Hyperbolic Navigation

...In that Empire, the Art of Cartography attained such Perfection that the map of a single Province occupied the entirety of a City, and the map of the Empire, the entirety of a Province. In time, those Unconscionable Maps no longer satisfied, and the Cartographers Guilds struck a Map of the Empire whose size was that of the Empire, and which coincided point for point with it. The following Generations, who were not so fond of the Study of Cartography as their Forebears had been, saw that that vast Map was Useless, and not without some Pitilessness was it, that they delivered it up to the Inclemencies of Sun and Winters. In the Deserts of the West, still today, there are Tattered Ruins of that Map, inhabited by Animals and Beggars; in all the Land there is no other Relic of the Disciplines of Geography.

—Suarez Miranda, Viajes de varones prudentes, Libro IV, Cap. XLV, Lerida, 1658

Multilateration is a navigation technique of revealing an unknown location by plotting an infinite number of points based on the differentials in distances between three known locations, forming a series of intersecting hyperbolic curves. When temporal differentials are associated with the pulsation of these curves, a small number of possible locations for the unknown are discovered. Cultural theorist Peter Sloterdijk posits that contemporary creative thinking necessitates abandoning polemic dualisms, which result in hybrid reality technological advancements, and is convinced that thinking must engage the ‘hyper-complexities’ of elastic horizons. Seeking to integrate historically erroneously detached territories provides fertile potentiality for revealing emergent manifestations of coexistence. Although centered upon humanism, the Renaissance discourse and fluidity empowered invention by mobilizing its polymaths (DaVinci, Michelangelo, Galilei, etc.) through simultaneous acceleration of the arts and sciences.

Akin to the mode by which perspectival space was originally conceived during the Renaissance, through the mathematization of psychophysiological visual space, we must also acknowledge potential invention of similar significance resulting from the transliteration of psychophysiological thermodynamic and metabolic space. While it is inherent that the emergence of the visual perspective coincided with humanist origins, the extent of cultural impact remains intrinsic to and within the realm of human systems. Art historian Erwin Panofsky observes a resistance and questioning into the basic concept of Renaissance most vigorously by those who are not obligated to professionally engage in the aesthetic aspects of civilization, citing in particular those from the natural sciences. Renaissance humanism was, in a sense, a reaction to

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2 Elastic horizon: a notion of conceptualizing presented by Steven Holl in collaboration with Alberto-Perez Gomez, which enables the humanist imagination to extend into global and cosmological awareness.
3 Erwin Panofsky. “Perspective as Symbolic Form” (1920).
medieval utilitarian educational frameworks emphasizing practical, pre-professional, and scientific studies, shifting focus instead to the humanities and arts. It is indeed congruous that the validity of the concept of sustainability is perhaps challenged most intensely by those who are not obliged to take a professional interest in the environmental aspects of civilization, yet most fully engages scholars and researchers of the natural sciences.

Sustainability embryonically emerged with the naturalists, scientists who examined the degrading structures of landscapes and biological entities with regret for human involvement, a particular pathos that was a new phenomenon beginning in the nineteenth century. This pathos resulted in an advocacy for the anastylosis of nature. Not coincidentally, the emergence of ecology as a discipline occurred around the time when Ernst Haeckel originally coined the term in 1870. This was a departure from the discipline of biology due to its focus on the interrelating processes, including intrinsic and extrinsic factors, influencing the patterns of living organisms. The culturally constructed discipline of sustainability formalized almost one century later through the UN World Commission on Environment and Development originating with the issuance of the Brundtland Report. The three epistemological domains of sustainability, including ecology, economics, and social equity, commenced as equivalently weighted aspects within the conceptual framework. However, more recent frameworks are evolving towards placing the cultural domains (economics and social equity) within a primary dependency upon the ecological realm – consisting of deepening the understanding of metabolic and thermodynamic flows between human and natural systems.

The Building Research Establishment Environmental Assessment Methodology (BREEAM) was the earliest initiative from a built environment discipline to respond politically to the 1987 Brundtland Report. The ultimatum of BREEAM building environmental performance criteria is based on a goal for carbon emissions’ reduction. Subsequent establishment of the U.S. Green Building Council occurred in 1993, an entity that coordinated the efforts of Leadership in Energy and Environmental Design (LEED) with the support of the National Resources Defense Council. Many of the measures and metrics established in both BREEAM and LEED operate fundamentally on an accounting methodology. Not coincidentally, the science of economics derived in part from energy accounting, and energy currency is the longest continuously traded stock in

