Unmodified Tools

Before discussing the wide range of tasks performed using unmodified shell tools, as recorded in the New Zealand early historic and ethnographic literature, it is worthwhile to briefly consider several of the problems associated with the observation and recording of shell utilisation and with the application of that data to archaeology.

Bias towards the unusual is apparent in most of the early accounts of the Maori way of life. Mundane and routine tasks were overlooked in favour of more spectacular activities. Consequently reports of the use of shells for scarification, for example, are far more frequent than references to their use for such everyday tasks as food preparation.

A second problem is that many European technological innovations were eagerly adopted by the Maoris. Tasks which had

traditionally been carried out using shells could be executed using introduced iron and steel tools, knives, scissors and glass, when they could be obtained by the Maoris, rapidly replaced shell tools as early as 1820 Cruise noted that

"The hair is cut with a shell....They attach a high value to some combs and sissors which we distributed among them." (Bagnall 1957:208, note 3).

It is worth noting, however, that the preparation of some European introduced foods was carried out with the traditional tools. Examples include the scraping of potatoes with pipi shell (Campbell 1953:92) and the cutting up of a cooked pig using a mussel shell (Nicholas 1817 Vol.1:353).

European customs as well undermined many traditional practices. Scarification for example, seems to have been a practice which was discontinued by the northern groups of Maoris within a decade or two of the establishment of mission stations (see Marsden in Elder 1932: 371). Similarly, the popularisation of beard wearing amongst the Maori men, together with the introduction of tweezers, results in shells no longer being used for depilation.

With the exception of those areas of New Zealand which had experienced little or no European contact, it would appear that by the late 1860s only one shell-using task - the scraping of flax - was still being carried out in the traditional manner. The remainder of these tasks had disappeared, or the shell tools, previously used to perform them, had been replaced by European equivalents.

A further problem concerns the identification of shell type. Some of the ethnographic and historical references specify the type of shell used for a particular task. During the eighteenth and nineteenth centuries, however, 'pipi' tended to be used as a generic name for many of the common species of New Zealand shellfish. Consequently, the identification of shells in the early literature is doubtful.

Lastly, until approximately 1835, European/Maori contact was largely confined to the coastal area of New Zealand and the Northland region. References to the utilisation of shell are, therefore, under-represented in the inland areas of both the North and the South Islands and the southern coastal areas. This situation is remedied, to some extent, by the later ethnographies of some inland tribal groups, e.g. Best's 1925 study of the Tuhoe (Best 1975).

The use of unmodified shell tools may be divided into three categories according to the activity involved. These are cutting tasks, scraping tasks and depilation.

(i) Shells as cutting implements:

The use of shell as a general cutting tool was first recorded in New Zealand in 1777 by Anderson who commented

"Their substitute for a knife was a shell, a bit of flint or jasper..." (Anderson in Beaglehole 1955 3 (Part 2):813).

Later writers also commented, in general terms on the use of shells for cutting. For example, Colenso (1868a) records the use of broken shells for cutting, scraping and carving while Cooper (1851:140) names two cutting instruments from the Rotorua area, kuku moe toka and ngaao, both of which are mussel shells. More specifically, there are references to the use of unmodified shells for cutting hair, human flesh, the umbilical cord, animal flesh and some fibrous materials.

The cutting of hair:

In Maori society, the head of a person of high status was sacred. In accordance with this many ritual observances were associated with the cutting of hair and with its disposal,

"To use the sissors or the shell, with which the operation [hair cutting] was performed for anything else, or for any other person would be a terrible profanation of sacred things."  
(Yate 1835:87).

Colenso (1868a) and Cowan (1930:71) both record that the hair of a chief was always buried so that it could not get into the hands of a sorcerer. It is probable that the implement used for cutting hair would also be buried or otherwise disposed of, and it is therefore unlikely to be found in a midden or living area of a site.

Obsidian is most frequently mentioned as the implement used for cutting hair (see for example Best, 1975:1096; Taylor 1855:93, and Shortland 1882:32) although the use of shell (see Table 1) and other stone flakes are also mentioned. Hutton (1897) states that obsidian flakes were used and adds that "...another stone was necessary to cut against". The use of a flat stone is also recorded by other later writers (Hamilton 1908:20; see also Buck 1950a). Crozet, although not mentioning the use of a slab to cut against, describes the cutting of hair as follows:

"...they tie their hair into a tuft at the top of their heads with a piece of cord or plaits of grass, and then cut it off in the form of a round brush a inch or two above the cord; for want of sissors for this operation they make use of a shell the edges of which they sharpen." (Roth 1891:37).

