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AN EXPERIMENT IN THE MANUFACTURE AND USE OF A  
STONE PATU MUKA

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This project, to manufacture and use a stone *patu muka*, was a Stage III assignment in Practical Archaeology at the University of Auckland. Information on stone working was consulted but no actual description of the making of a *patu muka* was available. Initially, modern tools were employed to form the rough *patu* shape. Traditional methods of grinding with sandstone and water were used to complete the pounder.

The word *patu* means to beat or pound and the term covers a variety of tools and weapons. The *patu onewa* is best known as a weapon of war but *patu* or clubs were also used for hunting and were made of wood, nephrite, whalebone or stone (Skinner 1931).

The *patu muka* is a stone tool used by Maori women to pound fibre hanks from the flax plant (*Phormium tenax*) to remove the epidermis and fleshy residue from the leaves. The flax fibres thereby became matted and soft to increase the warmth of finished garments. Fibres were first stripped by scraping the flax leaves with a mussel shell. The fibres were then rolled into threads which are washed and dried, and twisted into hanks. The hanks were beaten with the stone *patu muka* using a flat water-worn rock as an anvil. The flax fibre was thereby freed by pounding and individual threads could be picked out.

The most detailed description of *patu muka* is found in Phillips (1939). He did not discuss the actual manufacture but restricted his work to the description of the size, shape, and physical appearance of the collection in the Dominion Museum in Wellington. Maori stone working techniques have been broadly described by Best (1912). Several processes were employed: sawing, flaking, chipping, pecking and bruising. These techniques were used to shape the stone prior to final grinding and polishing. Suitable materials were first located. Pieces of stone were detached by cutting grooves in the rock source and breaking the piece off. Rectangular pieces were then further reduced in size using a stone knapping hammer.

To grind their tools the Maoris used a slab of sandstone (*hoanga*) near or in water upon which they rubbed the implements to acquire a smooth surface or sharp edge. Stone workers used certain prayers (*karakia*) when grinding their stone tools to enable good work to be done with them. Phillips (1939:73) suggests that in ancient times there were highly trained

experts in this work.

#### Making the Patu Muka

*Patu muka* in the collection of the Auckland War Memorial Museum were used as models and a pre-European *patu* was loaned by Mrs M. Lander, Department of Anthropology.

Maori stone pounders are made of argillite, greywacke, andesite, limestone or basalt (Grange and Fyfe, cited in Phillips 1939:77). The majority are greywacke or andesite. Work commenced but the greywacke from the Hunua Gorge initially selected proved to be extremely hard and almost unworkable for an amateur. Attempts were made to use a water-worn greywacke rock with similar results.

Some basalt was obtained from Maori Bay south of Muriwai. This basalt is fine-grained and does not contain many vesicles, and could therefore be worked into a sufficiently smooth implement. Basalt proved easier to work than greywacke.

A number of water-worn rocks of suitable size were duly selected from the beach. These were placed on the ground and indentations made down the centre using a 3 lb hammer and a cold-chisel. Modern tools were employed at this stage. Forceful blows cracked the rocks into workable pieces. Flakes approximately 30 mm across were chipped away by means of a carpenter's hammer and a large cold-chisel until rough shapes were formed. The most suitable block was then chosen. Further chipping with a smaller cold-chisel, caused fingernail sized chips and coarse dust to be removed. The work took about 6 hours chipping.

At this stage of the manufacture, the author sat on the grass with the stone block held securely under the left knee. Chipping with the hammer and cold-chisel was regular and steady but not exceptionally difficult. The rough *patu* shape was next treated by chipping with a tomahawk to remove small flakes. The tomahawk was held near the head and criss-cross cuts were made. Gloves and protective glasses were worn all through these chipping stages. After another four hours work the block had become quite an acceptable *patu*-shaped implement. The tomahawk was then used again to reduce the size of the handle which was too wide and clumsy.

For the rest of the work traditional stone working techniques were employed. A greywacke pebble which could be readily held in the hand was chosen to commence the smoothing process. Many hours of steady pecking removed the incisions and bruising made by the tomahawk, and the surface of the *patu* became smooth. Constant pecking and turning of the pounder removed irregularities and made it relatively symmetrical.

