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Spelling: We recognize that the journal serves English-speaking writers around the world and so do not require anyone's "standard" English spelling. We do, however, require all writers to be consistent in whatever convention they follow.

Citations:

- Our preference is for Chicago's parenthetical/reference style in which citations are given in the text as (last name of author year, page number), combined with full bibliographical information at the end of the article. One exception is that Polanyi's major works may be cited parenthetically using the following abbreviations (with abbreviations italicized):

CF *Contempt of Freedom*

KB *Knowing and Being*

LL *Logic of Liberty*

M *Meaning*

PK *Personal Knowledge*

SEP *Society, Economics, and Philosophy*

SFS *Science, Faith, and Society*

SM *Study of Man*

STSR *Scientific Thought and Social Reality*

TD *Tacit Dimension*

For example: Polanyi argues that (*TD*, 56). Full bibliographical information should still be supplied in the references section since many of us may work with different editions of his works.

- Endnotes should be used sparingly and be placed before the reference section.
- We do recognize that Polanyi's work connects with scholars who work in diverse disciplines that use different style guides. To the extent that our software allows, we will accept other styles (e.g., APA or MLA) so long as the author is consistent and careful in following it. The main point, of course, is to give the reader enough information to locate and engage your sources. Manuscripts that are not careful and consistent in style will be returned so that the author can make corrections, which may delay publication.

For more information see <http://polanysociety.org/Aims-and-Scope-9-12-18.htm> and <http://polanysociety.org/TAD-Submissions&Review-9-12-18.htm>

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PREFACE

We have a full and diverse issue that leads off with a forum addressing the current crisis of democracy in the United States. Several Polanyi scholars were invited to reflect on the recent election and its aftermath from a Polanyian perspective. In the seven responses published here, you will see some overlapping diagnoses and a range of possible responses, all of which serve to illustrate the continuing fruitfulness of Polanyi's ideas.

In addition, Alessio Tartaro identifies seeds in Polanyi's early writings that flower into his fully developed understanding of tacit knowledge. Walter Gulick explores alternatives to the concept of "field" that Polanyi introduces at the end of *Personal Knowledge*. Phil Mullins interviews Sheldon Richmond, a philosophically trained systems analyst, whose latest book is *A Way Through the Global Techno-Scientific Culture*. Martin Turkis II offers an extended analysis of Elizabeth Grosz's, *The Incorporeal: Ontology, Ethics, and the Limits of Materialism* and Bruce Vojak reviews *Essays in Post-Critical Philosophy of Technology*.

We hope that people are finding their way around the now online only version of *Tradition and Discovery*. As always, there is more to be found at www.polanyisociety.org, including the latest iteration of News and Notes.

Even with the change to online format for the journal, we continue to count on dues-paying members not only to make *Tradition and Discovery* possible, but also the annual meeting and other special programs of the Society, so do consider joining or renewing.

Paul Lewis
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POLANYIAN REFLECTIONS ON THE CURRENT STATE OF DEMOCRACY IN THE U.S.A.



Keywords: moral inversion, fidelity to truth, free society, public liberty, civic trust, civil and uncivil public discourse, democratic virtues, public vs. private liberty, populism, Michael Polanyi

ABSTRACT

In response to the events of January 6 and the second impeachment trial, which made clear the fragility of democracy in the USA, several scholars whose work has appeared in this journal comment on one or more of the following questions: (1) What causes, epistemic and/or social, might Polanyi see as contributing to the incivility, rancor, and division that now characterize American politics? (2) What would Polanyi say about the events of January 6, as well as the events leading up to it? (3) What remedies might Polanyi suggest for rehabilitating our experiment in democracy?

MICHAEL POLANYI ON SOCIAL ORDER

Phil Mullins

Michael Polanyi confronted and analyzed both extraordinary political turmoil and political violence in the last century. He was a physician in World War I and he left Hungary for Germany after the fall of the Liberal post-World War I government. He likely anticipated the Red Terror which came when the short-lived communist government took control but was soon succeeded by the Horthy government and the White Terror (Scott and Moleski 2005, 33-51). In 1933, Polanyi left Germany as the Nazis tightened their grip. He had recently declined a position at Manchester University but reconsidered after Hitler was given dictatorial powers, and he eventually advised the Vice Chancellor at Manchester he would take a position under any terms offered (Scott and Moleski 2005, 133-142). Later, he was refused entry into the U.S. to take a position at the University of Chicago due to the upheaval in the U.S. associated with Joseph McCarthy. Polanyi organized events and wrote about issues central to Cold War politics for fifteen years in the programs of the Congress for Cultural Freedom; the Hungarian Revolution, the invasion of Czechoslovakia and the possibility of nuclear destruction also profoundly troubled Polanyi and led him to write essays (Scott and Moleski 2005, 211-294).

