

Figuring Differentiation

The relationship between a discrete design and its environment is in many ways configured through the problem of “scale.” Scale can be both a means of invention and an instrument of convention; indeed, the former often re-strategizes the latter for its innovations. Within the architecture, urban design and landscape architecture, the concept of scale has three most common uses. The first is as a ratio between drawings and the

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constructions that they notionally represent. This representational scale inscribes disciplinary conventions about what kinds of information are germane to the part, the whole building or its relationship to its environment. The second concept of scale concerns qualitative relationships between architecture and the embodied condition of its subject. This we might call affective scale. A building is often said to be humanly-scaled if it addresses a singular subject, monumental if seeks to enfold the single subject within a larger collective or institutional identity. The third is most often employed when describing the relationship of a design to its surroundings. We might term this contextual scale. A building is often said to be “in scale” or “out of scale” with the city around it. In each of these common uses, we tend to treat scale as a more or less transparent descriptor. But of course in each of these uses, “scale” is neither a quality nor a quantity itself, but addresses the relationship between two or more domains. One might think of scale in the design disciplines as somewhat analogous to the trope or metaphor in literary fields, something that transposes one domain into another and, when successfully used, does so in way that awes us with its virtuosity or erases its operations and seems natural. In other words, scale delineates a world. Therefore, one might argue that scale is perhaps one of the most ecological of architectural instruments and concepts. Ecological processes are concerned with the transposition and transformation of information between autonomous systems and their environment. While we tend to think of this as relatively small systems (as an organism, or building as an organism) within a relatively larger environment (such as an ecosystem, or perhaps a city), we should be cautious of reifying the anthropomorphic scales that tend to govern architectural conventions of scale.

In architecture, there have been periodic attempts to cohere the three sorts of scales noted above into an organic synthesis that would, it has often been argued, be in greater harmony with the natural world. Le Corbusier's *Modulor* is perhaps the most well known attempt in Modernism to achieve such a formal-ecological alchemy. It conflated scale with the quite different concept of proportion through a ratio that, Le Corbusier argued, was to be found both in nature and in an idealized human form and perception.

In a rather different way, Charles and Ray Eames's famous 1977 film, "Powers of Ten," articulated an architectural approach to representing a synthetic representation of the real by focusing on "the relative size of things" and the "effect" of scaling in orders of ten (key terms in the film's subtitle). Produced for IBM, the film attempts to illustrate then-current scientific understandings of entities, ranging from the extremely vast to the extremely miniscule. In its attempts to produce such depiction, the film both deploys and provides an exegesis on how scale operates to order the knowledge of the architect. Throughout the film, the image is bracketed as a square frame with a large border filled with numeric and other annotations. Within each of these the square images, there is a series of smaller graphic squares nested inside. In the film, these nested squares denote the sequential scales of representation (as magnification to the power of ten) while steadily ticking numbers indicate the absolute size of each frame square at any stage, denoting the size of the things represented within. In other words, the filmic frame is ordered just as the architect's construction drawing and the sequence is a simplified linear version of the architect's construction document set. As an image bounded by a frame of supplemental information, and with smaller frames inside that are linked to other drawings at different scales that provide more information about that condition.

Moreover, while a flat and disembodied voice narrates this voyage as a simple description, the film is not a simple linear progression from large to small, or vice versa. Instead, the supine body of a man napping in a one meter square performs as the fulcrum of the scale of 1:1, out from which the frame recedes until it reaches the extent of the known universe and then back, through which it zooms down to the world of cells and, finally, atoms. In the film, the closer the scale of the image comes to this 1:1 figure, the more naturalistic and material the image becomes; as it diverges from the scale of the body, the images become increasingly abstract, shifting from figures to patterns and organization. Indeed, the super vast and the super small end up looking more of less similar in the film, depicted as purely graphic circles and orbs. One might chalk this up to limitations of the visualization tools available at the time (either as a scientific photograph, or as a drawn simulation facilitated, presumably, by IBM-sponsored computational power). However, the film reveals how architecture's conventions of scale govern different sorts of representation thought to be germane to each such scale. Conventionally, the closer the architecture drawing moves to 1:1, the more representational it becomes of the constructed condition it represents—and the more concerned it is with

articulating material conjunction of the anatomy of the building. The farther one move away from 1:1, the more notational the representations become as they move from material into organization. Yet, just as the figure of a man is the locus for the film, the figure of the building is the privileged scale for architecture. As we move from the plan down to the detail, we begin to see the anatomic/tectonic conjunctions. As we move up to through the site plan we begin to demarcate territory, then the patterns of urban design, and, finally, to the graphic dots and lines of regional urban planning. At each scale, conventions do not simply represent a design but rather coordinate the way in which we think the objects of design operate. At the same time, these conventions of scale delineate strict boundaries where certain expertise begin and end, drawing thresholds between expertise of the design disciplines, as well as normalizing what forms of knowledge are useful to translate design notations into actualizations. In the film we move from anatomy, to sociology, to geography, to astronomy, to cosmology, and then zooming back down into biology, molecular chemistry, and atomic physics. In architecture, one moves from the construction logic and the contractor to the logistical orchestrations of infrastructure and policy. This scalar delineation, the framing of the image, and the fulcrum of the male body indicates more is at work here than naturalistic depiction and its technological limitations. These devices work together to recreate a Vitruvianism, wherein the human body serves as a narrative hinge between microcosmic and macrocosmic, a privileged scale of measure, and arbiter of relative size. The film is a stunning work of anthropomorphism in its attempt to visually depict phenomena that are utterly beyond our senses, and when thought of in relationship with the Eames' bent plywood furniture descended from a wooden splint they created for the U.S. Navy, outlines a coherent intellectual program of attempting to couple the human with the inhuman through technological prosthetics.

