

Scientism: The Breeding Ground for Current Architectural Trends - or - Towards an Architectural Monoculture

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"Science, at its core, is simply a method of practical logic that tests hypotheses against experience. Scientism, by contrast, is the worldview and value system that insists that the questions the scientific method can answer are the most important questions human beings can ask, and that the picture of the world yielded by science is a better approximation to reality than any other."
- John Michael Greer

"Scientism is a scientific worldview that encompasses natural explanations for all phenomena, eschews supernatural and paranormal speculations, and embraces empiricism and reason as the twin pillars of a philosophy of life appropriate for an Age of Science."
- Michael Shermer, *Scientific American*

"Put bluntly, the I and the WE were colonised by the IT. The Good and the Beautiful were overtaken by a growth in monological Truth.... Full of itself and flush with stunning victories, empirical science became scientism, the belief that there is no reality save that revealed by science, and no truth save that which science delivers."
- Ken Wilber, *The Marriage of Sense and Soul*

"There is physics, and there is stamp-collecting...."
- Ernst Rutherford, physicist

THE PLURALISTIC LEGACY OF THE LINGUISTIC PARADIGMS AND THE AUTHORITY OF SCIENCE

Of the many things poetics, semiotics and deconstruction put on the table for the discipline of architecture, it can be argued that their abiding legacy is less about the language of architecture per se, and more concerned with the ethos of pluralism. When 'signifier' and 'signified,' 'authorship,' 'syntax,' and 'translation' became exhausted tropes in the architect's and theorist's toolbox, the residue pointed,

not to a singular predecessor, but to many possible subsequent movements. The value of this legacy is its spirit of inclusion, the conviction that many voices have a place at architectural discourse's table. However, detracting from these diverse offerings, is the sinking feeling that the discipline of architecture has no critical mass, that it lacks direction, and that it continues to wallow in an interregnum of 'anything goes.' This disciplinary dilemma is given institutional expression in the academy, which currently operates under two pervasive models: the inclusive model that features diverse pedagogical positions, but rarely articulates what this diversity is in the service of; and the single-interest model in which one position is intensified, valued, and advanced, however, the depth of this inquiry often comes at the cost of a potentially myopic worldview.

Amidst this institutional divide and this directional indecision enters scientism, the conviction that scientific logics and values are critical in answering the most pressing questions facing the discipline of architecture. So, how do we differentiate between scientific and scientistic tendencies currently operating within the discipline of architecture? When is science a useful analogical or methodological engine to architectural design, and when does it exert a hegemonic influence, marginalizing those discursive dimensions that lack empirical legibility? In his theorization of scientism, Tom Sorrel articulates five theses that access scientism within the tradition of scientific empiricism: "(1) science is unified; (2) there are no limits to science; (3) science has been enormously successful at prediction, explanation, and control; (4) the methods of science confer objectivity on scientific results; and (5) science has been beneficial

for human beings.”¹ Sorrel’s theses provide critical points of departure for locating scientism within the practices and theories of architecture.

The supposition that science is unified must be placed in the context of the pluralistic humanities. The virtue of empiricism is its claim to produce clear and verifiable truths, that when linked to other such truths contribute to a unified system of knowledge, or epistemology. Though this systemization has its virtues, a decided drawback is what Steven Connors calls its “manufactured amnesia of things.”² The criteria of clarity and verifiability privilege only the quantifiable aspects of things, and thus necessarily forget much of what is experienced. Bruno Latour alludes to this narrowed and exclusionary epistemological focus when he opines, “[e]pistemology is a professional hazard of first class air-conditioned train travel.”³ This systematic front of scientism, though appealing to architecture as a meta-narrative with the potential to gather up our discipline’s pluralistic trajectories, is achieved at the cost of suppressing the poetic, ethical, and experiential dimensions of our creative production. Complicating matters even further, the choice of a unifying epistemology rarely comes with a disclaimer or fine print about what is explicitly excluded.

