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Wood and Waka: material agency in the crafting of 18th century North Island Māori Waka Taua hulls

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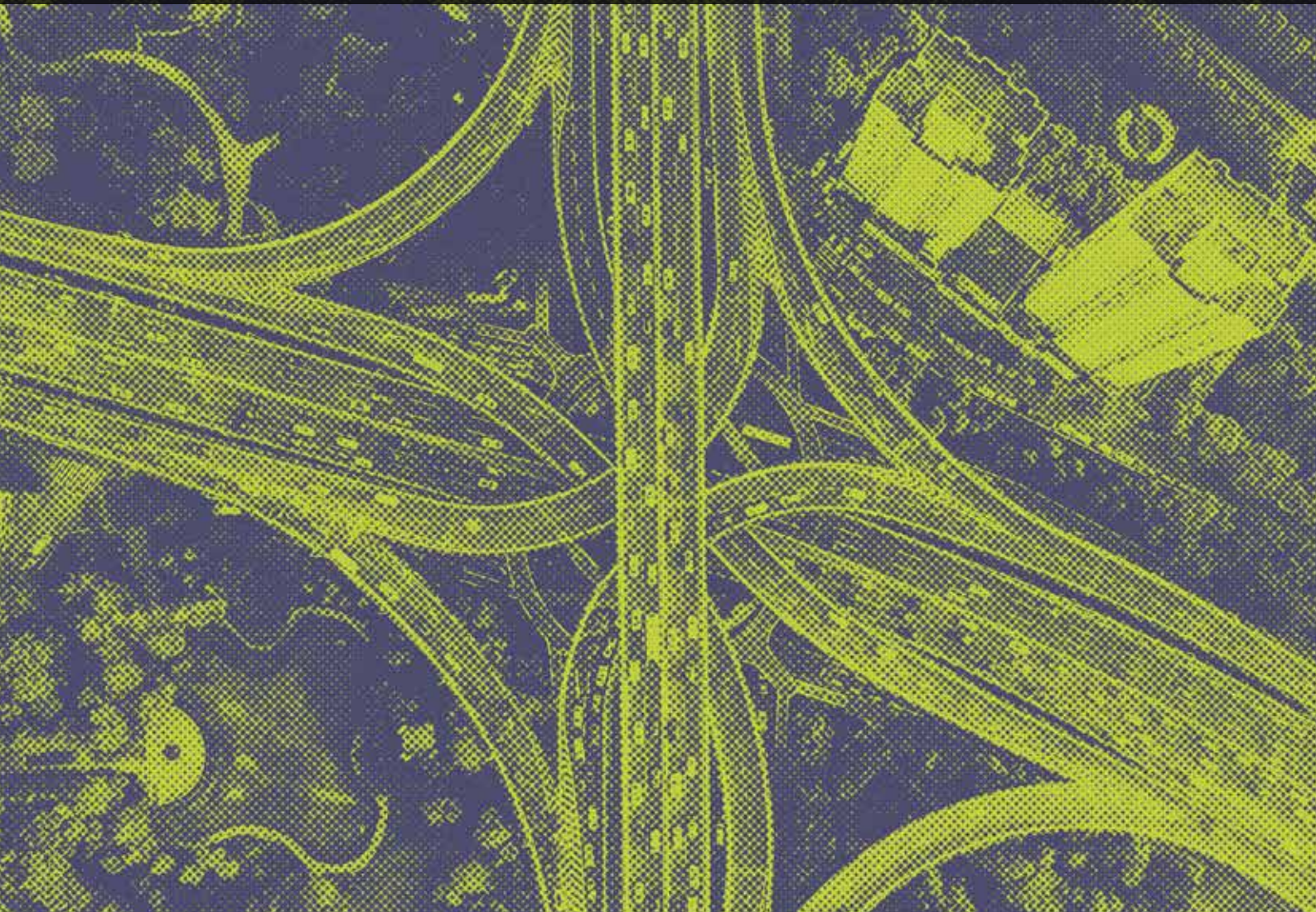
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**SPECIAL ISSUE:
HOW MATERIALS SHAPED
THE HUMAN WORLD**

