NEW HAVEN, CONNECTICUT.

thunder on the horizon.

m.carpo

The notion that scripts may generate an infinite variety of random instantiations is a basic technical aspect of digital parametricism. Scripts may also include rules for some kind of responsive adaptations to various external or environmental conditions, thus making the evolutionary process almost self-selective. This dialectic between code and variations is similar to the dialectics between genotype and phenotype in biology, and the morphogenetic metaphor has been very influential throughout the history of digital design since the early 1990s, when John Frazer was the first to put it to task as an aleatoric design strategy. Originally — and, indeed, in John Frazer's early experiments — digital phenotypes would self-organize based on environmental feedback of all kinds, social as well as natural, and provided by human, as well as by technical interaction. More recently, however, the social component of such responsive systems has been neglected or forgotten, and more emphasis given to the feedback generated by natural or material conditions. Today, designers of self-adapting systems, often called "generative" or "evolutionary" systems, deal primarily with natural, not social feedback.

After probing the nonstandard geometries of form during the first age of the digital turn (1990s), digitally intelligent design has more recently shifted its focus to the material nature of form, and to the structural, tectonic, and performative behaviour of materials — both natural and artificial. Standard industrial materials such as steel, which were specifically designed to be isotropic and homogeneous, have few secrets left to unveil. But today digital technologies could theoretically allow for some rational (calculable) use of nonstandard materials too, as found in nature (timber or stone) or newly engineered.

This, however, is what digital designers today are for the most part not doing. Instead, system theory, and various post-modern theories of chaos, complexity and nonlinearity have merged with a traditionally empiric approach to structural form-finding, which architects always cherished, and favoured the rise of a new practice (and almost of a new science) of holistic engineering. All designers know that some materials and material systems occasionally behave in unpredictable ways, and that in certain conditions normal relations of cause to effect (stress to deformation, for example) do not seem to apply. Similar shortcomings of predictive sciences have many rational explanations, and long before the rise of today's digital technologies for "big data" management, scientists often found it convenient or expedient to follow statistical models rather than causal ones. Others however may also conclude that as some behaviours of a given structural system in certain conditions cannot be causally predicted, that system must have a life of its own. If this assumption may appear improbable, in the etymological sense of being difficult to prove, it may not be more difficult to prove than its opposite; and vitalism has a long and distinguished tradition in the history of Western thought. So do magic and spiritualism, for that matter.

The above explains to some extent the belief system behind the frequent rejection of rational design, and of all forms of cause-to-effect calculations, amongst many of today's digital designers.

FOR THE LAST 20 YEARS THE TECHNICAL CONTINUITY BETWEEN COMPUTER-BASED DESIGN AND COMPUTER-DRIVEN FABRICATION HAS MIRRORED, AND AT TIMES REENACTED, ASPECTS OF TRADITIONAL, ONE-TO-ONE HAND-MAKING AND BESPOKE CRAFTSMANSHIP.

Today a new generation of digital craftsmen increasingly perceives CAD-CAM technologies as an extension of the mind and body of the designer, and many have embraced traditional, phenomenological and esoteric interpretations of craftsmanship.

