Embodied Design Thinking

Jerry Diethelm - Nov. 2017

One way of thinking more generally about design is to focus on the nature of the thinking that takes place in designing, what it is, how it works, and what it is especially good for.

There is a growing awareness that the collection of processes that we associate with design thinking can be strikingly effective in resolving complex situations, especially those that require imagination, creativity and innovation.

What is there then that is special about design thinking? How does it appear to differ from other kinds of thinking? Answering these questions will require the revisiting and rethinking of some of our taken-for-granted beliefs about thinking itself.

The path of inquiry here is to follow what has been called design thinking into its social-cultural habitat, the overlapping realities of the transformative situation; locate design thinking's metaphoric roots in mind and meaning; and explore some of the implications of the design thinking presence in complex systems.

Situations

In "The Bascombe Valley Mystery," Sir Arthur Conen Doyle wrote that, "There is nothing more deceptive than an obvious fact." And the mystery here is why the obvious fact that situations that arise in human experience are far from being primarily and predominately factual is not well-understood.

It was John Dewey who insisted upon and wrote about the essential qualitative nature of a situation. He described how each person brings to a situation, not just their Enlightenment logic and reason, but emotions and feelings, their tribal allegiances and trappings and all of their human needs and motivations, including the ones that we purposefully hide and those that are unconsciously hidden from ourselves.

Situations are instead, pro blema and pro balein - problematic social circumstances of a time and place thrown forward into human attention. They arise into arenas of qualitatively different experience, where competing interests and concerns need to be collaboratively brought into focus. It is from working through these occasions of difference and impasse that situations are made manifest and pressed forward for resolution and action. They arise out of a shared history that has arrived at a pressing need for change. And socially ripened, they send imagination energetically forward into the world of something better.

Ends and Means

In thinking, it would seem obvious that we align and aim our thinking toward different ends. And it would also appear that those ends justify (in the sense of strategically directing) their own means, that they target ends purposefully, and filter and edit situational content from their own point of view. In situations where the target is, for example, empirical knowledge, how things are and how they work, irrelevant cultural content can be and is strategically brushed aside. From an angstrom-scaled perspective, Homer's "wine dark sea" simply doesn't cut it. From a police procedural perspective, it is information pointing to an understanding of motive, means and opportunity that gets the priority pass. The focus of attention in situations quite naturally shifts to and sifts for the quality relationships that are of the highest value to their target.

Design thinking has its own distinct target and situational flavors. Its signature end is cultural transformation, the purposeful changing of unsatisfactory conditions and the unfulfilled yearnings, hopes and desires of a people, time and place into something satisfyingly better, fresh and new.

Transformational situations come in several emotional flavors. First, there is the emotional turning point from present dissatisfactions to hopeful conditions.   Second, there is the satisfaction that comes from achieving a common commitment to quest for something better, for a shared ideal, a new novel, a new product, a better policy, a new plan. And third, there is the excitement of imagination and the possibility of possibilities blending, merging and integrating into something new.

In design thinking, empirical knowledge, with its own target ends and means, becomes a supportive and enabling partner in transformation. Transformation rests on the knowledge that makes the desirable possible and sustainable - the economic knowledge that makes it feasible - the organizational knowledge that gets it done. And because design thinking's target is located in an evolving human culture, all the anthropological and ethnographical dimensions that had been strategically irrelevant in knowledge making purely for the sake of knowing return to center stage.

Thinking, Embodied Thinking…

In the popular view, thinking is what goes on in the brain. It is presumed to happen at the top end of a Cartesian dualism, to be at center stage in Herman Hesse's magic theater, or isolated somewhere inside the likes of John Crowe Ransom's "Painted Head." This taken-for-granted view of a command center for thinking in the brain persists even though more recent neuroscience agrees with Albert Einstein, that the experience of an interior and isolated thinking is an "optical delusion of consciousness" long past its sell-by date.

Cognitive science instead tells is that thinking is embodied and environmental, a whole-body-world information processing phenomenon. We are aware of - and have control over - only some of what is being continuously coordinated through the remarkable body partnership of blood, brain, nerve, lymph, skin, muscle, visceral and skeletal systems. The survival origins of this holistic system becomes very apparent when someone accidentally dumps coffee in your lap and you act before you've had a chance to "think" - and then come to realize that it is the part of thinking that we are aware of that has followed the body-world enaction. On this view, the pianist who insists that the memory of a piece of music is in her fingers makes perfect sense. Whole body thinking presents itself to our awareness most prominently and physically in all kinds of performance.

