Literature Review

CONTEXT: DESIGNER AS TOOL-MAKERS

Tools exist as an inseparable part of human history, all the way back to the days of *Homo habilis*.[1] While not part of our anatomy, they orbit closely, engaging with our species in a kind of intimate dance through the forwarding spiral of time. They are so inseparable, in fact, tools almost act like a prosthetic other to humans. Indeed, tools are not only objects but are also extensions to the human body. As the German phenomenologist Martin Heidegger asserts, when one is engaging in skilled activities with a hammer, it becomes transparent to the awareness of the wielder.[2] The brain stops recognizing them as external and perceives them as a part of one's body.

Undoubtedly, this transparency of tools is the most prominent in contemporary society. With the omnipresence of technologies, tools have become human's interface to the world more than ever before. Every process of production, every access to information, and every form of interaction are mediated by tool use with or without one's awareness.

[1] DISALVO, IX

[2] HEIDEGGER, 98

Not excepted from this situation is what John-Patrick Hartnett calls "the programmed designer." As Adobe consistently buys out competing programs (most recently Figma), they have gradually become the industry-standard tool and "penetrated the consciousness of its designers to become part of the 'normal reality' of their professional lives.[3]"

In other words, the permeating layer of software affects not only what graphic designers make but also how they think about making.[4] Just as humans designed tools, tools designed humans.[5]

Facing this continual erosion of agency, many have responded by making their own tools. *Graphic Design in the Post-Digital Age* (2021) outlines a global movement of designers wishing to augment their practices with custom tools using coding. Contrary to an engineering approach, the designers interviewed utilize coding as a form of "sketching [6]"—not unlike how masons "carve as if [they were] drawing[7]." In other words, it is not "learn to code" but "code to learn.[8]" Open Source Publishing echoes this DIY, irreverent sentiment:

> [Open-source software are] tools with which to think. Their interfaces, paradigms and functionalities translate countless ways of seeing and doing **that can emerge** because they are not subjected to marketing requirements that replicate standard practices. [9]

In short, tools not only inform how one engages in making activities but also lead to new potential ways of making and thinking—a concept that will be thoroughly discussed later in this text. In like manner, this workshop project wishes to situate itself adjacent to this counterculture of "designer as tool-makers," and hope to provide further insights

[3] HARTNETT

[4] MANOVICH, 15

[5] SEU; COLOMINA & WIGLEY, 51-52

[6] CONRAD ET. AL, 18-19

[7] SPUYBROEK, 40

[8] LORUSSO

[9] QTD. IN HARTNETT; EMPHASIS ADDED

through investigating the role tools play in a graphic design practice.

DESIGN AS MAKING

To fully understand tools, it is essential first to examine their interconnected relationship to the activity of making and design. As an enlightening case study, this section will begin by examining the oldest prehistoric tool: the Acheulean handaxe. It is a bifacial axe made of black flint dated more than a million years ago. It is bifacial—meaning it has two convex faces, one end being thin and sharp and the other thick and round. The chipped faces of the sharp edge are likely the results of a technique involving "successive removal of flakes"[10]. As it fits snuggly in the adult hand, it was widely speculated to be the first designed artifact. That is to say, its maker saw the final product in their mind's eye, then crafted it into existence.[11]

While sounding intuitive, the "designed" theory cannot reconcile the constant form of the handaxe throughout a million years. Had it indeed been designed, other iterations should have emerged across the globe—its consistency would stand as an extreme anomaly among artifacts. Instead, other theorists more accurately suggested that it was the product of continual usage of the stone in hand. In other words, the templates for the handaxe were not in the mind; it was in human's skeletal morphology.[12] The oldest tool was not designed—shaped not by forethought but by biomechanics via prolonged, rhythmic interactions.[13]

