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The Weft-Twined Structures of Cloaks of the New Zealand Maori

Margery Blackman
Otago Museum, Dunedin, New Zealand

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Margery Blackman
Honorary Curator of Ethnographic Textiles and Costume
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The Maori cloak

After the settlement of New Zealand in about 1200 AD, Maori women adapted weft-twining techniques for constructing warm clothing suited to the cooler climate of their new habitat. The principal garment was the cloak made with yarns prepared by working and twisting the long fibres extracted from the sword-like leaves of the indigenous plant *Phormium tenax*, commonly known as New Zealand flax.

The historical evolution of the Maori cloak is largely unknown as only a few fragments and one cloak found in a burial cave are known to be earlier than the cloaks collected by Captain James Cook on his expeditions in the 1770s. Those cloaks together with contemporary illustrations and written descriptions from Cook's and other early voyages of exploration by the English and French indicate that cloak making was highly developed by the 18th century. Many fine examples collected before 1800 are preserved in British and European museums.

All cloaks, whether the coarsely constructed rain cloaks with a thatch-like outer surface, the closely constructed cloaks with added strips of dog skin, or the more pliable finely made and shaped cloaks decorated with tassels and feathers or finely-patterned borders, are made by weft twining. Roughly rectangular, they vary in length from approximately 70 to 150 cm and in width from 100 to 200 cm. The body of the cloak is called the *kaupapa*. Most cloaks are simply finished on the edges with a thicker plied thread, narrow plaits or a fringe, but prestige cloaks with densely constructed patterned borders of *taniko* are called *kaitaka*.

This study

This study is based on an examination of over 200 cloaks, many with decorative *taniko* borders. These were made in the 18th, 19th and 20th centuries and are held in museums in New Zealand, the United Kingdom, USA and Sweden. I have attempted to use a terminology that consistently distinguishes the structure from the process of manufacture. In this, Fraser's comprehensive 1989 publication has been most helpful. Where necessary, I have made reconstructions to verify my observations.

Terminology and structure

Publications of the 19th and 20th century describing Maori cloaks seldom use terms which accurately describe their structure. Roth, Buck and Mead have published major pioneering studies of cloaks and details of the way they were made. However, their terminology does not accurately describe weft twining structures. For example, the word weaving is widely but loosely used in the terms finger weaving, downward weaving, *taniko* weaving and

canvas weave to describe weft twining. Even the terms tapestry and embroidery have been used, but inappropriately.

Connor (1983) set out to develop a classification system with some success, but continued to follow previous writers by using as structural definitions, terms describing the process of manufacture. More recently Pendergrast (1987) has made a significant contribution to our understanding of cloak structure by carefully analysing structural details of starting edges and decorative additions and providing accurate diagrams of cloaks in the Auckland Museum collection.

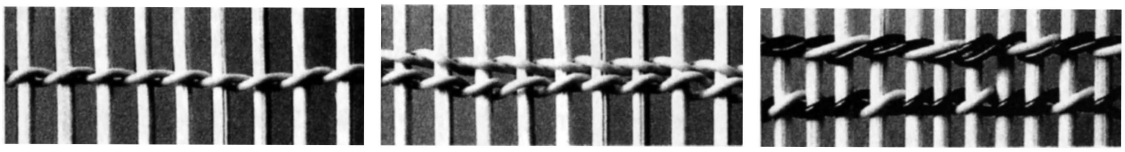
Definition of weft twining

In weft-twined fabrics, two or more weft threads interact or twist around each other as they enclose adjoining warp yarns. In Maori cloaks, the warp yarns lie in close proximity and there are seldom spaces seen between them. The twining twist may be in a clockwise, S-twist direction or in an anti-clockwise, Z-twist direction.

The two wefts may be given a half-twist around each other or a full-twist. In half-twist weft twining, both surfaces of the fabric are *similar* in appearance, but in full-twist weft twining (as used by the Maori) the surfaces of the fabric characteristically take on a *different* appearance with the active weft angled on the front side and a vertical stroke on the reverse with a second weft lying horizontally behind the warps on the reverse.

