Michael Polanyi: A Scientist Against Scientism

Charles Lowney

"The ideas of the Enlightenment bred scientism and romanticism in a multitude of connected forms… The revival of the liberal tradition can be assured only if we can establish it on a new, conscious understanding of its foundations, on grounds which will withstand modern self-doubt coupled with perfectionism." Michael Polanyi[1]

***

Michael Polanyi had a mixed relationship with the Enlightenment. As a scientist, he valued the light and knowledge that reason and rigorous method could provide, but he also realized that the critical standards for knowledge that the Enlightenment emphasized could promote dangerous distortions. While he cherished many Enlightenment values— especially the freedom that it had brought to formerly repressive societies— he saw that its critical program could not legitimize even its own humanist and political values. He saw that excessive skepticism and rationalism, which challenged traditional authority to topple monarchies and shake religious institutions, could ultimately lead to forms of nihilism that ushered in fascist and totalitarian regimes. As a practicing scientist, he saw that some problems in Enlightenment thinking were rooted in misconceptions surrounding how we discover and affirm scientific knowledge, and so, as a philosopher, he worked to correct epistemological mistakes behind a "scientism" that could distort how we understand reality, human beings, and human values.

In contrast to the Modern idea of objective knowledge that is passively engaged and discovered, Polanyi put forward the idea of *personal knowledge*. In contrast to the ideal of critical rationalism, which would have all knowledge be founded on an explicit analysis to immovable

[1] *TD* 83, 86, 87. To economize, references to Polanyi's *The Tacit Dimension* (Garden City, NY: Anchor Books, 1967), are noted with *TD*, references to *Personal Knowledge: Towards a Post-Critical Philosophy*. Chicago: University of Chicago Press,1958) with *PK*, references to "The Republic of Science: Its Political and Economic Theory*" [Minerva* 1(1962): 54-74] with *RS*, and references to Marjorie Grene (ed.) *Knowing and Being: Essays by Michael Polanyi* (Chicago: University of Chicago Press, 1969) with *KB.*

foundations, Polanyi put forward the ideas of *tacit knowing*, *interpretive frameworks*, *discovery* and *fallibilism*. And in contrast to substance dualism—and the growing materialist views that the really real consists solely of matter in motion, the human mind is fully reducible, and all meaning and value is merely subjective— Polanyi put forward the ideas of *emergent being* and *indwelling*. Through these facets of his post-critical program, he affirmed our contact with reality and our ability to discover true values.

Rather than reject the Enlightenment, Polanyi charts a course for revising the Enlightenment's notion of discovering truth through rational inquiry. His basic concepts work to balance the Enlightenment's excesses. In this, he hoped to avoid the recidivisms of Analytic philosophy, the repudiations of Postmodernisms, and the reactionary entrenchment of closed traditions. His approach provides hope for cautious progress in a society that both recognizes the value of its traditions, and is open to change.

The momentum of the Enlightenment's influence, however, is difficult to restrain. It is still a common conception in the 21st century that science, in opposition to religion or tradition, can provide all the answers that we need. According to the Enlightenment story, science and its method have liberated us from the dark ages. Its critical reason overcame the oppression and distortion that religious and political powers enforced. By the light of reason, the story goes, we find our freedom and our true human value... but all that seemed to fall apart amid the horrors of revolutions, wars, and economic depressions.

I. Polanyi and the Enlightenment Roots of 20th Century Political Extremism

Michael Polanyi was a physician, a physical chemist, a social scientist, and a philosopher.[2] Born in Budapest in 1891, he served as a medical officer during the World War I. Soon after the Red Army came to Budapest and first established a Russian influence in Hungary, Polanyi emigrated to Germany. There he established himself as a leading scientist at the Keiser Wilhelm Institute. When the Nazi party rose to power, however, Polanyi—being of Jewish descent—left Germany for England. There he continued doing research in physical chemistry at the University of Manchester for 15 years, but subsequently he exchanged his chair in chemistry for one in social studies. This allowed him more time to develop deeper and broader cultural criticisms and a philosophy of science that challenged mainstream views. During his life, he believed he saw some implications of Enlightenment thinking play themselves out in the social and political arenas. He believed that the Enlightenment's noble ambitions and scientific rationalism, while "a major influence toward intellectual, moral and social progress" could also produce "moral doubt" that was "frenzied by moral fury" and "armed by scientific nihilism" a combination which led to violent and totalitarian governments (*TD* 57, 60).

Polanyi asked, “Why Did We Destroy Europe?”[3] His answer was that the way science had come to be interpreted in Modernity helped foster the great wars of the 20th century. The ideal of critical reason that Enlightenment thinkers promoted could not sustain the values that Enlightenment thinkers held. If everything needed to be proven scientifically before it could be accepted as true, not only could traditional religious and aristocratic powers fall, but so also could ideals of political liberty and the free pursuit of knowledge.

