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SPECIAL ISSUE:
HOW MATERIALS SHAPED
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THE PHENOMENOLOGY OF MIND AND MATERIAL:
Ceramica Argentata Production In Etruria
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The human past has been shaped by materials, and our future will be too. Without a thorough understanding of the material powers that make us, we are not well equipped to create a more sustainable future. An archaeology of the material powers that make us, we are not well equipped to create a more sustainable future. An archaeology of the material powers that make us, we are not well equipped to create a more sustainable future.

This special issue was born out of a 2021 course titled “How materials shaped the Human World” at the Koninklijke Academie van Beeldende Kunsten – KABK, to familiarise both archaeology and design students with the new perspectives on human-material relations, offered by the theories of the ‘New Materialisms’. The course centered on a few key materials, such as concrete, clay and wood, which are featured in this special issue.

Concrete - opus coementicium - was a crucial material for the Romans, who used it to shape and connect their empire. In the modern age, it has allowed us to shape our world in unparalleled ways, becoming one of the main materials of the modern human habitat. And why should we not speak of the Clay Age rather than the Stone Age? As mundane and unpretentious as clay may be, this material has been foundational to prehistoric societies in the shape of pots and mud bricks. Holdable and forgiving, clay is a universally favoured material, and one of the most frequent archaeological finds. Finally, while evidence is often absent or poorly preserved, wood has played a central role from the early human past to the present. Wood is characterised by its diversities, as different types of wood offer a distinct set of traits, allowing it to fulfill many different roles, from planks to books to spears. In the form of mass-timber it is even making a come-back as a sustainable building material.

The contributions to this special issue can be conceived as thought experiments, aiming to explore how theories of new materialisms are inherently embedded in how archaeologists approach assemblages. As such, contributors were encouraged to reevaluate archaeological, historical or material phenomena by putting materials - not people - front and centre of the narrative. The resulting articles highlight the agency of the materials in shaping the social and cultural dynamics that surround them, as well as the networks that include them. This reframing of archaeology as a study of things and materials, rather than a study of the human past, allows us to extend archaeological thinking to recent and contemporary contexts. It encourages us to explore the materiality of the materials which shape our existence, as evidenced in the afterword by designer Nina Škerjanc.

In the first contribution to this special issue, Mikaela Radford integrates new materialism perspectives into the more processual operational sequence approach, taking the 18th century wooden Maori canoe, or waka, as a case study. By documenting the same operational sequence from both anthropocentric and material-centric perspectives, she manages to integrate Maori worldview into the processing of wood as a resource, highlighting the interrelationship between the affordances of wood and traditional indigenous knowledge.

In the third contribution to this special issue, Sven van Maris explores the material agency of concrete by examining 200,000 Albanian bunkers. By focusing on the material aspect of these bunkers, rather than the political context that led to their creation, Sven van Maris highlights the agency of concrete in activating and maintaining the social memory of the Hoxa dictatorship. This contribution exemplifies the use of archaeological new materialism thinking to recent historical and current phenomena, exposing the long-lasting effects of concrete’s material agency.

In the fourth contribution, Imme van der Leij takes on a similar approach in her discussion of the sociocultural role of concrete’s permanence in the case of the Shayad/Azadi Tower in Tehran. Materials are, through evidence, often absent or poorly preserved, examining the affordance of concrete in the design strategies of the monument, and in the lived experiences it produces. Imme van der Leij produces a holistic narrative of the materiality of concrete and its durable impact on state-building in Iran.

In the final article of this special issue, designer Nina Škerjanc discusses how both new materialism and new technologies informs and shapes modern design. Offering a reflection from a designer perspective on working with clay in modern times, Nina Škerjanc’s contribution documents the various impacts of industrialization on the cognitive processes of the maker, and on the clay’s material agency. In her afterword, she highlights the value of a designer’s perspective to the study of (past) crafts. The inherent relationship between things and materials, and material is emphasised, which sits at the heart of new materialism perspectives.

Our aim with this special issue is to show the extent to which people are entangled with materials. Realising how much we depend on materials helps us to better understand who we are, and what we have in common with all humans, and other living beings on planet Earth.

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The Phenomenology of Mind and Material: Ceramica Argentata Production in Etruria

Michael Dennis McCabe III

Abstract:
Ceramica argentata stands out in Etruscan ceramic production, particularly for its dialectical blending of two worlds into a finished product: metallurgy and ceramic production. Modern research on the topic primarily focuses on explaining the production sites and the step-by-step process of the production method. Recent developments in new materialist thought offer a new perspective on past analyses of ceramica argentata; the focus of this article is to demonstrate the applicability of material engagement theory (MET) on ceramica argentata to shed new light on the relationship between maker and material. This article combines past research on physicality, production and production sites with MET and the notion of prehension to break down previous delineations between mind and material, and frame new conversations around ceramica argentata. In doing so, this contribution aims to foster further conversations regarding agency and how it is produced, highlighting the role of sense-scapes and the mind as having no a priori location.

Keywords: Materialism, Prehension, Cognition, Ceramic production, Etruscology

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Material Engagement Theory: Thinging, Prehension, Throughness

Heidegger stands as one of the foundation figures for post phenomenology and as a result, one of his largest targets. His philosophy of technology has been criticized for being essentialist or in short, holding a “one size fits all” model of interpretation (Hilde 2010, 114). Other critics have ranged from the former, to “failing to connect with specific technologies” (Verbeek 2005, 95). Regardless, Heidegger’s early work such as Being and Time and the concept of Dasein inevitably lead to post phenomenological thought with its radical concept of “Being in the world” (ibid) and its understanding of the relationships (or lack thereof) in the development of New Materialist thought (see Heidegger 1996).

Malafouris, in his Mind and Material engagement, explains how material engagement takes a step forward with its phenomenological position, pressing the notion of the act of creation in the production method itself. The mental exchanges throughout this process are laid forth as a phenomenological experience, rather than the artist and material being in the world as separate entities. In the case of ceramica argentata this new application comes to fruition through a dialectical method, merging two unique crafts to create a synthesis that blends two completely different worlds—the application of metallurgy to ceramic production changes all of the senses involved with its construction. For instance, sight, smell, and touch all play a role in the shaping of the ceramic vessel.

To ground material engagement theory within this analysis, its historical roots must be addressed. The pioneering contribution of Olesen, Shanks, Weblem & Ritmore (2012) in Archaeology: The discipline of things has led to a series of new theoretical models surrounding material culture, applying new materialist thought. Similarly, to many of the new materialist strains, material engagement theory had not developed within a vacuum but instead resulted from a culmination of frustrations regarding the cartesian heritage of cognitive archaeology (Thomas 2004, 27). The development of material engagement theory by Lambros Malafouris (2013) focuses on creating an approach focused on the ontological unity of mind, world and body. What this means in archaeological practice is an appreciation of the relationship that exists between material culture and cognition through space and time, and what the consequences of material engagement theory offer. Understanding from shapings (143). Material engagement theory comes amidst the backdrop of similar theoretical discussions, such as the social brain hypothesis (SBH), 4E cognition, and the concept of mind (ToM) models, which aid in its genesis, notably in an attempt at a rebuttal against said Cartesian biases. Archaeologists have used SBH and ToM to represent the relationship between social cognition and psychological evolution, especially regarding the Paleolithic (Gamble et al. 2011; Gamble 2013; Gowlett et al. 2012). What both theories leave out, however, is the relationship between maker and material, material agency and the evolutionary efficacy of material engagement. The fundamental step forward with the development of material engagement theory is the perspective that while SBH offers to invoke matter more constructively by highlighting the underlying forces of change, material engagement theory suggests that these forces of change must be within the act of engagement itself, not before or following. The growing interest in 4E cognition is one of many perspectives attempting to push back against this cognitively driven impact of the location of mind and the material world.