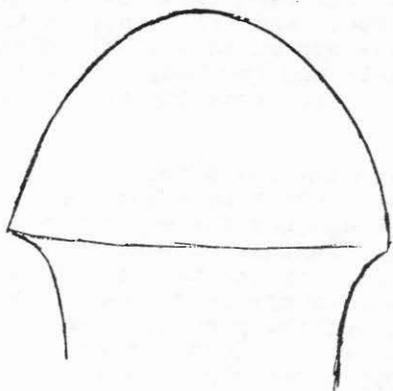
A large sandstone boulder was now used as a grinding block. Maoris would have worked near a water source. I used a hose. Water greatly assisted the speed and efficiency of the grinding process. The implement was worked in a longitudinal manner to grind and smooth the basalt and the body of the *patu* became smooth and acquired a sheen. This took approximately six hours.

Sandstone pebbles collected from the beach were used as grinders to sharpen the angle between the handle and the body of the beater. The lip at the butt end was formed to prevent the heel of the hand from slipping. Further pecking with the greywacke pebble reduced the thickness of the handle. This area was then ground on a sharp edge of the sandstone block. In this process the handle and butt of the *patu* were made somewhat oval. The end of the butt was rounded and smooth. The work to this point had taken approximately 16 hours and the *patu* was a perfectly serviceable tool.

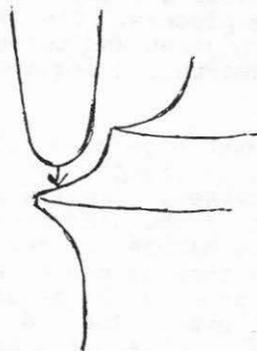
The next stage was to form the lozenge shaped decoration on the butt end of the handle. A careful scratch was made with a fine sliver of slate to commence the grooves. Off-cuts of basalt and greywacke chips were ideal tools also for this purpose. Pebbles of sandstone proved effective for widening the grooves. These grooves in turn were further widened using thicker pebbles as hand held grinding tools. Forming the grooves required much concentrated labour and proved very tiring to grind.

Information was sought regarding this decoration. Articles on fighting *patu* were examined in the *Journal of the Polynesian Society* in the hope that some insight may be obtained, but to no avail. No explanation was given regarding the butt designs. The pattern is called a *purori*, but the meaning and significance of the pattern is lost.

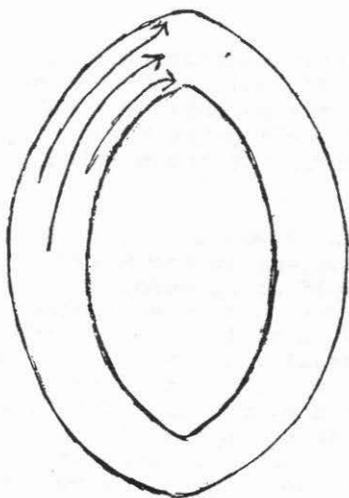
The finished *patu muka* took approximately 36 hours to complete and was indistinguishable from any in the Museum collection. The *patu* was roughly shaped using modern tools and finished using traditional methods. Making a stone implement using only traditional tools would be much slower and harder. The work was spaced over many days, usually not more than two consecutive hours worked at a time. Grinding the *purori* pattern was the most difficult part but eventually with trial and error a method was worked out as shown in Fig. 1. When the work was started it appeared to have almost insurmountable difficulties. However with hindsight the making of a *patu muka* required a mental image of the finished article followed by steady and persistent effort (Fig. 2). This kind of work is frequently designated "men's work" but it need not have been so.



The butt should be shaped and ground smooth prior to the grooves being formed



Angle of grinding using a sandstone pebble



Direction of movement using grinding pebbles.

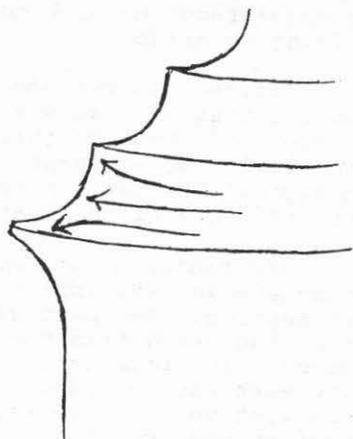


Figure 1.