From the performances of survival to the transformations of culture, an embodied thinking is environmentally whole and enactive. Embodied thinking's pragmatic roots lie in the brain-body-niche system of conscious environmental adaptation. John Dewey expressed this holistic enaction as, "We don't act because we have ideas and beliefs; we have ideas because we must act, and we act to achieve ends." This is thinking and acting, acting as one continuous process. Design thinking's provenance is in the evolutionary advantage that an embodied consciousness brought to environmental adaptation.

An embodied design thinking's promise today lies in the development and application of its transformational processes, embodied ways of thinking that have world changing potential.

Embodied Mind and Meaning

The name of the evolutionary process of brain-body-in-the-world, according to Mark Johnson in his 2008 book,*The Meaning of the Body,* is embodied mind. Embodied mind is personal and social enaction in environment. Concepts such as mind, body, value, will, desire, intent are "merely abstracted aspects of the flow of organism-environment interactions that constitute what we call experience. Embodied mind is neither here nor there but enactive physically, socially and culturally in an ever changing process of experience.

Johnson says that this "mindedness" is neither "inside" or "outside," but arises in what he calls a cultural process space made up out of the wholeness of organism-environmental interaction. The encultured words, images and other symbolic structures of thought in this process space are not externalized quasi-objects, but embodied **"modes of interaction and action"** in that cultural environment.

The key, Johnson says, is to **"stop treating percepts, concepts, propositions and thoughts as quasi-objects (mental entities or abstract structures) and to see them instead as *patterns of experiential interaction (*my emphasis*)*….They are in and of

the world (rather than being about the world) *because they are processes of experience*."

Embodied mind is situated in and conditioned through social-cultural experience. "Soliloquy," according to Dewey, "is the product and reflex of converse with others; social communication not an effect of soliloquy. If we had not talked with others and they with us, we should never talk to and with ourselves….*Thus mind emerges*."

Embodied mind, in Johnson, "sees meaning, imagination, and reason as embodied… links reason to emotion and requires an embodied spirituality"…and because it is temporal, "When your 'body' ceases to function as a living, organic whole of coordinated activities and processes, you loose your 'mind.' It doesn't just go away and hide because it ceases to exist."

The process picture of thinking as embodied mind that emerges from the pragmatic philosophy of Dewey, James and Johnson more than lets thinking out of its self imposed isolation and into the world. It remains, however, a struggle to escape the implied dualism that lingers in such language structures as organism-environment, interaction and enaction. Language has a tendency to slice processes at joints that do not exist. New process ways of describing the embodied wholeness of thinking are needed. Here is an image of thinking as a wave function, whose x-y coordinates locate it as always somewhere between contemplation and action in the world.
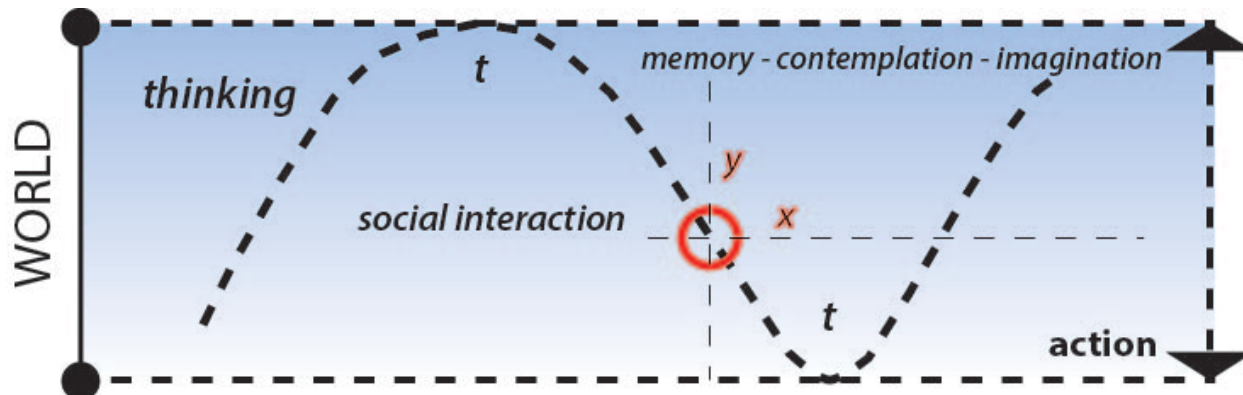
Thinking as a Wave Function in the World

