

What Does it Really Mean to Know Something?
The Contribution of Michael Polanyi to Science and Education

Introduction

*“Sweet is the lore which Nature brings;
Our meddling intellect
Misshapes the beauteous forms of things:-
We murder to dissect.”*
— William Wordsworth,
“The Tables Turned,” 1798

It was an era characterized by a “logic of destruction”¹ (if destruction can, indeed, be termed “logical”) that prompted the Jewish, Hungarian scientist Michael Polanyi (1891-1976) to turn his attention away from his acclaimed research in chemistry to the study of epistemology and the philosophy of science. Having lived through the destruction of European civilization, which included countless, unspeakable atrocities perpetrated on her own citizens, he could not help but ask himself this question: “why did we destroy Europe?”² A significant shift in the spiritual and intellectual climate of opinion had resulted in the crumbling of the moral foundations upon which Europe had been established for millennia. This sea change in perspective unleashed tidal waves of destructive nihilism which Friedrich Nietzsche in moments of philosophical lucidity had prophesied as a result of living in an “unsponsored”³ universe. For Polanyi, the specific problem resided in nothing less than in a particular way of viewing the

¹ Richard Gelwick, *The Way of Discovery: An Introduction to the Thought of Michael Polanyi* (New York: Oxford, 1977), 137.

² Michael Polanyi, “Why Did We Destroy Europe?” *Studium Generale* 23 (1970): 909-916; cited in Gelwick, *The Way of Discovery*, 160, n. 1.

³ Gelwick, *The Way of Discovery*, 3.

world, one that was rooted in an objectivist conception of science divorced from a human and moral base. As he put it, “the main [destructive] influence of science on modern man has not been through the advancement of technology, but through the effect of science on our world view.”⁴ Clearly, Polanyi did not blame science and technology *per se* for the European disaster; rather, it was the modern scientific image of the world, the specific kind of scientific outlook that shaped the Western mindset that was the most pernicious problem. But exactly what is the nature of this modern, scientific approach to knowledge and the world that Polanyi objected to so strongly? Mary Hesse describes it well in these terms.

There is an external world which can in principle be exhaustively described in scientific language. The scientist, as both observer and language-user, can capture the external facts of the world in propositions that are true if they correspond to the facts and false if they do not. Science is ideally a linguistic system in which true propositions are in one-to-one relation to facts, including facts that are not directly observed because they involve hidden entities or properties, or past events or far distant events. These hidden events are described in theories, and theories can be inferred from observation, that is, the hidden explanatory mechanism of the world can be discovered from what is open to observation. *Man as scientist is regarded as standing apart from the world and able to experiment and theorize about it objectively and dispassionately.*⁵

It was this detached, allegedly value-neutral, and essentially non-human way of knowing that spurred Polanyi’s stringent critique and prompted him to construct a credible alternative. Consequently, he turned his considerable intellectual powers away from the laboratory to epistemological considerations, especially to questions regarding the nature and justification of scientific

⁴ Michael Polanyi, “Works of Art,” p. 30 (from unpublished lectures); quoted in Gelwick, *The Way of Discovery*, 5-6.

⁵ Mary Hesse, *Revolutions and Reconstructions in the Philosophy of Science* (Indianapolis, IN: Indiana University Press, 1980), vii (emphasis added).

knowledge, along with its educational implications. Our purpose in this paper is to elucidate the essential themes in Polanyi's revolutionary model for what it really means to know something.

Polanyi's Epistemology

As he explains in the preface to his most significant work *Personal Knowledge*, his investigation involves a critique of "the [modern] ideal of scientific detachment" because it "falsifies our whole outlook far beyond the domain of science," and in its place he seeks to offer "an alternative ideal of knowledge," quite broad in scope and application.⁶ Indeed, it is the general ideal of "personal knowledge" which Polanyi promulgates, and according to him it means "that into every act of knowing there enters a passionate contribution of the person knowing what is being known, and that this coefficient is no mere imperfection but a vital component of his knowledge."⁷ He also adds this observation to his central thesis: "For, as human beings, we must inevitably see the universe from a centre lying within ourselves and speak about it in terms of a human language shaped by the exigencies of human intercourse. Any attempt rigorously to eliminate our human perspective from our picture of the world must lead to absurdity."⁸

⁶ Michael Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy* (Chicago: The University of Chicago Press, 1958, 1962), vii. This book is based on Polanyi's Gifford Lectures delivered at the University of Aberdeen in 1951-1952.

