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## **Design and the Automated Utopia**

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“On reflecting sufficiently deeply, under the shadow of Richard Hunt’s architecture, he decided that the American people probably knew no more than he did; but that they might still be driving or drifting unconsciously towards some point in space.”

(The education of Henry Adams, p.343).

Image: Richard Hunt’s Administrative Building for the Chicago World Fair in 1893

## Design and the automated utopia

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The fundamental subject of this paper is the formulation of a question about the historical processes by which the meaning of the word *design* has been constructed since industrialization. A working hypothesis is that the emergence of the concept of technology, rooted in the social and economic transformations in American society, culture and landscape of the 19<sup>th</sup> and 20<sup>th</sup> century (and largely uncontested today to most disciplines and fields) triggered changes in the place that the concepts of *design* and *creativity* occupy in imagination and culture<sup>1</sup>, thus changing the experiences associated with their pedagogy and practice. Addressing these changes might prove useful for building an understanding of the role that the so-called creative fields play in the current global capitalist society, and relevant to our understanding of the processes that determine the different environments –urban, visual, mobile- that we inhabit today.

As a first step in the formulation of this elusive question I first wish to attempt an *earthy* definition of design with which to interrogate this discipline's role in contemporary culture. Perhaps such definition can benefit from Karl Marx's notion of production of use-values.

Labour is, in the first place, a process in which both man and Nature participate, and in which man of his own accord starts, regulates, and controls

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<sup>1</sup> Here I am paraphrasing the STS-476 Syllabus.

the material re-actions between himself and Nature. He opposes himself to Nature as one of her own forces, setting in motion arms and legs, head and hands, the natural forces of his body, in order to appropriate Nature's productions in a form adapted to his own wants. By thus acting on the external world and changing it, he at the same time changes his own nature. (Karl Marx and Engels. Capitalism and the Modern Labor Process. p.66)

Karl Marx makes of the ability of man to plan a fundamental distinction between human and animal labor; "the architect raises his structure in imagination before he erects it in reality". According to Marx, the production process not only configures the physical matter that participates in the process, but also determines a new law that society needs to abide, a *production force*. His conception of history is, therefore, grounded on a fundamental dialogue between the man and the world that has as its main outcome the production of material life itself; an act that feeds back into society in the form of new needs.

The second point is that the satisfaction of the first need (the action of satisfying, and the instrument of satisfaction which has been acquired) leads to new needs, and this production of new needs is the first historical act. (p.71)

Heilbroner, discussing the notion of technological determinism exemplified by the Marxian idea of productive forces, warns that this talk tends to hide the social component that is inherent to the *design* of technology; in other words, that machines are designed and built by people, and that therefore inevitably reflect the particular social order in which they are designed and exist.

Even where technology seems unquestionably to play the critical role, an independent "social" element unavoidably enters the scene in the *design* of technology, which must take into account such facts as the level of education of the work force and its relative price. In this way the machine will reflect, as much as mould, the social relationships of work. (emphasis added p.342)

Heilbroner does acknowledge however that technology affects social order, and distinguishes two main areas for this impact. 1) The composition of labor force, that relates to the changes in the distribution of skills among the workers, and to the effect of an upcoming automation that would reduce the requirement of labor itself, and 2) The hierarchical organization of work, that relates to the fact that complex systems require

more internal controls in order to function properly. Heilbroner suggests that the direct result of industrial technology (i.e. the steam mill) is the industrial *manager*, whereas Marx had asserted that its outcome was the industrial capitalist (similarly he proposed that the hand mill had produced the society with the feudal lord). The impact of technology in these two dimensions of society account for what he calls (quoting William James) a *soft-determinism*.

Far from canceling each other, Marx's and Heilbroner's views contribute different angles to the understanding of the complex of relationships that society establishes with its technologies and artifacts; Karl Marx brings into focus the binding nature of technology and its tendency to crystallize social and cultural dynamics, and Heilbroner warns us of the risk of forgetting that technologies themselves are inescapably human.