Weft-twining structures used by the Maori

2-strand, half-twist, S-twining appears in coarsely constructed rain cloaks where thick warps are usually 2 to 3 warps per cm and the weft rows are spaced 2 to 4 cm apart (Figs.1a, 2). The weft rows may also be compacted with the warps 5 to 7 per cm completely covered. This is only seen in late 18th and early 19th century prestige cloaks worn by chiefs, some covered on the outer surface with strips of dog skin (Fig.3).

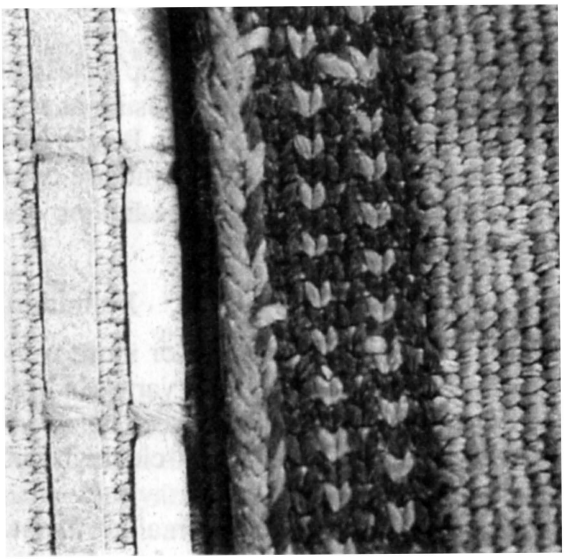


a *b* *c*

Figure 1. (a) 2-strand half-twist S-twining (b) countered half-twist twining; upper row, Z-twist; lower row, S-twist (c) 2-color 3-strand S-twist twining

Countered half-twist twining is produced by alternating the direction of the twining twist in successive rows (Fig.1b). The Maori worked two pairs of wefts at the same time with the upper pair in the Z-direction and the lower pair in the S-direction. Buck called this '2-pair interlocking weft', but this term does not indicate that the paired rows are countered and that the same structure can be made by working the two rows separately. The term interlocking is thus misleading.

The countered half-twist twining structure gives a very stable spaced twined fabric and is most commonly seen in good quality 19th and 20th century cloaks (Fig.4). The warps range between 7 to 12 per cm and the spacing of the weft rows is between 0.8 and 1.5 cm. Compact countered half-twist twining is only rarely seen in 18th century cloaks.

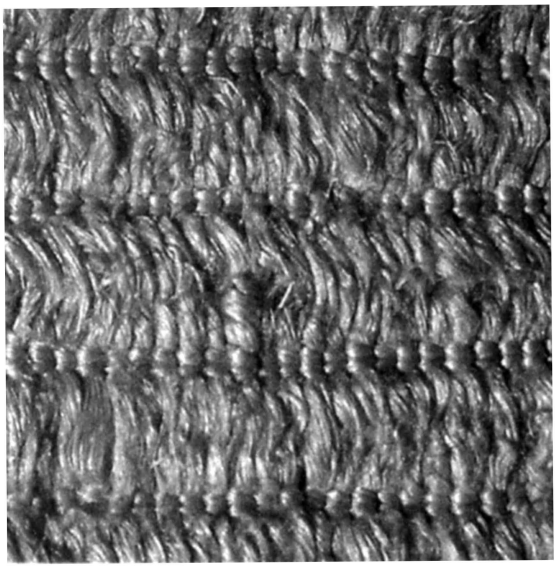


2 3

Figure 2. Rain cloak (detail). Spaced 2-strand half-twist S-twining. Otago Museum D18.245.

Figure 3. Dogskin cloak (detail). Compact 2-strand half-twist S-twining with 2-color countered half-twist S- and Z-twined border. Otago Museum D78.12.

Supplementary wefts are frequently added for decoration. These are worked into the twining rows on one side of the fabric only during manufacture and are not added later. They may be continuous colored threads or separate items such as feathers or tassels as in the finer quality cloaks (Figs.5, 6), or strips of leaves or groups of fibres as in rain cloaks.



4 5

Figure 4. Spaced countered half-twist S- & Z-twining (detail). Private collection, Dunedin, N.Z.