The cutting of human flesh:

Scarification was a widespread custom in New Zealand. It has been recorded in Northland (Elder 1932:90), Rotorua (Cooper 1851:282), the Ureweras (Best 1975:1060), Taranaki (Taylor 1855:187) and Queen Charlotte Sound (Cook in Beaglehole 1955 Vol. 1:242). Self laceration was an important part of death ceremonies (Oppenheim 1965:15) being performed during the initial lamentation for the dead and also, on occasions when re-interrment was practised, during



the final disposal of the bones (Cruise in Bagnall 1957:94). It was also customary to cut oneself during the departure (Bagnall 1957:178) and re-uniting (Savage 1807:43); Taylor 1855:103) of friends and kin.

"Nor is this lamentation confined to such occasions (death); on any persons known or related to each other meeting after an absence of a few weeks, or on the illness of a friend or relative, the muscle shell and the accompanying tangi are instantly put into requisition." (Polack 1840 Vol. 1:90).

Although it was mostly performed by women, there are accounts of men lacerating themselves (Cruise in Bagnall 1957:85; Nicholas 1817 Vol. 2:138).

While some writers record the severe disfiguration caused by scarification (Dieffenbach 1834 Vol. 2:66; Angas 1847 Vol.2:89) or the large quantity of blood shed on such occasions (Maning 1900:62), others indicate that this was not always the case:

"...often a single drop from the arm, breast or forehead, is deemed satisfactory..."(Polack 1838 Vol. 1:85).

"...lacerating every part of their bodies with sharp cockle shells until the blood flowed. This was done, however, with considerable regularity and attention so as to leave the scars rather ornamental than otherwise after the affair was over." (Wakefield 1955:128).

It is likely that the number and depth of cuts and the amount of blood shed was considered to be an expression of the intensity of the grief felt, or a measure of their "...love for their departed friends" (Elder 1932:244).

Scarification was carried out using a shell (see table 2) although stone (Cooper 1851:282; Gudgeon 1885:182), flint (Yate 1835:101) and fingernails (Polack 1840 Vol. 1:161) are also mentioned in this connection.

Yate (1835) gives a good account of how it was performed using obsidian: presumably a shell was used in a similar manner:

"A piece of flint (made sacred on account of the blood which it has shed and the purpose to which it has been used) is held between the finger and the thumb: the depth to which it is to enter the skin appearing beyond the nails. The operation commences in the middle of the forehead; and the cut extends, in a curve, all down the face, on either side: the legs, arms and chest are then most miserably scratched; and the breasts of the women, who cut themselves more extensively and deeper than the men, are sometimes woefully gashed." (Yate 1835:136-137).

Although Maning (1875) states that obsidian knives were used for making incisions into human flesh during surgical operations, there is historical evidence (see table 3) to suggest that this was not always the case. For example, Rutherford, an Englishman who lived as a Pakeha Maori in the northern part of New Zealand during the late 1810s and early 1920s records that a spear which was stuck into his thigh was cut out with an oyster shell (Drummond 1908:198).

#### Miscellaneous cutting tasks:

Since the working edge of an obsidian flake is sharper than that of a shell it is likely that obsidian was normally used to cut tough and fibrous materials. Unmodified shells, however, are recorded as being used to cut some fibrous substances such as the umbilical cord and the husk of karaka berries (see table 3). Cooked pig flesh was also sometimes cut with a shell:

"...the pig was very soon brought smoking hot before us, while the cooks began to cut it up with an experienced dexterity. I offered them my knife for this purpose, but they preferred to use a muscle shell, with which they divided it in a very short time..." (Nicholas 1817 Vol.1: 352-353).

(ii) Shell as a scraping implement:

The historic literature indicates that the use of unmodified shells as simple scrapers during food preparation, fibre manufacture and other activities was widespread in New Zealand.