Mind process aren't seen as being in relation to the world, but functions of it in time. And time varies in experience. In the diagram it widens and deepens in the place-time of memory, contemplation and imagination, and sharpens in the space-time of action.

Note too that Johnson describes embodied mind processes as multi-modal - "words, images and other symbolic structures of thought" - and not just a process in language.

Meaning in Experience

The concept of an embodied mind has as its counterpart that of an embodied meaning, one that "reaches deep down into our corporeal encounter with our environment." And, "It is this whole body [in-the-world-experience], with its various systems working in marvelous coordination, that makes possible the qualities, images, feelings, emotions and thought patterns that constitute the ground of our meaning and understanding."

The experience of meaning "is based first on our sensorimotor experience, our feelings and our visceral connections to the world; and second on various imaginative capacities for using sensorimotor processes to understand abstract concepts."

The standard linguistic meaning of meaning that is based on language, words and the truth conditions of propositions is far too narrow to account for the full measure of that bodily and social experience.

Embodied meaning as meaning in experience takes full measure of that enaction. It measures quality, significance, satisfaction and success as well as all forms of discursive and non-discursive signification.

This experiential meaning is the existential root of social and environmental ritual and belief. It measures joys and sorrows, weddings, births and deaths, graduations and promotions, loves and lives gained and lost. An embodied meaning is the continuous embodied commentary on, the hunger for, the drive for, and the consumption of the full-course existential meal.

Transformative situations ripen for change in the society of significant qualitative difference. Gregory Bateson described that gap as "the difference that makes a difference." And embodied meaning is the collective cultural difference that it makes.

Embodied Design Thinking

The root metaphors of embodied mind and embodied meaning when taken together don't merely add up, they conceptually blend and integrate into an enriched conception of thinking, embodied thinking.

In neuroscience this blending is called a "synaptic summary," but in its conceptual integration it becomes more than a multiplication.

Embodied Mind

A
shè

Embodied Meaning

B
jì

C

Embodied Thinking
shè jì

Embodied Design Thinking

Neural Summation as
CONCEPTUAL BLENDING AND INTEGRATION
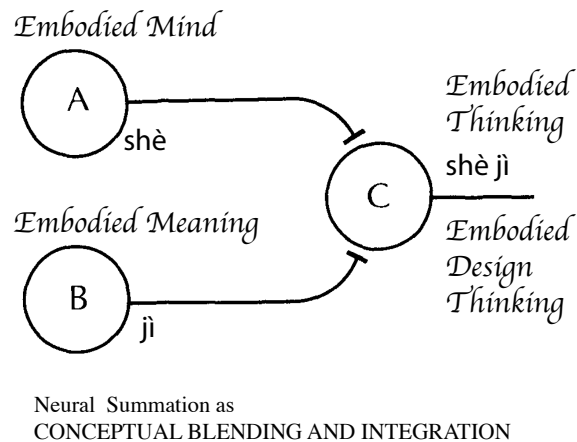
An example of this in designing is the way that the separate meanings of shè (set up or planning) and jì (strategy or calculating) transcend their separate and more focused dimensions when they are blended and integrated into shè jì, the larger Chinese concept for design and designing.

Perhaps the most famous example of this kind of quantum change is the 1905 transformation of space and time into the space-time of Special Relativity by Albert Einstein's in his annus mirabilis.

Here, when embodied minds with their embodied meanings take aim at cultural change, the name of the emergent integrated set of transformational processes that they employ is an embodied design thinking.

Second Order Cybernetics and Embodied Design Thinking

Another way of thinking about embodied mind and meaning has its roots in second-order cybernetics, sometimes referred to as the cybernetics of cybernetics or C2. Cyberneticist Larry Richards labeled it "a way of thinking about ways of thinking of which it is one."