The pervasive and well-worn claim that there are no limits to science goes a long way towards explaining architecture’s current capitulation to technological imperatives. However, there are a number of territories within the discipline of architecture that settle comfortably within the reach of the long arm of science’s limitless epistemological prowess. Architecture’s systems, tools, and logics owe a debt of gratitude to such scientific transgressions. Architectural systems-thinking at the structural, mechanical, and material levels exploit science’s limitless capacities in everything from diagrams of structural efficiency, to HVAC logics, to performative and responsive skins. The tools that we use for design, from graphite and triangles to the sophisticated machinery of digital fabrication, are instruments that simultaneously instrumentalize their users. Alberto Pérez-Gomez argues that architecture’s digital revolution polarized the discipline into disparate camps of fine arts and applied sciences, while these new tools instrumentalize the discipline. He writes:

“The introduction of computers into architecture during the past two decades has helped reduce architectural discourse to issues of instrumentality. The most popular discussions presume the importance of this so-called paradigm shift and focus on the potential and limitations of this instrument, aiding the perpetuation of the dichotomy. Thus theoretical discourse tends to remain caught up in instrumental issues of form (innovation) and production (efficiency), while the humanistic dimension of architecture is further jeopardized and educational programs become increasingly vocational.”⁴

A belief in the limitlessness of science can also be found in the various logics deployed by architects, from form-finding algorithms and scripting practices, to parametric design and Building Information Modeling (BIM). These logics share as a common denominator the conceit that architectural “problems” can be “solved” mathematically. What architecture’s systems, tools and logics eschew are the qualitative dimensions of experience (the sensual, the ephemeral, the transitory), the possibility for poetics, and ultimately, humanity. In a recent AD article entitled “Digital Solipsism” Neil Spiller writes: “Much recent architecture, especially the well-known examples, has been devoid of humanity and panders to a need for ever more gratuitous complex surfaces and structures. This justifies or obscures their simple, apolitical and vacuous objectives. Our short-sightedness caused by the development of ever more dexterous ‘printing’ technology, the ubiquity of global capitalism and the myth of the deity architect has encouraged a great ‘forgetting’ – a forgetting that has subtracted the humanity from the architectural products of our era.”⁵

When Sorrel’s third thesis of scientism – that science has been enormously successful at prediction, explanation, and control – takes root within the discipline of architecture, it occasions a discursive shift from questions of ‘what?’ to questions of ‘how?’ Here, scientism’s intrusion propagates a false choice between content and technique, and when the criteria for valuation are prediction, explanation, and control, the deck is decidedly stacked against content. In her seminal text, *The Human Condition* of 1958, Hannah Arendt makes a distinction that is critical to this prioritization of technique in architectural discourse. Here, Arendt describes the innate human capacity to understand the distinction between utility and meaningfulness, ex-

pressed linguistically by distinguishing between “in order to” and “for the sake of.” Arendt’s critique of utilitarianism is that it gets caught in “an unending chain of means and ends without ever arriving at a principle which could justify the category of means and ends, that is, utility itself.”⁶ Ultimately she argues that the “in order to” has become the content of the “for the sake of,” or more succinctly, that “utility established as meaning generates meaninglessness.”⁷ Arendt’s argument is an apt characterization of contemporary architectural discourse. In the past decade, we have witnessed the systematic purging of meaning from the discipline of architecture, an evacuation that has been accomplished by the subtle substitution of ‘how?’ for ‘what?’, of utility for meaningfulness, of technique for content. This shift represents an epistemological deviation in which knowledge is no longer constituted through a dialogue with the primary dimensions of reality, but rather is removed and preoccupied with the secondary engagement of methodologies, processes, techniques and other manifestations of formalized experience. This raises the question of the appropriate situation for technique within architectural discourse. Does it have a place within the discipline? Certainly. Is its place to redirect discourse exclusively to matters of performance? This constitutes an intentional depletion of the potential cultural agency of architecture – a self-imposed wound we seem only too willing to inflict.