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5 Haeckel’s definition of ecology, incidentally, is ‘the science dealing with the economics of nature.’
7 Philosopher Hannah Arendt anticipated this conceptual framework by means of comparative delineations between labor (ecology), work (economics), and action (social-economy) in her 1958 theoretical work “The Human Condition.” In addition, Manuel DeLanda adapts this conceptual framework in “A Thousand Years of Nonlinear History” (1997) by theorizing a biological history (flesh and genes), a geological history (lava and magmas), and a linguistic history (memes and norms).
8 BREEAM was initiated in the UK in 1988 and formally founded in 1990.
9 LEED building rating systems were launched in the US in 2000, a decade after BREEAM.
No cultural or intellectual movements, whether embedded in humanistic, political, or scientific dialogue, are permanent – all are transitory, providing contextually-based thought and idea that informs continuums of reaction, new influences, shifts, and non-linear changes. Debord acknowledges a constant struggle between tradition and innovation, indicating that the principle of internal cultural development of historical societies is dependent on the permanent victory of innovation, but also warning that the fraud of satisfaction is exposed by such changes. While scientific documentation and research are necessary for the contribution towards collective comprehension of the externalities of the built environment, architects must acknowledge that transcendence from such pedantry towards poetic intentions is not irreconcilable with architecture.

The integration of sustainability into a pedagogical framework does not imply an intention for symbolic outcome (sustainability positivism) through the application of prescribed design strategies and technologies, but rather a shift in methodology towards open-systems’ thinking and transdisciplinary fabrics. This paradigm shift in methodological framework also does not imply a dilution of the disciplinary integrity of architectural design, but rather an enhancement for fostering contextual solutions in response to future-oriented global perspectives through iterative and sedimentary design processes. Architecture operates within a cultural domain: the introduction of

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11 Total Gross Domestic Product of any given country stabilizes at a constant in steady state economies.
12 Guy Debord posits the “the economy transforms the world, but transforms it only into a world of economy.” (Society of the Spectacle, 1983: p.40). For instance, in the Capitalist paradigm of society, we observe the impact of such economic theory as an undercurrent of how architecture is shaped and formed, with specific reference to the proliferation of glass curtainwall skyscrapers with vast internal floor plates as objectives of maximizing leasable square footage.
14 In kind, census data documentation and research are necessary for the contribution towards collective comprehension of the externalities of social equity.
15 Nor does the integration of sustainability principles in design practice imply an outcome with a determinant syntax, language, or semiotic, as the narrative of engaging architectural design should always be founded in less predictable poetic spirituality and metaphorical interpretation.
sustainability concepts into the practice of architectural design should not limit the outcome to solely functional and quantifiable reductionisms, nor should this limit the outcome to a generalization through a large global narrative. Both cases avoid engagement in a relevant cultural project. While much criticism exists for the didactic nature of technological artifacts that result from isolated design procedures of scientific rationalism, social philosopher Pierre Bourdieu suggests, “that a ‘scientific’ analysis would have the effect of intensifying, rather than rejecting, artistic understanding and experience.” In addition, even the process of objective scientific analysis, or the scientific method, is understood to be no less a Homosapien-centric inquiry into discovery than historical, socio-cultural, or artistic endeavor. The long-standing polemic, therefore, between the ‘subjectivity’ of the arts and the ‘objectivity’ of science has lost much of its relevance.

More useful eristic discussion for architecture is perhaps a renewal of the Beaux-Arts debate of parti vs. rendu, challenging conceptual thinking between proposals for a physical reality versus evocation of an expression. Or perhaps the critical distance, logical thinking, and individualistic sublimity of the Apollonian vs. the emotional appeal, chaotic empiricism, and holistic unity of the Dionysian are a fruitful dialectic. Yet in both cases, neither can be valued more than the other if we accept that our existential being (and architectural expression as an extension of this being) is somehow determined through any comparable cogitation. Nietzsche opposes Socratic rationalism and its infusion of ethics, favoring instead the adversity found in the fragile balance of the Apollonian and Dionysian. And while we perceive the Dionysian to magnify human experience, the complexities of this encounter in fact emphasize harmonious unification, just as entropy exhibits increased disorder and eventual stable state equilibrium.

Frampton’s critical regionalism theory, both Marxist and phenomenological, is anticipatory of sustainability – conceiving geographic regions as perceived culturally and materially closed systems – encouraging architectural practice to engage in these place-based specificities and to limit the application of ubiquitous building technology. The discourse of sustainability, however, tends to default to globally-framed rationalisms as intentions for local activism, setting a misunderstood basis of an ideology rather than a foundation for meaningful contribution to the field of architecture. Science encourages transparent cross-sections through multi-scalar correlations, seeking demystification of divergent magnitudes. The Eames’ “Powers of Ten” dissection reaffirms this fascination for design disciplines. Transdisciplinary contextual analyses are a translation of the inter-scalar cross-section as genesis for making sense out of life’s complexities, as is a historian’s cross-section through time.

