

## “Design Thinking and the Structure of Tacit Knowing: Michael Polanyi for the 21st Century”

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### Personal Back Story

This inquiry of mine began 23 years ago when business consultant and fellow Polanyian Jere Moorman, at my request, read my recently published *Longing to Know*.<sup>1</sup> His quick response: “Esther, there is a business seminar in here, and I’ll help you bring it about.”

At the time, I was already excited about the lively conduits of connecting people (I was working in a Development office); Jere coached me along far enough to see how lively and fast knowing is in the field of business. Also, at that point, I was seriously considering making my newly inaugurated authorship into its own business. (Many authors effectively are their own business of promotion, etc.) Jere coached me into an elevator speech, and a 20-minute presentation—he then got me to present it to the head of a prestigious and large investment company (making the point about speed and access). With his expert guidance I developed and piloted a business seminar, “Epistemology for the Workplace.” A day-long affair, I even had appointed a very willing advisory board! And then Geneva College hired me as philosophy professor. Overwhelmed with fresh academic responsibilities, little remained of my business venture, apart from the spiffy E4W placard hanging on my office wall.

Since 2004, then, my mission to develop epistemology for the workplace has been simmering on the back burner. Along the way a few related events have transpired. After developing my philosophical thought further in the oversized *Loving to Know*,<sup>2</sup> I slimmed it down in *Little Manual for Knowing*,<sup>3</sup> a “how-to for knowing ventures in any field” with one of its explicit applications being to

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<sup>1</sup> Esther Lightcap Meek, *Longing to Know: The Philosophy of Knowledge for Ordinary People* (Grand Rapids, MI: Brazos Press, 2003). Jere was/is also a fan of Carl Rogers person-centered therapy; he loved the recorded conversation between Rogers and Polanyi. Also note, with Jere as with Matt Ayers (n. 6), similar to Bruce Vojak’s intellectual grandfather, Jere was saying to me: “There is something in there.” A critical authoritative word.

business ventures for individuals and teams. Over the years from time to time the book has garnered a few vocal fans who confirm its important application to business.<sup>4</sup>

Fast forward to 2022: I was the guest of entrepreneurs Tony Golsby-Smith and Mark Strom in Sydney, Australia, to speak at a conference.<sup>5</sup> Through that organization I connected with Matt Ayers, a New Zealand design thinker.<sup>6</sup> Matt's steady conviction is that my work provides the philosophy of knowing and reality that designers haven't known to tap into but desperately need to support and forward their work. Matt has generously engaged me in exciting conversation every eight weeks or so for the last four years. As I write I reflect on Matt's many insights.

## Introduction

In this paper I take a preliminary step toward this next book venture, *Doorway to Business*.<sup>7</sup> Since my personal philosophical work includes as a *sine qua non* Michael Polanyi's epistemology of subsidiary focal integration, here I reexamine a key text of his, "The Logic of Tacit Inference."<sup>8</sup> For this inquiry I look at a recently popular business approach known as *design thinking*, as expressed by one of its original proponents, Tim Brown, in his 2009 book, *Change by Design*.<sup>9</sup> I want to lay Polanyi's structure of tacit knowing alongside design thinking, to show that the definitive

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<sup>2</sup> Esther Lightcap Meek, *Loving to Know: Introducing Covenant Epistemology* (Eugene, OR: Cascade, 2011).

<sup>3</sup> Esther Lightcap Meek, *A Little Manual for Knowing* (Eugene, OR: Cascade, 2014).

<sup>4</sup> One person I met was Bryan Zug, an entrepreneur responsible for several start-up companies. Bryan's response to *Little Manual* was to say, "Every entrepreneur should read this book, so that they won't commit suicide." (Overstated, I trust). Also along the way, I met Polanyi Society member, Bruce Vojak.

<sup>5</sup> Tony Golsby-Smith, and Mark Strom, Founder and CEO of Second Road Design Consulting, Sydney, AU.

<sup>6</sup> Matt Ayers is a designer and design thinker from New Zealand, for the last two years with his family traveling, living and working around the world. After an impressive set of positions as designer for major companies (most recently a bank), and coaching interns in design thinking, it is as if Matt has moved design thinking so totally upstream that it has become the very way he lives his life.

<sup>7</sup> *Doorway to Business* is projected to be a second in my series, *Doorways*, in which I concretely work out my philosophical proposals into a particular field of human life and work. The first was *Doorway to Artistry* (Eugene, OR: Cascade, 2023).