If scientism, as Sorrel argues, assumes that the methods of science confer objectivity on scientific results, then the implications for the discipline of architecture bear principally on the territory of representation. For example, architecture’s objective impulse can be located in the hyperrealism of contemporary digital renderings. With a push of a button architects produce texture mapping, imbuing nondescript 3D models with materiality and lighting that rival photo-realistic images of actual spaces. The innate ‘objectivity’ of this practice resides in our ability as a profession to produce increasingly realistic representations of our work. Perhaps the consequences of this tendency are easier to discern in another discipline. Richard Rorty describes the philosophical trope of the mirror of nature as follows: “The picture which holds traditional philosophy captive is that of the mind as a great mirror, containing various representations – some accurate, some not – and capable of being studied by pure, nonempirical methods. With-

out the notion of the mind as mirror, the notion of knowledge as accuracy of representation would not have suggested itself.”⁸ Here, Rorty articulates philosophy’s dilemma, a dilemma shared by architecture. It is not that our representations are becoming increasingly realistic that is problematic, but rather that this tautological over-determination is being equated with the construction of disciplinary knowledge. Two examples might serve to illustrate how scientism and the objectivity it values have supplanted earlier linguistic paradigms in architectural discourse, proffering itself as the next new thing. Umberto Eco raises the first in an essay in *Travels in Hyper Reality*, and specifically a passage in which he examines a full-scale reconstruction of the White House’s oval office. Eco writes:

“Constructing a full-scale model of the Oval Office (using the same materials, the same colors, but with everything obviously more polished, shinier, protected against deterioration) means that for historical information to be absorbed, it has to assume the aspect of reincarnation. To speak of things that one wants to connote as real, these things must seem real. The ‘completely real becomes identified with the ‘completely fake.’ Absolute unreality is offered as real presence. The aim of the reconstructed Oval office is to supply a “sign” that will then be forgotten as such: The sign aims to be the thing, to abolish the distinction of the reference, the mechanism of replacement. Not the image of the thing, but its plaster cast. Its double, in other words.”⁹

The perversity entailed in constructing a full-scale model of the Oval Office is simply that this tautological representation has nothing to tell us. Its status of stand-in or double has effectively stripped the model of its communicative capacity “for the sake of” something else, it was fabricated “in order to” more closely approximate the thing itself. Scientism’s objective impulse evacuates and depletes any potential meanings and connotations of the sign, substituting a close approximation to reality, one that can be engaged empirically. The second example is a text by Robin Evans entitled “Translations from Drawing to Building” in which Evans articulates the particular agency of translation within the discipline of architecture. In this essay, Evans reveals that his belief in the generative capacity of the architectural drawing stems from a brief period teaching in an art school:

"I was soon struck by what seemed at the time a peculiar disadvantage under which architects labor, never working directly with the object of their thought, always working at it through some intervening medium, almost always the drawing, while painters and sculptors, who might spend some time on preliminary sketches and maquettes, all ended up working on the thing itself which, naturally absorbed most of their attention and effort.... The sketch and the maquette are much closer to painting and sculpture than a drawing is to a building, and the process of development – the formulation – is rarely brought to conclusion with these preliminary studies. Nearly always the most intense activity is the construction and manipulation of the final artifact, the purpose of preliminary studies being to give sufficient definition for the final work to begin, not to provide a complete determination in advance, as in architectural drawing."¹⁰

What Evans' observation articulates for the discipline of architecture, and what scientism and its privileging of objectivity ultimately renders problematic, is the representational question of just what constitutes this complete determination in advance. Is it a representation that is over-determined and assuredly predictive, or is it a representation that is suggestively incomplete and projective? At stake in these questions surrounding digital renderings are three critical questions for the discipline of architecture. Do we equate these increasingly realistic representations with the production of knowledge in our field, and if so, what sort of epistemology does this yield? Is the unintended consequence of scientism – the reorientation of our production towards 'objects' – an acceptable outcome? And finally, as images become increasingly realistic, they become decreasingly communicative in inverse proportion. Is the ability to approximate reality worth explicitly narrowing our discursive potential?