In her now famous keynote speech to the American Society of Cybernetics in 1967, Margaret Mead opened wide the conceptual door to making consciousness a partner in systems thinking.
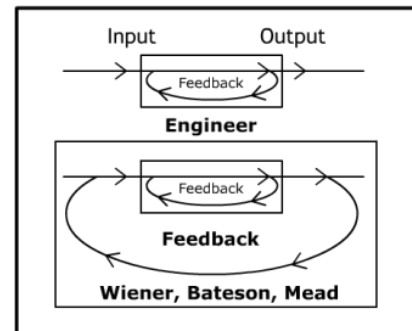
In the diagram she presented, the Mead, Norbert Wiener, and Gregory Bateson minds are shown in the primary and controlling feedback loop. Mind, she asserted, the presence of a personal and social-ecological consciousness, needed to be accounted for as an integral part of the whole system. The stepping up in class from C1 to C2 meant a shift from the closed and mechanical to the openness of the anthropological and cultural in systems thinking.

An anthropological mind was an embodied mind, a brain embedded and saturated in the reality of cultural experience and human purpose. Roy Ascott, another prominent early cyberneticist, called the culturally complex C2, "The art of interaction in dynamic networks."

The Mead, Wiener, Bateson diagram, which set C2 in motion, has long since evolved from its simple expression of hierarchical circularity to today's complexity of dynamic systems, networks and fields. Questions of where and how an embodied, embedded and distributed mind exists in such advanced systems remains a hot topic of discussion as does that of agency, intentional action, emergence, and transcendence.

In *Mind in Nature*, and *Steps Toward an Ecology of Mind*, Gregory Bateson extended his and Mead's conception of mind as an embodied, causally interactive, differentially driven transformational process to all living systems. "I do believe," he wrote, "that mental process is always a sequence of interactions between parts [of a whole system]. The explanation of mental phenomena must always reside in the organization and interaction of multiple parts."

Which raises the question: Would stepping up in class one level more conceptually to a C3 system lead to some form of extended, embodied, and distributed social thinking system?

Extended Phenomenological-cognitive Systems

This issue of embodied and extended cognition is actively under consideration in present day cognitive science. In their 2011 paper, "Dynamic, Agency and Intentional Action," Michael Silberstein and Anthony Chemero define extended cognitive systems as heterogenous, brain-body, niche systems that are non-linearly coupled to one another. This brain-body conception purposefully replaces the dualistic Cartesian division of self and action and of intentions prior to actions, detached from behavior. Their conceptual product is one of extended phenomenological-cognitive systems.

They argue that environmental features that form contextual, enabling and constitutive parts of the cognitive phenomenon are necessary for a cognitive system to be genuinely extended. They hold that consciousness is partly constituted by features of the environment and that cognition and conscious experience are therefore inseparable and extended. In an extended cognitive system, no one element or component process of the system represents another. They treat the idea of representation in this newer cognitive science as an unwanted conceptual hangover of the old Cartesian split.

Silberstein and Chemero studied an extended phenomenological cognitive system of {user-computer game & mouse} and concluded that in a system where dynamics are interaction dominant, "it is impossible to separate out the contributions from individual system components….these systems are genuinely agents and engage in intentional action."

"Intentions," are characterized as "order parameters that constrain the activity of system components….agents do not pop into existence (emerge) from complex brain dynamics, already armed with powers of intentionality and will." Rather agent and environment are co-dependent sides of the same coin." And they conclude that: "It is built into this conception of things that cognitive agents consciously experience the world in terms of their abilities and goals."

Mark Johnson writes "that there is also considerable evidence from cognitive anthropology that adult humans do not think in a manner consistent with the

dichotomies posed by classical representationalism. Like the social insects, we tend to offload much of our cognition onto the environments we create." And this is accomplished in two ways: "first we make cognitive artifacts to help us engage in complex cognitive actions; and second, we distribute cognition among members of a social organization."

But Michael Silberstein and Anthony Chemero are describing agency and intention in systems where cognition is extended, not distributed through off-loading or social exchange. And the niche in their {brain-body-niche} system is biological and ecological not complexly cultural as contained in the cultural conceptions of embodied mind and embodied meaning. Silberstein and Chemero have to step down and strip down culturally to a C1 level in order to find systemic forms of mind, agency and intention in the dynamics of living systems.