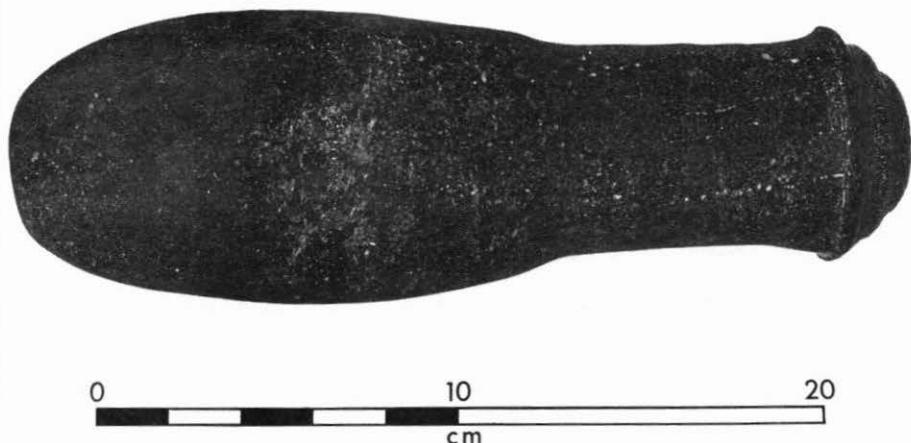


Figure 2. The finished *patu muka*

#### Use of the Patu Muka

The difference between the flax fibres which had been beaten with a stone *patu muka* and those beaten with a wooden beater was examined. A hank of previously prepared flax fibres was beaten with the stone *patu*. A second was beaten with a carpenter's mallet, a tool used by modern Maori weavers. These were compared with unbeaten fibres and fibres beaten by an expert weaver, Mrs Puti Rare. Samples were mounted on slides and examined under a microscope. The untreated fibres were coarse, slightly stiff, smooth and shiny. They were a pale green colour with remains of epidermal cells.

The other three samples were all similar. The fibres were smooth, shiny, silky and flexible. They were creamy in colour and very few epidermal cells were present. The sample provided by Mrs Rare had been beaten for about an hour and had a superior appearance. The two other samples were beaten for approximately 2 hours each with the stone *patu* and the carpenter's mallet respectively. Mrs Rare considers it takes about twice as long using a mallet to get the desired result. The major difference was in the amount of energy required. The *patu* is used with a slow steady rhythmical technique while the mallet requires a faster beat and needs more effort.

### Discussion

*Patu muka* are seldom found in archaeological sites. There may be a number of reasons for this. The *patu muka* may have become heirlooms handed down from mother to daughter along with the weaving skills. In times of danger or stress the *patu* probably would be rescued, preserved as valuable objects and thus may have seldom turned up in the archaeological record. Each *patu* was so distinctive that it was possibly owned and shared by a family. A *patu* could have stories and mythology related to it and be given a name.

Any small sandstone pebbles recovered from archaeological sites may have been used as grinding tools.

Making the *patu* evoked much interest from observers. In earlier times stone working was a time for socialising, singing and telling stories. It was an opportunity for enculturation and teaching the young how to prepare flax for warm clothing, a vital element for the health and survival of the community.

### Conclusions

Less time is required to prepare flax using a stone pounder. A number of Maori weavers consulted all positively preferred it to a mallet and were very interested in learning how one could be made.

The technique of making stone tools is well worth reviving. While it is somewhat time consuming, the work is not as difficult as the weavers imagined and the result is very satisfying.

### References

- Best, E. 1912. The Stone Implements of the Maori. Dominion Museum Bulletin 4.
- Phillips, W.J. 1939. An introduction to Maori pounding implements. Jnl Polyn. Soc. 48:71-91.
- Skinner, H.D. 1931. On the *patu* family and its occurrence beyond New Zealand. Jnl Polyn. Soc. 40:183-196.