Sorrel's fifth and final thesis on scientism is the tacit assumption that science has been beneficial for human beings. That most people would consider this thesis a truism is sufficient evidence of the pervasiveness of scientism in contemporary culture. If science fosters the empirical examination of things, and the rhetoric of scientific progress ensures that these things are constantly improving, then how could science be anything other than beneficial to human beings? Architects recognize

this line of thinking with respect to digital technology, which is a foregone conclusion in our field, and the supposition that these technologies make architecture (both as a practice and as a consequence of that practice) better. In his 2004 article, "Why has Critique Run out of Steam?" Bruno Latour calls this ameliorative assumption into question. At the crux of his argument is the distinction between "matters of fact," typically the domain of science, and "matters of concern," historically the territory of the humanities.¹¹ Latour argues that criticism has run out of steam precisely because there is no common ground between 'matters of fact' and 'matters of concern' – they are encountered as two disparate groups of things. The discipline of architecture, with its legacy of fine arts and applied science, stands straddling these matters of fact and matters of concern. Though we have demonstrated that we are unwilling to accept the tenets of post-critical theory, we remain at arms length from criticality, predicated upon our inability to recognize the territories we straddle, and architecture's unique capacity to find common ground between the two. Technology enters the discipline as an imperative, asserting its non-dialogical relationship with matters of concern. A snapshot of the current state of our discipline would reveal the waning of post-critical theory as a form of new aestheticism grounded in the subjectivity of taste and connoisseurship, on the one hand, and the waxing of a pervasive scientism grounded in the objectivity of mathematics and empirical science and the betterment they promise. If this survey of Sorrel's theses begins to account for the rise of scientism within the discipline of architecture, then it might be useful to examine both disciplinary and extra-disciplinary vehicles for the germination and dissemination of these ideas.

Digital Technology Tips the Scales

A perusal of AD issues over the last four or five years elucidates the degree to which digital technology not only dominates our discussions of practice, production and craft, but also has effectively eclipsed other discursive trajectories. An issue from 2006 entitled "Techniques and Technologies of Morphogenetic Design," guest edited by Michael Hensel, Achim Menges and Michael Weinstock of the Architectural Association's Emergence and Design Group, is a sequel to the 2004 issue "Emergence: Morphogenetic Design Strategies." Series

editor, Helen Castle, attributes this sequel to biological “content spiral[ing] outwards” – a prescient description of scientism’s increasingly dominant grip on the architectural imagination.¹² Though ostensibly the editors are placing scientific content, specifically morphology, on architecture’s table, they are doing so through the qualifications of strategies, techniques, and technologies. Each of these designations signal that the editor’s are not interested in scientific content, or the ‘what’ of morphology per se, but rather, the performances and operations of morphology, or the ‘how.’ The issue becomes something of a technique manual for the production of unique biomorphic forms, explicitly eschewing questions of why architecture benefits from an engagement with this content beyond the limited scope of formal agility. The reduction of what Hensel cavalierly calls the ‘biological paradigm’ to morphological techniques, severely limits architecture’s potential engagements with the content of biology. When Hensel writes:

It is precisely the complex and dynamic exchange between an organism and its environment, and the functionality that evolves from it, that makes synthetic life interesting for architecture. Understandably, the very notion of architecture that is alive may sound scary to some and blasphemous to others. However, what is proposed here is not a version of Mary Shelley’s *Modern Prometheus*. Instead, it involves embedding into buildings the biochemical processes and functionality of life for the advantage of humans, other species and the environment...¹³

it is difficult to assess whether he is advocating for a naïve literalism, or resorting to a metaphorical broadening of the territory that the focus on technique disallows, however revisiting the subtitle of the article leaves little room for doubt.

