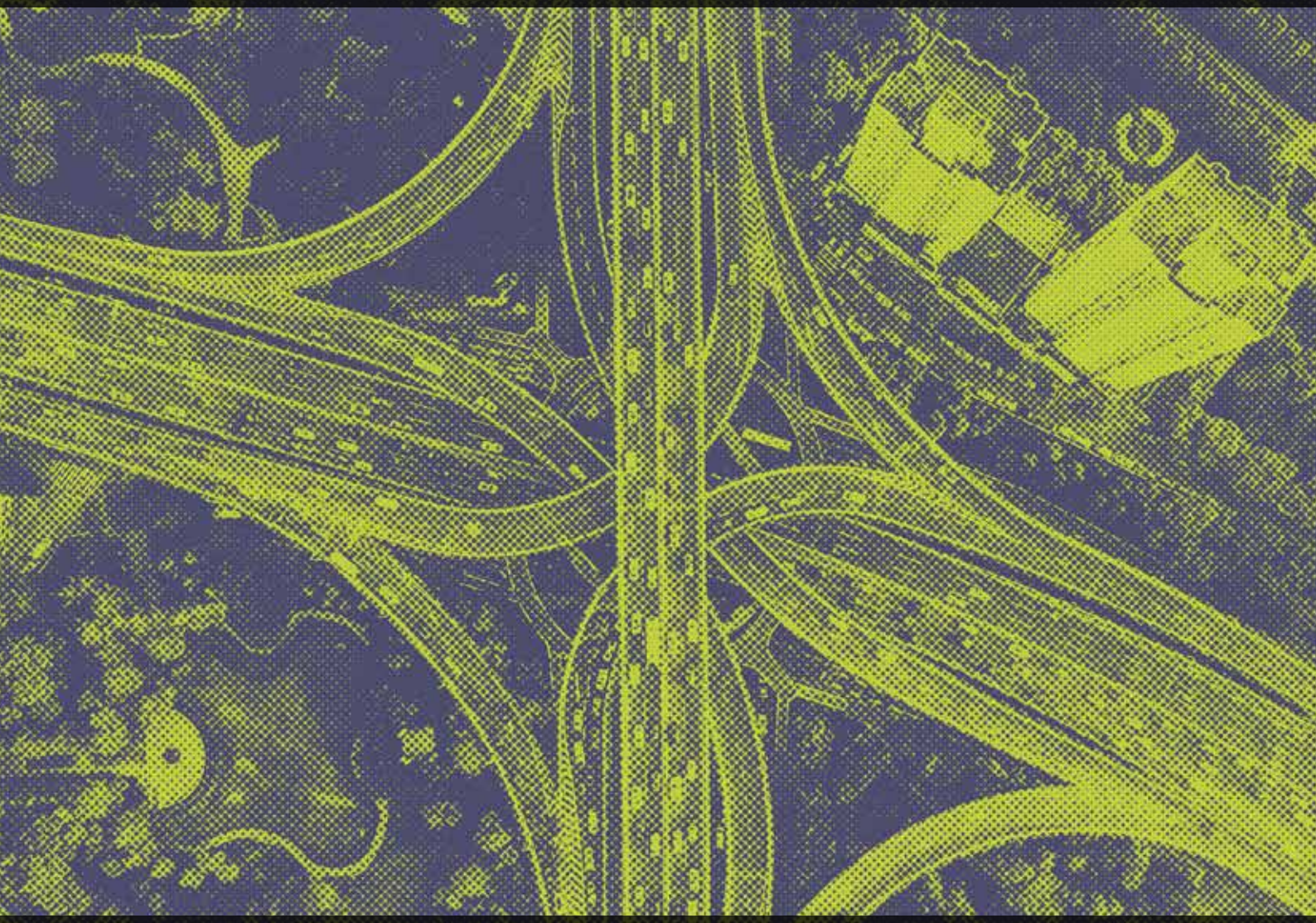
Pottery in the digital age

Škerjanc, N.