What follows is a selection of Polanyi comments on social order that I believe bear on the troubling, deep problems that surfaced at the end of 2020 and early in 2021 in U.S. political culture.

Mutual trust is fragile—and especially so in contemporary digital culture—and the crumbing of trust undermines agreement about facts:

The process of moral inversion inevitably undermines the very conception of facts, of ordinary matters of fact. After all, the overwhelming part of our factual beliefs are held at second hand through trusting others . . .

The widely extended network of mutual trust, on which the factual consensus of a free society depends, is fragile. Any conflict which sharply divides people will tend to destroy this mutual trust and make universal agreement on facts bearing on the conflict difficult to achieve (1956, 16).

Human beings must regard each other foremost as moral beings. Moral confidence among persons in a cultural and political context that relies upon public discussion is the underpinning of governance by consent:

Moreover, without moral confidence between men there can be no government by the consent of the governed. For no government would be trusted not to abuse its position and to relinquish power when consent was withdrawn....Thus inevitably, once we deny that moral motives play a part in politics, we find that the only possible form of government is by force (1947/2020, 27).

A free society can exist only if men firmly believe in each other as essentially moral beings. Free government is guided by discussion; that is its very essence. But how can you argue with people who have no moral conscience? What is the use of appealing to their sense of justice or to their social responsibility? They can neither be expected to respond to such argument nor to believe that it means anything on our own lips. And even if [in] the discussion we were only to make statements of facts, why should anybody believe that we are telling the truth? Unless people maintain a considerable degree of confidence in each other's respect for moral standards, there is no common ground between them and any attempt to seek remedy for grievances by appealing to public opinion is as senseless as it is impracticable (1947/2020, 27).

Populism is a great danger insofar as it suppresses genuine, serious discussion which is a primary domain for the exercise of public freedom:

Freedom to-day [sic] is drowned in popular emotion (1940/1975, 96).

The fight for freedom must aim...centrally at the voluntary reunion of conflicting groups. This is the unending task of those dedicated to the service of liberty. For life in a changing society can never cease to produce new dissensions and free citizens can therefore never pause in their search for new harmonious solutions to ever recurring conflicts (1947, 1058).

The rule of law, the exercise of public liberty, and democratic electoral practices focused on universal suffrage must go hand in hand.

We may call democratic a political system in which the rule of law sustains public liberties under a government elected by universal suffrage. . . [P]ublic liberties are the heart of democracy; the rule of laws is its muscular framework; and finally, a democratically elected government forms a dynamic centre for improving the laws by which men live in a free society (1958, 17).

Religious, political or scientific thought can best be cultivated where political liberty, rooted in democratic institutions and practices, is nurtured, where truth is recognized as transcending politics, and where open and reasoned discussion is recognized as the primary guide for public life.

Science, and generally the independent search for truth, is destroyed when political liberty falls. . . By its very nature. . . [religious, political or scientific] thought must claim superiority to temporal power. . .

[T]he link between science and liberty is completely reciprocal: while the profession of truth needs for its protection the free institution of democracy, these institutions themselves must decay and fall if people abandon their belief in reason. The idea of liberty derives its strength from many roots but among these there is one most vital: the belief that men can reach a better understanding by free discussion, that in fact society can be continuously improved if public life is steadily guided by reasoned controversy (1937, 710).

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JANUARY 6 AND ITS AFTERMATH: MORAL INVERSION 21st CENTURY STYLE

Paul Lewis

On 4 February 2021, *The Atlantic* magazine posted an article titled, “The Moral Inversion of the Republican Party.” The author, Paul Wehner, never alludes to the work of Michael Polanyi or explicitly defines what he means by “moral inversion,” but he does hint at a definition when he says that “the most damaging error...was prying apart politics from morality, viewing politics simply as a means to gain and hold power.” Moral inversion, for Wehner, seems to be the result of disconnecting political practice from ethics. While his phrasing is not identical with Polanyi’s discussion of moral inversion, it certainly resonates. Moral inversion, I think, serves as a useful lens for interpreting not only the attack on the Capitol building, but also some dimensions of our current political problems in the United States.