The "tacit knowledge" of the craftsman cannot be verbalised because it derives from a mystical union between the body of the artisan and the materials being crafted. This union, which traditional sciences called "intellection", can only happen through an *Itinerarium Mentis in Deum*. Why computers should facilitate that itinerary, however, or even take part in it, is less clear.
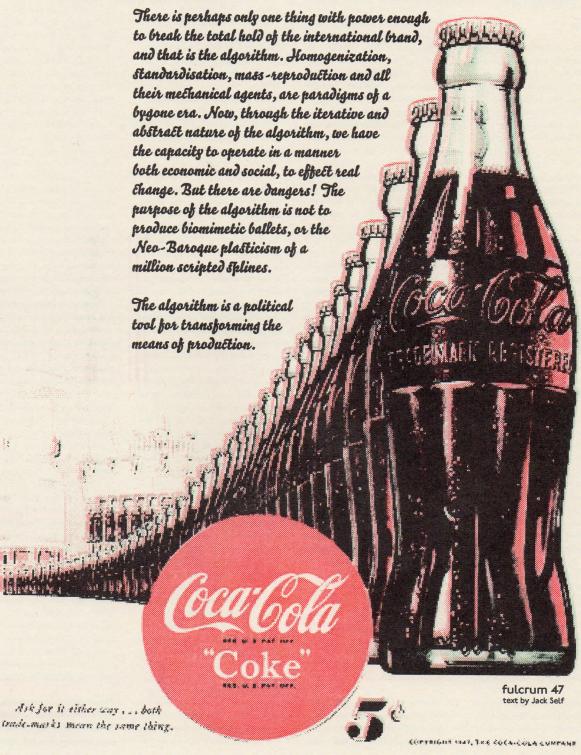
The phenomenological craftsman does not analyse, quantify, calculate, predict, design; he just makes, feels, and finds form by trial and intuition. Likewise, today's theories of "design by making" (always popular among architects, and particularly among architectural educators, but today enhanced, promoted and almost vindicated by the power of digital tools) often favour a silent and almost mystical or sensual experience of design without thinking: reason and speech are of little use to the maker that senses his making through his body, and, increasingly, through the body's digitally mediated prosthetic extensions. Digital simulations are a powerful ally of intuitive form finding and design by making, because they can make and break in no time more models than a physical craftsman could in a lifetime. And when a model works, either a physical model or its digital equivalent, there may be no need to tell why.

So while digital culture at large has embraced the interactive and collaborative way of making inherent in the technical logic of digitality, and has already developed a number of successful post-authorial strategies, in architecture and design the same digital pattern of devolution of agency has been mostly redirected from social participation to a new and daring partnership with the mysteries and indeterminacy of nature. And one can see many reasons why the quest for a renewed alliance with nature may seem a wiser policy today than at any time in recent history: the perception of the limits of human making, and of the finiteness of the natural environment have never been stronger since the early modern invention of the infinity of space.

In today's generative scripting, just like in the morphogenetic theories that have so powerfully inspired it, evolution emerges by natural selection (in the case of digital design, enacted by computational means). Digital Darwinism is indeed an implicit and often latent component of contemporary digital design culture, and given the vitalistic creed often associated with it, this may account for the often transparent political allegiances of today's digital phenomenology: a universe where forms are not designed but "found" — where forms "just happen" — is also a universe where, in the best Nietzschean tradition, the hero, the magician, the artist, or others, can and will capture, interpret and perhaps tweak the spirit of nature — to the detriment of all others. In this, today's digital irrationalism appears to be at odds with the more socially oriented inclination of mainstream digital culture. Perhaps digital design has chosen its *eigene Weg*. Perhaps designers are once again, as in the 1990s, anticipating more general trends and developments.

Time will tell. One thing for certain: whether in the social form of devolution of agency (the digital style of many hands) or in the naturalistic mode of dissolution of authorship (the digital style of chaos and nature), the visual forms that will result from the elimination of humanist authorship are likely to be a far cry from the polished smoothness, elegant curvilinearity and delicate intricacy which authorial parametricism has so far engendered. Social interaction creates bonds that the romantic identification with nature often likes to break. A digital Sturm und Drang may not be around the corner, but there is thunder on the horizon, as well as dawn.

Text excerpted from forthcoming article for the 2012 Venice Biennale.

Mario Carpo is an architectural historian deemed by Greg Lynn to be the premier scholar on digital drawing (see Fulcrum #38).

CONTINUOUS QUALITY IS QUALITY YOU TRUST

There is perhaps only one thing with power enough to break the total hold of the international brand, and that is the algorithm. Homogenization, Standardisation, mass-reproduction and all their mechanical agents, are paradigms of a bygone era. Now, through the iterative and abstract nature of the algorithm, we have the capacity to operate in a manner both economic and social, to effect real change. But there are dangers! The purpose of the algorithm is not to produce biomimetic ballets, or the Neo-Baroque plasticism of a million scripted splines.

The algorithm is a political tool for transforming the means of production.

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text by Jack Self