How is material engagement theory represented, and what makes it different in its approach to cognitive archaeology? First and foremost, the theory is shaped by the principle of the mind having no a priori location; this is fundamental in understanding the following process. There has been a significant effort to create boundaries and delineation between the mental and the physical in past analyses. However, as Malafouris argues, this frame of thought falls in most real-life situations where thinking and interacting with the physical are inseparable in a material ecology (Malafouris 2019). This pushes the concept of materiality playing a significant role in human cognitive evolution; humans think through construction and material interaction, thereby leaving memory traces (Malafouris 2008a, 363). These memory traces, for example, are one aspect of a built knowledge or rather learned knowledge in the larger ecosystem of the mind. MET is a theory seeking to understand intelligence, not merely as a reflected form originating within the physical brain, but as an intuitive process where intelligence is enacted throughout the physical (Iliopoulos 2019, 2). This contradicts many earlier barriers between the mental and the physical, in that it argues for our bodies not to be considered as external markers of human mental architecture as Malafouris puts it, but rather as active participants in the process of the mind (Malafouris 2019). If we take the mind as having no a priori location, it allows us an abstract stance in regard to what the mind really is. In that process we are given the ability to create a mindscape involving not only what resides within the human brain, but incorporating the senses in real-time, the build-up of memory through action, the surrounding environment and the material itself (Gosden and Malafouris, 2015).

MET varies slightly from the standard Heideggerian phenomenology and as a result has been expanded by Husserl and later expanded by Heidegger in the early 20th century. MET does this in stepping away from the notion of the mind as an independent act of thinking by developing the process of becoming with and through the world.

“The concept of thinging denotes the kind of thinking we do with primary and through things. For the material engagement approach, witness and throughness take precedence over abstraction… things should be seen itself as an act of consciousness” (Malafouris 2017, 9).

This is a transformative notion, the idea that experience is a mode of cognitive becoming. Rather than thinking that a flow of energies from materials to humans’ forms agency, we have to detach ourselves from the notion that the relationship between material and maker is one aspect of a built knowledge or rather learned knowledge (Malafouris 2019). Instead, the mind is an intuitive process where intelligence is enacted throughout the physical (Iliopoulos 2019, 2). This contradicts many earlier barriers between the mental and the physical, in that it argues for our bodies not to be considered as external markers of human mental architecture as Malafouris puts it, but rather as active participants in the process of the mind (Malafouris 2019). If we take the mind as having no a priori location, it allows us an abstract stance in regard to what the mind really is. In that process we are given the ability to create a mindscape involving not only what resides within the human brain, but incorporating the senses in real-time, the build-up of memory through action, the surrounding environment and the material itself (Gosden and Malafouris, 2015).

The development of ceramic ceramica argentata stands out particularly in ceramic production within the Etruscan sphere of influence. Ceramica argentata is a process which involved the dipping of ceramics into molten tin or rarely other precious metals, and drying them to form a slip that resembled a valuable silver finish. This development had a significant impact on how the viewer perceived the finished product, the senses involved, and the transformation on behalf of the craftsman (Haynes 2000, 326). Understanding Malafouris’ material engagement theory and how it applies to the case study of Etruscan ceramic production and, more specifically, the development of ceramica argentata offers to shed new light on this material development. What changes result from applying a metallic slip? How does the perception of the material change fundamentally when the slip is applied? What can be gained from applying material engagement theory’s phenomenological perspective, and how does its application vary from traditional Heideggerian phenomenology in this particular case? Material engagement theory and its impact on research on phenomenological studies are instrumental here in developing a new understanding of the impact and relationship between material and maker.

The resulting article will approach previous questions by providing a brief synopsis of the theory used and how it offers a new perspective; then attempt to document the materiality of ceramica argentata (what is to be done with this change and what physically happens to the material prior to and post slip application); then offer an overview of the production method itself; and finally discuss material engagement theory’s usefulness in our understanding of ceramica argentata. This article aims to analyse what can be gained with such an approach, as opposed to taking the materiality at face value (a typological approach) or using the older Heideggerian phenomenological perspective.

1 Material Engagement theory and many of the New Materialism strains find themselves in relation to 4E cognition sometimes known as enactivism. The 4Es is their most basic form of this mind as: Embodied, Embedded, Enacted and Extended see Thompson (2007) for a detailed description of enactivism.
ecution, rather it considers the production in its totality. The production then is a fluid process that takes form due to the cause and effect of the factors at play. In this case, this ontological gathering of mind-stuff, sensory experience, the ceramic or metallic material, or neural patterns is what Malafouris explains to be *thinging* (Malafouris et al., 2014, 1-4). The shift of focus from *thing-ing* to *thing-ing* represents a twofold process: *thing-ing* usually accounts for the understanding of something in its absence, whereas *thing-ing* can be understood as the process of thinking that occurs outside and through materials. In essence, the purpose of Material Engagement Theory is to shift focus away from the experience of thinking about materials to an approach where withness and thoroughness take precedence in action.

**CERAMICA ARGENTATA PRODUCTION**

As is the case with much of Etruscan ceramic studies, *ceramica argentata* has been subject to thorough scientific scholarship and, in a more traditional manner of a typological report (see Dionysus 2014; 2021; Ramage 1970; Rasmussen 1979). While these reports and scientific studies have added much to the study, especially regarding conservation, the analysis of ceramica argentata generally lacks in conceptual approaches. In this way, applying new theoretical models to overlooked areas of Etruscan ceramics can assist us in understanding the role of these various developments shaped Etruscan society.

The ceramic production process and, more specifically, the production of ceramics with a metallic slip can be limited to three main production areas: Volscian territory (workshops in Orvieto and Bolsena), Faliscan territory (Falerii, Corchiano, and Vignanello), and Volterra (Michetti 2005, 112). The workshops flourished from the end of the fourth and third century BCE and consisted of various vascular forms related to wine serving and banqueting. While the objects are seemingly related to large container vessels, they have been primarily observed in funerary contexts (Turfa 2017, 988).

Ceramica argentata production is closely connected to the black varnished ceramic as far as the imitation of metallic prototypes is concerned. Ceramica argentata as an archaeostratigraphic class also finds itself deeply rooted in the iconographic schemes of Magna Graecian ancestry and mythological portrayals (Ambrosi 2010, 60). The visual representation of the Amazonomachy attests to this (see Fig. 4), with connections being made between ceramica argentata production of the Volscian production and the metallic prototypes of Taranto in the mid 5th-4th century BCE (Fischer-Hansen 1993, 59; Michetti 2003, 34, 112).