**THE PHENOMENOLOGY OF
MIND AND MATERIAL:**

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CONTENTS

EDITORIAL STATEMENT	2
How materials shaped the Human World <i>Marie Kolbenstetter, Maikel Kuijpers and Ola Lygre</i>	
THE PHENOMENOLOGY OF MIND AND MATERIAL:	4
Ceramica Argentata Production In Etruria <i>Michael Dennis McCabe III</i>	
WOOD AND WAKA:	12
Material Agency In The Crafting Of 18th Century North Island Māori Waka Tava Hulls <i>Mikaela M.F. Radford</i>	
ONLY CONCRETE REMAINS:	18
Material Permanence And Ambiguous Experience Of The Shahyad Monument, Tehran <i>Imme Hannah van der Leij</i>	
CONCRETE'S MATERIAL AGENCY	24
And The 200.000 Albanian Bunkers <i>Sven van Maris</i>	
AFTERWORD	28
Pottery in the Digital Age <i>Nina Škerjanc</i>	

WOOD AND WAKA:

MATERIAL AGENCY IN THE CRAFTING OF EIGHTEENTH CENTURY NORTH ISLAND MĀORI WAKA TAUHULLS

MIKAELA M.F. RADFORD

ABSTRACT:

By adopting a perspective inclusive of material agency, this article explores the ways in which the affordances of wood influenced its use in the crafting of North Island Māori waka tauhull in the eighteenth century. In a practical sense, the wood itself was much more involved in the crafting of these vessels than has previously been considered in archaeological analyses, which have typically focused on the symbolic meanings of materials as opposed to the effects of their physical properties. A *chaîne opératoire* framework is used to outline the major steps the Māori of the North Island followed to craft waka tauhull, incorporating the agency of wood expressed as affordances in order to complement and expand upon the previously human-centric scope of this methodology. The inclusion of material agency within the methodology makes it possible to map the ways in which both the material and the Māori carvers shaped the production of the material culture.

KEYWORDS:

New Zealand, *chaîne opératoire*, affordances, new materialism, watercraft.

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INTRODUCTION

Wood inhabits a significant position in the Māori world and has always been an important resource for the Māori of the North Island of New Zealand, comprising a large part of their material culture in the form of canoes, meeting houses, tools and *taonga* (treasures) (Veys 2010, 87). A readily available resource on the North Island in the 1700s and centuries prior, trees existed as an abundant natural resource for Māori communities, providing a foundation on which to build strong traditions of wood working. The eighteenth century saw Māori woodcarving flourish on the North Island despite some early contact with Europeans (Graham 2014, 4). *Waka tauhull* (war canoes) were the largest and most elaborately decorated canoe type of the eighteenth century, bearing prow and stern pieces carved with lacelike patterns representing the tribes and their ancestry (Best 2005, 24, 46; Mead 1961, 11; Tregear 1904, 119). These vessels were and still are crafted by the Māori of the North Island as symbols of the power and strength of their communities (Graham 2014, 4; Tichborne 2020). As functional objects *waka tauhull* were used to navigate coastal and inland waterways for competition and warfare (Barclay-Kerr 2006, 2). The vessels had dugout hulls that were sharply crescentic in transverse section and were made either as a single piece or by lashing together up to three interlocking sections

(Haddon and Hornell 1975, 201). Fully assembled, *Waka tauhull* could measure between 9-30 m in length and had carved top-strakes lashed to the gunwales to increase their freeboard (Best 2005, 24, 46; Veys 2010, 95).

The techniques and tools that the Māori used to produce material culture, such as *waka tauhull*, from wood took into account their own capabilities and cultural practices as well as the natural characteristics of the material. The ways in which people and natural materials are mutually related can be explored when the agency of both craftspeople and materials is considered, and because material culture plays an active role in constituting social realities, it is apposite to focus some research on the role of the materials themselves (Harris and Cipolla 2017, 148; Jones and Boivin 2010, 336, 350). By incorporating the agency of wood, expressed as affordances, alongside that of Māori carvers within a *chaîne opératoire* for the carving of *waka tauhull*, this article explores the material aspects of the practices involved. This methodology makes it possible to put theory into practice and map the ways in which both the material and the Māori carvers shaped the production of the material culture.