INTER-SECTION

Archaeological Research Journal



INTER-SECTION
DECEMBER 2023

SPECIAL ISSUE:
HOW MATERIALS SHAPED
THE HUMAN WORLD

THE PHENOMENOLOGY OF MIND AND MATERIAL:
Ceramica Argentata Production In Etruria
Michael Dennis McCabe III

WOOD AND WAKA:
Material Agency In The Crafting Of 18th Century North Island Māori Waka Taua Hulls
Mikaela M.F. Radford

ONLY CONCRETE REMAINS:
Material Permanence And Ambiguous Experience Of The Shahyad Monument, Tehran
Imme Hannah van der Leij

CONCRETE'S MATERIAL AGENCY
And The 200.000 Albanian Bunkers
Sven van Maris

POTTERY IN THE DIGITAL AGE
Nina Škerjanc

COLOFON

INTER-SECTION
Archaeological Research Journal

SPECIAL ISSUE: HOW MATERIALS SHAPED THE HUMAN WORLD
DECEMBER 2023
ISSN PRINTED VERSION: 2452-266X (MAX. 200 COPIES)
ISSN ONLINE VERSION: 2452-2678

Einsteinweg 2
2333 CC Leiden
The Netherlands

editorialboard@inter-section.nl

www.inter-section.nl
Twitter: @_INTER_SECTION_
www.facebook.com/journalintersection

LAYOUT DESIGN AND ILLUSTRATIONS
Bo van de Vaart

Universiteit Leiden
Archaeology

CONTENTS

EDITORIAL STATEMENT 2
How materials shaped the Human World
Marie Kolbenstetter, Maikel Kuijpers and Ola Lygre

THE PHENOMENOLOGY OF MIND AND MATERIAL: 4
Ceramica Argentata Production In Etruria
Michael Dennis McCabe III

WOOD AND WAKA: 12
Material Agency In The Crafting Of 18th Century North Island Māori Waka Taua Hulls
Mikaela M.F. Radford

ONLY CONCRETE REMAINS: 18
Material Permanence And Ambiguous Experience Of The Shahyad Monument, Tehran
Imme Hannah van der Leij

CONCRETE'S MATERIAL AGENCY 24
And The 200.000 Albanian Bunkers
Sven van Maris

AFTERWORD 28
Pottery in the Digital Age
Nina Škerjanc

AFTERWORD

POTTERY IN THE DIGITAL AGE

Nina Škerjanc

THE CRAFTSPERSON AND THE TANGIBLE MATTER

When hearing about 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 process 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 are pliable, adjustable, additive, and subtractive. In this foreword, I will try to reflect on my practical experiences with clay and further explore the relationship between pottery and digital fabrication.

As simple as clay seems to be at first glance, one can experience the complexity of it when trying to form it to one’s will. The knowledge needed to transform a lump of clay into something as simple as a ceramic bowl requires the skills of a craftsman. Craftsmanship is generally associated with manual dexterity, skilled artistry, and the art of making, but can also express cultural identity and traditions (Rodriguez Carrion 2013, 376). A craftsman skilfully uses their experiences, tools, and knowledge to work with the material and create objects.

As a designer, I had little experience in forming clay and my skills would probably be considered nothing more than adequate when compared to skilled craftsmanship. Nonetheless, I was curious about working with clay and getting to know its material properties, so I started to experiment with different kinds of hand-building techniques, as well as extruding[1] and slip casting. By working with the material, I got a deeper understanding of not only clay itself but also the craftsperson’s mindset and workflow. Clay is a very pliable material that can be formed in its liquid state with slip casting or modelled by hands and tools when it’s firm. Because of its properties, clay can be formed with additive and subtractive techniques. These allow the process of working with clay to be very flexible, unlike for example working with wood where “mistakes” are harder to fix. This security of being able to adjust the shape of the clay very easily (even when making mistakes) encouraged me to experiment and improvise in my work process much more than when working with some other materials.