Figure 5. Supplementary wefts, tassels and continuous looped wool (detail) included in spaced countered half-twist S- & Z-twining. Otago Museum D51.349.

Warp grouping. Two or more warps are frequently grouped for the starting and finishing rows of twining, but throughout in the body of the cloak, individual warps are enclosed by the wefts.

Warp transposition. Contemporary cloak makers often combine several decorative methods in one cloak. An innovation not seen in earlier cloaks is to shift the position of a warp and hold it securely with the spaced countered half-twist twining to produce an open-work effect. In the following weft row the warp may return to its original position or be transposed to another position (Fig.6).

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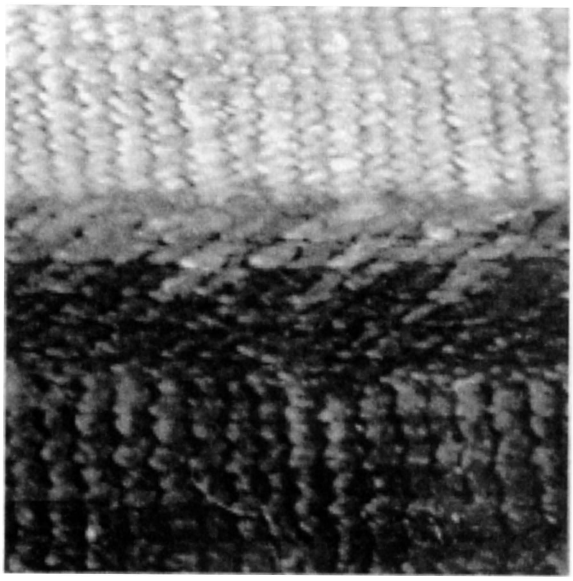

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Figure 6. 1970s cloak (detail) warp transposition, supplementary feathers and tassels, taniko. Made by Digger Te Kanawa, Te Kuiti.

Figure 7. 4-strand half-twist S-twining. Hunterian Museum, University of Glasgow, E.421.

3–strand or 4-strand, 2-color twining is sometimes worked on the first and last weft rows of the *taniko* border (Fig.1c). Each weft passes over 2 to 4 warps and under one forming a raised ridge. Several successive rows are occasionally seen in 18th century cloak borders (Fig.7). Also short rows of countered 4-strand, 2-color twining may be included within a *taniko* border.

Taniko structures

Taniko is the Maori name given to the weft-twined decorative borders of finely constructed cloaks called *kaitaka*. *Taniko* is not a single structure but consists of different combinations of full-twist and half-twist weft twining yielding a different appearance on each face of the fabric. By varying these combinations and including wefts of a number of colors, Maori generated a rich repertoire of border designs with which to decorate these finely constructed cloaks. While most *taniko* is used for borders of cloaks, a few cloaks include blocks of *taniko* within the body of the cloak and rarely a series of bands of *taniko* extend the full width of the cloak. Occasionally interlaced structures form borders on cloaks, but these are not weft twined and are not discussed here.