⁷ Polanyi, *Personal Knowledge*, viii.

⁸ Polanyi, *Personal Knowledge*, 3. Polanyi's conception of knowledge seems closely related to the biblical idea that the human heart is the unifying center and seat of the intellect, emotion, and will and consequently determines the very issues of life (see Prov. 4: 23).

This was a Copernican revolution of a radical kind. From a modern perspective, of course, it was entirely unorthodox and constituted a fundamental contradiction, “for true knowledge is deemed impersonal, universally established, objective.”⁹ However, with the help of the findings of Gestalt psychology which Polanyi embraced wholeheartedly, he is able to demonstrate the cogency of his revolutionary doctrine which neither abandons the scientific enterprise, though it does reshape it, nor does it give way to subjectivism, though it does entail the human dimension, nor does it sacrifice reality, though it is encountered in a new way. Around his central commitment to a re-humanized epistemology Polanyi constructs a battery of “correlative beliefs” that flesh it out. For what he intended was nothing less an fresh prescription for the European worldview which he hoped would spring forth from a comprehensive redefinition of the process of human knowing. I will examine several of Polanyi’s basic themes.

First of all, Polanyi argues that all knowledge is personal knowledge in the sense that *it is tacit or is rooted in the tacit dimension*. To employ the analogy of an iceberg, typical accounts of knowledge focus exclusively on what lies above the water line. From Polanyi’s perspective, however, the greater part of knowledge is hidden from view. It lies, so to speak, below the water line. Yet it is enormously influential in shaping the knowing process.¹⁰ There is an unobserved, background structure of thought and consequently “*we know more than we can tell.*”¹¹ This notion challenges modern objectivism and also points out its potential dangers.

⁹ Polanyi, *Personal Knowledge*, vii.

¹⁰ Gelwick, *The Way of Discovery*, 65-66.

¹¹ Michael Polanyi, *The Tacit Dimension* (Garden City, NY: Doubleday, 1966), 4.

The declared aim of modern science is to establish a strictly detached, objective knowledge. Any falling short of this ideal is accepted only as a temporary imperfection, which we must aim at eliminating. But suppose that tacit thought forms an indispensable part of all knowledge, then the ideal of eliminating all personal elements of knowledge would, in effect, aim at the destruction of all knowledge. The ideal of exact science would turn out to be fundamentally misleading and possibly a source of devastating fallacies.¹²

Obviously from Polanyi's point of view much is at stake if the thesis of the tacit dimension holds true. It would mean that a true model of knowledge, including the tacit aspect, would be under attack and potentially destroyed by the regnant objectivist paradigm. It would mean that this regnant objectivist paradigm devoid of the tacit component would in fact be deceptive and the potential source of multiple misconceptions. Consequently, Polanyi offers a complex model of the knowing process grounded in the tacit dimension and points out the limitations in the dominant paradigm. There is no way to do justice to the intricacies of Polanyi's notion of the tacit dimension in a short space, but a brief sketch is possible.

In Polanyi's estimation, knowing was a humanly active, skillful comprehension of the things known. It operates at two levels. First, there is what he calls "focal awareness." It is the task, problem or meaning to which a knower is attending directly, and because it can appear to be at a distance from the knower, he also calls it the "distal term." Second, there is what he calls "subsidiary awareness" or the "proximal term" in which a particular set of clues or tools is subordinated in the task of achieving a practical or theoretical insight. These clues and tools are things employed in the knowing process, but are not in themselves observed. The knower relies on them but does not focus upon them,

¹² Polanyi, *The Tacit Dimension*, x.

else there be a drastic change in the knower's awareness and performance (as any pianist, golfer, or carpenter knows). They are substructural, tacit in nature, a set of assumptions in which the knower dwells as he does his own body. In fact, they function as an extension of the body as the instrument by which the world is known, and consequently involve a change in the knower's very being. On account of these clues and tools, that is, because of the operation of subsidiary awareness, acts of understanding are non-critical in that they proceed on an assumptive basis. Also they are irreversible in that they can never be looked at in the same way again. In any case, people are able to know by relying on subsidiary awareness, and by attending to the focal awareness. Polanyi's alternative epistemological vision, therefore, blends objective and subjective factors as the best way of accessing reality, as he explains in these words.