[2] For more on Polanyi's life, see William Scott and Martin Moleski, *Michael Polanyi, Scientist and Philosopher* (Oxford: Oxford University Press, 2005).
[3] [1967] in R.T. Allen (ed.) *Society, Economics & Philosophy* (New York: Routledge, 2017) 107-118.

The demand that knowledge be fully explicit and objectively verifiable was unachievable and unlivable, and it fostered a backlash against rationality and truth. The misguided epistemic ideals not only produced a stronger dichotomy between faith and reason— charging up a reactionary conservatism— it also produced antithetical postmodernisms that followed Romanticist trains. So Nietzsche and Marx, with their suspicion of reason and traditional values, were natural outcroppings for democratic and classically liberal values to crash upon. Polanyi believed he witnessed the ill-effects of the Enlightenment's conception of knowledge and science when he saw the Russian Revolution commandeered by Stalinism, and National Socialism steered by Hitler into violence and death camps.

Critical rationalism led to a nihilism that could not reasonably ground any values, but losing the foundations for meaning did not negate human moral passion. The utopian moral ambitions of Enlightenment thinking could thus motivate what Polanyi called a "moral inversion" (*KB* 14). This inversion is a “dynamic coupling” uniting a moral skepticism, which saw rational argument about morality as ineffective, and an unchecked moral passion. In this "inversion" violent and immoral acts became permissible and sometimes even obligatory, so long as they were accomplished in the service of a greater humanitarian vision. Polanyi saw this nihilistic play acted out fully in Central and Eastern Europe, but thankfully, according to Polanyi**,** a lack of consistency between thought and action in Britain and the US, stalled its progress (*KB* 23). Anglo-American culture, in spite of romantic rhetoric about individual freedom from authority and skepticism of traditional values, was still guided by its traditional institutions and practices, especially the precedents of Common Law. This, according to Polanyi, kept the dangerous combination of perfectionist rationalist imperatives, moral skepticism, and moral passion from actively steering political policy toward destruction, as it had done earlier on the continent

beginning with the French Revolution. But although the effects of the Enlightenment in Anglo-American culture were different, they could still be pernicious.

Philosophers often attempt to carve different areas outside the purview of scientific method to make room for faith and higher values. But in a culture that idolizes science—our sort of culture—what cannot be shown to be true scientifically can become devalued, if not consciously then unconsciously; the plausibility of the justifications for non-scientific and moral beliefs can become undermined by the epistemology we affirm. There is thus an eventual crowding out of faith and values as they lose their justification. So, the rational consistency that took effect more quickly and with explosive effects in Continental Europe, sowed its effects more slowly and insidiously in the Anglo-American world. Like the frog that sits in gradually heated water and boils, we never recognize the need to jump out of the pot.

II. Historical Setting: The Rise of a Science Misconceived

Key figures in Modern philosophy, such as Descartes, sowed assumptions about scientific knowing and the nature of being that the Enlightenment endorsed in its conception of scientific progress. Descartes encouraged us to doubt *everything* that could not be put on secure and unquestionable rational footing. Such a foundation was thought to be open to view by everyone, regardless of their history and training, and so were the rational steps that move us from truth to truth. This advanced the ideals of critical reason and an impersonal objective stance, a God's eye view, that in principle anyone could attain.

All existing beliefs could now be subject to this corrosive, hyperbolic doubt, no matter how sacred or well-affirmed by purported experts. The only authorities Descartes recognized were the

unquestionable intuitions that were revealed by the light of reason. The project was to take apart any claim to knowledge and analyze it down, then we could rebuild knowledge up on secure and common foundations. In this conception, the notion of *phronesis*, or practical wisdom, becomes a mystifying charade and the knowledge of any true expert is considered fully explicit and rationally accessible to anyone. Descartes' method emphasized analysis and explicit knowledge. Complex ideas were deconstructed into simpler and more assured ideas. Correlatively, this epistemic method extended into our ontological understanding. Complex beings were understood in terms of their simpler parts. For the material world, this secure ground was found in material substance and causes.

The body and anything physical was thought to operate like a machine, which was conceived as a complex whole that reduced down to the smallest parts and their laws for combining together. This materialist conception led to the notion that all the sciences were reducible to what physics studies, e.g., biology was built on chemistry, and chemistry was built on physics and whatever smallest bits produced our objects of perceptions. This reductive materialism on its own might encourage nihilism but, for Descartes, the nihilism did not yet emerge as a problem. Since his dualism distinguishing between material and spiritual substance, it allowed for meaningful values beyond the material. While our bodies and animal passions reduced down to material causes, our higher values could be independently preserved.