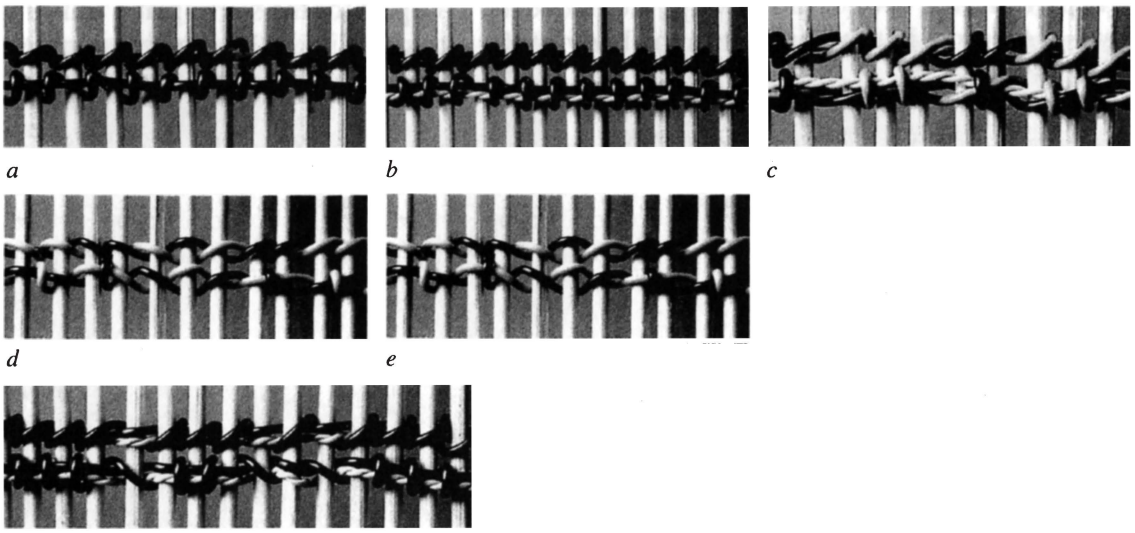

Figure 8. Upper and lower rows of pairs are respectively front and back face views.
(a) Taniko: 1-color full-twist S-twining; no passive weft.
(b) Taniko: 1-color full-twist S-twining; 2-ply passive weft.
(c) Taniko: 2-color full- and half-twist S-twining; 2-ply passive weft.
(d) Taniko: variation (3): 2-color full- and half-twist S- and Z-twining; no passive weft.
(e) Taniko: variation (5): 1-color reverse face full-twist S-twining; 2-ply passive weft.
(f) Taniko: variation (6): 1-color fine line structure; full-twist S-twining; 2-ply passive weft.

The basic taniko *structures*

Variation 1 — Full-twist S-direction twining. In the majority of *taniko* borders, three or more wefts in two or more colors are used. Full-twist S-direction twining is the most commonly seen with the weft lying obliquely angled on the front surface and in a vertical position on the reverse (Figs. 8c, 9). The remaining wefts are pulled taut to lie horizontally behind the warps and are enclosed by the twining weft. When a color change is required, another weft is brought forward with an S-half-twist. Full turns keep the new color on the front surface.

In earlier cloaks using only two or three colors of flax yarn, the colors not required for the pattern are carried across the width of the border. Many 19th and early 20th century borders incorporate colored wools in the design. To conserve the wool these often widely different colors are not carried on the back but only introduced when required by the design.

Variation 2 — Twining with a passive weft. To assist in holding warps in position, an undyed weft may be laid in on the reverse side within the twining (Figs. 8b, 8c). It does not usually shift from that position and has been called the 'passive' weft because it does not twist with a second weft. Its use is to keep tension even along each weft row. Some late 18th century, and most 20th century borders, do not include this passive weft (Fig. 8a). Today's cloak makers do not use it, as they consider its presence indicates a lack of skill.

Structures used in combination

The following variations are not used on their own but are combined with the basic structures (variations 1 and 2) described above.

Variation 3 — Full-twist and half-twist twining in both S- and Z-directions were used in some 18th century cloaks. It appears in all black areas of borders and as the light falls on the differing angle of twist, a subtle design becomes visible. In others a second color allows linear designs to be constructed. In two examples, these designs are simple vertical zigzags, but in one, a significant cloak collected by Joseph Banks on Cook's first expedition now in the Ethnographic Museum of Sweden in Stockholm (1848.1.63), a series of concentric diamond lines are enriched by small square spirals to form a border design not found in any other Maori cloaks (Figs.8d, 10).

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Figure 9. 4-color taniko (detail); full- and half-twist S-twining. British Museum 1854.12-29.133.

Figure 10. Reconstruction of part of taniko border, 2-color full- and half-twist S- and Z-twining. Banks cloak, Ethnographic Museum of Sweden 1848.1.63.

Variation 4 — Paired warps. A rare, but simple structure used in a cloak in the British Museum (1960.OC.11.7) achieves subtle changes in the texture of an all black area by grouping two warps in the twining. The warp count in this taniko is up to 20 per cm (Fig.11).