There was an extended period of replicating ceramics using metal prototypes in Etruria leading up to the fourth century BCE. Early Bucchero ware was a fundamental stepping stone in this process, attempting to replicate the desired appearance of metallic objects with its dark finish (Ramage 1970, 11). Perkins (2005) 4 states that there is a long-standing desire by Etruscan aristocrats to acquire advanced metallurgical constructions and the role that these newly developed artefacts play on Etruscan craft construction is significant. Examples of advanced metalworking can be seen stretching back centuries in constructions such as Etruscan armaments (Cowman 2014, 747).

Therefore, we can see that a thorough understanding of metallurgy developed in Etruria for some time, with a renewed interest in replicating it through shape or form in ceramic production. Ceramica argentata serves as a cheaper method at replicating Etruscan toretics, a tradition that has its origins deep in the ancient past, well into the creation of Bucchero ware a staple of Etruscan production (see Ramage 1970, 11). The cheaper method at replicating Etruscan toreutics, a tradition that has its origins deep in the ancient past, well into the creation of Bucchero ware a staple of Etruscan production.

The producer understood the finished ceramic product, its qualities, and operated concerning temperature, appearance, time to cool, and means to carefully ‘dip’ the ceramic vessel into the molten tin. All of which follow the material engagement needed to produce ceramic vessels, which comes from a complex working relationship with the material to produce a finished product (Ramage 1970, 11).

During the production of the vessel form (representative of the first ‘phase’), a potter’s wheel would have been required for the potter to interact with the material through the senses of sight and touch to feel the movement of the vessel as it began to take shape. These senses of sight and touch play a fundamental role in the build-up of sedimented gestures and motor habits forming practical knowledge. The second phase, which can be seen as a decorative transition, required the application of various tools to allow the creative mind to feel their way through the material and the allowances given to the potter, via the clay. This decorative phase serves as a primary example of the throughness that occurs in this process. The plasticity of the clay, while still open to change, significantly impacts the future of its construction and application of various elements (decorative and slip); the potter must carefully feel their way through the material and its allowances. This then affects the following stages, the plassticy of the material must be equally as represented in the mind, effectively creating a sense-scape, a state of consciousness in the moment of its creation and through a continuous flow of energies wholly intertwined with the action. This state of consciousness can be seen to be representative of the concept of *metaplasticity*. This, too, continued into the final step, applying the slip. The metallic slip involves the process of melting down tin (or sometimes other precious metals) and dipping the ceramic vessel into the molten material, then allowing it to cool once removed. This step completely changes the
sensory experience of the material, creating a new plasticity of metal in addition to the clay’s natural plasticity.

**Material Engagement Theory and its Relevance to Ceramica Argentata**

With the culmination of ceramica argentata, we see a new step in the material engagement of ceramic production. The multiplicity of factors lending themselves to the process of throwing clay and forming it into a vessel when synthesized into a process that merges metalworking and ceramic production. However, it is fundamental that this conversation remains on the modernist perspective of what matter and mind consist of; in other words, re-shaping the conversation from entities to events. For the cognitive imagination between material and mind, there is no definitive demarcation between the mind having no a priori role location in the construction of a finished product, which happens as a result of interaction, this interaction is explained below.

What then, can material engagement theory offer in its approach to the archaeological significance of ceramica argentata and how can it be applied in a practical manner? If we, for example, think of the processes of ceramic production as being the events unfold; the experience of working the clay, pushing and pulling the elements together, the spinning of the wheel, the pressure involved. However, this entire process is, from here we can gather pieces of an event unfolding, a flow of energy between potter and material (Malafouris 2019, 9). Here we can recognize the cognitive experiences that occur between material and mind, the affordances given by the material, and the reaction and production that is re-enamelled back into the clay to produce a particular form; there is no definitive demarcation that occurs between the material and mind, the material engagement between the plasticity of mind and material engages with form and flow. This is where the potter’s skill comes into the equation, ‘it is the precision in discovering the right balance of agency for each specific stage of the process of form-making...’ a new form brings about a re-working of the potter’s imagination and ways of seeing and a new understanding of the agentive capacities and vitality of the clay (Malafouris 2019, 11).

The visual examples help us understand the processes involved in the production of ceramica argentata. The resin over time resembles the process of exchange of energies occurring through material engagement illustrates the affordances given by the material, the clay, the potter (Malafouris 1977, 68). This can be seen here with the post-application of the frieze work to the outside of the shaped product. Working through the material, the potter would have faced countless pressures and changes in imagination as they worked with the clay. This is demonstrable of agency not existing as a permanent feature of the maker or the material – rather, it emerges through this creative tension. Rather than human intentionality forming the object through fixed directional capabilities and thoughts stemming from the brain, it results from the material being enveloped into the mental, during the act of creation, employing Whitehead’s notion of prehension (Hartshorne 1978, 256). We have a problem in our understanding of agency, if agency is to be accepted as not within material or the physical brain and rather understood in action; the question of agency then shifts from ‘what’ to ‘when’ (Barona 2020, 143). It is only after that a separate but similarly unique example of material engagement occurs in the pottery wheel. The clay is, from here we can gather pieces of an event unfolding, a flow of energy between potter and material (Malafouris 2019, 9). Here we can recognize the cognitive experiences that occur between material and mind, the affordances given by the material, and the reaction and production that is re-enamelled back into the clay to produce a particular form; there is no definitive demarcation that occurs between the material and mind, the material engagement between the plasticity of mind and material engages with form and flow. This is where the potter’s skill comes into the equation, ‘it is the precision in discovering the right balance of agency for each specific stage of the process of form-making...’ a new form brings about a re-working of the potter’s imagination and ways of seeing and a new understanding of the agentive capacities and vitality of the clay (Malafouris 2019, 11).

The example of an amphora constructed in ceramic argentata ware (figure 4), initially formed on a potter’s wheel, is an example of intimate engagement with the material throughout the above-mentioned process. The second part consists of the sculpting of the frieze element, which requires working through the clay to get the desired effect. Finally, the moment for the lip to be added, the slip would have needed to have been applied using precisely the correct temperature, time, and cooling. A very similar process occurs here as in the prior figures. Do the conceptions of enactivism and active externalism in the process of creation; the analysis for cognition must be responsive to the subject under study (Hutchins 2010, 426).

**Agency**

Agency is then the result of a flow of energies, a material engagement, whereby energies are transformed into agencies as a result of the creative tension that coalesces with form and flow. This is where the potter’s skill comes into the equation, ‘it is the precision in discovering the right balance of agency for each specific stage of the process of form-making...’ a new form brings about a re-working of the potter’s imagination and ways of seeing and a new understanding of the agentive capacities and vitality of the clay (Malafouris 2019, 11).

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Figure 4. Ceramic argentata production: complete amphora with a visual representation of frieze work, (www.getty.edu).

