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Technique as Method

> I have a life size map of the world, but I don't know where to put it.
> –Comedian Steven Wright

> The world is its own best model.
> –Rodney Brooks, *Intelligence without Representation*

The humor of comedian Steven Wright is that in one sentence he captures the irony of everyday life.

It is funny because there is truth in it, and I cannot help but link Wright's irony with our current technological models. In suggesting "the world is its own best model," Rodney Brooks is working against the technological model of creating virtual maps of the world by suggesting an alternate view that intelligence is situated and embodied, a "dynamics of the interaction with the world."[1] Developed through his mobile robots at MIT's AI Lab, Brooks shifts technological attention from mechanism to behavioral interaction. Brooks questions the very foundations of technological thinking in representational models or so-called expert systems, suggesting the thinking hasn't changed, only the technology has advanced, giving the impression that one's thinking is evolving. Questioning the foundations of technology is what this paper is about. My interest here is not robots, nor necessarily technology, but means to increase interaction between agents, artifacts and the environment as the foundation of human experience. As will be developed, the philosopher Henri Bergson suggests that the aspect of manufacturing artificial objects, particularly tools to make tools, and indefinitely varying their manufacture is so central to human intelligence that he proposes to replace the designation of our species from *Homo sapiens* to *Homo faber*.[2]

The outcomes of a second-year studio presented last year concluded that technique is not simply the application of skills, but involves intention, criticality and improvisation where technique is not a function of thinking then making, but thinking through making.[3] This research paper continues from these statements finding overwhelming support for thinking through making from other fields of inquiry from philsophy, sociology, neurobiology, and embodied cogni-

tion. What is unique about the relation between these different fields and their tie to architectural pedagogy is that they exemplify one simple point: *action precedes cognition*. In many ways it seems that I have simply found support for what I have *intuitively* felt all along, only now, linking it to *explict* knowledge from other fields is doing precisely what this paper is about—*making the implicit explicit*. Making the implicit explicit suggests that design is a mode of research at the point that we are able to connect what we do with larger sociocultural experiences and issues. While technique is certainly bound in process or action, technique *as method* intends to tie tacit and implicit actions with propositional objectives.

Architectural Context

As technology has become ubiquitous in architectural practice and most schools, and furthermore, as digitally-driven fabrication technology has forged connections between the digital and material, there has been a great deal of talk about technique in theoretical discourse and its relationship to design research, perhaps best illustrated by Foreign Office Architects *Phylogenesis*. Michael Speaks has challenged the higher status of theory calling for a focus on innovation through "design intelligence" in which "practices are the techniques, relationships, intelligence, and disposition that shape design" as these very practices encourage risk taking as opposed to problem solving.[4] James Corner adds a delightful proviso to Speaks' "design intelligence" where material techniques are the material matrix from which strategic techniques play out.[5] A general conclusion could be drawn that material technique is the foundation for strategic techniques, but material techniques only become innovative at the point they tie into strategic techniques. Similarly, Michel de Certeau in *The Practice of Everyday Life* distinguishes between two "logics of action" of strategy and tactics. Similar to material techniques, tactics form the bedrock of strategic actions in which "tactics in general form *a field of operations within which the production of theory also takes place*."[6] Certeau's central concern is on the relationship between discourse and action in which the overemphasis on scientific method has "progressively overturned the relationship between knowing and doing" in which discourse legislates action.[7]