Without going into detail with respect to other topical themes for other issues of AD, the point I want to make is that the digital revolution has not only radically changed the tools of our discipline, it has also shifted the content. New digital technologies have created an appetite for innovative techniques, pulling content with the greatest affinity – content that is unified, limitless, predictive, explanatory, controlled, and objective – into architecture’s orbit. Our discipline’s preoccupation with technique is an implicit content filter, perpetuating the ethos of scientism as the breeding ground for all subse-

quent innovations and developments. The prophecy seems to be equal parts debilitating and self-fulfilling.

The Global Crisis and the Mandates of Sustainability

The global ecological and economic crisis has similarly privileged the technological dimensions of architecture, transforming the discipline, or as Penelope Dean argues, “de-disciplining” it:

As architecture continues to be a target of environmental reform, the ambitions of the discipline have shifted from a Modernist notion of being able to design the environment to a subservient role as a part of an environment by design. In this realignment, architecture’s relationship to the environment has predominantly advanced through a combination of building and applied technology from the 1980s onwards, leading to a subcategory of architecture devolving into a kind of techno-science more commonly known as green architecture, or perhaps more accurately described as ‘green building.’

In this devolution the de-disciplining of architecture from a socio-cultural project into a technological specialization – the sustainable subculture where technology can apparently solve all problems – has taken place; in other words, de-disciplining by shrinkage.¹⁴

Dean’s description of architecture’s abandonment of our socio-cultural agendas is not surprising given the amplitude of the environmental crisis, and the cultural tendency to resort to technological imperatives in such moments. When technology assumes a dominant role within the practice of architecture, and design takes a back seat, conditions are ripe for a disciplinary receptivity to scientism.

The Complicity of Interdisciplinary Exchange

If the current buzzwords in academia are ‘interdisciplinary exchange’ and we are well versed in the advantages of critical discourse between disparate fields of study, then I would like to explore how this milieu ultimately fosters the spread of scientism. Architecture’s slightly schizophrenic legacy of fine arts and applied science presents a challenge to the notion of disciplinary identity. Jane Rendell describes this challenge as follows:

If we define a discipline as a system of rules of conduct or as a method of practice, then architecture is not a discipline, since it combines a number of methods of practice. However, if we define a field of study containing a number of disciplinary approaches but with a shared object of investigation as a recognized subject, then we could define architecture as a subject. As a subject, is architecture unique because of the particular combination of disciplinary approaches it comprises and/or is any one of these disciplinary approaches in themselves unique? We could argue that, as a subject, architecture encompasses several disciplines and uniquely brings together modes of research that are often kept apart (historical analysis and material science for example) and so provides possibilities for multi- and interdisciplinary research. We could also suggest that central to the subject of architecture is architectural design, a particular mode of practice led research whose disciplinary specificity cannot be found in other types of practice or design. We could therefore make the case that architecture is unique as a subject and as a discipline.¹⁵

At stake in Rendell's assessment of architecture's status as a subject or a discipline is the question of whether architectural discourse is always-already inter- and thus intra- disciplinary. Do all of the disparate trajectories collected under the subject architecture already model interdisciplinary communication and critical exchange without capitulating to scientism's seductively unifying meta-narrative? Architecture would then advance a model of disciplinary exchange that preserves criticality by (returning to Latour's terminology) placing matters of fact into dialogue with matters of concern.

Against Scientism: Averting an Architectural Monoculture

In conclusion, this paper has examined scientism and its portrayal as a unified, limitless, predictive, explanatory, controlled and objective worldview that is beneficial to human beings, and explored its role as a breeding ground for new architectural trends. It has examined the factors contributing to the proliferation of scientism, including: the revolution in digital technology and its affinity with scientific content; the global ecological crisis with its technological imperatives and subsequent marginalization of design; and the complicity of interdisciplinary exchange which is often usurped by

scientism in the search for a common language, meta-narrative or discourse. This leaves us with the question: how can we counteract the pernicious influence of scientism on the discipline of architecture? First, we can reclaim borrowed concepts and redefine appropriated terminology to impart disciplinary agency. Reyner Banham's often-derided use of the term 'ecology' serves as a useful exemplar of this strategy. Not satisfied to deploy the term according to the ground rules of environmental discourse, Banham made it disciplinary rather than capitulating to the logics and mandates of another discipline. Second, we can put science and technology into dialogue with poetics and the humanities, thereby fostering a rigorous conversation and exchange between matters of fact and matters of concern. And third, we can exploit the inclusive and communicative capacities of architectural representation in addition to its demonstrative and explanatory capabilities.