The difference between an aspiring C3 and the above C1 strategy to conceptualizing thinking processes in complex cultural transformation is captured, I believe, in this exchange between three of Charles Schultz's Peanuts as they lie on their backs interpreting the clouds. Linus says, "Those clouds up there look to me like a map of the British Honduras on the Caribbean… That cloud up there looks like the profile of Thomas Eakins, the famous painter and sculptor…and that group of clouds over there gives me the impression of the stoning of Stephen…I can see the apostle Paul standing there to one side…" Lucy: "And what do you see, Charlie Brown?" Charlie: "Well, I was going to say I saw a duckie and a horsie, but I changed my mind."

Six Keys to an Embodied Design Thinking

The first key is the concept of embodied mind - the body-brain in the world. Embodied mind releases thinking from its historic isolation and reconstitutes it as physically, socially, culturally, environmental and enactive.

The second key, is Mark Johnson's, "stop treating percepts, concepts, propositions and thoughts as quasi-objects (mental entities or abstract structures) and to see them instead as *patterns of experiential interaction…. because they are processes of experience*."

And a second, complementary key is to stop treating processes such as drawing, writing, speaking, modeling, diagramming, prototyping, testing and all the other many modes of developmental thinking and communication in designing as mere representations of thinking. They too are patterns of experiential interaction and processes of experience - developmental thinking become visible, physical, social and culturally enactive. Think of Somerset Maugham's, "I am not a great writer, but I am a great rewriter."   Think of the kind of multi-modal situational "mind-packing" that typically precedes conceptual blending and integration.

A third key is the adoption of a wider conception of meaning, one capable of taking the full-life measure of the experience that matters to people and all that they care about and bring to transformational situations.   It is this wider and deeper embodied meaning that raises into consciousness the consideration and construction of significant qualitative difference, "differences that makes a difference," and matter in peoples' lives, differences that when they've reach a tipping point lead to the potential for significant and satisfying change.

A fourth key is the qualitative difference in the off-loading and distribution of embodied thinking that takes place in the environmental processes and thinking tools of C3 systems. C1 mechanical models like the Silberstein and Chemero example can't illuminate the role of higher-order consciousness and cultural interaction in multi-leveled social systems because they hold no place for the place-time reality of shared human experience. They can't explain the qualitative difference in contribution to complex social systems of an Einstein because they have no place for an individual, innovative mindedness understood as deeply embedded and embodied in the culture of physics of his time.

There remain, of course, many important questions about individual initiative, leverage, distribution of power, "watershed" limits, and the care and "conviviality" of all such off-loaded thinking in social networks, including how such distributive intelligence, DI, might best incorporate and enfold new forms of artificial intelligence, AI.

One has to turn to literature for a more satisfying and culturally complex example of off-loading, distributed thinking, embodied mind and meaning. In the Martin Walker novels about Bruno, the chief of police of the town of St. Denis in the French Dordogne ("le Périgord"), it is Bruno's actively cultivated social networks rather than the individualistic mind wrapped in its "close-fitting soft cap" of a Holmes or the "leetle gray cells" of a Poirot that connects all the dots and participates in the resolving action. Walker presents a vision of community policing to die for, except not literally, as would sometimes seem to be the case elsewhere today.

Bruno's social network is cultivated, woven and held together by wine, food, friendship, respect, love and mutual assistance. It is the school's computer club that helps him upgrade his technical networking skills. And one could not possibly understand the crux of the situation that unfolds in *The Templars' Last Secret* without knowing how it was deeply embedded into the cultural history of the region.

Nearby the neighboring village of Montignac, are the wondrous 17,000 year old cave paintings of Lascaux and its three interpretive cave museums, which in the story are jeopardized by events. Archeological excavations are still underway in the region that saw the first remains of Cro-Magnon man, and Bruno, the orphan who might have become an anthropologist, has strong ties to the people and meaning of these projects. A château, once occupied by the Templars, is also being explored for hidden caves, believed to hold a key to lost Templar treasure, but even more importantly, evidence that would help resolve the long-smoldering dispute over Jerusalem. It's this

latter that brings terror to the town, illustrating the potential significance that distant issues can play in the ignition of local situations.