Descartes' bifurcation between spirit and matter was reproduced in Kant's distinction between the noumenal and the phenomenal. Kant's development of Descartes' dualism included the provision that any phenomenal entity or event would *always* be explicable in terms of causal laws, hence, everything that we could possibly experience and understand could be explained by science. This bolstered faith in the progress of science to explain not only biology and living organisms, but

also psychology and social phenomena. But while scientific study now included meaning and values, those values could be considered constructs that were more fully explicated by lower level chemical and physical laws, where their ultimate causes would be discovered.

While Descartes endorsed a spiritual reality (beyond the material) to preserve values, Kant endorsed a moral reality (beyond the phenomenal). Kant saw the moral law as noumenal, but also as something we could rationally grasp. But as the skeptical method of Descartes' philosophy morphed into the critical rationalism of the Enlightenment, natural science more and more seemed to do away with any independent foundation for spiritual or moral meaning. The subject matter of science, e.g., matter/phenomena, was supported by evidence and explained our experience; the spirit/noumena, in contrast, was seen as accounting for nothing tangible. So the spirit/noumena half of the dualism came to be rejected as intellectually suspect. The scientism that demands a reduction of all knowledge to science, and science to physics, could then become the full philosophical ideal. The slippery slope was greased. All values and meanings were thought to reduce to sociological or psychological causes, those reduced to biology, which reduced to chemistry, which in turn reduced to physics. Set in the context of scientism, this reduction and causal determinism left no room for freedom and responsibility to real values—these became epiphenomena or illusions.

The ontological force of this development can also be traced back into the analytic and reductive metaphysical prejudices of Descartes. He not only held that what is complex is explained by what is simpler, but that what is *most* real is what is causally prior: "[F]or where else can something derive its reality?"[4] This metaphysical assumption dovetailed with Descartes' proofs for God's existence. But, ultimately, when only one half of Descartes' dualism had scientific

[4] Rene Descartes, *Discourse on Method and The Meditations* (New York, NY: Penguin Books, 1968) 119.

credence and analysis is the rule, then what is *really* real is not God but the smallest and earliest material parts and their causal relations. The natural conclusion is that values aren't really real. And as Nietzsche's madman predicted, the implications of Descartes' epistemology and its corresponding ontology, like the light of the stars, took time to manifest in our thought and actions. According to Polanyi, the light of the stars hit us when logical positivism emerged, nihilism took hold, and moral inversion was blatantly displayed in 20th century political movements.

On the continent, where the ill-effects of Modern and Enlightenment thinking were most pronounced, postmodernists generally reacted against science and scientism, claiming instead that there was no neutral objective stance, and reason itself was in the service of power rather than truth. All ideas and values were effects of wills to power, or eddies in the fluid play of historical circumstance. This rejection of scientific validity and celebration of subjectivity or power went too far for Polanyi; he believed that the reactions against science were just as mistaken as scientism. He strove instead to correct analytic, reductionist, and dualist excesses rather than reject them.

III. Correcting the Excesses of Scientific Rationalism

Polanyi's post-critical philosophy emerged from his worries over two attitudes toward science. First, the attitude that subjects scientific truth to the will of political power. This undermines the scientist’s call to follow clues wherever they lead in the pursuit of truth. Thus, he reacted against the USSR's five-year plans and programs in Great Britain that would subjugate scientists' goals to political aims (See *RS*). But as we have seen, Polanyi also worried about scientism, i.e., the

idea that science is the only real source of truth and that it provides a purely objective approach that overcomes all prejudice and distortion. This second attitude encouraged efforts to unify science in a reductive account centered on physics as the most basic science. This reduction characterized logical positivism, and other efforts to unify science via analytic philosophy, into the 1950s and beyond. We see it today in "eliminativists" who claim human minds are fully reducible and are nothing but neurochemical processes. The second attitude (analytic scientism) feeds into the first (which aligns with postmodern skepticism) by undermining a foundation for moral values.

As a scientist himself, Polanyi saw that science did not proceed in the way that lay people and philosophers of science imagined that it did. The glamorized view of science that culture, history and philosophy promoted was a distortion. The ideal of objective knowledge, passively affirmed by an impartial observer, was a myth. Science operates more like a tradition itself. It relies on the indoctrination of apprentices, who are taught to use equipment and taught to see in various ways (e.g., in reading an x-ray, or understanding the significance of a protein immunoblot). The mutual agreement of the community of scientists also acts like a traditional authority. Polanyi saw that science itself relies on knowledge and values that it cannot justify fully or explicitly. Polanyi thus saw that our best claims to knowledge are better described neither as purely *objective* nor as merely *subjective*, but as *personal*.