## The scraping of foods:

In traditional Maori society many vegetables were prepared before they were cooked (Polack 1838 Vol. 1:198). Although scraping was usually involved, the form of preparation undertaken seems to have depended on the vegetable concerned and the method of cooking. For example, before placing in an oven, kumara (Polack 1838 Vol.1:70), taro (Penniman 1938:214), mauku (ti) roots (Colenso 1880) and mamaku stems (Taylor 1855:379) were scraped. Fernroot, however, was not scraped prior to roasting. It was dried, slightly soaked in water (Colenso 1880), roasted over a fire and then scraped (Best 1902:52; Best 1942:80; Taylor 1855:379). Sometimes the scraping was omitted (Colenso 1880).

Although some references to food preparation suggest that obsidian and stone flakes were used for scraping foods (for example, Hutton 1897) shells are more frequently mentioned in this connection (see table 4).

European introduced crops as well as the traditional foods were often scraped using shell tools (see table 4), Marsden (in Elder 1932) gives an interesting example of the inefficiency which resulted from the preparation of maize using the traditional means of scraping:

"She had stripped the maize of the leaves that covered cob, and was scraping the grain with a shell and reducing it to meal as well as she could; but she could only scrape off the outside until the grain became level with what was in the cob, which might be about half the weight of the whole grain contained in the cob." (Elder 1932:488).

An account from the Rotorua area, of how a shell was held when scraping potato is given by Penniman:

"In preparing a meal at Whakarewarewa, the women would first scrape the sweet potatoes (kumara) or potatoes (riwai) with the half of a kakahi (fresh water mussel shell), the potato being held between the thumb and the first and second fingers, and the shell between the thumb and the first two fingers of the right hand, about midway of the shell. A woman could waruwaru (scrape) a basketful in a very short time." (Penniman 1938:170).

Other foods recorded as having been scraped with shells before cooking are Pakeha (skin) (Cowan 1956 Vol. 2:218) and fish (scaling) (Best 1924a:96).

The scraping of fibres:

Flax, Phormium spp., was an important raw material in New Zealand. Because flax fibre was a valuable export product in the late eighteenth and early nineteenth centuries and also because

"...among the many inventions for the cleaning of flax, made by the European machinists, none had been found to answer the purpose equal to the slow method of scraping it by muscle-shells as used by the natives." (Polack 1840 Vol. 2:291).

the preparation of flax by traditional methods is well documented in the early New Zealand literature.

Flax fibre was usually prepared by women (Wade 1842:62) and sometimes by slaves (Polack 1840 Vol. 2:293) using mussel shells (see table 5). The use of obsidian and stone flakes to clean flax is also mentioned (Hutton 1897). Many different varieties of flax, each with varying qualities of blade length, stiffness of leaf, colour, and strength of fibre (Buck 1926:308) were recognised, forty seven being recorded by the Commission of Enquiry into the Preparation of Flax Fibre in 1871 (A.J.H.R. Vol. 2 G- No. 4, 1871, quoted in Mead 1965). The type and method of preparation of the flax fibre

depended both on the variety of flax and the purpose for which the treated flax was to be used. While many mats, fish nets, and baskets were made of undressed flax, other types of mats, cordage and garments required the removal of the anterior and/or posterior epidermis of the flax blades. This was done by scraping. There are two main methods of obtaining the flax fibre - the haaro method and the takiri method. A combination of both was sometimes used. (A description of both methods can be found in Mead 1968:18-19). These traditional methods of flax preparation are still being used today.

The long straight edge of the mussel shell, rather than the curved one, is used for scraping, although some women prefer to use the actual ligament edge. This is a matter of personal choice and depends on the most comfortable grip. The selection of the shell was carefully made. Left valves with a rounded working edge were preferred so that the fibres were not damaged during the scraping process. The mussel shell was usually seasoned by leaving it, in a "special" place to dry or occasionally by putting it in the ground. This was done to harden the shell. Shells treated in such a way would sometimes last for years. Once a shell had either broken or the edge had chipped, it was discarded, since the success of the operation depended on having a smooth rounded edge. (M. Penfold, pers. comm. 1978).