<sup>8</sup> Michael Polanyi, "The Logic of Tacit Inference"; in Marjorie Grene, ed., *Knowing and Being: Essays by Michael Polanyi* (Chicago: University of Chicago Press, 1969), 138-58. Further citations in text as LTI.

<sup>9</sup> Tim Brown, *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation* (New York: Harper Collins, 2009). Further citations in text as CD.

features of design thinking map at several points onto Polanyi's epistemology. I will suggest that the structure of tacit knowing that Polanyi distinctively has identified can be seen to make deeper sense of and drive design thinking. I believe that tapping this undergirding epistemology with awareness and intentionality will serve to make design thinking more expert and effective.

## Defining Features of Design Thinking

Design thinking is one of the movements within design. Its aim is to share how a designer goes about thinking with a general business audience. Thus, one benefit of engaging with the design thinking movement in this essay is that it helps us surface the key ideas and practices of designers, and how they work within the context of businesses.<sup>10</sup>

In this section I list a handful of defining features of design thinking. Design thinkers feel that it holds the prospect of shifting from the dead-end diminishing returns of incremental innovation typical of the dominant business model, to a disruptive, revolutionary, game changing approach with the potential for the kind of breakthroughs required to compete in today's fast pace of business competition (CD 3). Thus, we begin by **distinguishing design thinking from design** (CD 4 *et passim*). *Design*, in the conventional business model, is a "downstream" compartment of designers tasked to innovate new products for the overarching company. *Design thinking* "swims upstream" to unleash principles of design to every department and involve everyone throughout the company in design thinking, and to tackle everything using design thinking—including the world beyond, and even the company itself (CD 4-8).

Closely related to this, design thinking also shifts from being technologically centered to **being human-centered** (CD chap. 2). Not only does design thinking involve employees throughout the company, and invite people in other disciplines to join in the process, it prioritizes the company's customers, **moving passive consumers to being active participants**. DT majors on empathy and listening as a signature strategy.

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<sup>10</sup> Ayers, personal conversation.

In contrast to our culture's emphasis on thinking based on logic and deduction, analysis and convergence of thought, DT emphasizes using **non-linear thinking strategies** (CD chap. 3).

1. **Divergent, not just convergent thinking.** Divergent thinking multiplies options—the opposite of convergent thinking. It creates new possibilities (CD, 66-68). But since companies must be realistic, what is needed is a rhythmic exchange with convergent thinking.
  - o Design thinking promotes **multidisciplinary and multi departmental collaborators** for a project (including clients) (CD 58, 161, *et passim*). These seemingly unorthodox pairings can birth divergent thinking.
  - o **Brainstorming** (with stipulated guidelines for doing it successfully) aids divergent thinking. It is a structured technique for breaking out of structure (CD 77-79).
  - o **Post-it notes** is a concrete technique for surfacing and converging thinking in a team (CD 81-83).
  
2. **Synthesis, not just analysis.** Synthesis is a search, not for conclusions, but for connections and patterns. Businesses require analysis, but the creative process relies on synthesis. So we need to **move back and forth** between synthesis and analysis (CD 68-71). Brown calls these last two complementary strategies the seeds of design thinking (CD 70).<sup>11</sup>
  
3. **Integrative thinking** is “the single most powerful tool of design thinking.” Integration is “our ability to construct complex concepts, relying on “that empathic, intuitive, pattern-recognizing, parallel-processing, and neural networking Internet that each of us carries between our ears” (CD, 84-86). As long as there exists “no algorithm to tell us how to bring divergent possibilities into a convergent reality, or analytical detail into a synthetic whole, this talent will guarantee that accomplished design thinkers have a place in the world.” Brown remarks that perhaps someday neuroscience will tell us which parts of our brains light up, but in the meantime our task is not to focus on our brains, but to get this thinking out into the world, shared, and translated into concrete strategies (CD 86).

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<sup>11</sup> Other approaches which make Brown's list of elements of DT are: an attitude of experimentation, coupled with guidance from above (CD 71-75); and a culture of optimism (CD 76-77).

Brown offers a helpful list of rationalizations cited by would-be participants who opt out of design thinking. “I’m not a creative.” Design thinking is “just for the professionals.” “What I do is master the tools.” “There needs to be a precise framework or methodology to accomplish anything.” These rationalizers withdraw from the team effort when morale dips. “They don’t appreciate that design thinking is neither art nor science nor religion. It is the capacity, ultimately, for integrative thinking.” Design thinking is not only for the gifted. “The skills that make for a great design thinker—the ability to spot patterns in the mess of complex inputs; to synthesize new ideas from fragmented parts; to empathize with people different from ourselves—can all be learned” (CD 85-86).