Science made discoveries by relying upon both explicit and tacit commitments. And although these commitments cannot be fully justified explicitly and are subject to revision, they are held with what Polanyi calls "universal intent" (*TD* 78).[5] By contrasting *tacit knowing* with the ideal

[5] "A person speaks with universal intent when convinced of the truth of what she or he says. 'I speak not of established universality, but of a universal intent, for the scientist cannot know whether his claims will be accepted'

of explicit analysis, and contrasting *ontological emergence* with the notion of reduction, Polanyi mobilized a view of knowledge that rejected both scientism and postmodernism. Instead, he endorsed a non-skeptical fallibilism that gave degrees of autonomy to different fields of inquiry. His approach allows values to be real again, both as transcendent ideals and as emergent properties discovered by human societies.

i. Personal Knowledge and Tacit Knowing

How knowledge is personal, but not merely subjective, can be seen in how knowing works and how discoveries are achieved. There is nothing wrong with efforts to analyze and reduce knowledge to components, but that cannot be the whole story. There are inherent limits to analysis, and what now acts as our firm ground may shift in the future, hence Polanyi argues "[t]he pursuit of formalization will find its true place in a tacit framework" (*KB* 157).

Polanyi saw that we always *attend from* some unspecifiable background when we *attend to* something focal. Whereas Franz Brentano (*TD* x) emphasized that there is always an object at the distal end of intentionality, Polanyi emphasized that there were always tacit clues at the proximal end. This *from-to* vector of intentionality was the key to understanding that there is a tacit dimension to all knowledge. The background clues are integrated together into a focal awareness or meaning, but during the act of knowing we are not directly aware of the clues or context that we are seeing *from*. There is thus a dichotomy between a tacit awareness of background clues and the focal awareness that goes into the formation of our explicit knowledge.

Polanyi marshals many examples from perception, skills, and linguistic cognition to show general features of the *from-to* knowing process, and how the *from-to* dynamic can build in

(*TD* 18)." (Quoted from Walter Gulick, ed., *Recovering Truths: A Comprehensive Anthology of Michael Polanyi's Writings*, Glossary, 17, available with permission at polanyisociety.org.)

layers, i.e., the *to* can become a *from* in a further focal integration (*KB* 128, 154). Seeing in 3D shows how the *to* is a "joint comprehension" of tacit clues that displays new qualities. We attend *from* the two-dimensional pictures that each eye provides, and together they give us a focal image that includes the emergent feature of depth perception.

How clues fade into the background to operate tacitly can be seen in learning to use a stick as a probe. The muscles manipulating the stick and the nerve endings in the hand all fade as our attention and feeling move to the end of the stick and what it is touching; the stick becomes integrated into our bodily background clues as we learn to feel the dimensions of a dark room. When we develop a skill, Polanyi would say, we "dwell in" the clues in order to become aware of their joint meaning.

The tacit clues that we pick up on and distinguish are not all explicitly available. We recognize a face among millions of others, but we can't say precisely how (*TD* 4). According to Polanyi, the tacit dimension is at best only marginally accessible. To shift one's focus to tacit clues disrupts the focal integration. For instance, Polanyi notes that in playing the piano one is focused on the music as the end of the production. The trained motions of the fingers act as tacit clues. If one shifts one's attention *from* the music to a direct awareness of the fingers as focal, it throws off the integration of the clues and the music stutters or stalls.

We see this *from-to* structure in our use of signs as well. We look *from* the letters "c," "a," and "t" when we look *to* the joint meaning towards which they point, i.e., the word "cat." The individual letters form the background clues to a new meaning. Similarly, if we take the words "cat," "is," "on," and "mat," their joint meaning is different than when we take the words individually. At the next level of integration, the sentence is a clue, together with other

sentences, towards a more comprehensive meaning (we can then know if the sound "mat" refers to a small carpet or a person). If we look at the word or letters in isolation, then we lose our awareness of their joint significance. Instead of looking *from* the letters and *to* the words, and *from* the words *to* the meaning of a sentence, we would instead attend from other clues, e.g., isolated sounds, or dark marks on a light background, to see focally the shape of the letters.

The clues that we can uncover are inexhaustible and to a large extent unspecifiable. Polanyi saw that a tacit background can never be made fully explicit for several reasons (*KB* 124). We attend *from* it, but when we turn to look *at* or *to* it we inevitably miss something, and we cannot be aware of what we are missing. Also, the function changes: when we look back *to* the *from*, it is now the *to* and is no longer operating as it does when it functions as the *from*. So the pupil, eye, optic nerve, etc. are all tacit clues to seeing a cat, but when we look at the eye, etc. we do not see the seeing, since we are no longer *dwelling in* the physical and mental clues in the way we do when we see the cat.