Walker creates an "outsider" view and method of reporting on the town's system in the character of Amilie, who is sent by the next level up of French government to follow Bruno around and create an evaluation of his reputed policing skills. She, like all of the women in the Bruno novels, are interesting, capable, well-educated, and powerful people, full partners in all of their affairs. In one instance, she asks Bruno why it is that he coaches the town's young people in tennis and soccer off duty. And he responds,

"It depends on what you mean by off duty….They grow up knowing me as something other than a policeman. It helps once they're old enough to get into mischief that could turn into something worse."

As might be expected, Amilie's modern social media skills, satellite-enabled data base connections and her Parisian resources are all co-oped and enfolded into the local situation. Walker overlays and blends information from today's space-time adjusted satellites with the place-time social sedimentation of Bruno's St. Denis, a town ghosted with memories that reach back to the Hundred Years War with England and those of the more recent Nazi occupation.

The Martin Walker novels are excellent guides to thinking about the situated richness and multi-layered cultural complexity of cognitively distributed systems. Attempts to abstract or reduce their profound humanity to simultaneous equations or backwards to a C1-like simplicity are simply mis-directed and ill-advised. C1 systems are closed. The importance of the C2 cybernetic concept and that of a C3 beyond is to have open ended conceptual systems' tools with the ability to better consciously steer an open ended culture.


Complexity in Culture

The fifth and sixth keys are the two signature and defining concepts of cultural complexity and horizontal transcendence.

This first requires making a fundamental distinction between the outcomes of complexity in nature from those unique to culture. In weather systems, for example, feedback loop complexity often gives unanticipated and counterintuitive results. Changes linked complexly to warmer seas can lead unpredictably to the rise of destructive winds, but the point here is that wind remains wind. Ice melting faster than the best models can predict may change its state more quickly than expected, but it is still water.

An outcome of complexity in culture is of an uniquely different order. It yields emergent transformation, innovation, creation and the appearance of the new, the station after the last station on the line, "the next room of the dream." This conceptual blending and

integration of ideas, systems and processes in human experience opens doors into the unanticipated, the innovative and the unexpected creations of an open-ended evolving culture.

Embodied Design Thinking
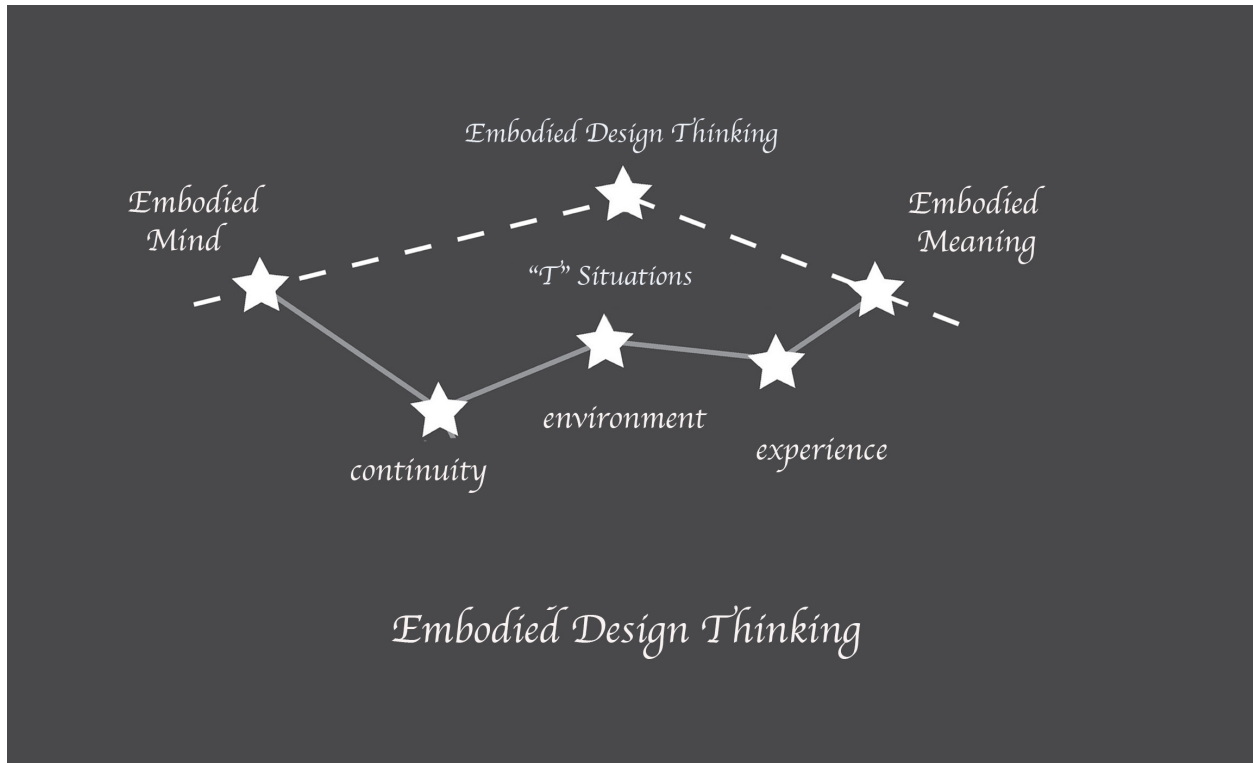
In *Our Own Metaphor*, Mary Catherine Bateson wrote that "in poetry a set of relationships get mapped onto a level of diversity in us that we don't ordinarily have access to. We bring it out in poetry. We can give to each other in poetry the access to a set of relationships in the other person and in the world that we're not usually conscious of in ourselves. So we need poetry as knowledge about the world and about ourselves, because of this mapping from complexity to complexity."