**Conclusions**

What new perspectives does can material engagement theory offer in terms of ceramica argentata production? This offers a visual representation of the concept of thinging. Through thinging, the depths and bounds of creative imagination run deep and are the result of a reworking of the ways of seeing and capacities of the material, which manifests itself in agency as a ‘when’. A phenomenological approach and incorporation of Whitehead’s notion of prehension allows for the introduction of multisensorial thinking and abstract conceptions of time and learned behaviour. Through material engagement theory, we can shift the thinking of production from a perfect set of phases that result in a perfect finished product, into an experience wholly defined by what happens in the moment of production. This fluid process, always subject to change and development, is a relationship between material the senses and mind, and finally, a link between times and physical barriers that amount to a profound reshaping of material engagement. This process can be demonstrated well past the boundaries of mind and matter, even to other dimensions of craft production and learned knowledge. The application of MET provokes larger questions regarding the systems of relata, affordances, memory, time and the entanglement of mind and world. Pinpointing themes of development and applying new theoretical moulds offers to reshape the creative histories of peoples from one limited to the directional capacities of one human shaping of the material to its situated creation in the material. Themes and trends may be called into question not strictly as cultural influences separate from
the mind, but as key cognitive developments. MET, 4. 45
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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 part of their material culture in the form of canoes, meeting houses, tools and part of their material culture. The inclusion of material agency within the 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.

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 part of their material culture. The inclusion of material agency within the 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.

The techniques and tools that the Māori used to produce material culture, such as waka taua, from wood took into account their own capabilities and cultural practices as well as the natural characteristics of the material. Understanding the qualities that are inherent to a material in aiding the understanding of the physical realities of past interactions between craftspeople and material. North Island kauri and totara trees were representatives of the god of the forest, Tāne, who formed a link between earth and sky (Neich 2021, 146). Tāne’s children were trees, and individuals, so appropriate rituals were performed by priests to appease Tāne before one could be cut down for use in crafting a carved object. 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 tohu (expert) for the carving of waka taua hulls involving the methods and material variables to each step. A chaîne opératoire describes as a series of steps the organisation of labour surrounding the crafting of waka taua. Nonetheless, the location of a tree, however far from shore, was not a deterrent if it was deemed as ideal 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, 152; 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 totara and kauri trees were representatives of the god of the forest, Tāne, who formed a link between earth and sky (Neich 2021, 146). Tāne’s children were trees and involved individuals, so appropriate rituals were performed by priests to appease Tāne before one could be cut down for use in crafting a carved object. 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 tohu (expert) for the carving of waka taua hulls involving the methods and material variables to each step. A chaîne opératoire describes as a series of steps the organisation of labour surrounding the crafting of waka taua. Nonetheless, the location of a tree, however far from shore, was not a deterrent if it was deemed as ideal for the final vessel (Mead 1961, 11).

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The crafting process for carving a process. wherein the material centred aspects of each step are chaîne opératoire expand upon this, Figure 2 presents a human centred aspects of crafting. To complement and following the typical format that presents primarily the tools of the eighteenth century is represented in Figure 1, actions are indicated in parentheses).

Figure 1. Chaîne Opératoire for the Carving of an Eighteenth-Century Māori Waka Taua Hull, the Human Aspects. (Optional

The hollowing out and shaping processes could then beh. However, the majority of the work was completed without outlines or measuring tools (Evans 2000, 22).

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

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).

...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).

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 carving multiple interlocking hull pieces when one trunk could not produce a canoe of the desired length (Neich 2001, 149). When carving 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 woodworking 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 totara (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 be reduced in a circle around the base 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
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-strokes 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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ONLY CONCRETE REMAINS

MATERIAL PERMANENCE AND AMBIGUOUS EXPERIENCE
OF THE SHAHYAD MONUMENT, TEHRAN

Imme Hannah van der Leij

ABSTRACT
Concrete, inherent to modernist architecture, possesses agency. Its ambivalent properties have diverse material effects on the spectator. Drawing on Ingold’s ‘anthropology of materials’, the framework of the social life of materials allows to interpret sociocultural implications of material manifestation. Within the underdeveloped domain of autocratic modernist architecture, this discussion of the case of the Shayad/Azadi Tower in Tehran, Iran aims to illustrate how the material properties of concrete produce ambiguous experiences which are reflected in the design-strategies of the monument. The materiality of the Shahyad monument emits experiences of modernity and ancientness at the same time, which aligns with the design-strategy and ideology of the Pahlavi regime. Evoking imperial continualty, the Shah rooted his modern vision of Iran’s future national identity in the permanence of Persian civilization. Yet, the highly malleable properties and agency of concrete have made the monument an active locus of power which continues to shape Iranian society after the Islamic Revolution of 1979.

KEYWORDS: modernist architecture; autocratic regime; the social life of materials; agency; national identity

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INTRODUCTION
Concrete is the material of the modern. ‘Talking about concrete means talking about modernity’ (Forty 2013, 14). It is the material which constitutes the origin and development of modern architecture. Now, concrete is accepted as the most widely used construction material worldwide (Meyer 2005, 1). Therefore, its presence and impact on public space is significant. Signalling modernity, concrete in architecture is used to separate the ancient from the modern (Wickstead and Barber 2015, 1). This gave rise to the ideological meaning of modernist architecture in the 20th century wherein concrete structures represent ‘architectural utopias of social emancipation’ (Minuchin 2013, 240). In contrast, besides aiming to elicit a sense of awe, concrete is also able to render an ‘uncanny feeling of not being at home’ (Croft 2004, 8). Experience of estrangement through architecture is especially relevant based on the idea that architectural forms shape the political structure of a society (Minuchin 2013, 240). In contrast, the role of concrete architecture in democratic societies, knowledge about its functioning in autocratic states is underdeveloped. Yet, this is perhaps even more relevant based on the idea that architectural forms can shape the political structure of a society (Minuchin 2013, 240). Hence, choice of material and the resulting structures matter considerably indeed. By focusing on the role of material properties, this essay discusses to what extent material experiences of concrete are significant when studying the design-strategies of autocratic modern architecture. Here, the Shayad/Azadi Tower in Tehran, Iran (hereafter: Shahyad monument) (Figure 2), a prime example of concrete modernist architecture in an autocratic context, will be used to illustrate how the concrete structure produces ambiguous experiences which are affected by concrete’s material properties.