We learn by doing, and we can gain skills, like walking or being able to recognize a face, without being able to explicitly break down all the clues and steps involved in performing the skill. We often gain knowledge by interacting in the world, e.g., by "subception," where we are not aware of how we gained knowledge from experience (*TD* 7,8). All explicit knowledge is based on skills and tacit knowing, but that does not delegitimize the knowledge that we gain, it just means that we cannot always fully account for what we do know.

Making room for faith, like partitioning off an insensible spirit world, merely undermined it. But Polanyi saw that the assumptions behind that strategy were all wrong. Instead of making room for faith in an epistemology dominated by critical rationalism, Polanyi showed how faith was

interweaved even in our most certain beliefs. In *Personal Knowledge* (1958), he moved against the ideals of objective knowledge, explicit analysis, and ontological reduction that had been brewing in our culture since the dawn of Modern thinking. There is always a side to knowledge that we must take on faith—a personal side— even in science.

ii. Interpretive Frameworks, Discovery, and Non-Skeptical Fallibilism

In practicing skills and in comprehending texts, the tacit background becomes marginal and often invisible to us. Similarly, we are not fully aware of the background interpretive frameworks by which we understand the world. This is why Polanyi says "*all knowledge... is either tacit or rooted in tacit knowledge*" (*KB* 195) and "formalizing all knowledge to the exclusion of any tacit knowing is self-defeating" (*TD* 20). We can see how the background functions as a tacit *from*, and how some traditional knowledge, learned by apprenticeship or subception, forms an "inescapable framework" for Polanyi by looking at how scientific discovery works (*TD* 63).

Discovery involves personal commitment and a reliance on a tacit interpretive framework. To even see a problem in science one has to have sufficient immersion in a background theory. Only then can one recognize gaps or notice that some observations don't quite seem to fit. Polanyi related this searching to a problem in Plato's *Meno*. Socrates posed a paradox: If we don't know what we are looking for, how do we know when we find it? And if we are able to recognize it, doesn't that mean we knew it already and do not have to search? The tacit dimension of knowledge was the solution (*TD* 22-25). A scientist's tacit sense of the background not only makes her aware of problem but can help guide the search in a productive direction. The solution is recognized when the background clues come together in a focal comprehension that is more consistent and satisfying.

Each discovery shifts or enriches the background framework. In making an important discovery, one might need to shift an interpretive framework in a radical way. (This is what Thomas Kuhn would later call a paradigm shift). Polanyi follows Poincaré in laying out the stages of discovery (*PK* 121-131). First the question arises; then one searches, exploiting all the resources one has available. One is driven by passionate commitment to finding a solution. If it is an important problem that cannot properly be solved inside the current conceptions, one might then hit a wall and experience a "dark night of the soul." In this dark night, the interpretive framework through which you normally understand the data breaks down. The factual observations no longer seem to make any sense. Then "Eureka!" a solution may arise, which involves understanding things in a radically different way. "Intuition" has tacitly integrated clues together into a satisfying conception. This solution is first affirmed by a feeling of validation, but then might be better verified in more explicit terms (*PK* 121).

The personal commitment of the inquirer, along with his or her personal, cultural and theoretic background, are indispensible for knowledge and its progress,[6] but this does not make the knowledge acquired "merely subjective." We recognize that there may be new discoveries in the future and we may find better theories, but this does not make our current best theories "simply wrong." Just because there will be better ways of understanding our observations does not mean "anything goes" regarding theories and truth. We get closer to the truth, and we act on our commitments, even though tacit knowing is ineliminable and Cartesian certainty is impossible. We thus act with the "universal intent" of our current best knowledge, while attempting also to

[6] Compare here Alasdair MacIntyre's notion that rational thinking can only take place in the context of a coherent tradition of inquiry in his *After Virtue* (Notre Dame: U of Notre Dame Press, 1984). Also note that MacIntyre studied at Manchester University while Polanyi taught there.

be open to new information and ideas. We acknowledge our fallibilism even as we acknowledge the progress of knowledge.

iii. Emergent Being and Indwelling

Just as focal meanings cannot be fully reduced to tacit clues, some emergent wholes cannot be fully reduced to their subsidiary parts. For Polanyi, emergent beings can gain an independence from the conditions they relied upon to come into existence. Here Polanyi reverses the machine metaphor that is typically associated with reduction.[7]

Polanyi noted that a machine has principles or laws that govern its operation that are *not* reducible to the principles or laws of chemistry or physics. The machine does not violate the lower level laws, but it must be identified and understood in terms of a higher-level context and its laws. This is what Polanyi termed "dual control": the subsidiary lower-level sets necessary conditions, but the emergent higher-level can commandeer parameters left open by the lower level to effect its own control (hence I can raise my arm, but I cannot make it grow to the size of a submarine). So, the principles of physics and its elements were *necessary* but *not sufficient* to the understanding of the mechanical principles of a machine. By the light of the meanings of physics and chemistry alone, Polanyi noted, one could not distinguish between a working steam engine and a broken one (*KB* 176).