"It all begins," a poet being interviewed on the PBS Newshour one evening revealed, "when I begin to see one thing in terms of another."

Like the ancients of old who mapped their stories on the stars, I look up at the teapot in Sagittarius and see the base stars of philosophical and evolutional continuity, of physical, social and cultural environment, and what Joyce called, the reality of experience, which together give birth to embodied mind and embodied meaning. And these stars in turn conceptually blend and integrate into an embodied design thinking needed for the "T" situations of cultural life. And when I stand back, the Sagittarian teapot becomes the bow of the archer, who shoots her arrows of birth and becoming into the target of unbeing around the corner of the sky.

Plato called this process, which is here being called embodied design thinking, poetic, "the bringing of non-being into being." And thus the emergence in culture generally, according to Fauconnier and Turner, of systems of government and religion; the birth of science, philosophy and art, including everything from the cave art of Lascaux to the blues and ballet.

My more limited and situated examples in this essay have been the emergence of a Chinese sense of design from the conceptual integration of a shè and jì, the space-time of Special Relativity, the place-time of the reality of experience, the projection from a cybernetic C1 and C2 into a place-time cybernetic C3, and the blending of embodied mind and embodied meaning into an embodied design thinking.


Horizontal Transcendence

The concept of a physical, social, cultural, embodied mind in continuous process with its world calls into question the possibility of a vertical transcendence, according to Mark Johnson. The idea of a personal, embodied, enactive mind can't survive the death of the body in its present environmental system. And from this it follows that If there is such a thing as spiritual transcendence, the elevation of consciousness into a system we aren't able to conceive, it would have to be made up of a disembodiment that is other than we are or know.

"But there is a different notion of transcendence," Johnson suggests, "which we might call horizontal transcendence, that recognizes the inescapability of human finitude and is compatible with the embodiment of meaning, mind, and personal identity. From this human perspective, transcendence consists in our happy ability to 'go beyond' our present situation in transformative acts that change both the world and ourselves. This is tied to a sense of ourselves as part of a broader human and more-than-human ongoing process in which change, creativity and growth of meaning are possible."

On this view, the Bruno of St Denis and the idea of a nurturing and humane culture of policing will survive Martin Walker. The quality management concepts of an W. Edward Deming will continue to drive new possibilities in qualitative evolution. Books like Harriet Beecher Stowe's, *Uncle Tom's Cabin*, will continue to start Civil Wars. And we will continue to geo-synchronize our satellites, adjusting for the elasticity of space-time in Special Relativity (a little ahead) and General Relativity (a little behind).