Design thinking lists as one of its defining features quick and creative recourse to **the visual and the tactile** as part of the process (CD 80-81). Everybody on the team is encouraged to draw, no matter how simply. And **prototyping** in particular is a prized, driving strategy (CD chap. 4). It is quick, rough and ready, bodied thinking with your hands. A whole string of prototypes mark progress toward a solution. And we may add here that utilizing post-it notes to converge our thinking is also visual and tactile.

Another feature of design thinking: it’s important to **tell the story** of the unfolding knowing venture and of the big picture which makes the meaning clear (CD chap. 6). This keeps everyone on track and in enthusiastic pursuit. It will also help sell the product and shape the world.

Finally, the skill of DT is **best learned by doing it** (CD 5, 64).

### Grene on the Structure of Tacit Knowing<sup>12</sup>

As an important introduction to my summary of Polanyi’s “Logic of Tacit Inference,” I mark philosopher Marjorie Grene’s expert interpretation and assessment of it. I concur with her approach in my own steady recourse to Polanyian epistemology. This is the specific interpretation which I place alongside design thinking.

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<sup>12</sup> Marjorie Grene, “Tacit Knowing: Grounds For a Revolution in Philosophy” (*Journal of the British Society for Phenomenology*, 8:3 (October 1977)). Further citations in text as TKG.

Memorably, Grene claims that Polanyi's tacit knowing is "grounds for a revolution in philosophy."<sup>13</sup> By this Grene means that Polanyi's insight regarding the structure of tacit knowing "constituted, in his thought, a major break with the tradition and a possible foundation for a new turn in the theory of knowledge and, *a fortiori*, in philosophy as such" (TKG 163).

According to Grene, the structure of tacit knowing is Polanyi's most important insight (as he himself, in retrospect, affirmed). In fact, it is the epistemology necessary to justify his otherwise groundless doctrine of commitment and all his insights about the social structure of science. The purpose of Grene's own essay is to show this by recounting her firsthand recollection of the unfolding of Polanyi's thought.<sup>14</sup> Notably, Grene reports that Polanyi, in contrast to the widespread preoccupation of mainstream philosophers with the problem of "justified true belief," accorded far more significance to the problem of justifying dubitable belief: "JDB" is far more pervasive and essential in the scientific enterprise (TKG 165-67).

Grene corrects widely held but mistaken views of tacit knowledge: first, that it is subjective, second, that it is a remainder (TKG 164). *Personal Knowledge* addresses the first adequately. Regarding the second: "What is essential is not the existence of the tacit, but the relation of the tacit to the explicit (or, more generally, so as to include cases of wholly tacit knowledge, as in practical skills, the relation of the subsidiary to the focal). The tacit component is not a residuum, but an indispensable foundation. What matters is not that there is something unspecifiable, for example, in science, but how unspecifiability works and what it accomplishes. It is the function of the tacit in all knowledge, however exact and

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<sup>13</sup> This is in direct challenge to, on the one hand, many scholars' preoccupation, not with Polanyi's structure of tacit knowing, but with his doctrine of commitment, his fiduciary program, and his extensive insights regarding the social organization of science. And on the other hand, Grene is challenging academic philosophers' who generally overlook Polanyi's proposal. Thus, her titular claim can be read, tacit knowing is grounds—for a REVOLUTION (not more of the same academic modernist philosophy)—in PHILOSOPHY (not other dimensions such as social organization organization of knowledge).

<sup>14</sup> However, I search the essay for an argument which proves that the structure of tacit knowing grounds the doctrine of commitment. I don't find it expressed. My own surmise—and I believe it is borne out in LTI, as it is in my own extensive experience teaching it—is that myriads of examples and undeniable firsthand experience of subsidiary focal integration "show up" to bear it out: the hermeneutical circle that Grene references seems to subside in the fun and reality of riding a bike. I see that something similar happens in the process of design.

‘objective,’ that the tradition had neglected or denied, and that Polanyi’s epistemology allows us to accept and articulate.”