Rather than a materialist reduction in which all levels of inquiry reduced down to the lowest level, Polanyi envisioned a hierarchy of dual control relations in which a lower level and its laws were not violated, but higher-level constraints could define new real beings with emergent qualities. So, that which physics and chemistry studies is subsidiary to biological organisms, and

[7] See Charles Lowney, "Rethinking the Machine Metaphor since Descartes: The Irreducibility of Bodies, Minds and Meanings." *Bulletin of Science, Technology and Society* 31, no. 3 (2011): 179-192.

that which biology studies is subsidiary to psychology and sociology. Reality was no longer identified with the lowest, simplest, and earliest, instead, emergent and complex entities could also count as real. Similar to C.S. Peirce, Polanyi rooted reality in the notion of the effects something can have in the world; something real had "the power for manifesting itself in yet unthought of ways in the future" (*TD* 32). Minds could be more real than cobblestones (*TD* 33).

The epistemology of tacit knowing and the ontology of emergent being come together in that we often know and understand *wholes* focally by attending from their *parts* and operations as tacit clues; we dwell in the parts to understand a whole "comprehensive entity" (*TD* 18-21).[8] Similarly, Polanyi says that we understand the mind of a person by dwelling in the behaviors and words of that person. Polanyi's view here is similar to Gilbert Ryle's or Merleau-Ponty's in that we dwell in the body to experience mind (*KB* 222). Polanyi, however, distinguishes his view from theirs because he wants to forestall a collapse of the *expressions* of mind or the actions of the body into an *identity* with mind. An identification leaves open the possibility that the mind might be reductively considered "nothing but" bodily actions. Instead Polanyi is careful to emphasize the structure of knowing and being and distinguish between clues and subsidiary conditions, on the one pole, and the independent reality towards which they point or gather, on the other. Just as we can gain a glimpse into a chess player's mind by watching the moves he makes on the board, we can get a glimpse into a person's mind by dwelling in a person's words and behaviors (*KB* 215), but minds, for Polanyi, are not only the joint meaning of the body, they are active centers (*KB* 135) emergent upon the body and its physical and cultural environment—an integral part of a comprehensive entity.

[8] For the importance of this notion see, Phil Mullins, "Comprehension and the 'Comprehensive Entity': Polanyi's Theory of Tacit Knowing and Its Metaphysical Implications" *Tradition and Discovery 33* no. 3 (2006-2007): 26-43.

Descartes' matter-spirit substance dualism is a misapprehension of the subsidiary-emergent relation of body to mind. This dualism is also encouraged by the subsidiary-focal or *from-to* trajectory of intentionality. As we saw, there is a gestalt switch in the shift from looking *from* the clues to looking *to* those clues. When we look *from* the clues *to* the focal meaning, the subsidiary clues become invisible to us (the music appears to exist on its own, unproduced; we forget about our fingers); and when we look *to* the subsidiary clues, their focal meaning disintegrates into nothing (the music disappears when we focus on our fingers).

For Polanyi the body provides the subsidiary base for the mind; body and mind are two levels in a dual control system and not two separate substances. We are comprehensive entities, but since attention *to* the focal meaning neglects the tacit or subsidiary structures, focusing on meaning and ideas (the stuff of mind/spirit) makes us forget their dependence on the *from* (material subsidiaries) that form their tacit, supporting conditions (we forget about our fingers; the individual letters become transparent when we focus is on the meaning of a word.) This makes it easy to imagine that the "spiritual" can exist independently from anything material. Similarly, when we focus on the material or subsidiary base as the *to* (as we do in scientific investigation; we look at the letters in isolation and their rules for combining) rather than *dwell in* them as the *from*, we get the impression that the meaning and ideas (meanings; mind/spirit) are ephemeral and illusory, and all that is really real are the material subsidiaries. It is easy to forget that we dwell in clues and subsidiaries when we experience meanings and focal wholes. So substance dualism— and the monisms that take one half Descartes' dualism and deny the other (materialisms or idealisms)— are easy mistakes to make.