MATERIAL AGENCIES
Moving away from a semiotic approach of the object’s ‘symbolic meaning’, Gell proposes that objects have an agency which mediates between art and social processes. His ‘anthropology of art’ studies social relationships caused by the agency of objects, which signals the move towards a ‘material perspective’ (Gell 1998, 6-7). As such, social ‘agents’ have the ability to initiate causal sequences of action and act on ‘patients’. Many combinations of relationships between agents and patients are possible. Even so, Gell (1998, 39) ultimately argues that the agency of an object on a ‘recipient’ (spectator) is placed there by an ‘artist’ (maker). In the context of modernist architecture as the expression of power, (Mehan 2016, 317), specific experiences of a structure could reflect or result from the intention of the patron. Gell (1998, 12, 18) however, remains somewhat descriptive of the various interactions that are possible between humans and ‘things’. His theory could be used to analyse the relationship that is possible between artist’s intentions, their creations, and their audience (Humphry 2005, 43). Nonetheless, Gell does advance understanding of how these interactions occur. This could be the result of Gell’s focus on things as his loci of agency, rather than the material. As Ingold (2013, 7) critiques, the study of material culture has mostly focused on finished objects and their role in the life histories of those who use them. Ingold (2013, 7, 12) argues the role of sensory awareness in processes of making and knowledge through materials is lost. In order to study the role of agency in shaping design-processes and material experience, the concept of material properties is chosen. This is defined as ‘the ascription of the quality of having material effects’ by the material substance of which a thing comprises (Drazin 2015a, xxvi). Consequently, the focus of this essay moves away from analysing specific moments of interaction between objects and individuals (Gell) towards an ‘anthropology of materials’, which interprets sociocultural implications at moments when a material substance takes on a specific form (Drazin 2015b, 13). In the case of the Shahyad monument, this moment of material manifestation takes place when concrete becomes architecture. The study of social relations in the vicinity of architecture from the material perspective of concrete, as an ‘anthropology of materials’, is a valuable contribution of this essay (Ingold 2013, 10).

MATERIAL MANIFESTATION AND EXPERIENCE
So, what happens at moments of material manifestation? Drazin (2015b, 23) argues that these manifestations constitute the exercise of authority and mobilization of...
those actors who view themselves as being in control. Tompson (2004, 295) adds that those in control have the power to ensure their objects are durable, whereas those of popular ownership. Hence, materials underpin inalienable, and naturalize established hierarchies and social orders (Drazin 2015b, 27). Consequently, this conceptually enable, and naturalize established hierarchies and social and political perspectives.

Material manifestations impact public space. Findley (2005, i-xii) clarifies those processes and material qualities in public space are a locus and indicator of power relationships, architecture is integral to reasserting cultural and political agency and is used as a spatial strategy by those in power to control and manipulate the physical world. Moving beyond the role of the architect as an agent in architectural creation, Findley (2005, xiii) asserts that the political, economic, and socio-cultural power structures inherently connected to architecture result from its dependency of patronage. Therefore, approaching monumental architecture as a locus of power integrates Gell’s notion of patronage with Ingold’s view on material properties and effects.

As concrete constitutes the most widely used construction material worldwide, the application of concrete as a structural material is omnipresent across architecture. By altering its constituent orders (Drazin 2015b, 27). Consequently, this conceptually enable, and naturalize established hierarchies and social and political perspectives.

A UTOCRATIC MODERNISM AND NATIONAL IDENTITY

The creation of monumental architecture involves the material, the architect, and the patron. Here, Iranian Shahyad monument serves as an example to investigate the material experiences of concrete modernist architecture. The monument was built by architect Hossein Amanat and inaugurated in 1971 for the celebration of the 2500-year anniversary of the Persian Empire. Grigor clarifies (2003, 215) that Shahyad was a material manifestation of the political ideology of Shah Mohammad-Reza Pahlavi (reign 1941-1979) to create a modern Iran as a continuum of the Great Civilization of the Sassanian past into a bright future of the nation-state. Hence, Shahyad reflects the autocratic tendency to crystallize identity through the fixation of memories in objects and institutions (Grigor 2003, 209). The monument, however, was appropriated by other socio-political meanings when it was claimed as the ultimate symbol of the Islamic Revolution in 1978-79 by the Islamic clergy, after which an Islamic Republic was established (Grigor 2003, 207). From this moment onwards, the original name Shahyad Aryanmehr (denoting the Shah’s name), was changed to Azadi Tower (Freedom Tower). Accordingly, Grigor (2003, 224) argues that a monument’s social and cultural meaning depend on those in power, as those generate the culture of signage of society at that specific time. Thus, monuments are constantly appropriating new cultural memory, due to which the human-centred understanding of a monument is constantly evolving.

In contrast, from a material point of view, Grigor (2003, 223-224) states that Shahyad endured the shifts of power in Iran and became a central locus in the popular up-rising, precisely because of the formal and architectural qualities of the monument. Shahyad’s only pre-Revolutionary meaning that remains is its disciplinary memory of inherent architectural qualities, such as its monumen-tal size and shape, its modernity, and its material pres-ence. Disciplinary memory is defined as the process of architectural design and the practice of the architectural profession, which is therefore based on cognition and experience (Grigor 2003, 208). This alludes to Ingold’s (2013, 7) notion of knowledge through materials. As such, knowledge of materials through experience is vital in the process of architectural design and the disciplinary memory of a building results from its material physicality. In other words, Grigor (2003, 207) asserts the physical persistence and durability of monuments is indicative of their disciplinary memory. In terms of disciplinary memory, Shahyad is constructed of reinforced, poured-in-place concrete, in order to address the challenging physical and seismically active location. After this, the structure was clad in white marble, of which every stone cladding is unique due to the complexity of the Tower’s structure with arches and curves (www.archdaily.com) (Figure 3). Even though the skin of the monument is not made of concrete, the shape of the cladding was dictated by concrete material. Material can also be understood as a structural form. The structure’s shape gives direct meaning to the material of which it is constructed, according to Poerschke (2013, 151). The constructive essence of concrete is strength and malleability, which enables Sha-hyad’s dynamic shape to be ‘stable on the ground and bursting into the sky’ (Grigor 2003, 214). Thus, the material properties give physical presence to the ideology of the Pahlavi regime: the nation’s movement towards the future. The material experience of concrete’s properties culminates with the design-strategies and the meaning the autocratic patron intended for the monument. Grigor (2003, 214) states that the autocratic tendency to crystallize identity through the autocratic movement upward was designed to imply achievements still necessary to reaching that future. Therefore, the shape shows that the nation is heading towards a new modern destiny, under leadership of the Shah. In materi-al terms, the concrete creates a solid base, which enables the building to present a powerful, simple, and central-ized experience (Figure 2, 4). The concrete allows for the creation of pure and bold lines, revolving around a mon-arch who would lead the nation to a modern and bright future (Figure 2, 3). This sense of centrality, directionality and power of the Pahlavi government is what was sought to be represented in the monument.

In addition, Shahyad’s modernism, colour and concrete material implies a sense of openness and honesty (Gri-gor 2003, 215-216). These utopian modernist experiences of concrete are thus present in the design-strategies and objectives of the monument’s architecture. Significantly, the Shahyad square and monument as its focal point constituted the centre of Tehran’s urban renewal during the Pahlavi regime. Grigor (2003, 97-98) used the term ‘Tabu – Rasa‘ to describe the dominant strategy of political and social modernization, comparable to the Hausmannisation of Paris, which created a ‘utopian blank slate upon which a new city could arise‘ (Grigor 2003, 215). The central positioning of the monument in a modernized Tehran and the structure’s composition revolving around a central point strengthen each other. This could mark the glory of absolute power, according to Mehian (2016, 317). Taken together, the materiality of Shahyad marks a new urban identity (Mehan 2017a, 218). In the formation of this new urban national identity, modern concrete materiality is central.