MATERIAL AGENCY AND AFFORDANCES

In the spheres of modern Western thought, agency has been variously defined by the display of intentionality, language capabilities, reflexivity and creativity (Calton and Law 1995, 491; Jones and Cloke 2008, 82). New, Western considerations of agency have removed these qualifiers and are attempting to do away with dialectical distinctions, such as subject and object, that have previously been engrained in many realms of archaeological thought (Harris and Cipolla 2017, 147; Jones and Boivin 2010, 347). Differentiating subject and object implies that the former acts and the latter is acted upon, with no reciprocal effects. Material agency has entered the stage as a concept that allows researchers to explore the ways in which humans and materials equivalently affect change. Of particular interest are the roles that materials play in the foundation of practices involved in the production of material culture (Jones and Boivin 2010, 351). Material agency recognises materials as agents in practices of craft. Therefore, craftspeople and material are viewed on the same footing, essentially as collaborators. From this conceptual basis there is the potential for archaeological research to reveal just as much about the history of materials as of human experience and practices (Witmore 2014, 211).

The concept of affordances similarly seeks to unravel subject-object dualities (Barati and Karana 2019, 113) and does so by acknowledging and exploring the impact of matter. Affordances are all the features of an environment that provide an animal with possibilities for action (Gibson 1986, 127; Hodder 2012, 48; Rietveld and Kiverstein 2014, 327; Voestermans 2021, 2). Affordances are closely tied to human practices and skills because the opportunities presented to any animal are dependent on the capacities of their species (Rietveld and Kiverstein 2014, 325; Voestermans 2021, 2). The agency of naturally occurring materials, such as wood, is expressed through their affordances, manifesting in the actions they inspire and enable. Human material culture is consequently the result of tension between materials, cultural practices and skill (Lipińska 2021). It exists as the outcome of an interplay of human and material agents.

Understanding the qualities that are inherent to a material aids in understanding the physical realities of past interactions between craftspeople and material. North Island Māori traditions include longstanding relationships, both physical and spiritual, with wood that culminated in a rich material culture, including their *waka tauhull*. Taking a perspective of material agency when studying Māori traditions of woodworking helps to shed light on how and why practices came about by delving not only into the human but also the material past.

WOOD FOR WAKA IN THE MĀORI WORLD

The presence of large tree species on the North Island of New Zealand allowed for the production of wide dugout canoe hulls that did not require an outrigger to be stable in the water (Hiroa 1949, 202; Veys 2010, 27). For *waka tauhull*, the Māori of the North Island typically used *kauri* (*Agathis australis*) or *tōtara* (*Podocarpus totara*) trees,

favouring *kauri* (Evans 2000, 19; Veys 2010, 98). Mature *kauri* reach average heights of 30-50 m, while *tōtara* can reach 30 m and both species grow straight trunks comparatively free of knots (Bergin 2003, 6; Bergin and Steward 2004, 5; Ecroyd 1982, 17; Evans 2000, 19). The necessity of transporting a large piece of wood intended for carving from the felling site to secondary work sites and, eventually, to water, was an essential factor in the organisation of labour surrounding the crafting of *waka tauhull*. Nonetheless, the location of a tree, however far from shore, was not a deterrent if it was deemed an ideal specimen (Best 2005, 68). The time, effort and cooperation required then depended on the dimensions of the tree as well as the vision of the *tohunga* (expert) for the final vessel (Mead 1961, 11).

In Māori tradition, the act of carving was itself a ritual and therefore *tapu* (sacred), requiring the correct protocols to be performed in order to protect both the *tapu* of the carved object and the mana (power) of the carver (Mead 1961, 11; Neich 2001, 153; Veys 2010, 58). The trees used for carving and their trunks were also *tapu* and needed to be approached and treated in accordance with protocol. The immense amount of effort involved and the potential for costly accidents meant that a strong need for things to be done correctly surrounded all work, extending into spiritual considerations. Large *tōtara* and *kauri* trees were representatives of the god of the forest, *Tāne*, who formed a link between earth and sky (Neich 2021, 146). *Tōtara*, the children of *Tāne*, were respected as living individuals, so appropriate rituals were performed by priests to appease *Tāne* before one could be cut down for use in crafting and to protect those working in *Tāne*'s domain (Evans 2000, 18-19; Neich 2001, 146).