THE MATERIAL AS AN AGENT

Within the process of making traditional pottery lies an intimate relationship between the intent of the craftsman and the execution of the work. The level of skill, involving both mind and body of the craftsperson, usually determines the quality of the model (Loh et al. 2016, 653). The greater the skill, the more one is able to form the material to one’s will and to create an accurate physical model based on one’s mental model. The lack of skill, as personally experienced, takes away one’s control over the material and makes the material an active participant, 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 skilful 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 can be obtained from different sources such as personal experience with the material (learning while doing), theoretical knowledge of the material’s properties, and learning from other people’s experiences. Because of the mind and body coordination when working with the material, manual skills have to be trained too.

THE INTERACTION BETWEEN MATERIAL AND BODY

Through experience and practice, a craftsperson 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 some theoretical knowledge and learned from my mistakes, I realized that achieving that the level of trust in your skills and the material takes years of practice which I was missing. Nevertheless, 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 hand and 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. When observing the craftspeople at work, we can notice that they constantly improve and experiment in their way of making, which can lead to new inventions and early adoption of new technologies (Harrow and Brayman 2014). In that way, the craftsman is not only the person behind the pottery wheel but also an innovator, a pioneer, or an engineer. The craftsman is nowadays able to use an array of mechanical equipment like electrical kilns, extruders, and CNC (computer numerical control) tools. The craftsman has to learn how to skilfully control or even modify electrical tools as well as hand-guided tools to improve and innovate in their working process. Even though the conventional idea of craft usually does not bring to mind a high-tech process, technology has always been there to advance craftsmanship (Rodriguez Carrion 2013, 376).

THE CRAFTSPERSON AND THE DIGITAL FABRICATION

In the late 20th century we entered the so-called “Third industrial revolution” or the “Digital revolution”, which began as a shift from mechanical to digital. That shift also affected the field of pottery where introducing the digital in the process of making resulted in the wide use of CNC[2] tools in creative practices and studios. The development of more powerful and smaller computers, programming languages that are easy to use, as well as the more widespread availability of highly technical information through the internet, all contributed to the introduction of digital technologies to the craftsman’s making process (Harrow and Brayman 2014). To elaborate on just how this computer numerical controlled and digitally driven production system affected the craft and craftsman behind it, I am going to examine the example of 3D printing with clay.

Within the last decade or so, 3D printing technology has made its way into almost every type of production, including pottery and other objects made of clay. 3D printing, also called Additive Manufacturing, is an advanced technology that combines layers of printed material into three-dimensional entities using a computerized numerical control model. In short, 3D printing is the process of layering material (in this case, clay), to produce three-dimensional objects (Luo et al. 2020, 564). This way of shaping clay allows the craftsman to explore a variety of shapes and techniques that were previously impossible.

Digital fabrication as such has multiple advantages like increases in speed, scale, precision, complexity, and less laborious forming than traditional techniques. It also provides the opportunity for repetition, small-batch production, and the shareability of a digital file via the internet (Sharif and Gentry 2015, 684). On the other hand, 3D printing also has its limitations. For example, 3D printing with clay tends to produce layered marks from forcing or extruding material through the nozzle, which is common to all 3D printed objects. This may represent an aesthetical limitation where additional action is needed to change the surface of the material. The limitations also occur on a more practical level, since the (3-axial) limitation of its movement does not layer the material in certain shapes. One could argue, that these limitations associated with digital fashioning techniques would limit the creative process, and lead to homogeneity or a lesser variety of material culture techniques. Based on the continued inventions in the use of other tools, however, I would argue that craftspeople 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 limitation in forming round symmetrical objects, 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 as we know it today. With the invention of digital fabrication technologies, we can speculate that the visual language of 3D-printed ceramic objects will become synonymous with clay forming in the future. Because of the increasing use of digital fabrication technologies today, many people fear the tradition and skill related to craftsmanship will be lost. On the contrary, I believe that even with the extensive use of digital tools among craftspeople, there will always be a need for skills and knowledge related to hand-forming craftsmanship.