We can thus frame our working definition of *design* in Karl Marx's "earthy" definition of history, as a continuous unfolding of material processes that is at the same time driven by, and a source of, production forces, a sort of cultural contracts between the people involved in their elicitation and practice. We can posit that design's evolving pedagogical apparatus and body of practice, broadly understood as eminently human means of devising ways for allocating matter and resources for a given purpose, is fundamentally concerned with the imagination, or *projection*, of physical realities. The production of these projections is a historical act in the Marxist sense by virtue of the fact that these are, even if loosely, bound to the physicality of the world. These projections embody a set of assumptions, a contract. Design is from this perspective a cultural process and a historical act.

Crafting such an inclusive (and materialist) definition of design may be useful to underline some of the social and political implications of the designer's social role, which should be further examined if we are to build a critical perspective on this field's

pedagogy and practice. How can we define, and what are the inherent costs of a technologically deterministic architectural “scientifism”?<sup>2</sup>

The science-craft dichotomy, crucial in the definition of contemporary disciplinary boundaries, is visible in all its power in Melville’s pragmatist Ishmael, a complex character at whose core lies a subtle –and delightful- criticism of scientific truth, and more generally, of language’s fundamental failure to capture meaning.

As yet, however, the sperm whale, scientific or poetic, lives not complete in any literature. Far above all other hunted whales, his is an unwritten life. (*Moby-Dick* p.116)

His skeptic stance towards scientific discourse is underlined by Melville’s use of scientific language as a poetic device, a flexibility that is a manifestation of the still incipient rise of an unquestioned scientific authority in the literary imagination, and presumably in the spirit of its time; Ishmael’s poetic licenses with Linnaean biology (whales are fish) fit his role as both a hands-on whale man and a whale scholar in a world where this distinction was just starting to be dimly delineated and announced. Ishmael’s flexibility wouldn’t fit a world in which the production of scientific truth has been itself industrialized, rendered unquestionable and deprived –at least in the literary imagination- of its link to the world of action, the world of whales.

Similarly, in the pre-industrial world the disciplinary boundaries between design and construction were not as clearly defined as they are today; the archetypal medieval figure of the architect as a master builder is an example of this integrated state in which design was not separated from construction. The emergence of this distinction –in the discourse at least- can be traced back to Renaissance architect and scholar Alberti (who distinguished *lineamenta*, drawing, from *structura*, construction), but it was not until the emergence of the concept of technology entailed a definitive increase of the distance between science and craft that design and construction were officially and practically

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<sup>2</sup> I use the terms design and architectural interchangeably. Design as projection (and not as an end in itself) is the scope of the definition.

separated in their professional jurisdictions, configuring the traditional division between the architect and the engineer.

The science-craft dichotomy resonates with the material-psychological dichotomy, an issue that arises not only in Melville's *Moby-Dick*, where we are constantly reminded that scientific abstractions fail to capture the essential, empirical truth of physical experience, but also in the industrial debates between Carlyle and Walker. These echo back to a dualistic –in the Cartesian sense- view of the world. The dichotomy is captured powerfully in Walker's dream of an automated and purely mental utopia, where materials and craft are to be replaced by machinery, affording people the time to devote to the "clean" activities of "art and poetry". On June 1829, in his heartfelt rebuttal of Thomas Carlyle's *Signs of the Times*, T. Walker contends that "Machines are to perform all the drudgery of man, while he is to look on in self-complacent ease" (Walker, p.123). He asserts that once the corporeal necessities of man are satisfied "without the intervention of human labor, there would be nothing to hinder all mankind from becoming *philosophers, poets, and votaries of art*"(emphasis added). I will briefly discuss how the Walker-Carlyle industrial debate has an equivalent in computer design culture, affecting the way designers see their activity and themselves as professionals, quietly shifting the place that words *creativity* and *design* occupy in culture.