Such is the *personal participation* of the knower in all acts of understanding. But this does not make our understanding *subjective*. Comprehension is neither an arbitrary act nor a passive experience, but a responsible act claiming universal validity. Such knowing is indeed *objective* in the sense of establishing contact with a hidden reality; a contact that is defined as the condition for anticipating an indeterminate range of yet unknown (and perhaps yet inconceivable) true implications. It seems reasonable to describe this fusion of the personal and the objective as Personal Knowledge.¹³

Since all knowledge is personal and possesses a hidden or "tacit" dimension, such characteristics must be taken into consideration when attempting to grasp the nature of knowledge itself. Polanyi hoped that his new model would offset the devastating effects of a scientific objectivism that severed the connection between knowing and being, that eliminated a sense of responsibility for truth, and that entailed the valueless manipulation of the world and its objects, including its human inhabitants.

¹³ Polanyi, *Personal Knowledge*, vii-viii.

Second, Polanyi argues that all knowledge is personal knowledge in that *it is fiduciary in character*. This means that all knowledge is rooted in faith and that from faith all understanding proceeds. This was St. Augustine's perspective. The venerable Church father was responsible for the first "post-critical" philosophy, and Polanyi calls upon him to establish yet a second.

Modern man is unprecedented; yet we must now go back to St. Augustine to restore the balance of our cognitive powers. In the fourth century A. D., St. Augustine brought the history of Greek philosophy to a close by inaugurating for the first time a post-critical philosophy. He taught that all knowledge was a gift of grace, for which we must strive under the guidance of antecedent belief: *nisi credideritis, non intelligitis* [Unless ye believe, ye shall not understand].

This Augustinian approach ruled Europe for a thousand years. However, with the advent of the Enlightenment, the doctrine of faith as a cognitive source declined and was replaced by a growing confidence in the rational and empirical powers of the human mind, giving birth to modern critical philosophy. Polanyi quotes John Locke as the exemplar of this new perspective from his *A Third Letter on Toleration*.

How well-grounded and great soever the assurance of faith may be wherewith it is received; but faith it is still and not knowledge; persuasion and not certainty. This is the highest the nature of things will permit us to go in matters of revealed religion, which are therefore called matters of faith; a persuasion of our own minds, short of knowledge, is the result that determines us in such truths.¹⁴

As a result of this increasingly majority opinion in the seventeenth and eighteenth centuries, "Belief was so thoroughly discredited that . . . modern man lost his capacity to accept any explicit statement as his own belief. All belief was reduced to the status of subjectivity: to that of an imperfection by which

¹⁴ Polanyi, *Personal Knowledge*, 266.

knowledge fell short of universality.”¹⁵ But the Polanyian project is nothing other than the rehabilitation of the fiduciary mode as a humanly inescapable source for the knowing process.

We must now recognize belief once more as the source of all knowledge. Tacit assent and intellectual passions, the sharing of an idiom and of a cultural heritage, affiliation to a like-minded community: such are the impulses which shape our vision of the nature of things on which we rely for our mastery of things. No intelligence, however critical or original, can operate outside such a fiduciary framework.¹⁶

To be sure, this framework of faith is not self-evident. Whatever certainty it possesses is the result of robust belief. Still, as the centerpiece of a human being, a faith-based knowing provides the exodus from a thorough-going objectivism and consists of a set of convictions that precede and govern any assertion and any form of knowledge. It is faith, therefore, which seeks understanding, and in seeking understanding the faith itself is also challenged in a kind of critical dialogue. By invoking this Augustinian formula, Polanyi writes: “It says . . . that the process of examining any topic is both an exploration of the topic, and an exegesis of our fundamental beliefs in the light of which we approach it; a dialectical combination of exploration and exegesis. Our fundamental beliefs are continuously reconsidered in the course of such a process, but only within the scope of their own basic premises.”¹⁷ In other words, faith is always the basis of knowing, but in seeking knowledge, the faith is always put to a test, but only within the boundaries that the faith itself provides. Hence, in drawing upon this thesis, Polanyi asserts that unless one first believes,

¹⁵ Polanyi, *Personal Knowledge*, 266.