Shahyad’s modernist style is nonetheless also influenced by the shapes and structures of Antiquity it derived its inspiration from. Grigor (2003, 212) describes the monument as a modernist abstraction of ancient Persian ar-chitecture, such as the renowned iwan of the Sassanian palace of Ctesiphon (Figure 5) which inspired the central arch of Shahyad. The monolithic and solid design of Sha-hyad is a reference to the monumental sizes of ancient Persian architecture. The monument’s materials and the constructive essence of concrete’s properties not only allows for experiences of modernity but is also rem-iniscent of ancient Persian structures. As a result, the strong and monumental shape of the concrete inscribes antiquity and timelessness, according to Grigor (2003, 216).

Forty (2013, 10) argues this results from concrete’s ability to blur categorial distinctions such as modern/ancient, as well as liquid/solid, smooth/rough, natural/artificial and base/spirit. Similarly, the cladding of the monument is engraved marble (Figure 6). When a spectator...
approaches the structure, the experience of a monolithic concrete building is replaced with the experience of ‘vernacular’ engraving, creating a more ‘tangible’ experience.

**Figure 4. Aerial view of Azadi Square.**

**Figure 5. The ruins of Taq Kasra (Madin, Iraq). Photo courtesy from Wikipedia.org**

In short, the monument allows for experiences of modernity and antiquity at the same time, due to which Shahyad embodies the uncommon representation of both the modern-and the un-modern in concrete (Forty 2013, 34). Unifying the past and the present, the monolithic Shahyad monument represents the locus of the creation of Iran’s national identity. Its architecture embodies language of form, shape, colour and concrete materiality which enables ambiguous experiences. All this serves to remember, narrate, glorify and legitimize the nation state. Hence, the initial purpose of the monument was to freeze the Shah himself in time and space, as an ‘architectural manifesto of Shah’s monarchy, his vision, ideology and ultimate aim’ (Grigor 2003, 216). The Shah aimed to ascribe political status to the Shahyad monument through association with historical memory and collective imagination of the Sassanid Empire’s glorious past. Mehan (2017a, 319) cites that once this memory fades, the monument serves as a spatial-temporal threshold between the glorified Persian empire and the Pahlavi capital (Grigor 2003, 215). Through this concrete monument, the vision of Iran’s national future was aligned with the permanence of Persian civilization.

**Figure 6. View of Shahyad monument from the Azadi Tower.**

Ultimately, the highly malleable properties and agency of concrete allow the architect of automatistic modernist architecture to engineer its plasticity in order to articulate a form of material politics. The impact on human experience of the monument itself and the variable image it represents, bringing together the ancient and the modern, is part of the monument’s design strategy (Minuchin 2013, 241). Therefore, the ability of concrete to elicit many different experiences affects the strategies and outcomes of automatistic modernist architectural projects. Yet, despite the changing sociocultural context surrounding the material presence of Shahyad, its endurance has not been influenced. Significantly, instead of contrasting these different properties, the concrete permanence, has become a locus of meaning-making which continues to shape the development of Iranian society. In essence, all fades but concrete remains.

**CONCRETE FUTURES**

In this article, I have argued that Shahyad presents ambiguous experiences, due to its various material properties. Significantly, instead of contrasting these different experiences of the concrete monument, the modern and the ancient align in the design-strategy and ideology of the Pahlavi regime. The Shah legitimized his rule through referencing historic precedents in his architecture in order to evoke notions of continuity. The Shahyad monument served as a spatial-temporal threshold between the glorified Persian empire and the Pahlavi capital (Grigor 2003, 215). Through this concrete monument, the vision of Iran’s national future was aligned with the permanence of Persian civilization.

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CONCRETE’S MATERIAL AGENCY AND THE 200,000 ALBANIAN BUNKERS

SVEN VAN MARIS

ABSTRACT:
Thousands of concrete bunkers, built during the communist dictatorship of Enver Hoxha, are scattered all over Albania. This essay investigates this materiality by examining concrete, the bunkers’ defining material. During the ‘bunkeration’ of Albania, concrete’s agency was somewhat limited. The communistic dictatorship could use the material at their will. It was after the dictatorship however, that concrete’s agency became apparent. As a result of concrete’s properties the bunkers are now involuntary monuments to the past.

KEYWORDS: Concrete, Material Agency, Bunkers, Communist Albania, Monuments

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INTRODUCTION
Albania, the small and mountainous country in Eastern Europe, is littered with concrete bunkers (e.g. Figure 1) built during the communist dictatorship of Enver Hoxha that lasted until 1985. Documents show that 173,371 bunkers were constructed in 1983, out of a planned 221,143 (Veizaj et al. 2020, 1011). The bunkers have mostly been examined for what they as physical objects symbolise. Galaty et al. (1999) investigated how the bunkers have been deployed by Albania’s communist dictatorship to impose its ideology on the Albanian people. They argue that they were constructed to stand for social solidarity and defence, but have since the end of the dictatorship stood for an overthrown and openly mocked political regime (Galaty et al. 1999, 299). This theme comes back in the many journalistic travel pieces that are written about the bunkers every year: the bunkers are ‘concrete testaments to the paranoia of Enver Hoxha’ (Ellers 2016), and ‘burrowed between an isolated past and a reinvented future’ (Crevat 2017).

Less focus has been on the materiality of the many concrete bunkers. The bunkers have not been studied principi-
ally on the basis of what they are as physical, material objects. This lack of considering the material significance of the bunkers have been deployed by Albania’s communist dictatorship to impose its ideology on the Albanian people. They argue that they were constructed to stand for social solidarity and defence, but have since the end of the dictatorship stood for an overthrown and openly mocked political regime (Galaty et al. 1999, 299). This theme comes back in the many journalistic travel pieces that are written about the bunkers every year: the bunkers are ‘concrete testaments to the paranoia of Enver Hoxha’ (Ellers 2016), and ‘burrowed between an isolated past and a reinvented future’ (Crevat 2017).

Less focus has been on the materiality of the many concrete bunkers. The bunkers have not been studied princi-

materiality is also prevalent in archaeology, argues Olsen in his aptly titled in Defence Of Things (2013). According to Olsen, archaeologists recurrently interpret material culture and landscapes as ‘metaphorical “stand-ins”’ that always represent something else (Olsen 2013, 3). According to the ‘materialist’ perspective, the ‘social’, the ‘cultural’, the ‘political’ and so forth are all implicitly conceived of as extramaterial entities’ (Olsen 2013, 3).

An idea that helps emphasise the importance of materiality is the concept of material agency. It is the idea that material has agency and impacts humans emotionally, sensually, socially and even physiologically. This agency is given by its physicality, meaning qualities like its colour, weight, and strength (Boivin 2008, 129-130). The fact that material has agency does not entail that we should see things deterministically. Humans are able to shape material and likewise, material shapes humans, making it a two-way relationship. With the acknowledgement of material agency, justice is done to the things themselves.