In accordance with protocol, wood carvers, almost exclusively men in Māori society, would never blow upon their work to remove the shavings but would brush or tip them off instead (Mead 1961, 11; Neich 2001, 153). As a general rule the act of carving was performed away from the activities of daily life (Brown 2003, 32). Carvers kept their work and tools at a distance from the presence of elements free from *tapu*, such as cooked food and women (Neich 2001, 153) although the tangential involvement of both was essential for the completion of a project (Best 2005, 74-75). All steps performed in the production of any carved object took into account the cultural and craft knowledge surrounding the activities as well as the affordances of the wood at hand, such as its weight, density and grain.

A CHAÎNE OPÉRATOIRE FOR NORTH ISLAND MĀORI WAKA TAUHULLS

A *chaîne opératoire* describes as a series of steps the actions performed in the process of crafting an object, and involves considerations of the raw materials, tools, knowledge, ideas and agents involved (Gosselain 2018, 2). However, since *chaîne opératoire* originated as an analytical tool in Western scientific thought the role of agent has typically been restricted to humans. Consideration of material agency, expressed as affordances, within the *chaîne opératoire* for a Māori *waka tauhull* hull adds material variables to each step. A *chaîne opératoire* for North Island *waka tauhull* hulls involving the methods and

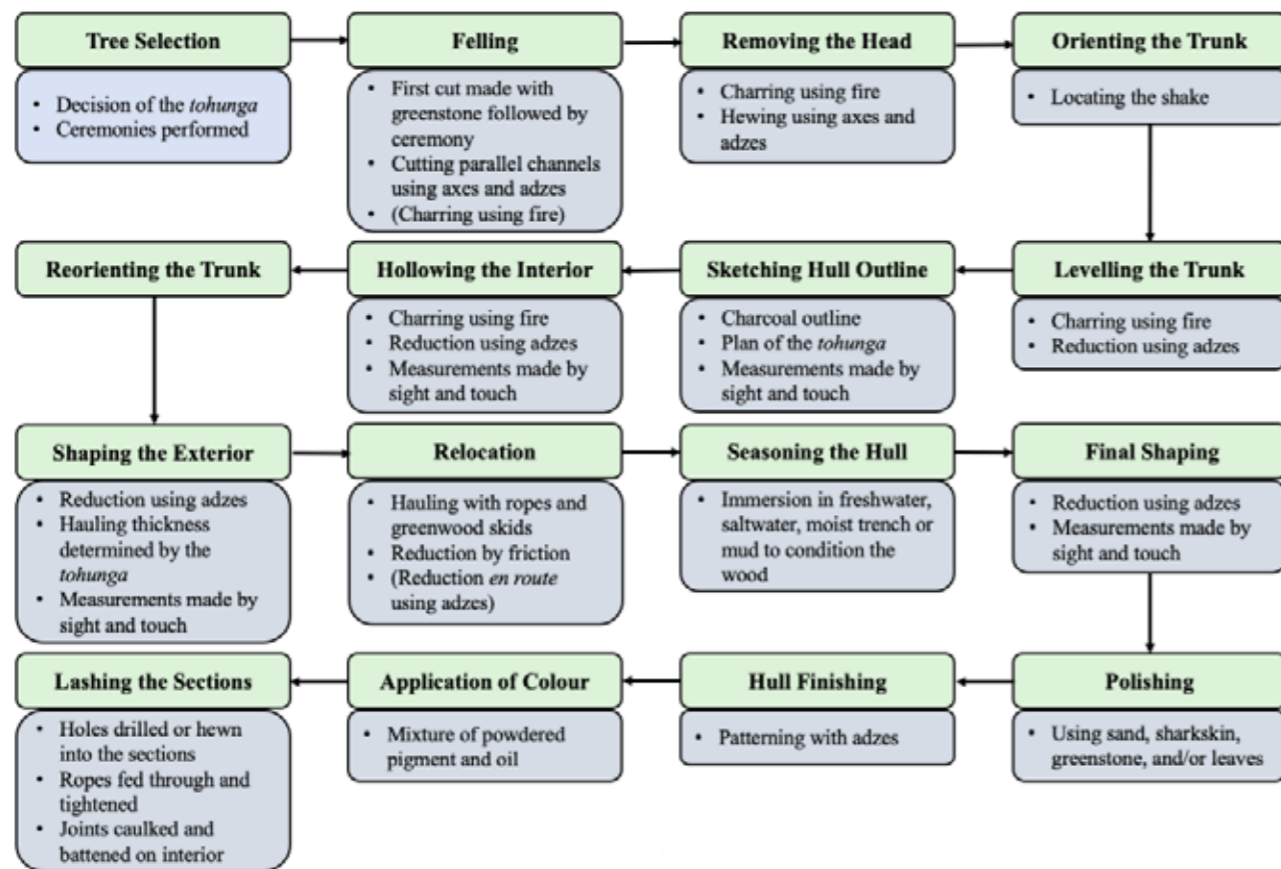


Figure 1. Chaîne Opératoire for the Carving of an Eighteenth-Century Māori Waka Taua Hull, the Human Aspects. (Optional actions are indicated in parentheses).

tools of the eighteenth century is represented in Figure 1, following the typical format that presents primarily the human centred aspects of crafting. To complement and expand upon this, Figure 2 presents a *chaîne opératoire* wherein the material centred aspects of each step are enumerated in order to map the effects of wood on the process.

The crafting process for carving a *waka taua* hull began with tree selection. The *tohunga* would examine prospective trees for signs of imperfection and would look for a connection to the tree by contemplating both the physical and spiritual worlds, drawing on craft knowledge, an understanding of affordances, and ritual knowledge (Evans 2000, 19; Tichborne 2020). Positive physical signs for a trunk included thick bark, indicating that the tree was mature and had a strong, close grain, and trees growing close to the valley floor were likely to have been well nourished and therefore possess strong grain (Evans 2000, 20).