18 “Towards a Critical Regionalism: Six Points for an Architecture of Resistance” was published in 1983, four years prior to the Brundtland Report.
Multilateration of each of these dimensional transects in turn provides the groundwork for emergent discovery and innovation. This methodological approach is certainly open for appropriation by technocratic eco-capitalists, but that should not discount the ethical nucleus of sustainability. Sustainability pedagogy is a practice of educating visionaries in their respective disciplines. Contrary to the artistic, literary, and political movements of the Italian and Russian futurists, which sought to fervently reject the past and embrace violent speeds of change associated with Fascist aestheticization, sustainability engages peaceful parabolic spatiotemporal wavelengths. The scientific management and analysis of synthesized workflows prevalent in Fascist politics lingers in the 20th century sustainability context through nationalistic objectives of energy, economic, and labor efficiency metrics, but this is rapidly shifting towards an ecocentric qualitative efficacy emphasis based on regional multilateralism.19

Contemporary disciplinary conservatism tends to preference historic architectural texts (Vitruvius, Alberti, Palladio, etc.), which establish early delimitations of architects’ design process considerations, including aspects of climate and materials, but excluding integration of a global physiology of increased complexity. Darwin’s theories exhibit the inherent evolution of organisms from simple, single cell entities, to the more complex. In concert with the survival of the fittest (best performance Apollonian order), chance mutations are dependent upon the subjective lens of designers (Dionysian fantasticism). Just as life is essentially the transmutation of energy and matter,20 “architecture can be understood as a material organization that regulates and brings order to energy flows; and, simultaneously and inseparably, as an energetic organization that stabilizes and maintains material forms.”21 Critical of the social advantages of pluralism as a dissipation of the architect’s convictions, architect Vittorio Gregotti warns against the expulsion and self-exclusion “from our own universe of specific expertise (traditionally) called upon to give meaningful form to the available techniques for transforming the physical world.”22 The role of the contemporary architect’s imagination as a depository of universal truths (neo-Platonist, romanticist, surrealist, etc.) is to envision a hypothetical, potential, non-existent repertoire in coexistence with scientific knowledge. Multilateration serves as a contemporary method to inform efflorescent techne for evolutionary physis.

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19 This shift is revealed through emergent discourse on energy, exosomatic artifacts, and health and well-being emphases.
As environmental designers, we have extremely limited control over evolutionary timeframes. Nevertheless, we must comprehend contemporary global dynamic forces, complexity theories, and inter-scalar relations pertinent to regional perspectives in order to invent efficacious architectural cultural currency. Even Kant’s philosophy on aesthetics, which is centered upon a subjective understanding of Platonist rationalism and ideas, clearly identifies with an extrinsic finality – pleasure and aesthetic judgment are inextricably dependent upon direct experience of an empirical representation. Great architecture succeeds at the synthesis of multiple criteria simultaneously through a subjective and cultural lens. Choreography of projective and anticipatory design intentions, whether filtered through dystopian or utopian futures, seeks territories beyond sustainability and transcend into entropic realms of ideals and meanings. Implementing sustainability principles within an architectural studio curriculum should not be misinterpreted as a device for ideological institutionalization. Rather these theorems should stimulate intellectual synergies for critical and theoretical inquiry within the process of design. Process manifests within technique, craft, and the act of making. Process evolves amidst a continuum of technological shifts, and technology itself becomes the basis upon which history and nature intersect to facilitate critical cultural artifact.

Symbiosis is at once conjunctive and disjunctive. The iconicity of architecture in service of cultural agendas of global capital need not ignore the problems of socio-contextual organization and ecology, or the depth of material logic and affect, as neither is an implicit disavowal of form. Further, historical positioning of culture as protagonist and nature as antagonist (as well as traditional binary structures such as LeCorbusier’s mechanism vs. Wright’s organicism) is obliterated and obfuscated through contemporary multilateral techniques. Kevin Lynch instructs that buildings and cities are neither machines nor organisms, and states it is culture that stabilizes or alters the habitat system, even though collective cultural preferences remain persistently unclear. On the other hand, Lewis Mumford stresses the inseparability of the organism and the machine and advocates the relevance found in knowledge assimilation of this bond.

Theoretical multilateralism can be found in Ruskin’s criteria from “The Seven Lamps of Architecture” (1849) as a codification of Gothic Revival influence, including: sacrifice, truth, power, beauty, life, memory and obedience – the seven moral categories that Ruskin considered vital and inseparable from architecture. Italo Calvino, the Italian

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fiction author, identifies five literary values in his 1985 memos, including: lightness, quickness, exactitude, visibility, and multiplicity. Inspired by such individuals’ interpretations of relevant contextual disciplinary values, the CAPLA School of Architecture task force for sustainability pedagogy proposes an adaptation of the Living Building Challenge (LBC) framework, informed by the collective intellectual depth of contemporary interdisciplinary sustainability research. The multilateral values outlined in the LBC include: site, water, energy, health, materials, equity, and beauty.

Now the work of art also represents a state of final equilibrium, of accomplished order and maximum relative entropy, and there are those who resent it. But art is not meant to stop the stream of life. Within a narrow span of duration and space the work of art concentrates a view of the human condition; and sometimes it marks the steps of progression, just as man climbing the dark stairs of a medieval tower assures himself by the changing sights glimpsed through its narrow windows that he is getting somewhere after all.

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29 The “Living Building Challenge,” launched by the International Living Future Institute in 2006 in Canada and the U.S., with a thesis of catalyzing a global transformation towards sustainability, is the most recent of sustainable building certification programs with attempts at more holistic measures than prior rubrics.