Polanyi treats moral inversion as one of the factors, if not the most important one, in the collapse of liberal Europe and the rise of Marxism and fascism. He argues that the passions that drove those revolutions could be traced to the ways that positivism rejected the notion of moral ideals, since such ideals were not “objective,” i.e., they could not be verified “scientifically.” As Polanyi puts it, moral inversion takes place when “people pursue moral ideals within a system of thought that denies reality to moral scruples” (*PK* 234). The result is that what is immoral appeals to someone’s moral passions (*PK* 232). He later seems to equate moral passions with a fervor for social betterment (*TD* 58). Under certain conditions, moral inversion results in a “creed of salvation by violence” (*M* 28). Moral inversion thus resembles a philosophy in which what is perceived as a moral end can be pursued by any means.

While I do not think we have enough evidence to indict either Republicans (as a whole or even in part) or the insurrectionists of January 6 for being positivists in any technical sense, it does seem that moral passions have been divorced from any grounding in truth. The insurrectionists who stormed the US capital on January 6 gathered first at a rally dedicated to “stopping the steal” and so saw themselves as patriots who were preserving the integrity of the election. These people and others believed in the fiction that then President Trump had won re-election in a landslide, despite the fact that for weeks elected officials, such as Republican Secretary of State Brad Raffensperger in Georgia (the state where I live) vigorously defended the results of the election and that lawsuits alleging election fraud were thrown out for lack of evidence here, in Pennsylvania, and several other states.

The inversions of this situation seem patently obvious to those who have eyes to see. In the name of preserving the integrity of the vote, the insurrectionists of Jan. 6 were actually subverting it. In the name of patriotism, they were attempting to destroy democratic practices. Such passion disconnected from truth can be seen, too, in supporters of former President Trump who have treated Republicans who voted to impeach by censuring them, making death threats against them, and/or promising to vote them out of office in the next round of mid-term elections. Whatever may be the virtues and vices of other groups, the Republican Party’s complicity with “Trumpism” is a particularly clear expression of moral inversion that has stimulated what some are calling a civil war within the party. To what extent the Republican Party has betrayed its best and highest convictions is something that will indeed keep pundits and political scientists exploring for the foreseeable future.

In any case, our society does not seem to be one that Polanyi describes in *Science, Faith, and Society*, one that is “dedicated to the fourfold proposition (1) that there is such a thing as truth; (2) that all members love it; (3) that they feel obliged and (4) are in fact capable of pursuing it” (71). He goes on to say on that same page that if we begin to think that others no longer share that love of truth, our own confidence in the existence of truth will wane. What he acknowledges a bit further on that page is that we cannot foster such dedication in theory. Instead, these propositions have to be embodied in the “practice of an art” that is carried on by civil institutions that are themselves imbedded in a tradition that is passed on from generation to generation.

At least part of the solution to our present predicament would then seem to require rebuilding the institutions that have supported democratic processes. Here I find Jeffrey Stout’s description of democracy to be useful: a tradition of giving reasons and holding other people accountable to give reasons (2004, 13-14). Of course, political institutions can only be part of it. Educational institutions need to teach that truth is a quest, not simply a possession. As Polanyi learned from his work in labs as a physical chemist, reality is that which promises to reveal itself to us in unexpected ways in the future (*TD* 32). Our understanding of reality, our knowledge of what is true, is therefore always incomplete. To say that, however, is not to say that our claims about truth are wrong. It is instead to recognize that we need to commit ourselves to continued exploration and learning, or, as Matt Crawford puts it, we have to become people who “love the truth more than you love your own current level of understanding” (2015, 63). Other elements of civil society, too, must reinforce this commitment and these practices so that our moral passions, i.e., our determination to achieve a better life, are directed toward something that is truly good, using means that are consonant with that vision of the good.