Most notably, on Walker's side, Stephen Coons, an MIT mechanical engineer and early advocate of computer aided design and manufacturing (CAD/CAM) told an audience of artists and designers that computers were "perfect slaves" that are to perform the dirty work of dealing with materials while the artist or designer is free to "concentrate fully in the creative act" (Coons 1966)<sup>3</sup>. Depending on the kind of labor they claim to replace, design-automation advocates update Walker's utopia to subtly different political agendas. As an example, Charles Eastman, a leading researcher of design technologies based in GeorgiaTech, refurbishes the perfect slave discourse adding a contemporary flavor. In a recent talk at MIT he stated that technology will enable 'us' to replace

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<sup>3</sup> Coons, Stephen 1966 Computer, Art & Architecture. Art Education, Vol. 19, No.5 (May,1966), 9-11

immigrants in the US American construction industry (an argument I had heard from Marvin Minsky already, for agriculture)<sup>4</sup>; Walker's artificial –and deceiving- pastoralism (machines will afford us a life of pleasure and contemplation) is replaced in Eastman's desire for a clean, racially homogeneous and automated utopia.

Social and political implications of technology apart, the important aspect of Eastman's and Coons' talk is that a large part of computer design pedagogy (computers as "creative" tools) is based on their assumptions, and that along the way, the meaning of words "design" and "creative" adopt nuances that modify the experiences these activities entail, and therefore need to be confronted and debated.

In the nineteenth century works such as Henry Adams *Education* are rich in references to a "new spirit" that emerged from society's massive implementation of machinery. The symptoms of an incipient century and of a nascent understanding (and awe) of what would soon be called "modernity". Even though throughout *Education* the word Technology is never used (it was not yet available as we know it), its absence might seem blunt to a reader today. In Chapter 22, in a description of the Columbian fair, Adams sharply outlines this absence in all of its promising and worrisome implications:

Chicago asked in 1893 for the first time the question whether the American people knew where they were driving. Adams answered, for one, that he did not know, but would try to find out. On reflecting sufficiently deeply, under the shadow of Richard Hunt's architecture, he decided that the American people probably knew no more than he did; but that they might still be *driving or drifting* unconsciously towards some point in space; and that, possibly, if relations enough could be observed, this point might be fixed. (p.343, emphasis added).

The absence of the word only makes the description more powerful to our eyes, a description of an entity in its own right, an inexorable agent of change based on a continued process of discovery of previously invisible *forces* by enlightened minds.

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<sup>4</sup> A feature that becomes explicit in Eastman's talk is that design-automation advocates speak about getting rid of the "drudgery" of physical matter, they often refer to other *people*. I think rich questions can be posed around the euphemisms of design and technology made by advocates of this idea of *progress*; those questions, however, will not be addressed in detail here.

“Evidently” Adams says, “a new variety of mind had appeared”. It is in the context of this nascent technological capitalist world-order (the point in space where Adams saw we unconsciously *drift* or *drive*) where design becomes an asset in a production chain geared towards the maximization of production; the ultimate reason for the design-automation argument (larger, faster, stronger, cleaner) is the maximization of profit.

Two traditions are distinguishable in design culture today as it relates to digital technologies. An embodied one, still under-theorized (is there such a thing as a digital-pastoral?<sup>5</sup>) but certainly present in the work of architects truly concerned with sustainability and sufficiency –in the Jefferson sense- instead of in profit, and a view committed to the execution of an automated design utopia, that fully inherits the perfect slave ideology present in the early industrial debates of Walker and Carlyle.

I have examined design automation in some of its cultural weight, as a result of historical processes derived from industrialization, as a means to gauge its implications to design, and more generally, to the fields often defined as *creative*. Widely portrayed as liberating, design technologies embody assumptions and “contracts” about their use that often go unnoticed and that determine many aspects of our activity as architects and designers. A large portion of computer design discourse seems to have embraced the dream of an automated utopia, purporting a view of *design* and *creativity* as respectively the process of and the ability to manipulate symbols in the clean environment of a computer screen, unconcerned with the physicality of the artifacts these symbols describe, and unaware of the inescapably human nature of any technological endeavor. Fundamentally, I have attempted a working, *earthy*, definition of design from a materialist’s perspective that ties back design to the world of physical reality, in order to formulate the question: Is getting one’s hands dirty all that bad after all?

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<sup>5</sup> Is this the shape-grammarian enterprise?

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