¹⁶ Polanyi, *Personal Knowledge*, 266.

¹⁷ Polanyi, *Personal Knowledge*, 267.

one will neither know nor understand. At the same time knowledge and understanding can also challenge and/or affirm faith. Belief is the key to knowledge and is a critical component of the tacit dimension. Faith is the unifying center of every person, and as a consequence the personal component is inextricably linked to every act of knowing.

Third, because of the tacit dimension and fiduciary nature of personal knowledge, *the task of truth-seeking is always carried out in a circle, thereby entailing risk and inducing humility*. However, this does not mean being swallowed up in subjectivism. Polanyi believes firmly that there is an independently existing reference point for all knowledge enterprises. "The effort of knowing," he says, "is guided by a sense of obligation towards the truth: by an effort to submit to reality."¹⁸ In fact, the real problem comes when thinkers try to approach this objective reality with pure objectivity. Those who embrace the scientific outlook and its corollary of personal detachment face what Polanyi calls "the objectivist dilemma," namely the requirement to abandon commitment in order to reach a commitment! "The reflecting person is then caught in an insoluble conflict between a demand for an impersonality which would discredit all commitment and an urge to make up his mind which drives him to recommit himself."¹⁹ Some, in trying to keep this requirement, end up dividing their lives into public/professional and personal/private spheres. The former realm is characterized by an attempted detachment, and the latter gives free reign to the human personality. The alternative to such a destructive personal dichotomy and the ultimately vain attempt at public/professional self-dispossession is to

¹⁸ Polanyi, *Personal Knowledge*, 63.

¹⁹ Polanyi, *Personal Knowledge*, 304.

recognize the inescapable omnipresence of human beliefs, and to acknowledge the circular character of the reasoning process. There is a danger in this, but what other alternative is left to human knowers? "*I believe that in spite of the hazards involved,*" says Polanyi, "*I am called upon to search for the truth and state my feelings. . . . Any enquiry into our ultimate beliefs can be consistent only if it presupposes its own conclusion. It must be intentionally circular.*"²⁰

This is not far removed from Polanyi's recognition that people uncritically accept and identify themselves with their presuppositions as their inarticulate context for life. "When we accept a certain set of pre-suppositions and use them as our interpretative framework, we may be said to dwell in them as we do in our own body."²¹ Since an inevitable, commitment-based circularity attends every act and field of human knowing, every act of knowing presupposes a measure of risk. Things cannot be known either exhaustively or objectively because of human limitations and prejudices. Human limitations and prejudices mean that human knowers will know only in accordance with their constraints and commitments. Consequently, Polanyi's system calls for and he himself exhibits a unique epistemic humility. Even regarding his entire project, he explicitly denies any illusion of objectivity and recognizes that its roots and warrants are grounded in his own convictions.

Personal Knowledge is an intellectual commitment, and as such [is] inherently hazardous. Only affirmations that could be false can be said to convey objective knowledge of this kind. All affirmations published in the book are my own personal commitments; they claim this, and no more than this, for themselves.²²

²⁰ Polanyi, *Personal Knowledge*, 299 (emphasis his).

²¹ Polanyi, *Personal Knowledge*, 60.

Thus, Polanyi seems to suggest that while it may be true that we know more than we can tell at the subsidiary level, at the same time we must be careful not to tell more than we actually know at the focal level. Personal knowledge is inherently circular, hazardous and humble.