[10] INGOLD, 33

[11] COLOMINA & WIGLEY, 31

[12] INGOLD, 36-43

However, such an assertion is not to paint the construction of this tool as a simple matter. In fact, It is a step-by-step process following the flow inherent in the material, enabled by dexterity and guided by judgment.[14] Furniture designer David Pye calls this *regulated workmanship*. It is a term that describes making processes involving manual skills, perceptiveness, and ongoing improvisation.[15] Along the same lines, anthropologist Tim Ingold adds that all craftspeople engage in the activity of making in the same kind of improvised perfor-mance. Unlike the perfect, abstract geometry found in "designs"—drawings and plans—makers constantly negotiate with the inconstancy in their environment, tools, and materials. They tackle design problems as they arise during the process of making "through the manipulation of the instru-ments and materials at their disposal.[16]"

[14] INGOLD, 45

[15] PYE, 20

[16] INGOLD, 53

Fundamentally, the knowledge possessed by people who engage in making activities is learned "on the job[17]"—they learn through making. As archi-tect Juhani Pallasmaa explains, design is "a search for something that is unknown in advance[18]" Prede-termined mental images of design cannot come into existence before being carried out by makers using their set of tools. Workers are those whose practice embodies the implicit knowledge that is unearthed through a tradition of making.[18] In essence, design does not stop at one's intellectual forethoughts but continues into the process of making.

[16] INGOLD, 52

[17] QTD. IN INGOLD, 84

[18] PYE, 53; INGOLD 52

To illustrate this concept, Ingold uses the example of a watchmaker. A watch is made not by heading towards a predetermined projection but by treading through continually improvised passages. Through their making process, the watchmaker

brings the distinct pieces into coherence:

> *The task of the maker is to bring the pieces into a sympathetic engagement with one another, so that they can begin – as I would say – to correspond. Peering through his eyeglass, the watchmaker inhabits a realm in among the pieces, rather than above and beyond them, adjusting each in relation to the others, and serving as a kind of go-between in their correspondence.[19]*

[19] INOGLD, 69; EMPHASIS ADDED

Undeniably, there is *thinking in making*. The distinc-tion between prepositions "above and beyond" and "among" is insightful. The former predetermines, prescribes, and dictates—a top-down approach; the latter discovers, unearths, and investigates—a bottom-up approach. It is not unlike a mindful collaging exercise. A graphic designer brings the constituent elements into their correspondence. Whether by allowing forms to blend or juxtapose, the formal relationships between pieces reveal themselves through the collaging process, with the designer acting in between.

This form of making resembles that of graphic designer Martin Venezky's closely. By curating his studio space, he intentionally creates conditions under which physical artifacts can have conver-sations with each other, inadvertently leading to unplanned "collision[s]" of forms.[20] In his mono-graph, *It Is Beautiful…then Gone's* forward by Karen Levine, she depicts Venezky as someone who seeks to engage the inconstant, physical nature of material reality.[21] This characterization is not dissimilar to Ingold's description of builders. Expressing the enjoyment he finds in his process, Venezky exclaims:

[20] SLANE, 3:18-3:24

[21] VENEZKY, 23

*There is something incredibly gratifying in having those gears interlock and your **body** become part of the machine that produces the beautiful geometric result. [22]*

It is not just a dance between forms; it also involves one's body. While the pieces contribute their own forces, the force of the body is constantly involved during Venezky's process.[23] As the anthropologist Leroi-Gourhan states, the process of making is a dialogue between the maker and the forms. [24] It is a constant back and forth with the maker continuously iterating and adjusting their movements via their sensory awareness of the material. [25]

[22] VENEZKY, 25;
EMPHASIS ADDED

[23] SLANE, 07:10-07:15

[24] LEROI-GOURHAN, 306

[25] INGOLD, 115-116

THINKING IN MOVEMENT

Expanding on this topic, Ingold highlights the concept of *thinking in movement* by dance philosopher Maxine Sheets-Johnston. Notably, it is *in movement*, not *by movement* or *translated into movement*.[26] In the correspondence between body and materials, movement is not secondary to thinking—it *is* thinking. Thinking is "immanent in the action [27]" itself, as exemplified by the maker's improvisation in response to the flux of the material. Demonstrating using the activity of kite-flying, Ingold states:

[26] IBID., 98

[27] IBID., 102

For the aerial gymnastics of the kites were not only outwardly visible, [they] were also inwardly felt. We [Ingold and students] were aware of the kites' flying in the same way that we were aware of our running, through the bodily sense we had of our movement, or in a word, through

*kinaesthesia...In the dance of animacy, bodily **kinaesthesia** interweaves contrapuntally with the flux of materials within an encompassing, morphogenetic field of forces.[28]*

[28] IBID, 98;
EMPHASIS ADDED

Movements against a medium (in this case, aerial) are not a mechanical, inert act of repetition. With every gesture employed, the human continuously iterates, adjusting their rhythmic action via physical feedback.

One crucial factor that must not be overlooked here is the tools involved. Returning to Ingold's examples, he refers to the kite as a *transducer*—a tool that sets up the correspondence between the body's movements and the medium. [29] Moreover, transducers transcribe the kinetic movement of human gestures into the material. In the example of pottery throwing, the transducer would be the wheel between the human and the clay. [30] While the wheel is not necessary for humans to interact with clay, it enables a specific kind of engagement. It is a correspondence in which the potter's manual gestures are translated into the rotary form of the emerging clay vessel over time. As that happens, the material keeps a record of the manipulation. Conversely, the potter's hand also senses the clay's presence and force in its rotating shape—a dialogue between the maker and the material enabled by tool use. [31] As Beatriz Colomina and Mark Wigley conclude, "Artifacts are interfaces, enabling different forms of human engagement with the world *but equally enabling the world to engage with the human differently*. [32]"

[29] IBID, 101-102

[30] IBID, 101

[31] IBID, 118

[32] COLOMINA & WIGLEY, 32;
EMPHASIS ADDED

TOOLS AS ENABLERS

As demonstrated, design continues into the activity of making, which has a profound, deeply human connection to tools. Nonetheless, thinking or intelligence is not found in tools. Neither does it reside in the other constituent parts—body or material. "Any object that might be used as a tool," Ingold proclaims, is " no more than an inert lump of stone".[33] Instead, intelligence is found in the making activity and its gestures, which completes the gestalt of body, tool, and material. In a famous quote, Leroi-Gourhan asserts, "The human hand is human because of what it makes, not what it is. [34]" Thinking is found in the conjunction of the perceiving mind, the sensing body, and the physical material. All of these are brought together by the transducer—the tool. [35]

A return to the example of the pottery wheel is merited to interrogate the nature of tools further. It is not unique for enabling one's engagement with materials (a property of all tools), but how it enables that engagement. In other words, it is unique in the mode of interaction it activates when in use. Tools set different stages for improvisation in the activity of making. As such, different tools entail different modes of thought—even new modes of thought. Colomina and Wigley echo this conclusion:

> *Artifacts are therefore never simply the representatives of human intentions and abilities. They are also openings, possibilities of something new in the human, even a new human… The artifact offers something unexpected, some additional quality or resistance. This excess opens up new ways of thinking, new modes of design.*[36]

[33] IBID., 115

[34] LEROI-GOURHAN, 240

[35] INGOLD, 115

[36] IBID., 24

In other words, tools have potentiality. Not only for making differently but also for thinking differently. To return to the phrase by Silvio Lorusso, graphic designers who sketch with programming "code to learn".[37] They treat code as a tool to improvise, not execute the predetermined, industry-standard best practices. Not only is it a tool for learning, but also a tool with which to create more tools. This self-transforming gesture is what characterizes the relationship between humans and tools—"Artifacts themselves are thoughts that potentially also trigger new modes of thought.[37]"

