After the Hand: The Growing Autonomy of Self-Expression in a Post-Craft World

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"…[H]omo faber *is at once both artificer and tool-maker… While one addresses itself to the "what" of representation and reification the other concerns itself with the 'how' of utility and process."*[1]

"In architecture, the vertical integration of computer-based design and manufacturing is narrowing the divide between conceivers and makers … [N]ew digital tools liberate creative forces that technology and society have long constrained"[2]

Introduction

The project of expanding autonomy in the built environment is an old one, anchored in the idea that control over an individual's immediate environment by the individual themselves is a fundamental good. Much has been said about the practical reasons for such an expansion: that it would lead to more apt, individualized solutions to design problems; that it would collapse delivery times and eliminate waste by localizing solutions; that it would promote innovation by pluralizing problem-solving. Equally significant but more difficult to articulate are the positive effects that such an expansion seems to have on human well-being, on the flourishing of spirit. An apparently grounded set of concerns — about tools, materials, and material processes — is found to be entangled with metaphysical questions about the nature of an individual's existence as a free, self-defining actor and the ethical duties we have to shape these apparently-value-neutral technologies to best serve both individual human spirit and collective well-being simultaneously.

Contemporary sociologists and psychologists have also made us aware of the extent to which our direct physical involvement in the making of our world, not just our abstract control over it, is a key source of meaning and belonging. For this reason, advocates for autonomy have increasingly become concerned with its expansion not only over the *use* of a completed design or over the *conception* of a design before it is produced but also over the physical *production* of spaces, landscapes, and things. Never before has this triune power — over use, conception and production — been fully vested in the average individual, but the present shift from industrial to digital fabrication seems herald such a future.

This paper will briefly track control over conception & production through three paradigms of design & fabrication — pre-industrial, industrial and digital — demonstrating the ways that access to both forms of control have undergone radical expansion in recent years, extending opportunities for full human expression to an unprecedented portion of the human population. It will also question whether and to what extent we might seek to circumscribe this newly expanded autonomy to prevent its abuse by bad actors or unthinking amateurs, exploring the possible role of professional designers as both referees of and educators to the newly empowered.

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[1] Frampton, Kenneth. "The Status of Man and the Status of His Objects." In *Labour, Work and Architecture*, 24-43: London, UK: Phaidon Press, 2002. p.30.
[2] Carpo, Mario. *The Alphabet and the Algorithm.* Cambridge, Mass.: MIT Press, 2011. pp.111, 117.

Background
Our society has at present a widespread collective anxiety over the "de-skilling" of production jobs from auto plants to construction sites to craft furniture shops. This anxiety is born of the notion that we are all diminished — practically and spiritually — by the increasing proportion of production tasks once performed by a class of skilled laborers but now realized by a range of "intelligent" digital production systems.

Such fears about the replacement of skilled human labor by non-human devices have been around since the earliest days of industrial production. In contrast with the products of handwork, critics see a subversion of the human worker's self-expressive drive in industrial processes. The denial is twofold. First, machines follow a pre-conceived program, taking away from the tool operator any ability to input their own intentions, thereby denying them any opportunity to conceive of their own program of production. Second, machines subsume the *technē* — skill in making or manifesting and end — that previously belonged only to human bodies, and, in working faster and never tiring, make that human skill economically inviable.

While those who champion the craft-made over the industrially produced seek to highlight the ways that industrial production centers control over *conception* in the hands of a small class of people, denying it to the average person, they frequently fail to see that the accompanying tyranny over *production* was already present in craftwork, manifest in the very symbol of that work: the hand. In pre-industrial production methodologies, this hand was, inevitably, a skilled hand; one conditioned in a rare way by time and experience to accurately execute whatever was conceived; one possessing *technē*.

When we talk about de-skilling today, we are primarily referring to the transfer from man to machine of those final skills complex enough to have resisted two-and-a-half centuries of industrialization. What threatens these skills now is the advent of so-called "intelligent" tools; tools possessing the last bits of *technē* that heavy industry could never seize from human labor: complex motor skills, informed decision-making, instantaneous response to feedback. Technologist Mario Carpo has disclosed the ways in which these new digital tools are undermining the serial logic of industrial production through their ability to produce infinite variations and new expressions within a comparable time- and cost-framework, distributing the authority of the designer to more individuals, allowing each of us the opportunity to *conceive* of our own material expressions from greeting card to building. Various small, comparatively affordable CNC tools democratize design by wresting authority from the few individuals who presently dictate the pattern for large production runs and placing it back in the myriad small workshops and home studios that dominated pre-industrial production.

What Carpo and his colleagues have not fully articulated is the way that the very de-skilling these new tools seem to cause by their often-uncanny expressions of advanced *technē* can overcome the control historically exercised by the select class of skilled laborers over *production* for most of human history. Somewhat ironically, given its central place over the last two centuries as a symbol of more "human" making, the wholesale removal of the hand from production and the migration of its *technē* from man to machine is precisely what is facilitating this unprecedented democratization of production. For perhaps the first time in modern human history a huge portion of humanity will be able both to conceive of and produce their own material expressions autonomously, beholden neither to the production choices of industry or the rarified skills of craftsmen. It may be that all of this "de-skilling" of human work and the expanded possibilities for self-expression it allows us are making us more spirited; more creative; more human in the end.

Production Regime	Ability to project (concieve of) what is to be produced		Ability to produce what is projected *(Technē)*	
	Vested in	Controlled by	Vested in	Controlled by
Pre-Industrial	Individual Consumer-commissioners	The Many (Commissioners)	Human Hands (Skilled Laborers)	The Few (Skilled Laborers)
Industrial	Class of Industrial Programmers	The Few (Programmers)	Machinery (Industrial)	The Few (Machine Owners)
Digital	Individual Designer-makers	The Many (Designer-makers)	Machinery (Digital)	The Many (Designer-makers)

Fig. 1: Fundamental autonomy over both conception and production is extended to the many for the first time in recent human history by the vesting of technē in digital machinery.

Conclusions & Extended Discussion Points

Given the near-term possibility that most humans will be able to produce whatever they want relatively quickly, easily and near-to-home, the conversation must no longer be about man vs. machine but about man vs. his own desires. We have entered the era of 3D-printed shelters and of 3D-printed weapons. What will it mean for everyone to be a designer and maker? How can we extend the education we now receive as a specialist class of designers to the wider populace — the technical considerations we have grown familiar with; the ethical; the metaphysical? How can these new sites of autonomous production — these maker-spaces, fab-labs and home workshops, become sites for community, not just individual expression: the negotiation of common values and the creation of common goods? Working through the innovations that brought us here, I would like to end with a preliminary engagement of these issues and open these questions to the symposium for consideration.

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