A *tohunga* could see all possibilities in a piece of wood before beginning his work (Neich 2001, 156), but its qualities still presented challenges, each piece providing both opportunities and boundaries. Māori carvers always worked within the bounds of their original material, such as crafting multiple interlocking hull pieces when one trunk could not produce a canoe of the desired length (Neich 2001, 149). When crafting with wood, individual pieces can only be shaped by reduction or by warping

and separate pieces must be fastened together in the production of larger objects, as seen with *waka taua* hulls made from multiple sections (Haddon and Hornell 1975, 201).

Felling a tree using stone adzes required immense effort and many days of work (Evans 2000, 20). The size, density and weight of the chosen wood affected the practical physics of felling and shaping a trunk, thereby affecting the technology and skills the Māori developed and diversified to most efficiently do so (Lee 2019, 22). From the 16th century onward, stone woodcutting and carving tools were made predominately of greenstone (nephrite), which had to be sourced from the South Island (Brown 2003, 33; Brown 2009, 32). This hardstone was ideal for handling dense woods, such as *kauri* and *tōtara* (Brown 2003, 33). One technique of felling involved the repetition of carving out two parallel horizontal channels all the way around the tree, and then the removal of the material in between (Evans 2000, 20). Alternately, fires lit in a circle around the base of the tree could be used at this early stage to speed the process of removing material (Evans 2000, 20; Tregear 1904, 117). Wood's ability to behave as a fuel in the process of combustion afforded the use of fire as an additional tool of reduction. Once a tree had been felled, controlled fires were again used in alternation with adzes to char then chip away at the head of the tree so that it could be removed from the trunk (Best 2005, 68). Without moving the tree from the felling site, it was examined to locate the shake, a naturally occurring

crack that runs lengthwise through a trunk. The trunk was then manoeuvred and oriented to position the shake at a right angle to the desired vertical dimension of the boat (Best 2005, 69). The shake, however, had the potential to restrict this dimension if close to the centre point of the tree. Then, to level the trunk to the desired height of the gunwale, the wood on top was repeatedly charred to a rough depth of 3-5 cm at a time and the weakened material was removed each time using stone adzes (Evans 2000, 21). Once levelled, the *tohunga's* vision for the hull, conceived for that specific tree, was transferred to the trunk as a sketch. However, the majority of the work, was completed without outlines or measuring tools (Evans 2000, 22).