Colenso records the use of fibre from the leaves of the kiekie (Freycinetia banksii), ti, (Cordyline australis), toi (Cordyline indivisa), pingao (Desmoschoenus spiralis), toetoe (Cortaderia richardii), nikau (Rhopalostylis sapida) neinei (Dracophyllum spp.) (Colenso 1868b) and the kahakaha (Astelia spp.) (Colenso 1891). It is likely that when necessary the fibre of these plants was also prepared for use by scraping with shells.

"The long leaves of these plants pingao, kiekie, flax were shredded with the thumbnail into strips of

from one tenth to one eighth of an inch wide. The strips were placed in hot water, and then scraped (kaku) with a shell to remove part of the outer epidermis covering the fibre. (Buck 1921b:454).

(See also Penniman 1938:208).

The stems of Muehlenbeckia sp., Lycopodium australianum, the roots of the flax and bark of the tree houhere (Hoheria spp.) and Pimella arenaria are also noted by Colenso (1868b) as having been used in New Zealand for various purposes e.g. cordage. Unfortunately the methods of preparation are not described. The roots and stems of other plants, however, are said to have been scraped before use. Examples are rengarenga roots (Yate 1935:89) and the stem of the tawara (Yate 1935:111).

Other scraping tasks:

The use of unmodified shells to scrape wood and human bone is also recorded (see table 6). A description of the preparation of a spear, observed in the Ureweras is given by Cowan:

"The long, slender timber spears used in the killing of the pigeon and tui were still in use in the Urewera Country when I visited that mountainous region... In making the bird spears, the pole from which each was cut was scorched with fire until very dry, then it was shaped and scraped down with shells and scorched again, and once more scraped and shaped with great care and industry, until it had been reduced to the size desired and was perfectly smooth." (Cowan 1930:170).

The cleaning and scraping off of superfluous flesh from bones prior to re-interment seems to have been a practice that was performed in all areas of New Zealand (Kendall in Elder 1934:81). It is recorded in Northland (Polack 1840 Vol. 1:76,113), Waikato (Reischek 1882:24), Taranaki (Taylor 1855:100), the Chatham Islands and the South Island (Beattie 1954:22). The bone was scraped using either obsidian (Reischek 1882:214) or shell (see table 6). It

is unlikely, however, that the tools used for this task would be deposited in a normal archaeological site, although might be present in burial sites.

(iii) Shell as a plucking implement

Only one task has been recorded which involves the use of shells as pulling or plucking instruments - depilation. Two shells, the left and right valves, were used together.

Although observed by Banks (Beaglehole, 1962 Vol. 2:15) and other early explorers, beard wearing was not very popular in pre-European Maori society (Brown 1851:30; L'Horne in McNab 1914 Vol. 2:323; Angas 1847 Vol. 1:328). Colenso suggests that beards were more popular in the south than in the north:

"...some (particularly the northern tribes) were wholly without hair on the face; no doubt owing to their continual and early attempts to eradicate it." (Colenso 1868a).

Many men had some form of facial tattooing. The eradication of facial hair was necessary if the pattern of the moko was to be seen in full:

"To set off the moko to advantage, it was necessary to give up the beard, which was not considered in the light of an ornament." (Taylor 1855:150-151).

This was accomplished by pulling out whiskers individually, using a pair of shells as tweezers (see table 7). Makereti gives a good description of how the operation was performed:

"The hairs on his face were pulled out by means of an empty pipi or kakahi shell. The operator would hold the two pieces in his right hand, and with his left hand on the back of the neck of the man who was to be shaved, would catch the hair between the two shells and pull it." (Penniman 1938:238).

Angas (1847 Vol. 1:328, Vol. 2:21, 28), however, reports of having seen men pulling out their own beards.

Miscellaneous uses of unmodified shells:

In addition to the functions discussed above, shells were used to perform a number of other tasks. The carving of wood (Chapman 1891) and the engraving and carving of greenstone (Roux in McNab 1914 Vol. 2:399; Chapman 1891; Best 1912:61) are both recorded.

Other tasks include the extraction of a cooked mussel from its shell (Angas 1847 Vol. 2:33) and the making, in stone, of a small depression to receive the drill point (Best 1912:73).

The manner in which shells were used to perform these tasks is not recorded. It is possible that they were modified in some way before use.