Greene summarizes the STK as follows.<sup>15</sup> Michael Polanyi claims that even the most explicit knowledge is grounded in clues that the knower must already have assimilated and of which he can be at best only subsidiarily aware. There are two aspects of cognition, subsidiary and focal, relying on and attending to. Or to express this so as to show their necessary connectedness, we may say that all cognitive processes (including learning and discovery as well as developed knowledge) have a from-to structure. This insight constitutes a 180-degree reversal to the problems of epistemology; most other proposals presume without scrutiny that knowledge is totally explicit and wholly focal. This insight alone rescues epistemology and philosophy of science from triviality.

### “The Logic of Tacit Inference”

In this 1969 essay, Michael Polanyi returns to a 20-year-old realization of his, that the progress of science is determined at every stage by indefinable powers of thought. He writes to offer fresh evidence for his theory of knowledge and expand it in new directions (LTI 138). Here is a short summary of his claims.

At critical junctures in a scientific inquiry, no firm rules nor explicit inference justify decisions made, or conclusions or guidance drawn (LTI 138). Therefore, discovery is arrived at the tacit powers of the mind. Notice that Polanyi never entertains the notion that what is going on is nonrational, random guessing. This is significant. As a working scientist he had every confidence in the existence of these tacit powers: there is something positive and reliable there. So we need to identify “a logic by which tacit powers can achieve and uphold true [and dubitable, as Greene notes] conclusions.”<sup>16</sup> Polanyi proceeds to identify, expound and apply this structure of tacit knowing, offering scientific evidence and everyday examples.<sup>17</sup>

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<sup>15</sup> I cull this synopsis from throughout Greene’s essay.

<sup>16</sup> Later (LTI 148) Polanyi says that when we attend from a set of particulars to the whole which they form, we establish “a logical relation” between the particulars and the whole. The structure of tacit knowing is this logical relation.

<sup>17</sup> Studying this essay after many years, I recognize that in easily teaching people subsidiary focal integration, I simply repeat Polanyi’s many claims and examples in this essay.

Perception itself offers a model; perception is continuous with discovery. Scientific knowing, like perception, involves “discerning *gestalten* that indicate a true coherence in nature” (LTI 138). Gestalt psychology, Polanyi says, has demonstrated the tacit operations that establish such coherence: I can integrate a thousand changing particulars into a single constant sight: I see real object before me. This is further confirmed by experiments in “derealization”: blocked out subsidiaries render the object of our attention less real (LTI 139).

Further, we can see that, remarkably, integration of this sort “depends on clues to which I am not directly attending,” including *subliminal* ones, and *marginal*. So we see that our tacit apprehension of coherence requires *two kinds of awareness*: *focal* awareness of the object, but also *subsidiary* awareness of clues (LTI 139-40).

Gestalt psychology has shown that in recognizing the whole we see the parts differently. In scientific discovery as well as in ordinary perception we undergo a shift of attention from particulars to their focal coherence. This is the feat of integration. “*Integration* is the tacit power we have been looking for”; Polanyi calls it, *tacit knowing* (LTI 140). Among many things to be said about integration is this: in contrast to explicit inference, integration displays a leap in speed and complexity (LTI 144).

Polanyi adds terminology and exposition. Subsidiaries are *proximal* (nearer me) and the focal pattern is *distal* (farther from me) (LTI 140-41). He identifies four aspects of tacit knowing: the *functional*, or vectorial, relatedness of subsidiaries to the focal pattern; the *phenomenal*: the way that integration changes how the particulars-turned-subsidiaries appear; the *ontological*: achieving the pattern indicates its reality—an aspect of reality which as such may yet reveal its truth in an inexhaustible range of unknown and perhaps unthinkable ways; and the *semantic*: the focal pattern supplies the joint meaning of the subsidiaries, the whole is the joint meaning of the parts (LTI 141, 145).

Thus, *the structure of tacit knowing* is a mechanism which can produce discovery by unspecifiable steps. Sometimes called scientific intuition, it is a workaday skill for scientific guessing with a chance of guessing right (LTI 143-44).

Thus: “All knowledge is *either tacit or rooted in tacit knowledge*. A wholly explicit knowledge is unthinkable” (LTI 144).<sup>18</sup>

In addition to the findings of Gestalt psychology and experiments of derealization, the structure of tacit knowing is scientifically supported by experiments in “subception,” which demonstrate the phenomenon of discovery without [focal] awareness (LTI 142-43). What is more, we can identify areas in which explicit knowledge is utterly ineffectual. A common example Polanyi cites is riding a bicycle: it isn't the explicit knowledge of the physics formula which supports the performance. The same with integrating our two lines of sight to see three dimensionally (LTI 144). In cases of teaching a skill, the teacher utterly relies on the student to figure out what it is s/he needs to know (LTI 142).