One of the most salient features of scientism as a prevalent post-linguistic paradigm is the degree to which it continues to rehearse the form/content division of linguistic thought in the guise of a technique/content disparity. If this paper proffers an explicit critique of scientism, its ambition is equally to ensure that science does not become the baby that gets thrown out with this disciplinary bath water. How can architecture tap into science as a source of interdisciplinary inspiration without falling prey to scientism?

Historians of science Lorraine Daston and Peter Galison explore the possibility of the ontology of epistemology, which Daston refers to as "applied metaphysics."¹⁶ This positioning of the history of science mitigates against the universalizing tendencies of scientism by positing an epistemological and ontological dimension to its operations, situating science simultaneously in the real and the constructed, the factual and the experiential. Three final examples will serve to demonstrate how this conception of science as applied metaphysics might allow architecture to tap into the nascent potential of the sciences without reproducing the linguistic paradigm's form/content division.

In a discussion of the historic debate between Ernst Haeckel and Wilhelm His over the appropriate modes of scientific representation, Daston and Galison introduce the concept of 'epistemologies of the

eye.¹⁷ His accused Haeckel of smuggling subjectivity into his scientific illustrations, and supported his argument with the evidence that Haeckel had photographic equipment available to him, but chose not to use it. Daston and Galison use this example to demonstrate that reality is a matter of degrees, and that although photography might be less subjective than scientific illustration, there are large degrees of subjectivity in this purportedly “objective” scientific endeavor. For Daston and Galison, epistemologies of the eye bring together the science of the eye and the experience of seeing into a seamless reality. Parallels can be drawn between this moment in the history of science and the rhetoric of eschewing authorship that is prevalent in the contemporary discourse surrounding parametric design. This rhetoric lapses into scientism when it tacitly equates the suppression of authorship with the ambition to objectively read the parameters of any given design problem and proffer a formal solution. This process culminates in an overtly subjective eureka moment in which the disinterested author capriciously chooses the final form. When architects like Ben Van Berkel and Caroline Bos of UN Studio critique the authorless process of parametric design calling for increasingly “intelligent” parameters – they nudge the scientific statistics of parameters towards the lived experience of spatial practice.

In the 1920s, theatrical designer Adolphe Appia produced a series of monumental stage sets, deploying an abstract and reductive modernist language. Architectural historian, Peter Carl, describes this moment as “Appian materiality” – a moment in which the material conditions of architecture became generalized. Carl locates a historical moment in which the universalizing tendencies of early modernism and the universalizing tendencies of scientism elided, and the legacy of generalized materiality extends from the 1920s to contemporary digital representational practices like texture mapping. When all material can be applied to representations like a thin veneer, though paradoxically in photorealistic renderings, this condition of generalized materiality has reached its apex, or nadir, and the universalizing tendencies of scientism – the dual conviction that science is unified and has no limits – have insinuated themselves into the discipline of architecture once again. But perhaps in response to the scientism of this generalized materiality, a scientific alternative has emerged in

the form of the Material Connexion showroom and database. The ambition of this extensive sample collection is to de-specify materials according to their use, while exhaustively cataloging the inherent properties of any given material. Through the act of de-specifying materials, Material Connexion is opening up the potential for materials to be deployed for multiple uses specific to their intended performance. As the depth of material epistemologies are probed, the breadth of potential applications of material experience expands exponentially, producing an open-ended ontology of epistemology.