The hollowing out and shaping processes could then begin, being completed once again using fire in combination with adzes (Best 2005, 69). Next the trunk was turned over and the exterior was shaped and reduced to its optimal relocation thickness (Evans 2000, 22). Completing these initial steps of hollowing and shaping at the felling site lessened the weight that would need to be manoeuvred to a secondary shaping site closer to water. However, long distances and rough terrain required a sturdy hull so as not to suffer damaged (Evans 2000, 22). The rough hull was then hauled using rope attached to the bow, stern and sides, and skids of green wood were used in the process of moving the hull along a safe route determined by the *tohunga* (Best 2005, 70; Evans 2000, 22). The abrasion of hull material during hauling was accounted for in the initial reduction phases, but if it did not occur at a sufficient pace some additional hull material could be

removed *en route* to lessen the weight further (Best 2005, 70). The rough hull could then be seasoned for several months either in a moist trench, freshwater, seawater or mud, otherwise the hull would undergo this process after final shaping (Evans 2000, 19, 27).

The final shaping and construction of the vessel would be completed under a shelter near to the water where it would make its maiden voyage (Del Mar 1924, 125; Evans 2000, 26; Veys 2010, 98). Greenstone adzes were used to finish the exterior with a fine scalloped or fish scale pattern to improve hydrodynamics of the hull (Evans 2000, 21, 27; Veys 2010, 98). During the final shaping of the interior, experienced carvers would ensure that it was completely symmetrical, doing this without the aid of any plans or measuring tools (Evans 2000, 27). After all shaping was completed the hull sections would be fitted together and the vessel would be painted and equipped with its carved top-strakes and bow and stern decorations (Evans 2000, 19, 29).

The process of reducing a tree trunk in order to produce an object like a *waka taua* hull was not only the application and manifestation of a mental model (Goto 2012, 59). The techniques that the *tohunga* and other carvers developed did not exist solely in the mind, but developed out of a continual interaction of mind, body and material (Goto 2012, 59). During each step of the *chaîne opératoire* (Fig. 1 and Fig. 2), the characteristics of the material affected, in subtle or drastic ways, the actions carried of the carvers who continuously interacted with the wood critically and reflexively. While *kauri* and *tōtara* trees pos-