In this essay I explore the concept of material agency in relation to the Albanian bunkers. The defining material of the Albanian bunker is concrete: it gives it its look, its strength, and its shape. While the materiality of bunkers could not be researched geologically as it is rock that shelters the bunker (Garrett and Klinke 2019, 1071-1073), this is not true for the Albanian bunkers. These bunkers were made in situ, in urban as well as rural environments, near the coast as well as inland. The geological setting thus varies greatly, making it not geology that defines the Albanian bunker, but concrete. By using material agency and focussing on concrete, it is possible to inquire into the materiality of the Albanian bunkers. To what extent did concrete’s material agency shape the programme of ‘bunkeration’ by the Hoxha regime and the bunkers’ existence afterwards?

CONCRETE AND THE BUNKERISATION PROJECT
Concrete is a combination of cement, aggregates (such as sand and pebbles) and water. Concrete starts as a liquid, which later solidifies. This flexibility means that it can achieve any shape in its liquid form. This is where concrete’s appeal lies (Bartolini 2015, 196). The most important component, cement, is made of up of a finely ground mixture of clay and metallic oxides, fired in a kiln at a high temperature (Smil 2014, 19). Cement that was satisfactory to produce reliable concrete was available after 1824. From then on, it was possible to produce concrete that is strong under compression; however, the material is weak in tension. To combat this flaw, the concrete can be reinforced with iron. Concrete and iron bond solidly and the iron is protected from rust by the hydratu-

llic cement. In the last decades of the nineteenth century, reinforced concrete steadily developed, its popularity growing. By the twentieth century, reinforced concrete was well in place and became the basis of huge urban ex-

pansions (Smil 2014, 28-37).

There is a strong connection between communism and reinforced concrete, and one could state that the use of concrete by Albania’s communist dictatorship is part of a tradition. On the 7th of December, 1954, Nikita Khru-

shev, first secretary of the Communist Party Central Com-

mittee of the Soviet Union, gave a speech about concrete and its use in construction. The speech was the starting point for the famous Soviet apartment blocks made of reinforced concrete panels. Khushchev declared that reinforced concrete was to be used for everything possible: if some-

thing could be made with concrete, it should be made with concrete, out of the sake of efficiency, prefabrication to reduce working days should take precedence over in situ production. Further-

more, the importance of standardised designs was em-
phasized (Forty 2012, 149-159).

The Albanian bunkers fit into this tradition. The Alba-
nian bunkers were built during the rule of Enver Hoxha, which began in 1944 and lasted until Hoxha’s death in 1985. The context in which they were built was one in which Albania became more and more isolated. Albania’s alignment with the USSR, formed in the years after the Second World War, broke down in 1961. An alliance with China followed, but in the late 1970s this partnership fell apart, too (Payne 2014, 161-162). The bunkers were the result of a plan by the communist leadership in 1971 to solidify the country’s government. According to this plan the idea was that the entire population was to be prepared militarily. The resulting project was implemented in 1975, and consisted of placing bunkers throughout the country to protect soldiers and the civilian population in case of an attack by foreign armies. This lasted until the mid 1980s (Veizaj et al. 2020, 1010) and was known as the ‘bunkeration project’ (Payne 2014, 161).

The Albanian bunkers have been tentatively categorised into three groups, based on size: small (Figure 1), medi-

um (Figure 2 and Figure 3) and large bunkers (Veizaj et al. 2020, 1011). The small bunkers have a diameter of 3 m and the medium bunkers a diameter of 8 m (Stefa and Mydtby 2009, 74-75). The large bunkers vary in size. Up to 1983, roughly 160,000 small, hemispherical bunkers were built. They were prefabricated and then trans-

ported to their intended location. Meant for soldiers and civilians, these bunkers were everywhere: in urban and non-urban areas, in the mountains, and on shores. The medium bunkers, on the other hand, were only placed in strategical locations and designed to withstand attacks from tanks. They were typically mushroom-shaped, but other shapes were possible too. The different elements of the bunkers were prefabricated and then assembled on site. Almost 10,000 were made until 1983. The larger bunkers were designed to be used as military control centers or storage of military equipment. These were tunnel bunkers composed of both prefabricated elements and parts that were made on location. Roughly 2,000 were made (Veizaj et al. 2020, 1010) and was known as the ‘bunkeration project’. The Albanian bunkers fit into this tradition. The Albanian bunkers were built during the rule of Enver Hoxha, which began in 1944 and lasted until Hoxha’s death in 1985. The context in which they were built was one in which Albania became more and more isolated. Albania’s alignment with the USSR, formed in the years after the Second World War, broke down in 1961. An alliance with China followed, but in the late 1970s this partnership fell apart, too (Payne 2014, 161-162). The bunkers were the result of a plan by the communist leadership in 1971 to solidify the country’s government. According to this plan the idea was that the entire population was to be prepared militarily. The resulting project was implemented in 1975, and consisted of placing bunkers throughout the country to protect soldiers and the civilian population in case of an attack by foreign armies. This lasted until the mid 1980s (Veizaj et al. 2020, 1010) and was known as the ‘bunkeration project’ (Payne 2014, 161).
If we consider the concept of material agency and Alba-
nia’s bunkerisation, it would seem that concrete’s agency
was secondary to the agency of the dictatorship. Just like
the Soviet Union, Albania’s communist dictatorship was
able to successfully manipulate and use concrete, with
the help of methods like prefabrication and standardisa-
tion. The communist regime could take great advantage
of the properties of reinforced concrete: its strength un-
der compression and tension and its ability to be poured
into any desired shape. Yet concrete had some agency
of its own. Bartolini (2015), as we shall see, has clearly
understood reinforced concrete here, are the costs of separating the concrete
from the metal. These costs are very high on account of
the solid bond to the reinforcement (Smith 2014, 56). So, because of concrete’s
agency, locating, transporting and recycling every bun-
er is just too expensive. Nullification is not possible.

The next strategy, adaptation, would see the bunkers adapted and reused (Payne 2014, 165). There are also
problems with this, though, because of concrete’s materiality.
It is often thought of, and executed by, humans. In this process
concrete is just too expensive. Nullification is not possible.
The Anyway, there is the risk that Albanians forget what the bunkers are, argues Payne. The strategy of ambivalence aims to
make the bunkers unacceptable. This is especially the case with
concrete that is of poor quality (Smith 2014, 56). Concrete’s
agency makes the strategy of adaptation unavailable.

As the result of concrete’s properties, two final, work-
able strategies are left: indifference and ambivalence. Indifference is a sort of passive preservation where the bunkers are left.
Ambivalence is like indifference, but without the passivity. If the bunkers were just left alone, there
is the risk that Albanians forget what the bunkers are, argues Payne. The strategy of ambivalence aims to
promote the continuity of the bunkers and to investigate what the bunkers mean (Payne 2014, 165-167). Indiffer-
ence is about forgetting as time passes by, ambivalence is about trying to remember. Concrete’s properties cause
concrete’s materiality to almost seem to exist independently of the material. By
employing the concept of material agency in relation to the Albanian bunkers, it is demonstrated that politics and
the material are (of course) closely related. It is a gentle
reminder to archaeologists that materiality matters.