Fourth and finally, because of the tacit dimension, fiduciary character, and circular nature of personal knowledge, in short, because personal knowledge has such a different form and function, *it must be taught by means of alternative pedagogies*. In short, tacit knowledge requires tacit teaching and personal knowledge requires personal teaching. This is the primary educational implication of Polanyi's ideas. Let me explain.

Knowledge that is "objective" can presumably be passed on to others in a traditional way by objective pedagogical methods: formal lectures, experiments, the memorization of facts, regurgitation of memorized facts on objective tests, and so on. However, personal knowledge, especially in the form of an art, is different, involving a genuinely human dimension. "An art which cannot be specified in detail," according to Polanyi, "cannot be transmitted by prescription, since no prescription for it exists. It can be passed on only by example from master to apprentice."²³ Here is his fuller description of the process of learning personal knowledge by means of personal example.

To learn by example is to submit to authority. You follow your master because you trust his manner of doing things even when you cannot analyse and account in detail for its effectiveness. By watching the master and emulating his efforts in the presence of his example, the apprentice unconsciously picks up the rules of the art, including those which are not explicitly known to the master himself. These hidden rules can be assimilated only by a person who surrenders himself to that extent

²² Polanyi, *Personal Knowledge*, viii.

²³ Polanyi, *Personal Knowledge*, 53.

uncritically to the imitation of another. A society which wants to preserve a fund of personal knowledge must submit to tradition.²⁴

In due course, such an apprenticeship develops into the expertise of a “connoisseurship,” which “like skill, can be communicated only by example, not by precept. . . . you must go through a long course of experience under the guidance of a master.”²⁵ Furthermore, this whole process can only be sustained by “the civic coefficients of our intellectual passions,” that is, by the support and nurture of a community that respects and promotes the intellectual passions which, in turn, provide a rich cultural life for that community. In Polanyi’s term, it is the involvement of human knowers in the “conviviality” of a like-minded social group that is crucial. As he puts it, “our adherence to the truth can be seen to imply our adherence to a society which respects the truth, and which we trust to respect it. Love of truth and of intellectual values in general will now reappear as the love of the kind of society which fosters these values. . . .”²⁶ Consequently, then, over against the impersonal pedagogy and radical individualism bred by the epistemology of scientific objectivism, there is a strong sense of commitment to learning by personal example and to the importance of an intellectually supportive community of conviviality fostered by the epistemology of personal knowledge.

Central to this pedagogical approach is the personal contact, the face to face encounter, the up-close-and-personal relationship between teacher and student, between mentor and apprentice. Learning from a master and in community cannot take place at a distance. It values real people in real places learning together, if valuable skills and venerable traditions are to be preserved

²⁴ Polanyi, *Personal Knowledge*, 53.

²⁵ Polanyi, *Personal Knowledge*, 54.

²⁶ Polanyi, *Personal Knowledge*, 203.

and passed on from one generation to another. R. L. Zigler explains the implications of this aspect of Polanyi's educational vision in these terms.

This personal contact is deemed essential to the passing on of the elements of a skill and understanding that the . . . [teacher/mentor] may not be able to articulate — that is, it is in contrast with that knowledge accompanied by the verbal component which defines our explicit knowledge domain. Thus personal contact, over generations, is obligatory to successfully transmitting the highest expression of any given craft. This personal contact represents, for Polanyi, one of the most important characteristics of what may be termed a “tradition” of knowledge and understanding. As Polanyi indicated, one must in many respects be bound to a tradition — and a community that sustains it — if one is to extract this element of understanding. Once the tradition is broken, however, recovery is problematic because the personal contact that sustained it is lost.²⁷

Polanyi's pedagogical proposal certainly finds support in the biblical doctrine of the incarnation of Jesus Christ: The Word of God who became flesh and dwelt (literally, pitched His tent or tabernacled) among us (John 1: 1, 14). The vital presence of Jesus as the Master-Teacher in the flesh was the critical component in the remarkable transformation of His disciples from relatively obscure, uneducated individuals into the kind of men who, in due course, turned the world upside down (Acts 17: 6, KJV). Certainly the formation of these kinds of mentor/apprentice relationships and the development of significant spiritual and learning communities grounded in tradition ought to be a high priority for DBU faculty and students if we ourselves wish to emulate the disciples in their world-changing effectiveness.