CONCLUSIONS:

The evidence from the historic and ethnographic literature presented above indicates that unmodified shell tools were used to perform a wide variety of tasks in traditional Maori society. While unmodified shells were tools exclusively used for some tasks such as flax fibre preparation, there is considerable overlap with stone and obsidian flake tools in a range of functions. It would seem beneficial, therefore, that archaeologists studying the pre-European technologies of New Zealand expand their research to include a consideration of unmodified shell artefacts.

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TABLE 1.

HISTORIC REFERENCES TO THE USE OF SHELL  
FOR THE CUTTING OF HAIR.

<u>Year.</u>	<u>Author and Reference.</u>	<u>Implement Used.</u>
1771-2	Crozet in Roth 1891:37	Shell (sharpened)
1810s-20s	Drummond 1908:129	Oyster
1820	Cruise in Bagnall 1957:208	Shell
1830s	Yate 1835:87	Scissors or shell
1830s	Polack 1838 V.2:260	Mussel shell
	Shortland 1882:58	<u>Uwha</u> (a bivalve)
	Buck 1921a:450	<u>Kakahi</u> (fresh water mussel)

TABLE 3.

HISTORIC REFERENCES TO THE USE OF SHELL FOR CUTTING TASKS

OTHER SCARIFICATION AND HAIR CUTTING.

<u>Year</u>	<u>Author and References</u>	<u>Cutting Task</u>	<u>Implement Used.</u>
1814-15	Nicholas 1817 V.1:353	Cooked pig	Mussel
1810s-20s	Drummond 1908:198	Operation	Oyster shell
1840s-50s	Thompson 1859 V.1:221	Operation	Thorn or shell
1830s	Wakefield 1955:100-1	Karaka berries	Cockle shell
	Penniman 1928:210	Karaka berries	Shell
1840s	Dieffenbach 1843 V.2:24	Umbilical cord	Shell
1840s-50s	Taylor 1855:75	Umbilical cord	Shell
	Buck 1921a:450	Umbilical cord	<u>Kakahi</u>
	Penniman 1938:118	Umbilical cord	<u>Kakahi</u>

TABLE 2.

HISTORIC REFERENCES TO THE USE OF SHELL FOR SCARIFICATION.

<u>Year</u>	<u>Author and Reference</u>	<u>Implement Used</u>
1769	Cook in Beaglehole 1955 V.1:242	Shell and jasper
1769	Banks in Beaglehole 1962 V.1:430	Shell
1777	Anderson in Beaglehole 1955 V.3, Part 2:815.	Shell or flint
1777	L'Horne in McNab V.2 1914:337	Pieces of shell
1805	Savage 1807:43	Pieces of shell
1814	Marsden in Elder 1932:84, 90	Shell and flint
1814	Marsden in Elder 1932:125	Shell
1814	Kendall in Elder 1934:64	Shell
1820	Cruise in Bagnall 1957:43, 44, 85, 94, 154, 178.	Shell
1827	Earle 1909:63	Shell or glass
1830s	Wakefield 1955:28	Cockle shells
1838-42	Servant 1973:28,42	Shell
1830s	Polack 1838 V.1:85, 117, 373, 383	Mussel shells
1830s	Polack 1838 V.2:103	Mussel shells
1830s	Polack 1840 V.1:161	Fingernails or mussel shells
1830s	Polack 1840 V.1:62,89	Mussel shells
1830s	Polack 1840 V.2:161	Mussel shells
1830s	Markham in McCormick 1963:60	Shells
1830s-40s	Maning 1900:62-55	Shell, flint, volcanic glass
1840-41	Campbell 1953:109	Shell
1840s	Dieffenbach 1843 V.2:35, 62,66	Shells
1840s	Angas 1847 V.1:242	Pipi shells
1840s	Angas 1847 V.1:301	Shells
1840s	Angas 1847 V.1:331	Pipe & Mussel shells
1840s	Angas 1847 V.2:84	Shells
1840s	Angas 1847 V.2:89	Pipe shells
1830s-70s	Buller 1878:219	Shells
1840s-50s	Taylor 1855:187	Shells and obsidian
1840s-50s	Thompson 1859 V.1:78,186	Shells
	Cowan 1930:247	Shells and obsidian

TABLE 4.