Grace, in horizontal transcendence Johnson wrote, is "the undeserved experience of transformative growth even in spite of your individual or communal failures to do what would make things better." I asked my 95 year old grandmother, Grace Kirtley, who embodied her eponymous name for nearly a century, what she would miss most, and she replied, "not knowing what they will think up next."

Embodied design thinking is the name of the embodied cultural processes that will continue to take us from here to that new there.

The Archer &
Embodied Design Thinking
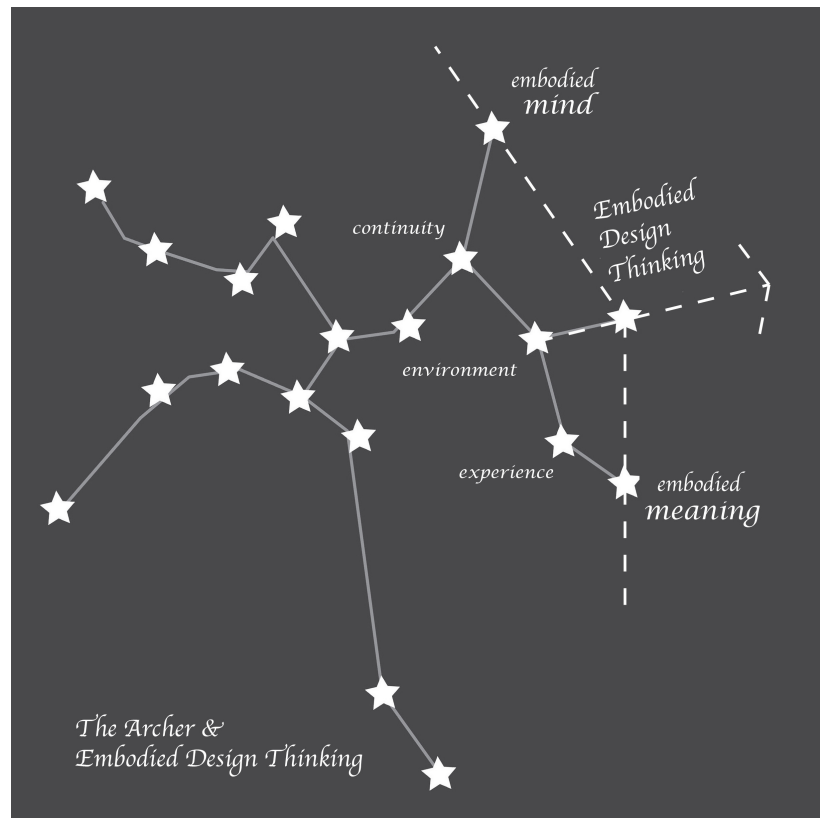
References

Conan Doyle, A. 1892. The Bascombe Valley Mystery: The Adventures of Sherlock Holmes. London: George Newnes Ltd.

Ransom, J. C., 2014. "Painted Head": The Collected Poems of John Crowe Ransom. Boston: Un-Gyve Press & Alfred A. Knopf, Inc.

Johnson, M. 2008. The Meaning of the Body. Aesthetics of Human Understanding. Chicago & London: The University of Chicago Press.

Fauconnier, G. and Turner, M. 2002. The Way We Think: Conceptual Blending and the Mind's Hidden Complexities. New York: Basic.

Fauconnier, G. and Turner, M. 1998. Conceptual integration networks. Cognitive Science, 22(2) (April–June), 133–187.

Friedman, K., Yongqi Lou & Jin Ma. 2015. She Ji. Editorial: The Journal of Design, Economics, and Innovation. Issue No.1. Tongi University Press.

Mead, Margaret.1968. ”The Cybernetics of Cybernetics." In Purposive Systems, edited by Heinz von Foerster, John D. White, Larry J. Peterson and John K. Russell, 1-11. New York: Spartan Books.

Bateson, G. 1972. Steps to An Ecology of Mind. New York: Ballantine Books.

Bateson, G. 1979. Mind and Nature: A Necessary Unity. New York: E.P. Dutton.

Bateson, M.C.. 1972. Our Own Metaphor: New York: Hampton Press, Inc..

Silberstein, M. and Chemero, A. 2011.“Dynamics, Agency and Intentional Action”, Humana Mente, 15: 1–19.

Walker, M. 2017. The Templar's Last Secret. New York: Alfred A. Knopf.