Inverting Method

In the chapter entitled "Theory in Relation to Method," in *Architectural Research Methods*, Linda Groat and David Wang suggest that research methods are "a way to verify or test theories."[8] Furthermore, these theories are drawn from a larger pool of philosophy. The diagram they draw is so familiar in terms of scientific method, it likely isn't questioned (figure 1). But is this design? Certainly this is the central concern of their extensive work, and this is not intended as a critique. As evidenced here, I am influenced by philosophy and theory, but I do not suggest that practice proves theories derived from philosophy, but rather, effective theories are developed through experience. As a result, I ask a simple question: what if we invert their diagram (figure 2)? What if we begin with tactics, generalize to strategy and develop theory from there as it seems de Certeau would suggest? Technique as method may be a more fitting research strategy for the design studio, particularly as the design process is not prescriptive, but one of problem discovery. Rather than fitting design research into a restricted mode of scientific research, this paper follows Ranulph Glanville that design is a mode of research.[9] Glanville argues for an increase in know-how, as opposed to know-what, and in a recent conversation has suggested a further development from know-how to know-for, or knowledge-for-action. However, where technology is concerned, it seems know-how is quickly turned into know-how-to-do, or a series of procedural steps without any connection to larger objectives. It is also clear that technique, or practical knowledge, without larger propositional objectives, folds back on itself, becoming a self-proscribed circle in which the work is about technique which only follows from the technology being employed. Yet, this weakness also provides a proscriptive criterion to test the validity of technique as method: that technique does not become a description of the procedural steps taken. Rather, the subtle shift from know-how to know-for is congruent with technique as method—linking know-how, or technique, with know-for, or method. So what might that *link* be? I suggest that it simply may be feedback, which stems from the cybernetic perspective from which Glanville writes, which consequently originates from the very technological development which we now take to be ubiquitous.

Cybernetic Perspective on Method

Cybernetics is not a unified field or discipline, but represents a consortium of philosophers, mathematicians, biologists, psychologists, cognitive scientists and sociologists, which are generally bound in an epistemological shift moving from ideal static types or states with origins in Platonic thought, to active processes relating internal and external systems. I do not

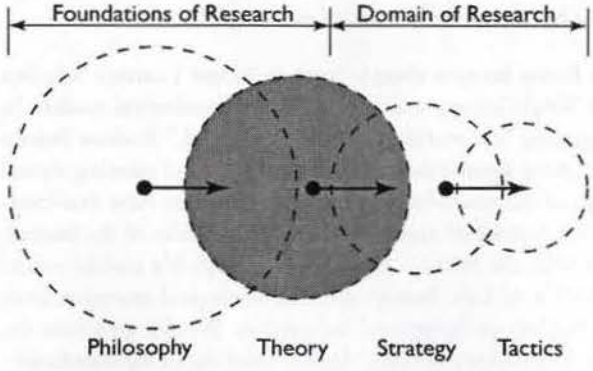

fig. 1 Philosophy = Theory = Method.

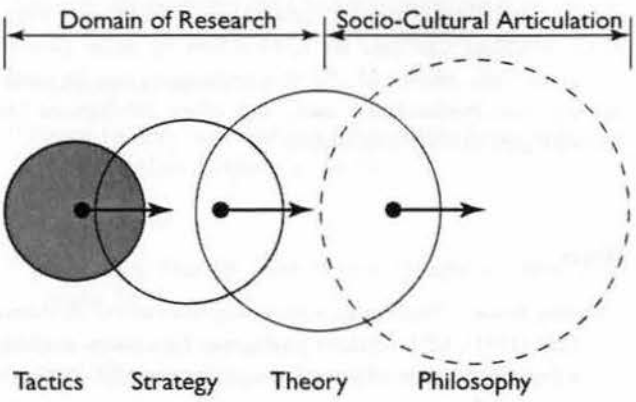

fig. 2 Tactics = Strategy = Theory.

wish to follow cybernetics too closely, as its theories are as nuanced as its authors; however, there are a few general principles that affect the relationship between method, technology and human understanding.