Polanyi parses out the significance of Descartes' material-spiritual dualism in terms of the dynamic of *from-to* awareness; that we dwell in a body and experience value and meaning as

emergent creatures with minds already breaks down the matter-meaning and fact-value dichotomies that scientism endorses. Emergence and indwelling also overcome any deep or impassible gulf between me-in-here and the world-out-there.[9] We see this gulf incipiently in John Locke's philosophy, and it is made fully manifest in Kant's. The chasm between mind and world can lead to representationalist views, according to which I can *only* know my own perceptions, concepts, or signs—and whatever they are meant to grasp or symbolize "out there" is too foreign to comprehend. This dichotomy between inner and outer leads to a radical skepticism about the world's existence and to the problem of knowing whether or not there really are other minds like mine. The notion of indwelling bridges theses gaps. Our tacit clues, signs and ideas are, as Aquinas said, "that *by which*" we understand and not merely "that *which*" we understand.[10] Rather than the endpoint on the nearside of the chasm, they are the bridge. Representations and ideas become clues to our experience and understanding of the world. Just as a microscope or a telescope becomes a tool by which we can better grasp a focal awareness, and just as our bodies and their extensions can bring us an awareness of something real, so our concepts and conceptions act as tools that can allow us to better grasp reality.[11] According to Polanyi, we make contact with reality, and we make discoveries, but reality will always continue to surprise us in its possible future manifestations (*KB* 133).

IV. Reality, Morality, Science & Society

[9] See Charles W Lowney II, ed., *Charles Taylor, Michael Polanyi and the Critique of Modernity: Pluralist and Emergentist Directions* (New York: Palgrave Macmillan, 2017) 162.
[10] Polanyi's move here is similar to C.S. Peirce's notion of triadic semantic structures; see Polanyi's "Sense Giving and Sense Reading" in *KB*, 181-210.
[11] Polanyi's notion of dwelling in technical clues anticipates Andy Clark's "extended mind" in Clark's *Supersizing the Mind: Embodiment, Action, and Cognitive Extension* (New York, NY: Oxford University Press, 2008).

While analysis and synthesis can indeed enrich knowledge (*KB* 125, 130), a fully explicit analysis and justification of knowledge is impossible. We always rely on tacit background knowledge which constitutes what Polanyi called "the tacit dimension." And just as we cannot always have a full analysis to simples in knowing, we cannot always have a full reduction to constituents in being.

Polanyi challenges Cartesian assumptions that were the root source of Enlightenment rationalism. In doing so, he also challenges naive cultural assumptions about how science validates knowledge and progresses. But he also challenges postmodern skepticisms. Polanyi shows that knowledge is not purely objective, but neither is it merely subjective. Instead knowledge is personal and must be affirmed with universal intent if one is to advance towards further discoveries.

Polanyi thus re-envisions a role for faith and values in a world impressed with the advances of science. His understanding of tacit knowing and emergent being lead him to a Neo-Platonism of sorts, like that of the pragmaticist C.S. Peirce, in which universals are real, since they, like minds, can show themselves in “indefinite future manifestations” (*KB* 167, 168). There can thus be ideals such as Truth, Beauty and Charity that emerge and gain a transcendent status. These “transcendentals” can help guide our actions and our progress.[12]

In addition to re-imagining transcendent values, Polanyi, via his conceptions of discovery and an emergent world, can encourage a notion in which new moral values emerge. As new entities emerge, they interact at a different ontological level than their subsidiary parts and have their own emergent laws. This allows for the possibility of emergent *moral* realities. Just as we can

[12] One can relate these “transcendentals” to telic goals that draw us forward to new possibilities for being. See *TD* 88-92 and also D.M. Yeager’s “Taylor and Polanyi on Moral Sources and Social Systems” for a discussion of the significance of Polanyi’s transcendentals in a political context (in Lowney, ed., 2017, *op. cit*., 189-214).

make scientific discoveries, we can make discoveries about better ways of being, and better ways of being together.[13] I believe Alasdair MacIntryre's work here is consistent with a Polanyian notion of emergent value. MacIntyre sees traditions of enquiry as essential for rational discussion, and he sees valid moral claims emerging from the practices of cultures and traditions.[14]

New values can emerge as people and societies discover new and better ways of being together in response to existential problems.[15] Some of those new, important, and true values emerged with the Enlightenment, but some, as Charles Taylor says, can take on "degenerate forms,"[16] hence Polanyi says, "I will not resist in any way the momentum of the French Revolution. I accept its dynamism. But I believe that the new self-determination of man can be saved from destroying itself only by recognizing its own limits in an authoritative tradition it upholds" (*TD* 62).