Polanyi adds everyday examples that display STK's common integrative shift from looking at to looking from: learning to drive from a driving manual; bicycling; recognizing someone's face; how an object becomes a tool (LTI 141, 144, 145). All these, we may surmise, displayed for Polanyi the mechanism he knew quite commonly in the stages of scientific discovery, and which he recognized to be the main act undergirding his efforts (LTI 143).

Polanyi discusses a host of significant implications and applications of the structure of tacit knowing. One cluster of insights develop the semantic aspect of tacit knowing as a theory of meaning. He notes the telling paradox that language, seemingly, is explicit, but its use is tacit (LTI 145). Also, the structure of tacit knowing makes better sense of naming than the usual understanding that it functions by association. It shows that a name becomes transparent as its sounds integrate to the object named (LTI 145).

The subsidiary focal, from-to relation, once achieved, is *durable*. However, it can be impaired by reversal. You can either be looking from the subsidiaries to their integrative whole, or, you can return to look at them, returning them to focal awareness. This latter obliterates their meaning (LTI 146).<sup>19</sup> However, Polanyi notes, actually shifting back and forth between the two, though risky, can advance one's inquiry.

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<sup>18</sup> Italics Polanyi's.

<sup>19</sup> Elsewhere Polanyi calls this “destructive analysis” (PK 50-52).

Polanyi introduces the idea of interiorization: To attend from subsidiary clues is to *interiorize* them. We endow a thing with meaning by interiorizing it (LTI 147). Interiorization is indwelling in the opposite direction. The body grows in meaningfulness: through subsidiary indwelling we interiorize our language and our whole cultural heritage (LTI 146). Indwelling makes us participate feelingly in that which we understand: our puzzlement, our intrigue, our relief, our sense of mastery. All this reveals the bodily roots of all thought: all knowledge is rooted in the body (LTI 147). Our own bodies we know almost exclusively subsidiarily—which is why it is that we feel them to be our own.

Indwelling deepens in the act of knowing life. Knowing life is a sharing of life, growing even more intimate in knowing persons, deepening all the way to “I-Thou,” to be immeasurably rich in things we know and cannot tell (LTI 149). The indeterminacy of another person’s mind can be discerned only by a personal judgment and is personal and knowledge (LTI 150-51). In light of this, by contrast, the disastrous consequences of behaviorism are obvious (LTI 151-55). A person studying the thought of a master indwells the master’s bodily movements in order to access the vast resources of the master’s mind, to get the feel of the master’s skill (LTI 152).<sup>20</sup>

Polanyi sums his argument with this emphatic pronouncement: “Let us recognize that tacit knowing is the fundamental power of the mind, which creates explicit knowing, lends meaning to it and controls its uses. Formalization of tacit knowing immensely expands the powers of the mind, by creating a machinery of precise thought, but it also opens up new paths to intuition; any attempt to gain complete control of thought by explicit rules is self-contradictory, systematically misleading and culturally destructive” (LTI 156). He adds this critical corollary: “In this light, there is no justification for separate approaches to scientific explanation, scientific discovery, learning and meaning. They ultimately rest on the same tacit process of understanding.”

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<sup>20</sup> In my summary of LTI, I omit consideration of two other implications important to Polanyi: the matter of cybernetics (LTI 152, 156-57), and the matter of levels of reality (LTI 153-55).

## Mapping the Structure of Tacit Knowing onto Design Thinking

Now let us map Polanyian claims onto the defining features of design thinking. In the process we will see that Polanyi's structure of tacit knowing provides an undergirding epistemology that not only suits but grounds and expands the design thinking approach.

### **Distinguishing design thinking from design.**

Design thinking evidently sets itself over against a conventional modern model of business which embodies a linear, analytical, epistemology of information, and corresponding formalization, and compartmentalization. On this model, design and innovation itself have been compartmentalized "downstream" from the defining activity of the company.

This defining move compares favorably with Polanyi's about the scientific enterprise: the conventional approach isn't good for business the way exclusively explicit inference is prohibitive for discovery. Design thinking itself compares more favorably with discovery than with explanation.<sup>21</sup> Design thinking's vision to move design "upstream" parallels Polanyi's claim that the unformalizable powers of thought which drive discovery pertain to all forms of knowing (LTI 156)—in effect, to all departments.