Recent digital design often conflates the proportional relationship between part and whole with the scalar blurring of such hierarchies, and with its accompanying interest in producing affect and atmosphere for the subject. In the mid-1990s, Greg Lynn explicitly coupled digital techniques with conceptual and ideological discourse to create a post-humanist prosthetic architecture designed to displace such anthropomorphism. Lynn's writings at the time strategically moved across scales of models: from microscopic organisms, to the insects, to aging prizefighters, to the gargantuan scaled body of the Statue of Liberty. Lynn's project also contained an integral interest in "animate form" and animation as a software technique to produce forms that, as he put it then, may not literally move but carry with them the trace of the dynamics of their formation, and indeed, have a sort of uncanny "animate" aura. His more recent "Toy Furniture" projects continue this lineage of the uncanny use of scalar displacement. In this movement from technique to affect, Lynn shifted from a discourse of proportion to a discourse of scale in all three sense listed above. That Lynn did so almost imperceptibly but disruptively suggests, in retrospect, a level of virtuosity with architectural concepts analogous to the most breathless turns of literary phrase. However, the genre of work

his writing and design helped establish now often seems almost oblivious to these operations, risking turning them into merely residues, clichés. The uncanny moves towards the quotidian.

This session seeks to reanimate the potential of scale by interrogating how an ecological, epistemological, and design framework may question or confirm the conventions of architectural thinking. The session was open both to historical and theoretical examinations in addition to the presentation and analysis of design projects that engage but also critique and advance the design discourses of parametric design and formal variation and performance. One of the most important potentials of ecology in design lay in displacing the conventions exhibited in the film, and whose naturalism we risk falling back into. However, one could also argue that ecology has also served as model and metaphor for architecture that as also tended to reinforce a rather non-ecological but disciplinarily entrenched understanding of the relationship between the building (as a sort of organism) and its surroundings (as an environment). Designers can uncritically adopt approach phenomena such as “emergence” and ecological relationships to reinvigorate a new form of Vitruvianism. Rather than anthropomorphize, what is the potential of ecologizing our instruments of architectural knowledge and interventions to problematize convention—especially the relationships between interventions smaller than a building, discrete architectural projects, and urban-scaled conditions?

On the one hand, ecology has been used at the scale of urban and environmental systems both to understand them as coherent systems of ordering (for example, in the work of Reyner Banham) and as technological and ethical criteria for determining building design. On the other hand, ecological tropes have recently been used in association with parametric digital tools as a way of understanding the design as a system of performative criteria. Such architectures have often privileged part-to-part relationships through digital processes and aesthetics of variation, implicitly or explicitly extending a post-humanist critique of organisms part-to-whole relationships found in Greg Lynn’s writing and more recently summarized as a primer in Reiser + Umemoto’s *Atlas of Novel Tectonics*. Practices most focused on the translation of parametric design tools to fabrication explore the disruptive potential of two additional concepts of scale. One concerns material performance and physical phenomena and how these change with increasing size of elements or changing materials. Michael Hensel and Achim Menges have described this mode of design as producing Morpho-Ecologies, enfolding this more engineering-based concept of scale into the design practices of drawing. In turn, we use scale to enrich the understanding and potential of installations and the prototypical fabrications as strategically operating the gap between measured scale and material scale, advancing what Robin Evans called the gap between drawing and building. If Peter Eisenman once advocated for Cardboard Architecture as a post-modern means of displacing normative conventions of the “real” and the “imaginary,” at their most innovative, such explorations leverage the abstract and notational into material actualization. This mode of operation

is often tactical and relatively small-scaled, operating as a prosthetic to the building or to the city, and even in rather low-tech and low-budget conditions where traditional top-down architectural and urban strategies cannot be deployed and in any case would not be effective.

Another additional sense of scale is linked to the opposite scale of architectural (re)production, when such design tools are “scaled up” to contend with the economic and manufacturing systems of construction and project management. Firms such as SHoP and, in a rather different way, Gehry Technologies, are probing this fifth sense of scale, which we might call scales of production. Of course this is also the moment most in danger of collapsing into convention.

Rather than dissolve the discipline of architecture, acquiesce to our displacement by related fields of landscape and industrial design, or retreat into an isolated autonomy determined by convention, design approaches that traverse conventional scalar boundaries through an ecological sensibility may be one way to deploy the specificity of architectural knowledge to engage the world at scales either smaller or larger than what has become the conventional scale of architecture practice. ♦