Norbert Weiner is often cited as the founder of the term cybernetics through his book *Cybernetics: or the Control and Communication in the Animal and the Machine.*[10] One of Weiner's principle contributions is the idea of negative feedback shifting from pre-programmed mechanisms to creating feedback loops correcting the difference between the desired goal and the actual condition. Said another way, the shift in technology is not in the mechanism itself, but the means to relate the mechanism with the world: *technology becomes about the communication of information in time.*

An interesting application of cybernetic thinking in computer graphics is the program Logo developed by Seymour Papert (which I was quite good at in elementary school). Papert follows closely from Weiner's trajectory and sums it up in a simple phrase: making best use of limited knowledge.[11] Unlike Weiner's technological focus, Papert's mentor was psychologist Jean Piaget, and consequently, Papert's focus was on human behavior, and education in particular, enabled by technology. Papert, following Piaget, proposes that to understand is to invent: when technology enables invention, or innovation, it becomes tied to human cognition. Papert suggests that this cybernetic view is not simply mechanically different, but is epistemologically different, or what Weiner described as the turn from a Newtonian or mechanical view of the world, to a process or time-based view of the world, which he terms Bergsonian Time.

Bergsonian Time and Intuition

The philosopher Henri Bergson wrote *Creative Evolution* about 50 years before the first conferences on cybernetics were held, and yet the epistemological shift he sought is largely congruent with the cybernetic epistemology. Duration is the central theme of time in Bergson's work, which is concerned with active processes. This is not process in general, as in "the design process," but rather those specific moments, those intervals in which improvisation occurs. Thinking, for Bergson, is thinking through matter, in which duration cannot disassociate the "theory of knowledge" (general concepts) from the "theory of life" (action). Duration is a circular process between action and representation that "push each other on unceasingly" reciprocating between instinct and intellect in which *our actions do not play out our thoughts any more than our thoughts evolve from our actions.* Duration then supports the inversion of scientific method, not as opposed to it, but as another way of working through process.

Furthermore, this Bergsonian view ties technique to method through intuition. Intuition, like improvisation, is a word that is frequently used in design education and for good reason; intuition seems to be many things to many people but most of all is casually used as synonymous with instinct. For Bergson, intuition is distinct from instinct, and this distinction is the inspiration for technique as method. Intuition is central to Bergson's method as the go-between of instinct and intellect: "by intuition I mean instinct that has become disinterested, self-conscious, capable of reflecting upon its object and of enlarging it indefinitely."[12] And while it would seem this intuition leans toward instinct, Bergson also continues, "without intelligence, it would have remained in the form of instinct, riveted to the special object of its practical interest." In this way, instinct pulls intuition to material action, and yet, the intellect pulls intuition toward a conscious reflection of its actions. If intuition is thought to be instinct, it conceals the very reciprocal process by which material practices lead to propositional knowledge. It is the leaning of intuition toward intellect as *a conscious reflection of action* that method can give validity to technique—shifting technique from simply being instinctual habit by tying it to a larger picture.

Action and Cognition

Returning to the cybernetic view, and moving from Weiner's mathematical influence to Papert's pscyhological influence, a transition to learning through technique can be made through Humberto Maturana and Francisco Varela's biologically-inspired approach to cybernetics, whose work at times seems like a seamless development of Bergson's *Creative Evolution.* Varela and Maturana follow from Bergson's reciprocity between action and knowledge quite explicitly: "All knowing is doing; all doing is knowing."[13] What they call "walking on the razor's edge" is closely linked to my motivations here, in which they wish to "walk" between the absolute objectivity of a knowable world and the total arbitrariness or relativism of anything possible.[14] Like Bergson, their concern over representational models is that they blind the

possibility of moment-to-moment behavior of organic systems, which conceals the actuality of social interaction, the potential of unforeseen actions or improvisation, and how the environment influences actions. Through their biological background, they show convincingly that action is tied to cognition through sensori-motor coupling. Distinguishing between the automatic actions of the most basic single-celled organism in which the sensory surface and the motor surface are one and the same, and complex organisms which link separate sensory and motor surfaces processed through neuronal networks and transmitted through the nervous system, they show that the very seat of human consciousness is based on an internal reciprocity between sensory and motor activity (internal system) and the reciprocity between this internal system and the environment (external system).[15]

