Homeorrhetism

FEW OBSERVATIONS ON THE NATURE OF EXPERIMENTATION IN COMPUTATIONAL ARCHITECTURE

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"There is just no calculus for metaphors."

-Nicholas Negroponte[1]

Nearly 40 years after the publication of Nicholas Negroponte's "Soft Architecture Machine", the experimental nature of computational architecture continues to raise questions related to our perception of the architectural object, and in particular the way it expresses the instability of our world. For Negroponte, two prevailing models define the relation between the object and its environment. The first is qualified as "problem solving" and engages with the building of models that view the world as a set of well-defined parameters. These context-oriented parameters continuously compose, decompose and recompose our perception of the world while assuring a "comprehensive whole". The second model is coined as "problem worrying" and takes in consideration the meaning of the context in which the experiment takes place. Here, past experiences, learning processes, sensory control and psychological stimulus between man and machine are seen as primary sources of interaction. As Negroponte acknowledges, it is rather difficult, if not severely simplistic, to classify experiments in computational architecture solely on such bipartition. And yet, in the following notes on the nature of today's experimentation in computational architecture, I propose to assess the relation between these two models, which I would call respectively deductive and inductive experimental models. This consideration is crucial today if considering the persistent dialogue between morphogenetic models and atmospheric desires that inhabit the world of digital architecture since the first experiments of Ivan Sutherland.

From the point of view of computation, concerns over the nature of an experiment raise questions that often belong to a deductive reasoning; in other words the possibility to understand the world in terms of established principles and theories: What kind of information should be extracted from our environment? What would be a comprehensive system of information that reflects the complexity of our world? How can one assure objectivity in the building of a model?

In contrast, the experimental context of architecture calls for a different set of questions: How can a model convey the meaning of our world? What kind of effect is the model supposed to create? Why a particular model is more likely to express the condition of a culture versus another?
Here, concerns over the inductive nature of the experimental protocol prevail, or in other words, the questions do not call for fixed principles but a range of possibilities often related to the cultural, social and even political sensitivity of the experimenter.

These distinctive sets of questions therefore range from deductive to inductive experimental approaches. Most importantly, they express the essence of the now established field of computational architecture and its capability to propel a confluence of knowledge; a form of transdisciplinarity that oscillates between architecture's core knowledge and its disciplinal periphery. While both deductive and inductive assumptions are pre-requisite to operative experimentations, the question remains as to the principles managing their confluence.

In one of his last letters to his friend Maurice Solovine, Einstein diagrammed the nature of scientific experiments according to two streams of information[2]: The first described the deductive approach as a series of vectors flowing from a condensed set of axioms, decompressing into a series of inferred propositions that finally constitute the vast field of immediate experimental senses. The second stream described the inductive approach to experimentation. Here, the information flow got reduced to a single vector that ran from the field of experimental senses back to the field of accepted axioms.

From the point of view of our analysis on the role of deductive and inductive processes in experimental architecture, Einstein's diagram offers a model by which accepted principles (e.g. mathematical and physical laws) and observations (e.g. far-from-equilibrium and statistical systems) are not distributed according to a dialectical position but are rather part of a feedback loop where operations of various natures interact and influence the distinct domains of universal laws and phenomena. This system characterizes the surfacing of an alloy of hybridized information embedding determinism and uncertainty, principles and observations, laws and phenomena, reductionism and emergencism, calculus and metaphors.

This hybridization marks a reversal of Jean Piaget's description of experimental sequence according to which observations often lead to the building of abstract principles.[3] In contrast, computational architecture is engaged in the "geometrization of information,"[4] that is, a reversed movement originating from linguistic modes of abstraction and leading toward spatial representations. It is in this context that the act of "computing" the object, or more precisely its potentiality, should be perceived as a new practice in architecture. It indeed marks an epistemological shift according to which a new nomenclature largely inspired by the sciences is introduced. One of the most obvious expressions of this shift is found in the almost obsessive reference to terms such as "emergence", "organism" and "homeostasis" as a way to describe the experimental model. Reference to such terms is not coincidental if considering the model as an organism, rather than a system,[5] that is increasingly engineered to act on and react to a multitude of information processes.

Referring to the terminology of the French philosopher Michel Serres, the architectural model thus conceived is homeorrhetic;[6] or in other words, it acts as an open source that is formed by information torrents.[7] These torrents continuously transform and influence its existence, similarly to a living organism. Standing at the crossing of these highly meshed energetic flows, computational architecture engages with reinforcing its own identity as a discipline while assessing information across other domains of knowledge as an irreversible process of disciplinary erosion. Computational architecture is foremost an activity in constant instability, evolving according to countless experimental points of bifurcation. Its activity epitomizes a dissipative character that results from the intrinsic nature of information that is neither solely deductive nor inductive but operative. A nature that is neither artificial nor virtual but abstract. An homeorrhetic nature as Michel Serres describes.

It is precisely this homeorrhetic nature that is scrutinized by the participants of this panel on 'integrating diverse information". Using distributed technological operators that are both empirical and intuitive, the participants to this panel describe our reality using agent based models, multi-objective principles of optimization, biological analogies, distributed technologies, multimedia interactions and automated protocols of fabrication among others. All of these models are homeorrhetic in some capacities because they express our reality in terms of potentialities that stem from deductive and inductive experimental principles. These various models exemplify the influencing role of computation on architecture, namely its capacity to transform the object from a state of "being" to one of "becoming."[8]

Notes

1. Nicholas Negroponte, "Soft Architecture Machines" (The MIT Press, 1975).

2. C. H. Von Baeyer, "Information – The new Language of Science" (Harvard University Press, Cambridge, Mass., 2004),136.

3. Ibid., 35.

4. Ibid.,23.

5. M. Serres, "The Origin of Language: Biology, Information Theory and Thermodynamics" in "Hermes – Literature, Science, Philosophy," eds. J. V. Harariand D. F. Bell, , (The Johns Hopkins University Press, Baltimore, Maryland, 1982) , 74. See the editor note: "The word system is abandoned because of its origin in the Greek verb histanai, to cause to stand."

6. Ibid.,74. See the editor note: "The word homeorrhesis is formed from the Greek words Homos, meaning "same" and rhysis, meaning "flow". Serres replaces the normal term describing the equilibrium of a self-regulating system, "homeostasis" by "homeorrhesis" in order to emphasize the idea of continual movement and exchange as opposed to the less dynamic idea of statis."

7. Ibid., 74.

8. Ilya Prigogine, "From Being to Becoming" (W. H. Freeman:San Francisco, 1980).