Conclusion

Michael Polanyi certainly walked to the beat of a different drummer, and did so courageously. Ever so briefly we have seen that for him personal knowledge is tacit, fiduciary, circular, and requires unique pedagogical methods

²⁷ Ronald Lee Zigler, “Tacit Knowledge and Spiritual Pedagogy,” *Journal of Beliefs and Values* 20 (1999): 166-67.

by which it may be transmitted to others. Gelwick thinks that his unique contributions consist in the ideas that he forged a creative relationship between tradition and innovation, emphasized the knower's unity with the world, creatively joined science to the other human arts, tightened the bonds between the world and humankind, and fostered a view of history as a drama of high moral purpose.²⁸ Overall, however, his purpose was iconoclastic, yet with a constructive goal in mind. Truly he sought to smash the images which had smashed European civilization at the hands of a ruthlessly objectivist science. Yet at the same time he labored assiduously to grind the lenses of a new *Weltanschauung* by which Western civilization, and indeed, the whole human race could know itself and the world around it in accordance with the civilizing themes of personal knowledge. As Harry Prosch puts it, "Polanyi therefore attempted to show us what the consequences of his prescription are when we apply his new and more correct understanding of epistemology and of the philosophy of science to our views of life, of human beings, and of their activities. . . ."29

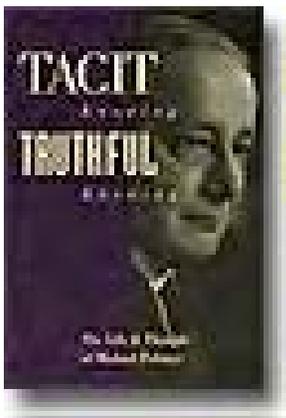
Michael Polanyi has, indeed, helps us to better understand what it really means to know something. The implications of his thought for science and

²⁸ Gelwick, *The Way of Discovery*, 139-141.

²⁹ Harry Prosch, *Michael Polanyi: A Critical Exposition* (Albany, NY: SUNY Press, 1986), 124. Polanyi's significant contribution was not lost on subsequent generations of thinkers. In fact, there is a remarkable confluence between Polanyi's understanding of the tacit character of the scientific enterprise and Thomas Kuhn's revolutionary concept of the 'paradigm' and his own revolutionary postmodern philosophy of science. See his *The Structure of Scientific Revolutions*, 2d. enlarged ed., vol. 2, no. 2, *International Encyclopedia of Unified Science* (Chicago: The University of Chicago Press, 1970).

education are profound. Let us take his suggestions seriously. They can change the way we go about the whole process of studying, teaching, and learning. Most importantly, they can change the way we live.

MARS HILL AUDIO exists to assist Christians who desire to move from thoughtless consumption of modern culture to a vantage point of thoughtful engagement. We believe that fulfilling the commands to love God and neighbor requires that we pay careful attention to the neighborhood: that is, every sphere of human life where God is either glorified or despised, where neighbors are either edified or undermined.



Tacit Knowing, Truthful Knowing: The Life and Thought of Michael Polanyi

Though largely ignored, the work of research chemist-turned-philosopher Michael Polanyi (1891-1976) offers rich insight into the methods of science, the role of belief in all human knowing, and the important connections between knowledge and responsibility. *Tacit Knowing, Truthful Knowing* explores Michael Polanyi's criticisms of both objectivism and subjectivism, and his attempts to develop a more truthful understanding of how we know the world. His ideas are based on the belief that all knowledge is either tacit (silent and unspoken) or rooted in tacit knowledge.

This two and one-half hour program (on two audio cassettes) features interviews with leading interpreters of Polanyi's thought, including Marjorie Grene, Richard Gelwick, Thomas Torrance, and Martin Moleski. Interviews with Nobel Prize-winning chemist Dudley Herschbach, educator Steven Garber, and master violin makers Peter and Wendy Moes, along with readings from Michael Polanyi's books and correspondence, further illuminate his ideas.

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