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I would like to thank Maikel Kuipers and Marie Bolivin, N. 2008. Material cultures, material minds: the im-


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T he Craftsperson and the Tangible Matter

When hearing the terms “craftsmanship” and “digital fabrication” one might think that they are complete opposites, something that excludes one another. But even if the manual and digital working processes differ, as a designer I would suggest that digital matter and tangible matter, in this case, clay, are similar. The experience of forming a digital model in a 3D virtual space is comparable to forming clay with your hands. Both matters of forming a digital model in a 3D virtual space is compare to forming clay, an agent with the ability to influence the outcome. This is the moment where the interaction between the material and the human body and mind is the most obvious.

As a skilled craftsman, this interaction would resolve quite smoothly with humans forming the material as close as possible to their initial intention. As an unskilled craftsman, the interaction becomes much more dynamic and at times rather frustrating, since the material's agency can influence the final result, making it different from the initial idea. No matter the outcome, intimate relationships form between humans and the material as a consequence of that process. Humans use all their senses, body, and knowledge to form the material. The material on the other hand informs the human how it can be formed, and of its limitations and possibilities. A skilled craftsperson listens to the material, works with, and reaches the compromise, which represents the mixture of the workman's idea and the material's final physical form.

As easy as this might seem in theory, multiple factors can affect the quality of the craft product in practice. For instance, the knowledge of the craftsman plays an important role in their ability to handle the material. Knowledge obtained from different sources such as personal experience with the material (learning while doing), theoretical knowledge of the material’s properties, and knowledge of the equipment is needed. Because of the mind and body coordination when working with the material, manual skills have to be trained too.

T he INTERSECTION Between the MATERIAL AND Body

Through experience and practice, a craftsman has to learn how to control their body, senses, and tools to create the desired outcome. A skilled craftsman’s movements are both smooth and precise, involving a form of muscle memory that is cultivated by repetition. The mind of the craftsman is focused on the work and the interaction between their body and the material. Every move and moment is important since a single mistake could result in the failure of their vision. Even though I acquired quite a few theoretical knowledge and learned from my mistakes, I realized that achieving the level of trust in your skills and the material takes years of practice which I was missing. Nonetheless, the pliable properties of clay gave me the opportunity to acquire a more experimental and intuitive workflow, which encouraged my creativity when shaping objects.

Even though the process requires a lot of direct contact between the person and the material, it is often necessary to use tools. Tools, can therefore act as the extension of the body and a good craftsperson has to learn how to control them as well as their own body. The interaction between tools and human bodies is something that can be observed throughout our history. The need to extend the physical limitations of our body has been rooted in us for several millions of years. Since everything made by humans depends to some degree on tools or technology, it is not uncommon for craftsmen to modify or invent tools, which would simplify their crafting process and make the manipulation of material more efficient. In this sense, the craftsperson fabricates not only the end product itself but also the tool.

Since clay-working is often romanticised and stereotyped as objects handmade on a pottery wheel, we have to keep in mind that craftsmanship nowadays not only involves hand-held tools but also digitally controlled machines. Even though the craftsman is not the person behind the pottery wheel but also an innovator, a programmer. The craftsman is nowadays able to use a variety of mechanical equipment like electric kilns, extruders, and CNC (computer numerical control) tools. The craftsman has to learn how to skillfully use or even modify electrical tools as well as hand-guided tools to improve and innovate in their working process. Even though the limitations of the way the clay is formed in the workshop, the creative process, and lead to homogeneity or a less variety of material culture techniques. Based on the continued inventions in the use of other tools, however, I would argue that craftspersons use new tools in unexpected ways, which continues to contribute to the variety of material culture. For example, the potter’s wheel, which has its limitations in that it is round and symmetrical, has been in use for more than 5000 years and it is still in use today by the craftspeople to produce unique and highly varied forms (Harrow and Brayman 2014).

Technological innovations play a central role in the development of identity and visual elements in a period of time and culture. When the pottery wheel was developed, the visual language of rotated symmetrical pottery became the image of clay forming that we know today. With the invention of digital fabrication technologies, we can speculate that the visual language of 3D-printed objects will be the image of digital forming in the future. Because of the increasing use of digital fabrication technologies today, many people fear the traditional craftsperson and the digital fabrication.

In the late 20th century we entered the so-called “Third industrial revolution” or the “Digital revolution”, which started with the introduction of the digital in the process of making resulted in the widespread availability of highly technical information. This may represent the change of the material. The limitations also occur on a more practical level, since the (3-axial) digital control allows for manipulation of material more efficient. In this sense, the craftsperson fabricates not only the end product itself but also the tool.

The craftsperson’s idea and the material's final physical form is the result of the interaction between the craftsperson and the digital fabrication process. In short, the relationship between tools and human bodies has something to do with the consistency of clay forming as we know it today. In the tradition of craftsperson, the interaction between tools and human bodies has something to do with the digital control model. In this way, the craftsman is not only the person behind the pottery wheel but also an innovator, a programmer. The craftsman is nowadays able to use a variety of mechanical equipment like electric kilns, extruders, and CNC (computer numerical control) tools. The craftsman has to learn how to skillfully use or even modify electrical tools as well as hand-guided tools to improve and innovate in their working process.

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Crafting with Digital Matter

Because of the nature of digital tools, the practical knowledge and the making process of the craftsman changes from working directly with the material through touch to working indirectly with the material digitally. The craftsman needs to not only gain knowledge and understanding of the limitations and possibilities of digital tools, but also needs to acquire new skills in digital modelling and software controlling. Because clay 3D printing becomes one of the construction techniques (which resembles the traditional coiling), we have to remember that digital skills alone are not enough. Significant material knowledge is still required as well as knowledge of many of the other traditional clay-working methods.


New theoretical models suggest that materiality is not only connected to notions of physical substance or matter, but that it embraces both the material substrates and abstract programming languages (Casemajor 2015, 6). Digital information which allows 3D printed digital output does not only exists in the immaterial realm like we tend to imagine. It consists of physical inscriptions coded in bits (1 or 0) and stored on hardware devices made from physical matter, that depend on the operating system (Casemajor 2015, 7). Just like clay, a 3D printing system has its limitations and affordances that makers need to master if they want to create a skilful physical model. Furthermore, if the craftsperson lacks skills and experiences in digital making, the control over the final product will shift over to the 3D printer, which could result in execution divergent from the initial idea of the maker. In that way, we can see a resemblance between the material properties of clay and 3D printing software.

Conclusions

Due to the misconceptions and stereotypes of what digital fabrication and craftsmanship are, it is easy to assume that these fields are contradictory and that in the future only one will prevail (with a higher possibility of craft extinction). I would argue that as long as the craftsman finds joy in experimenting and working with either tangible or digital matter, future craftsmanship will include both ways of creating new works. Traditional pottery and clay 3D printing demand a different way of working. However, because of this variety in knowledge, skills, and material culture, that comes with a new way of working, manual and digital production become complementary.

Bibliography


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