One trajectory of discursive representations can be traced from images of disembodied hands performing scientific experiments in the Enlightenment, to the serialized, how-to imagery of D’Alembert and Diderot’s Encyclopedia, to the combinatory logics of Durand’s comparative building types, to the tautological representations of Peter Eisenman’s early houses, to contemporary representations by architects like Philippe Rahm. In Rahm’s discursive representations of climatic architecture, scientism’s propensity for prediction, explanation, and control are explored. His use of meteorological representational conventions produces drawings with a great deal of explicitness, and very little room for interpretation and experiential insinuation. Conversely, James Corner’s use of eidetic operations in which he refers to “a mental conception that may be picturable but may equally be acoustic, tactile, cognitive, or intuitive,” results in an entirely different form of representation.¹⁸ Field Operation’s representations belong in the category of the ontology of epistemology because they exploit the common ground of natural and human cycles, bringing the concerns of ecological science into dialogue with the exigencies of human spatial practice.

Before considering the next new trend in architectural practice and theory, we need to escape the chokehold of scientism on the discipline. In order to have a rigorous discussion about what comes next, we need to eschew the allure of scientism and the seduction of technique that as we speak, are busy anticipating the next trend that looks alarmingly like the last trend. Is the discipline of architecture busy whittling itself down into a discursive monoculture, a mere shadow of its former self, or can we resist this vocational impulse and recover the subject of architecture in all of its ungainly diver-

sity? If scientism is the new black, what can we do to ensure that it is a fad with a very short shelf life?

ENDNOTES

- 1 Tom Sorrell, *Scientism: Philosophy and the Infatuation with Science* (London: Routledge, 1991): 25.
- 2 Steven Connors, < <http://www.bbk.ac.uk/english/skc/thinkingthings/> >, "Thinking Things," accessed 25 August 2008.
- 3 Bruno Latour, "Trains of Thought: Piaget, Formalism, and the Fifth Dimension" *Common Knowledge*, 6: 187.
- 4 Alberto Pérez-Gómez, *Built Upon Love: Architectural Longing After Ethics and Aesthetics* (Cambridge: MIT Press, 2006): 199.
- 5 Neil Spiller, "Digital Solipsism and the Paradox of the Great 'Forgetting,'" *Architectural Design*, no. 80, (July 8, 2010) 131.
- 6 Hannah Arendt, *The Human Condition* (Chicago: The University of Chicago Press, 1958), p. 154.
- 7 *Ibid.*
- 8 Richard Rorty, *Philosophy and the Mirror of Nature* (Princeton: Princeton University Press, 1979): 12.
- 9 Umberto Eco, *Travels in Hyper Reality: Essays* (New York: Harcourt, Inc., 1967): 6-7.
- 10 Robin Evans, *Translations from Drawing to Building* (Cambridge: M.I.T. Press, 1997): 156. Italics are mine.
- 11 Bruno Latour, "Why has Critique Run Out of Steam? From Matters of Fact to Matters of Concern," *Critical Inquiry*, 30, no. 2., (Winter 2004) 233.
- 12 Helen Castle, "Editorial," *Architectural Design*, 76, no. 2 (June 2006) 4.
- 13 Michael Hensel, "(Synthetic) Life Architectures: Ramifications and Potentials of a Literal Biological Paradigm for Architectural Design," *Architectural Design*, 76, no. 2 (June 2006) 25.
- 14 Penelope Dean, "Never Mind All that Environmental Rubbish, Get on with your Architecture," *Architectural Design*, 79, no. 3 (May/June 2009) 25.
- 15 Jane Rendell, "Architectural Research and Disciplinarity," *Arg: Architectural Research Quarterly*, 8, no. 2 (2004): 143.
- 16 Lorraine Daston, "The Coming Into Being of Scientific Objects," *Biographies of Scientific Objects*, ed. Lorraine Daston (Chicago: The University of Chicago Press, 2000), 1.
- 17 Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007), pp. 17-54.
- 18 James Corner, "Eidetic Operations and New Landscapes," in *Recovering Landscape: Essays in Contemporary Landscape Theory*, ed. James Corner (Princeton: Princeton Architectural Press, 1999), p. 153.