Polanyi opposed scientism, but he saw in the operation of the scientific tradition a model for how democratic institutions might work. The scientific community is both conservative (vetting papers, marginalizing crackpots) and liberal (valuing novelty and discovery). The institution of science was comprised of free equals that advanced by cooperation, criticism, and "mutual

---

[13] In "From Science to Morality: A Polanyian Perspective on the Letter and the Spirit of the Law" [*Tradition and Discovery* 36 no. 1 (Fall 2009): 42-54] and in "Morality: Emergentist Ethics and Virtue *For Itself*" [*TAD* 36 no. 3 (Summer 2010): 52-65], I show how different moral theories—deontological, utilitarian, virtue, and sentiment based—each catch part of a moral reality that is better understood as emergent rather than pre-existent or rooted in some totally-other dimension. Even purportedly simple moral "intuitions" have their tacit subsidiary support in lived experience. See also Lowney, ed., 2017, *op. cit.* chapters 8 "Overcoming the Scientistic Imaginary" (143-168) and 9 "On Emergent Ethics, Becoming Authentic, and Finding Common Ground" (169-187)].

[14] MacIntyre, 1984, *op. cit.*

[15] See Lowney, "Morality: Emergentist Ethics" *op. cit.* and Lowney "From Morality to Spirituality: Society, Religion and Transformation" *Tradition and Discovery* 37 no. 1 (Fall 2010): 19-38.

[16] See Taylor's *A Secular Age* (Cambridge: Harvard University Press, 2007) and *Ethics of Authenticity* (Cambridge: Harvard University Press, 1991). For more on authenticity as an emergent value, see my "Authenticity and the Reconciliation of Modernity" (2017, *op. cit.*, 71-92).

control" (*TD* 74). People in science must responsibly (77) advance ideas with universal intent (78) for the consideration of the community.

Polanyi, like F.A. Hayek, relied (perhaps a bit too much[17]) on the notion of "spontaneous order" in which the free actions of individuals could produce a stable yet open system.[18] Direction should not be imposed solely from the top down by one central agency but should emerge from the ground up through the combined efforts of free individuals and their emergent institutions. Science functions and grows best when scientists are free to pursue questions that interest them. Similarly, Polanyi endorses a political pluralism in which people are committed to their individual views but exercise a mutual control as they engage each other in an effort to come to new and better views.[19]

The political, for Polanyi, needs to be guided by the moral and not merely the economic. The political-economic order thus has the markings of a dual control system. Polanyi says "Society, as an organization of power and profit, forms one level, while its moral principles lie on a level above it" (*TD* 86). From his perspective a capitalist economic system was important for the creation of wealth, but its operations should be guided toward moral outcomes with the help of higher-level moral constraints—just as a steam engine does not simply drive a ship forward, but its power is constrained and steered in worthwhile directions.

V. Conclusion: Progress via Dynamic Orthodoxy

[17] According to D.M. Yeager, 2017, *op. cit.*
[18] See Richard T. Allen, *Beyond Liberalism: The Political Thought of F.A. Hayek and Michael Polanyi* (Rutgers, NJ: Transaction Publishers, 2016). or Straun Jacobs and Phil Mullins, "Friedrich Hayek and Michael Polanyi in Correspondence" in *History of European Ideas* 42 no.1 (2016): 107-130.
[19] See my chapter 12, "Robust Moral Realism: Pluralist or Emergent?" in Lowney ed., 2017, *op. cit*., 235-270.

Polanyi's understanding of personal knowledge and tacit knowing sets the basis for trusting our knowledge without the need to reduce everything to the demands of explicit scientific evidence. It allows the possibility that traditional and religious values can be responsibly upheld. His notion of emergence also allows minds, people, and values to be real.

Polanyi was a critic of scientism, but he was also an advocate of science and scientific truth. Similarly, Polanyi was a critic of rationalism and Enlightenment thought, but was also an advocate of the use of reason and Enlightenment values. With a better epistemology and ontology correcting the distortions that the Enlightenment's rationalism promoted, Polanyi hoped the danger of nihilism and moral inversion could be averted and the European liberal tradition-- which valued individual freedom and political openness-- could grow.

While our society, as a legacy of the Enlightenment, is far from perfect, Polanyi held hope for continued improvement. He thus firmly upheld the Enlightenment value of progress, and saw it as an important ideal for both science and society. He says, "Any tradition fostering the progress of thought must have this intention: to teach current ideas as stages leading on to unknown truths which, when discovered, might dissent from the very teachings which engendered them" (*TD* 82). According to Polanyi, this progress relies on a "dynamic orthodoxy" in which both stability and change are important. While building on the values of traditions, we should be open to competing views and make an effort to discover new truths together.