Variation 5 — Reverse-face *taniko*. Reversing the faces of the twining results in a raised area and an increased density of color. This structure was almost exclusively reserved for black areas. It was achieved by moving the passive weft and the second black weft to the front surface to be covered by the vertical stroke of the twining weft (Fig.8e). Simple designs were built up in this way in adjoining weft rows. In some a vertical column is built up with this variation by working alternate rows only to give a ladder-like design as in British Museum 1960.OC.11.7 (Fig.11).

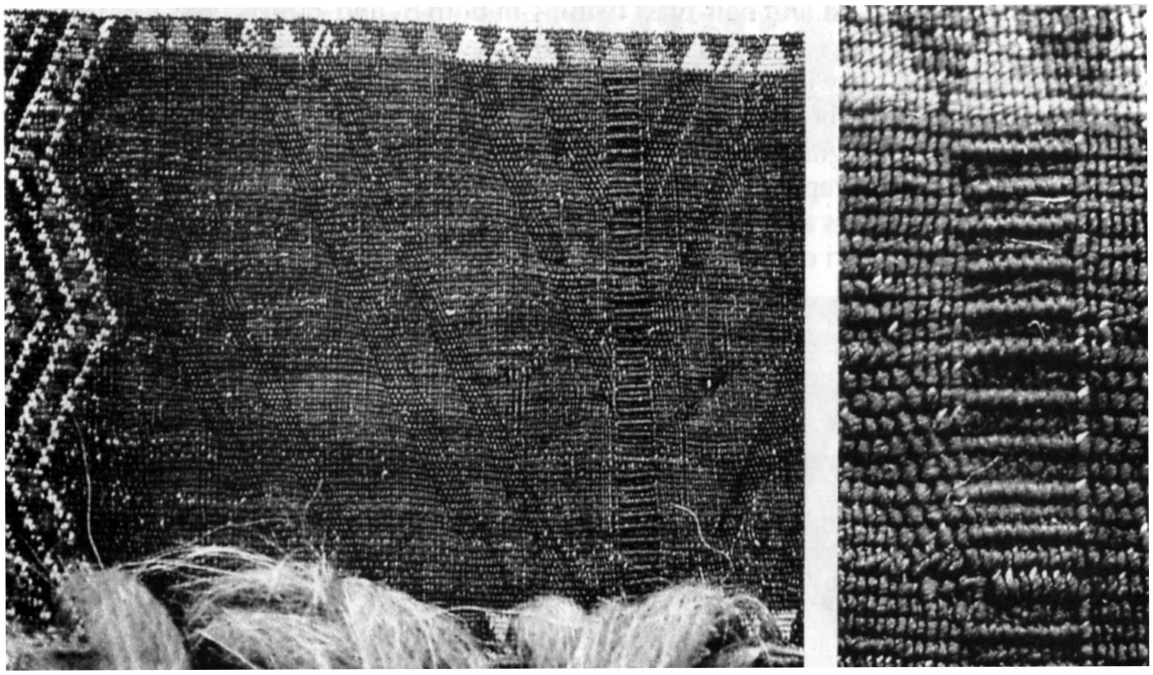
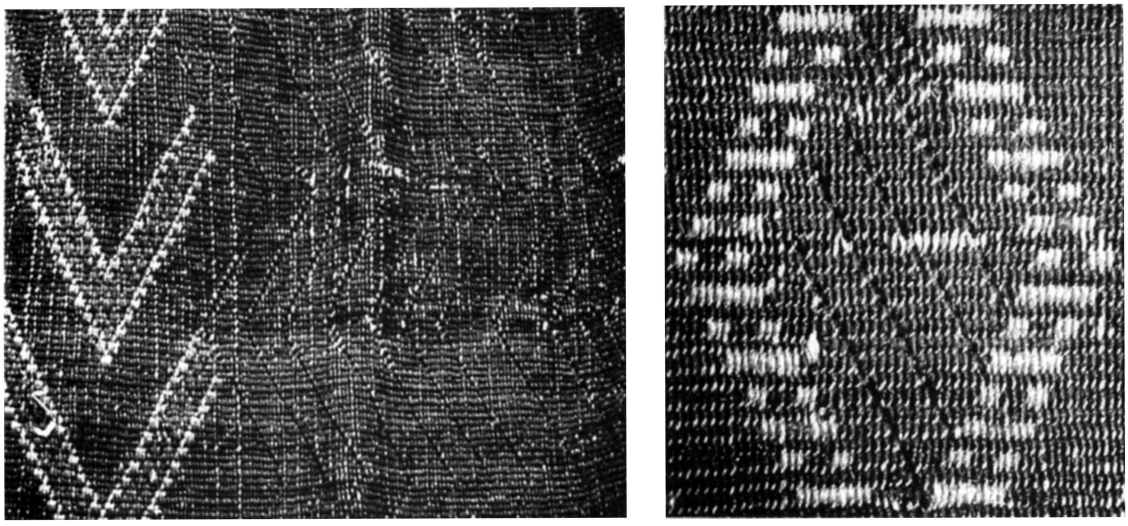