HISTORIC REFERENCE TO THE USE OF SHELLS AS SCRAPERS DURING  
FOOD PREPARATION

<u>Year</u>	<u>Author and Reference</u>	<u>Vegetable</u>	<u>Implement used</u>
1814-15	Nicholas 1817 V.1:325	Potatoes	Mussel shell
1830s	Wakefield 1955:31-32	Potatoes	Cockle
1830s	Markham in McCormick 1963:44	Potatoes	Shell
1830s	Polack 1838 V.1:70	Potatoes and kumara	Mussel shells
1840-41	Campbell 1953:92	Potatoes	Pipi
1870s	Reischek 1882:153	Sweet potatoes	Mussel
1830s	Polack 1838 V.1:81	Potatoes, corn, taro, kumara and wild turnip	Mussel shells
	Hamilton 1908:13	Potatoes	<u>Kuku</u> (mussel)
	Best 1902:86	Potatoes	Pipi
	Penniman 1838:170	Kumara, potato	Kakahi
1830s	Marsden in Elder 1932:488	Maize	Shell
1840s	Taylor 1855:379	Fernroot	Shell
1844	Williams in Kenny 1956:110	<u>Raharahu</u> root	Shell
	Best 1942:40	Fernroot	Shell
	Best 1924a:96	Fish scaling	Shell
	Cowan 1956 V.2:218	Human skin	Cockle shells

TABLE 5.

HISTORIC REFERENCE TO THE USE OF SHELL FOR FIBRE PREPARATION.

<u>Year.</u>	<u>Author and Reference</u>	<u>Implement Used</u>
1771-72	Crozet in Roth 1891:43	Large seashells
1772	D'Clesmeur in McNab V.2 1914:477	Shells
1793	Jamieson in McNab V.1 1908:182	Cockle shells
1793	King in McNab V.1 1908:215	Mussel shell
1796	King in McNab V.2 1914:544-545	Mussel shells
1810s-20s	Drummond 1908:477	Mussel
1821	McCrae in McNab V.1 1908:537	Shell
1823	Bigges in McNab V.1 1908:591	Sharp shells
1828	Curtis in McNab V.1 1908:685	Mussel shells
1830s	Wakefield 1955:21-22	Mussel shells
1830s	Polack 1838 V.1:390	Mussel
1830s	Polack 1840 V.2:291	Mussel
1830s-40s	Maning 1900:211	Shell
1840s	Wade 1842:62	Shell
1840s	Angas 1847 V.1:324	Mussel
	Buck 1926:61-62	Shell
	Hamilton 1908:13	Mussel
	Beattie 1954:15, 59	Long blue pipe
	Buck 1950a	Shell
	Mead 1965,1968, 1969	Mussel
	Buck 1921b:454	Shell
	<u>kiekie</u> and <u>pingao</u>	

TABLE 6.

HISTORIC REFERENCES TO THE USE OF SHELL FOR SCRAPINGBONE AND WOOD

<u>Year</u>	<u>Author and Reference</u>	<u>Scraping Task.</u>	<u>Implement Used.</u>
1830s	Polack 1838 V.1:225	Bones (human)	Mussel shell
1830s	Polack 1840 V.1:76,113	Bones (human)	Mussel shell
1830s	Maning 1900:67	Wood (spear)	Pipi
	Cowan 1930:170	Wood (spear)	Shells
1891	Colenso 1891:451	wood (spears)	Shells

TABLE 7.

ETHNOGRAPHIC AND HISTORIC REFERENCES TO THE USE OF SHELLFOR DEPILATION

<u>Year.</u>	<u>Author and Reference</u>	<u>Implement Used</u>
1830s	Polack 1838 V.2:260	Mussel shell
1840s	Brown 1851:30	Pair of mussel shells or pincers
1840s	Angas 1848 V.1:328	Pair of shells
1840s	Angas 1848 V.2:21, 28	Pair of shell tweezers
1840s	Dieffenbach 1848 V.2:56	Cockle shell
1840s-50s	Taylor 1855:151	Pair of mussel shells
1840s	Thompson 1859 V.1:78	Shell pincers
	Hamilton 1908:13	Pair of <u>kuku</u> (mussel)
	Penniman 1938:238	Pipi or kakahi

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