[1] With extruding technique, the clay is pushed through mechanical device called extruder. With the force of the lever, clay is formed through the device to achieve a specific elongated shape.

[2] CNC or computer numerical control is automated control of machining tools (for example drills, mills and 3D printers).

CRAFTING WITH DIGITAL MATTERMATTER

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 (Keep 2019, 18). This kind of knowledge can only be obtained by working directly with the material, in which case hand-forming skills are necessary to acquire. In other words, the new does not replace the old; the digital skills coexist with the material know-how of working with clay.

Digital tools also profoundly influence the craftsperson's creative experience, their way of thinking and working. The interaction between our body and tools, our senses, and the material in the making process shapes the cognition of the maker. The emotive or sensory touch is considered an essential part of traditional craftsmanship, mainly because this interaction promotes material knowledge, encourages one's creativity, and forms an emotional connection. One could claim that the use of digital tools can hinder this intimate connection between the craftsman and the material since the craftsperson can not rely on their senses in the software environment. On the other hand, I believe that the maker does not lose the connection between him and the material but merely interacts with a different kind of matter, existing in a digital world. This way of making can open the door to work that explores new visual content rather than manual dexterity (Keep 2019, 18).

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.

I believe that the way we work and make affects the way we think, so craft is not only about the final product but also the making process itself. Through it, the craftsmen gather knowledge, skills, experiences, and develop their relationships, and creativity. As previously established, the making process heavily differs when working with clay manually or digitally. But at the same time, these differences offer a wider variety in our material culture and craftsperson's skills, coming together in a richer, more diverse practice. Incorporating digital tools in studios allowed the production of different shapes and techniques, but most importantly allowed the craftspeople to explore and experiment with materials, tools, and techniques that were previously not accessible.

BIBLIOGRAPHY

Casemajor, N., 2015. Digital materialisms: Frameworks for digital media studies. *Westminster papers in communication and culture*, 10(1), 4-17.

Harrow, D., Brayman, A., 2014. Towards an Aesthetic of Digital Clay. *Studio Potter* 24(1), https://studiopotter.org/towards-aesthetic-digital-clay.

Keep, J., 2019. Potting in a Digital age. *Studio Potter* 47(1), 17-21.

Loh, P., Burry, J. and Wagenfeld, M., 2016. Workmanship of Risk: continuous design¬ing in digital fabrication, in S. Chien, S. Choo, M. A. Schnabel, W. Nakapan, M. J. Kim, S. Roudavski (eds), *Living Systems and Micro-Utopias Towards Continuous Designing, Proceedings of the 21st International Conference of the Association for Computer-Aided Architectural Design Research in Asia (CAADRIA 2016)*, 652- 660.

Luo, W.E.N.J.I.E., Xinchen, M. and Jian, Y., 2020. Application and Research on Building 3D Printing. *Journal of Critical Reviews*, 7(12), 564-78.

Rodriguez Carrion, A., 2013. New Ecologies, Art of Workmanship in the Digital Age, in E. Mitchell and I. Berman (eds), *New Constellations New Ecologies, 101st ACSA Annual Meeting Proceedings*, 376-383.

Sharif, S. and Gentry, T.R., 2015. Design cognition shift from craftsman to digital maker, in Y. Ikeda, C. M. Herr, D. Holzer, S. Kaijima, M. J. Kim, M. A. Schnabel (eds), *Emerging Experience in Past, Present and Future of Digital Architecture, Proceedings of the 20th International Conference of the Association for Computer-Aided Architectural Design Research in Asia (CAADRIA 2015)*, 684-692.