However, I do not believe that design thinking recognizes that a key issue is epistemological foundation: the conventional business paradigm roots in a modernist epistemology. To be thorough in building a fresh approach, what is called for is a revised epistemology.<sup>22</sup> Design thinking is shifting methods "on the surface." Design thinking's methods are suggestive of a revised epistemology, but apart from laying a stabilizing epistemological groundwork, its proposals can succumb to a kind of undertow pulling it back toward the dominant epistemic paradigm, rather than accrediting the processes key to the success of design thinking. Apart from ground-level epistemological revision, the recommendations of a book such as *Change by Design* can revert to a linear system of focal activities.<sup>23</sup>

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<sup>21</sup> However, it should be noted that for design thinkers, "discovery" can mean merely surfacing already established facts, to be distinguished from creation/innovation (CD 16). From a Polanyian perspective, the two are close kin as ventures toward the yet to be known.

<sup>22</sup> This is Matt Ayers' assessment (personal conversation).

<sup>23</sup> Looking online at IDEO U's 2026 description of design thinking, one can recognize the striking similarity of the list of features to the steps of the scientific method; <https://www.ideo.com/pages/design-thinking>. This appears to

Design thinking can hardly be faulted for such slippage, given the dominance of conventional epistemology as over against Polanyi's proposals. And design thinking is to be commended for posing that "there is something there" of incredible value to business. But Polanyi's structure of tacit knowing distinctively eliminates the undertow by dispelling defective epistemology itself restoring us to the way we actually already are going about knowing.

This feature, moving design upstream in a company may well be listed first not only because it defines and positions design thinking. It may well be because from the designers' point of view, the conventional model of business is itself the major culprit thwarting their efforts.<sup>24</sup>

I suggest that the particular methods of design thinking that Brown proposes in this book should themselves be located at the subsidiary: it is as we indwell them subsidiarily as per Polanyi's epistemology that healthy innovation results. As with all other subsidiaries maximally articulated, these particular methods can be artfully interchanged and amplified. This is the philosophical structure of tacit knowing at work.

### **Being human-centered.**

Arguably business is essentially directed to human persons and groups in a way that science is not. However, perhaps in trying to be like science conventionally perceived, conventional business has disregarded and dehumanized persons—their own clients. Thus, design thinking's priority of centering on humans is a move to return business itself to what it is meant to be. It is about restoring dignity and regard and common decency.

Human centeredness is truer to reality—which makes good business sense by suggesting true-to-reality innovative possibilities. The move to recenter on human persons also suggests subsidiary focal integration. It rightly shifts the focus of a business from fixating on itself and its product development to attend to a larger, all-encompassing meaning-giving pattern more true to itself and to the world

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me to reveal the tendency to revert to the prevailing underlying modernist epistemic paradigm.

<sup>24</sup> Ayers, personal conversation.

beyond. It's good to put the product and even the company itself at the subsidiary!<sup>25</sup> At the subsidiary, the product itself becomes more artfully adaptable in service to the larger vision.

In "The Logic of Tacit Inference" Polanyi speaks of attention to living things scaling up toward I-Thou intimacy. Business essentially concerns people. So, on an undergirding Polanyian epistemology, business should indeed be human centered and prioritize empathetic listening. Empathetic listening is Polanyian indwelling: subsidiary indwelling is necessary to invite the breakthrough of the larger pattern of understanding. Thus, business essentially requires an epistemology of tacit indwelling.<sup>26</sup>

Communion with reality is an endlessly lively interchange. Our lives and insight, let alone our businesses and innovation, grow as we continually return to attend to the larger picture, and bring it back to shape the proximal subsidiary. This is not futility but a privileged living adventure. Fixating on the product closes a business off from its own central source of insight and future possibilities.

### **Non-linear thinking strategies.**

It is just at this point that I would like to preface design thinking's list with a concrete lesson on Polanyi's structure of tacit knowing. I would like to demonstrate the subsidiary focal integrative structure using the everyday skill of riding a bicycle. This easily makes the case that when we are knowing, we all are always already carrying out subsidiary focal integration. We are well acquainted with the structure and good at it. Teaching subsidiary focal integration in bike riding also shows just how easy and fast it is to teach it to anyone. I personally have decades of experience conveying effectively and transformatively.