This may seem obscure until we compare it to certain preposterous statements like "I think, therefore I am."[16] It also suggests that when a student says they have it all "worked out in their head," and now just need to do it, they have nothing but a trace of an idea, but who could know if it's stuck "in their head." Or worse, a student cannot sit idle "waiting for an idea." Ideas are not simply found as much as they are actively developed and uncovered; *ideas are relations.*

Most significantly, Maturana and Varela show that our most basic actions, even walking, are learned from a social and environmental context and are not biologically inevitable. We do not simply "take in" information from the environment, but actively explore it through "structural coupling." This is fundamental to learning, as knowledge is not received, but develops through observing change in behavior between an organism and its environment in a realm or domain defined by a question, either implicit or explicit.[17] Therefore technique offers a means of invoking change, of actively exploring one's actions and their effects on an environment, but can only become knowledge at the point that a question is involved, coupling method, or objective, to technique, or action.

Technique is not Magic

Technique is thought to be tricky, slight of hand, in fact tied to "magic" through mythology.[18] Instead of suggesting a magical component of technique, de Certeau reminds that our practical actions are connected to narration, which is distinct from description.[19] Making the implicit explicit may reveal that our techniques are not based on anything but the technology we are using, which suggests we have only gathered the techniques required, but have not yet set out to innovate from this foundation. Alternatively, when we are able to tie material technique to larger socio-cultural issues, I think we will find we are no longer talking about technology. It is only when we are able to structurally couple our techniques with larger socio-cultural issues that technique can tie to innovation and working through collaboration. Perhaps this pragmatic tendency can best by summarized by John Dewey: "Practical skill, modes of effective technique, can be intelligently, non-mechanically used, only when intelligence has played a part in their acquisition."[20]

Notes

[1] Rodney Brooks, "Intelligence without Representation," *AI Memo 1293* (1991), MIT Artificial Intelligence Laboratory, available at http://www.ai.mit.edu/people/brooks/papers/AIM-1293.pdf

[2] Henry Bergson, *Creative Evolution* (New York: Dover Publications 1998): 139.

[3] Mark Cabrinha and Keith Wiley, "Making is Thinking: Emphasizing Inquiry Through Technique in the Beginning Design Studio," *A Beginner's Mind* (Proceedings of the 2003 NCBDS San Antonio) to be published.

[4] Michael Speaks, "No Hope No Fear," *Architectural Research Quarterly* 6/3 (2002):209-212, see also "After Theory," *Architectural Record* 6 (2005:) 72-75.

[5] James Corner, "Not Unlike Life Itself," *Harvard Design Magazine* 21 (2004): available at <http://www.gsd.harvard.edu/research/publications/hdm/back/21_corner.pdf>

[6] Michel de Certeau, *The Practice of Everyday Life* (Berkeley: Univ. of CA Press, 1988): 78.

[7] Ibid., 65.

[8] L. Groat and D. Wang, *Architectural Research Methods* (New York: Wiley) 75.

[9] Ranulph Glanville, "Researching Design and Designing Research," *Design Issues* 15/2 (1999): 80-91.

[10] Norbert Weiner, *Cybernetics: or the Control and Communication in the Animal and the Machine* (Cambridge: MIT Press, 1948, 1965).

[11] Seymour Papert, *The Children's Machine: Rethinking School in the Age of the Computer* (New York: Basic Books, 1993): 185.

[12] Bergson, 176-8.

[13] Humberto Maturana and Francisco Varela, *The Tree of Knowledge* (Boston: Shambhala Publications, 1987): 26.

[14] Ibid., 133.

[15] Ibid., 142-176.

[16] And let's also not forget that Descartes came to this in his *Discourse on Method*, one of the foundations of scientifc method!

[17] Maturana and Varela, 174.

[18] Patrick Harrop, "Agents of Risk," *Fabrication* (Proceedings of the 2004 ACADIA Conference): 66-75.

[19] De Certeau, 79.

[20] John Dewey, *How We Think* (Boston: Houghton Mifflin, 1933, 1988): 63.