[37] LORUSSO, 31

[38] COLOMINA & WIGLEY, 53

TOOLS IN THE HISTORY OF TYPOGRAPHY

In graphic design history, the transformative effect of tools is the most evident in typography. Before the printing press, the shape of the stylus always guided the appearance of letterforms. Wedge-tipped styluses created cuneiform, brushes led to calligraphy, and flat nib pens informed the old-style writing hand. More prominently, the printing press had an impact on making activities that cannot be understated. First seen as another kind of writing, the printing press was conceived to be a more economical means to meet the demand for books.[39] Apprenticed as a goldsmith, Johann Gutenberg was able to transfer his workmanship in metalworking and gem-cutting to the construction of the press.[40] What started as another tool for making typography using segmentation and rationalization opened up new ways of thinking. The mechanization of the scribal hand was not only "'applied'

[39] MCLUHAN, 158

[40] MEGGS, 72

knowledge" that affected craft, but an epistemo-logical upset that extended its logic to all parts of society.[41] The aftermath of the Gutenberg press is still deeply embedded in the contemporary world. It is no exaggeration to claim: tools design the human. As Colomina and Wigley aptly summarize:

> Tools are born as challenges to existing concepts of utility. They open up new under-standings of what could be useful. Utility is not a given unambiguous need. Ambiguity about utility is what drives new forms of utility.[42]

[41] MCLUHAN, 151

[42] IBID. 53

TOOL-MAKING AND DESIGN

Norman Potter, cabinet maker and political thinker, notes, "Design is a field of concern, response, and enquiry, as often as decision and consequence.[43]" This stance is a position that interests this design project, which is in itself an investigative attempt. To approach design activity as an inquiry is to look at, assess, and deal with a given situation through an ongoing practice of reflective making. As exten-sively delineated in the body of this review, making is not only a sufficient means of research in design. It is a necessary one. Core to this project is its belief in the intrinsic value of making.

Moreover, design is an activity that "can be constructed as a way to look at communication within a specific context.[44]" To prioritize an investi-gative approach is to deconstruct and reconstruct communication—a bottom-up building process. Reiterating that design is not purely an activity of the mind, Venezky explains:

[43] POTTER, 32

[44] GRANT, 27

> I rarely have a final effect in mind, and if I do, it almost never comes out as I intended. I often choose the tools I'll use just because I enjoy the challenge or am curious what will happen. The tools and materials and the camera and scanning device are all elements of a larger visual and physical experiment.[45]

The camera and light boxes involved in his process are tools he sees with. It is much like Ingold's mounds, which are things one looks with.[46] In contrast, one looks at monuments. They are locked out of the gathering. "It is closed, finished.[47]" It is worth enquiring, what are some tools that one looks *at*?—Black boxes whose outcomes one sees and declares, "there, that's what it made." Conversely, what does it mean to say one look *with* tools?—Enablers who situate the makers in different perspectives and modes of thinking and making. A tool that invites the designer into a gath-ering is one that allows them to see the engage-ment of parts. No doubt, this relationship hinges as much on the tools as it does the nature of the making activity.

To return to the concerns at the beginning of the review, it is non-trivial then to consider the implications when one cannot choose the tools they work with, whether self-imposed or otherwise. To take the tools away from one is to forbid them from choosing how to make and more importantly, how to think. By positioning design as a form of inquiry, tools can be the question marks—they are that which help ask the questions. Tool-making is therefore an activity through which one decides how to ask the questions.

[45] VENEZKY, 25

[46] INGOLD, 127
[47] IBID., 83

While deconstructing communication and building from the ground up, tools are the hammer and axe that aid the construction process. They are an "opportunity for [the human] rather than an accomplishment".[48] Vibrating with possibilities, they ask the designer, "How would you like to start? Where do you want to go? What do you want it to intersect with?"—Which are answered by making with the tools. By choosing their tools, one is dictating for themselves how they would like to think, see, and make. Thus, tool-making is a radical assertion of one's agency in their design process.

[48] COLOMINA & WIGLEY, 53

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