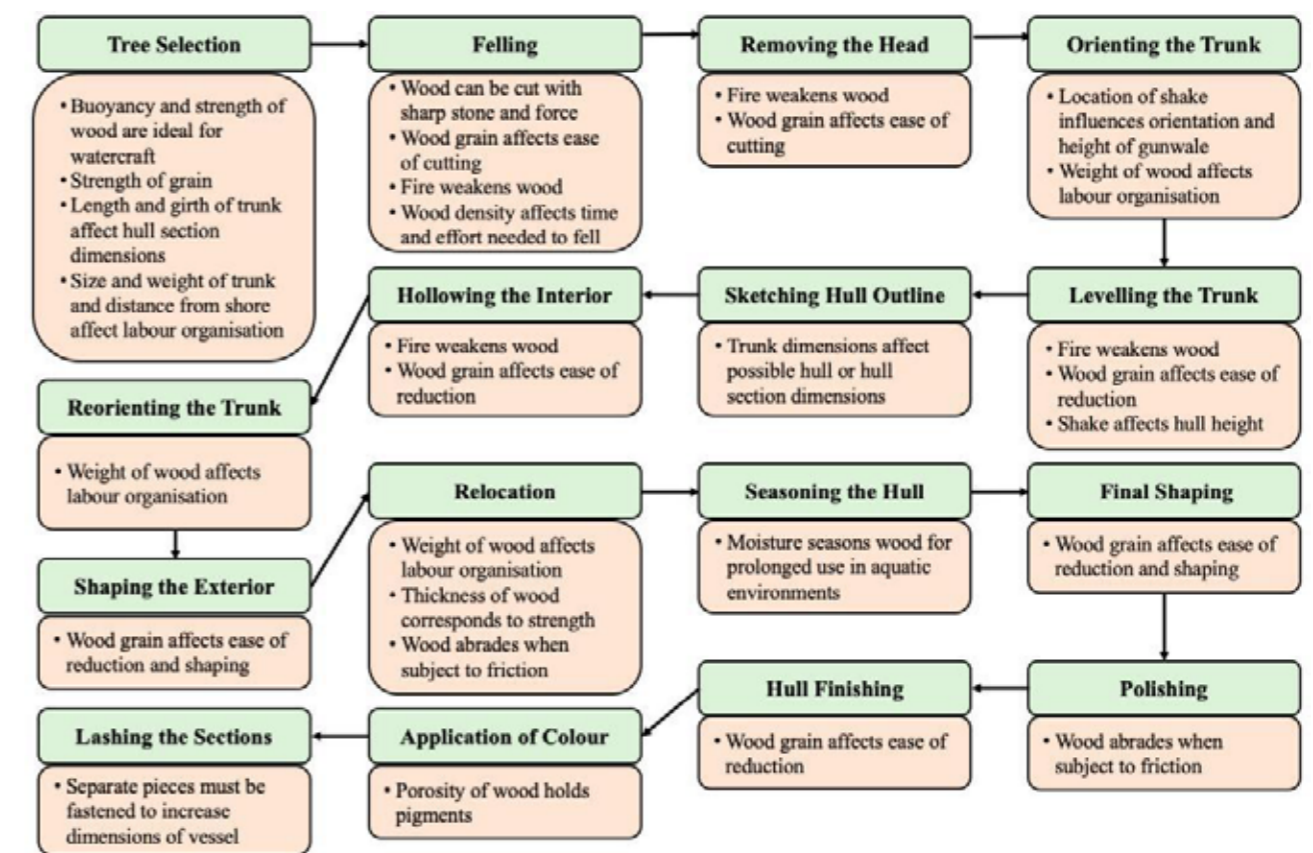


Figure 2. Chaîne Opératoire for the Carving of an Eighteenth-Century Māori Waka Taua Hull, the Material Aspects.

sessed natural qualities that were ideal for making *waka taua* hulls such as buoyancy, strength and malleability, their natural dimensions and features while alive, such as height, girth and shake affected and ultimately constrained the dimensions of individual hull sections. It can be seen in the way measurements and cuts were made by sight and touch that the decisions of the carvers were driven by the affordances of the wood as well as by individual knowledge and in the moment interactions with the material (Lee 2019, 19-20).

CONCLUSIONS

Material agency as a theory contributes to material culture studies by placing people and materials on the same footing in order to move beyond considering solely what material objects mean to include what effects materials themselves have on the production of material culture. The methodology of *chaîne opératoire* offers a way of operationalising this theory by providing a framework within which to map expressions of material agency, adding affordances as material variables to the various steps of production. For this article, this methodology provided a material perspective of the production of eighteenth-century *waka taua* hulls. Māori carvers engaged in the production process would have taken into consideration through all steps the characteristics of the material they were interacting with, as well as their cultural practices and knowledge, which were developed out of countless interactions with wood. The final product as well as the enduring practices were affected by both the carvers and the wood, and therefore were the result of both human and material agency.

The impact of material agency on the crafting of *waka taua* can be further explored by examining in greater detail the ways in which the material influenced the social organisation surrounding manufacture, including the networks of resource acquisition and community participation. In addition, further research may seek to utilise the incorporation of material agency within the *chaîne opératoire* methodology to explore the relationship between Māori carvers and their material in the context of decorative carving, such as for the bow and stern pieces and the top-strakes of *waka taua*. The same may be done in analysis of present-day crafting practices, as *waka taua* continue to be built as fundamental identity markers for North Island Māori communities.

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