This cognitive structure of tacit knowing is an epistemological one, not a neurological one, except insofar as all neurological events themselves are bodily subsidiary to all our focal understanding. The operation of subsidiary focal integration reveals why something like these elements of design thinking are often

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<sup>25</sup> Ayers offers this memorable aphorism: "A product is a conversation about being human" (personal conversation).

<sup>26</sup> It should be noted that the acquiring the skill of design thinking involves tacit indwelling too: novices pick up the master's skill through apprenticeship—which is tacit, bodied, indwelling over an extended period of time.

effective. And in implementing subsidiary focal integration, design thinking itself would subsidiarily (and thus more effectively) enact these strategies.

### **Divergent, not just convergent thinking.**

Casting a wide net, as we say, is truer to the lively, fecund, reality that we seek to engage and understand. A larger, half-hidden but focal vision creates new possibilities because it is open to there being hidden possibilities. Involving (and indwelling) people from an array of disciplines and multi departmental collaborators expands what we are able to hear and attend to. Also, for Polanyi, it is when focally disparate items and outlooks are juxtaposed subsidiarily indwelled that a transformative integrative pattern can be accessed. His ready example throughout his work is vision: subsidiarily indwelling two contradictory lines of sight produces three dimensionality.

Polanyi argues in *Personal Knowledge* that for a discovery to occur, in advance of the event the seeker's latent vision of reality needs anticipatively and subsidiarily to have shifted to a world in which that discovery is a feature.<sup>27</sup> This phenomenon also shows why divergent thinking would be valuable. However, it shows that in the quest for discovery, it isn't randomness which produces fruit, but a steady, subsidiary scrabbling toward a yet-to-be-known which unspecificably guides us. Brainstorming may open the door for this, but it isn't the same thing. The same can be said about post-it notes: putting them up, moving them around, removing them, prompts our subsidiary scrabbling toward the yet to be known. This latter is the main act of innovation.

### **Synthesis, not just analysis.**

From the start, Polanyi casts the structure of knowing as involving gestalt. Gestalt itself is a structured dynamic, an integrative synthesis to a whole which therein identifies parts to which the whole is irreducible. In every finding of a pattern—and life is full of making sense by finding patterns—this unformalizable tacit power and tacit structure is patently at work. Subsidiary focal integration thus reveals what is going on in synthesis—or rather, what needs to be going on for there to be the breakthrough of insight we seek. And Polanyi, like design thinking, has affirmed

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<sup>27</sup> PK 59-60, 160-70. See also Esther Lightcap Meek, "Excitement, Michael Polanyi's Intellectual Passions and the Real," in Walter B. Gulick, Paul Lewis, eds., *The Comprehensive Legacy of Michael Polanyi: Dwelling In and Breaking Out* (Cambridge: Cambridge Scholars Press, 2025) 6-8.

the concrete value of rhythmical to and fro as one creatively works out both whole and parts.

### **Integrative thinking.**

It is salutary that Brown identifies integrative thinking as the single most powerful tool of design thinking. Design thinking is on to something which Polanyi's work helps. Polanyi's structure of tacit knowing and subsidiary focal integration display what integrative thinking is, and how we go about it. And just as Brown asserts, subsidiary focal integration is not only for everyone, but already operative in all knowing. And it is a teachable skill.

### **The visual and tactile (prototyping) as part of the process.**

The magic of prototyping is just that it is anticipative, subsidiary scrabbling toward the yet to be known. It is really helpful to recognize this, for it allows us to be openhanded and creative as we attend from the prototype to the as yet half hidden focal vision. For Polanyi, all subsidiary indwelling and scrabbling is bodied—even language. In fact, he says, we know our bodies almost exclusively subsidiarily as, for example, our fingers scrabble towards various performances. Prototyping, as a bodied activity, is effective to sidestep what is thought to be slower linear thinking; it invites, at times speedily, a profounder, sought-after innovation.