Figure 11. 1-color taniko over 2 warps and reverse face (full depth of border and detail). British Museum 1960.OC.11.7.

Variation 6 — Fine-line *taniko*. Subtle fine black lines appear in black areas of a number of finely constructed cloaks with warp counts of 12 to 18 warps per cm. This structure involves both the passive weft and the second twining weft passing in front of one warp only. The active twining weft passes behind this warp and does not twine over it (Fig.8f). The fine line builds up when a series of rows includes this structure and results from the single warp being depressed and not covered on the front surface. If this variation is worked on the same warp, the line becomes vertical, but when, as is usual, it is worked on the adjoining warp in the next weft row, the resulting line is diagonal (Figs.12, 13).



12 *13*

Fig 12. Fine-line taniko: 1-color full-twist S-twining. British Museum 1938.10.1.79.

Fig 13. Fine-line taniko: 1-color full-twist S-twining. Otago Museum D25.1002.

Comments

I have observed the 2-direction twist (variation 3) in only five 18th century cloaks. Other variations in the *taniko* structure of the cloaks I have studied occur in the black areas worked in *Phormium* flax fibre. Borders partly using colored wools have areas of reverse-face and fine-line designs but I have not observed any of these variations in all-wool or cotton borders or in any late 19th or 20th century *taniko* borders. Mead (1969), Shawcross, Porter, Simmons and Pendergrast (1987, 1996) all note some aspects of the variations in *taniko* structure, but do not explain accurately the movement of the threads. From my reconstructions of each variation I have found that factors such as warp count and balance of dimensions of warp and weft threads are critical to achieving effective designs with these structures. Other variations may exist.

The cultural significance of the subtle designs within black areas of *taniko* is not known. Te Rangi Hiroa recognised that to understand the cloaks "we must learn their language as expressed through the minute details of technique." As Pendergrast (1996) has said of the black-on-black patterning, "contemporary students often fail to notice them."

Because of the importance of the cloak in Maori culture and the wide distribution of examples in museum collections throughout many countries, an essential step towards furthering their study is the use of an accurate and consistent terminology to describe their structure.

Acknowledgments

I thank Toi Maihi for encouraging me to document my observations and the Otago Museum for assistance. I am indebted to staff of the following museums for the opportunity to study cloaks in their collections. The asterisk (*) denotes museums with cloaks featuring variations 3–6 in *taniko* structure.

New Zealand — *Auckland Museum; *Canterbury Museum; Manawatu Museum; *Te Papa, Museum of New Zealand; Nelson Museum; *Otago Museum; Rotorua Museum of Art and History; Southland Museum; *Taranaki Museum; Waikato Museum of Art & History.

United Kingdom — *British Museum; *Horniman Museum; *Hunterian Museum, University of Glasgow; *Merseyside County Museum, Liverpool; *Pitt Rivers Museum, Oxford; *Royal Scottish Museum, Edinburgh; *University Museum of Archaeology and Anthropology, Cambridge.

USA — *Field Museum of Natural History, Chicago; Fowler Museum of Cultural History, UCLA; *Natural History Museum, Smithsonian Institution, Washington DC; *Peabody Museum, Salem; *University Museum of Archeology and Anthropology, University of Pennsylvania.

Sweden — *Ethnographic Museum, Stockholm.

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