Design thinking is fighting the propensity of conventional business to fixate on their already existing products and to use prototyping only for refining them. It has recast the activity, and I think design thinking itself sees prototypes as anticipative and subsidiary. So design thinking can benefit from an epistemology that makes sense of the way it now employs prototyping, and which keeps their efforts lightly held in light of a not yet fully understood solution.<sup>28</sup>

### **Tell the story.**

To begin with, a story itself is an integrative, interpretive, coherent whole, a focal pattern. And a good story reveals a pattern in reality. Polanyi's semantic aspect of

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<sup>28</sup> Another tacit power which Polanyi identifies and encourages us all by confirming one's "sense of increasing proximity to the solution" (find this reference—again!) How else can anyone ever utter, "We're getting closer!" Also, it is important to realize that *naming* can be prototyping. Just the way someone labels something can open (or obscure) a possibility. See further Eugene Gendlin, *Focusing* (New York: Bantam, 1979); and Mark Strom, *Lead with Wisdom: How Wisdom Transforms Good Leaders into Great Leaders* (John Wiley and Sons, 2014).

tacit knowing is in play here: a focal pattern is the joint meaning of the clues we are indwelling on the way to making a discovery. A story offers the normative guidance we require in order to see what is there. For design thinking, a story can raise people's eyes from particular items to a larger, meaning giving picture. And this move invites design thinkers into the from-to subsidiary-focal anticipative orientation which concatenates inspiration and innovation.

It is significant to note that a book such as Brown's is brimming with stories: stories of the unfolding breakthrough discovery and its significance. On the way to the breakthrough, business leaders guide everyone involved by helping everyone share the unspecifiable sense of the unfolding story and where they are in it along the way.

### **DT is best learned by doing it.**

The act of integration to a pattern irreducible to clues is such that, as Polanyi famously remarked, the "conclusion" comes before the "premises."<sup>29</sup> In teaching others about subsidiary focal integration I often tell the story of my father teaching me to ride a bike: quite literally, he put me on the bike at the top of a hill and *pushed* me. I'm sure he was thinking that the skill of bike riding is best (perhaps only) learned by doing it. It is only within the integrative pattern that particulars and clues and parts assume their rightful service and meaning. It may be noted that we in the Western tradition find this difficult to understand due, we might say, to the Meno Dilemma having been left unresolved for centuries—until Polanyi, as Marjorie Grene claims.<sup>30</sup> That design thinking states it quite baldly suggests its awareness that there is more to knowing than information. Doing invites the real.

## **In Conclusion**

In his epistemology of a structure of subsidiary focal integration, what does Polanyi offer in the 21<sup>st</sup> century, particularly to the innovation strategy of design thinking? What he offers has been succinctly expressed by philosopher Marjorie Grene, and by Polanyi himself. I repeat passages quoted earlier:

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<sup>29</sup> William Taussig Scott and Martin X. Moleski, SJ, "*Michael Polanyi: Scientist and Philosopher* (New York: Oxford University Press, 2005) [ref]

<sup>30</sup> Grene, "Introduction," in *Knowing and Being*, ix.

Greene states: "What is essential is not the existence of the tacit, but the relation of the tacit to the explicit (or, more generally, so as to include cases of wholly tacit knowledge, as in practical skills, the relation of the subsidiary to the focal). The tacit component is not a residuum, but an indispensable foundation. What matters is not that there is something unspecifiable, for example, in science, but how unspecifiability works and what it accomplishes. It is the function of the tacit in all knowledge, however exact and 'objective,' that the tradition had neglected or denied, and that Polanyi's epistemology allows us to accept and articulate" (TKG 164).

And according to Polanyi himself: "Let us recognize that tacit knowing is the fundamental power of the mind, which creates explicit knowing, lends meaning to it and controls its uses. Formalization of tacit knowing immensely expands the powers of the mind, by creating a machinery of precise thought, but it also opens up new paths to intuition; any attempt to gain complete control of thought by explicit rules is self-contradictory, systematically misleading and culturally destructive" (LTI 156).

Both Greene and Polanyi state that the structure of tacit knowing pertains to all forms of knowing, and that includes design thinking, spread throughout and beyond a company into the world. Indeed, we can hear Polanyi's claims directly applied to this thesis regarding design thinking: identifying the structure of tacit knowing as Polanyi has done—"his formalization of tacit knowing"—"immensely expands the powers of the mind but also opens up new paths to intuition." And his warning pertains significantly as well: "reverting to an epistemology of controlling, explicit rules "is self-contradictory, systematically misleading and culturally destructive."

I believe that the tenets defining design thinking are maxims which, along with the vision of design theorists such as Tim Brown, serve effectively as they are subsidiarily, creatively, indwelled. Specifying design thinking's undergirding epistemology of the structure of tacit knowing will heighten the knowhow, artistry, confidence and effectiveness of ventures in innovation in business. Understanding and working in light of subsidiary focal integration not only will support design. It will, as design thinking has hoped, nourish business itself as well as the world it serves.