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THE NECESSITY OF VIRTUE IN THE FREE SOCIETY

Matthew D. Sandwisch

There is a lot of anger and distrust in our political discourse today that it is not limited to one side. Both right and left, conservative and liberal, have a hard time trusting the other side. At times, this distrust has resulted in violence, which is no surprise as much of our political rhetoric is also violent. Frankly, the state of our public life saddens me. But what is to be done? Reading and studying Michael Polanyi for the last number of years, it is natural that I look to his thought for answers. In what follows I offer what I take to be some of Polanyi's lessons for our current time. I only offer a general outline of what I think needs to be done. Much more thought and effort will be required to make concrete what is here offered as only generalized and abstract.

One of Polanyi's central concerns in his writings is the practice of science. Science, for Polanyi, is not a dogma or a specific set of facts. It is a practice. In order to participate in this practice, scientists must assent to and pursue scientific values. These scientific values are cultivated through apprenticeship to experienced scientists. Gradually, the would-be scientist learns to indwell these scientific values. Scientific values become part of the way he sees and understands the world.

Ultimately, Polanyi sees the practice of science as dependent upon the larger practice of the free society. Polanyi writes that "Dedication to the premises of free thought means adherence to some national tradition in which similar institutions have taken root" (*SFS* 71). Free thought is not something that occurs *ex nihilo*, but is instead something that we must be brought into, that must be cultivated. And part of what needs to be cultivated are civic and intellectual virtues. The language of virtue is seldom explicit in Polanyi, but I think it tacitly undergirds much of his thought. In fact, I think much of the language Polanyi uses is highly suggestive of virtue. Consider the following:

A community which effectively practices free discussion is therefore dedicated to the four-fold proposition (1) that there is such a thing as truth; (2) that all members love it; (3) that they feel obliged and (4) are in fact capable of pursuing it (*SFS* 71).

In this passage we see that the free society is dependent upon the metaphysical belief that there is such a thing as truth and is further dependent upon such virtues as love of knowledge, trust in our fellow citizens, and the various virtues necessary to aptly obtain truth. If we examine current political discourse in light of this passage, we find that power has replaced truth. We no longer trust our fellow citizens, particularly those who disagree with us. We are more concerned with political victory and vindictiveness than the persuasion of our fellow citizens. And it is readily apparent that most politicians and citizens do not have the requisite intellectual virtues needed to obtain truth and persuade others.

Polanyi discusses two virtues (he calls them principles) in *Science, Faith and Society*: fairness and tolerance. By fairness, Polanyi means the practice of presenting our viewpoints as objectively and honestly as possible, opening ourselves up to criticism by our opponents. He writes that we "must sort out facts, opinions, and emotions and present them separately, in this order. This makes it possible for each to be separately checked and criticized" (*SFS*, 68). This virtue requires self-knowledge of our motivations and emotional states in holding a particular view, and an openness in sharing them with others for the possibility of

criticism. By tolerance, Polanyi means something different than what is commonly meant by the term. He means something much more rigorous. It is not just accepting the fact that others disagree with you. It is actively seeking what kernels of truth can be found in their position. He describes it as “the capacity to listen to an unfair and hostile statement by an opponent in order to discover his sound points as well as the reason for his errors. It is irritating to open our mind wide to a spate of specious argument on the off-chance of catching a grain of truth in it; which, when acknowledged, would strengthen our opponent’s position and be even unfairly exploited against us” (*SFS* 68). Tolerance in Polanyi’s sense is the capacity to enter into our opponent’s viewpoint, and to attempt to understand it as he does. In doing so, we do not give up our own position but seek to more fully understand and indwell the mind of another who thinks differently. Doing so might alter our position, but it also might help us persuade our opponent to ours. It is a risky endeavor. In this way, we walk the tightrope of conviction and humility, which is I think a central concern of Polanyi’s thought.

A citizenry that has developed and practices virtues such as fairness and tolerance would be a much healthier society than the one we inhabit now. And thus, I think the task of restoring our democracy is ultimately an educational task. We must cultivate in our citizens the belief in and love of truth. We need to instill in them the belief that their fellow citizens also believe, love, and pursue truth. We must also cultivate in them the virtues to adequately pursue it and persuade others of it, virtues like tolerance and fairness. The cultivation of these beliefs and virtues must begin early on. For as Aristotle says, “It makes no small difference, then, to be habituated in this way or in that straight from childhood, but an enormous difference, or rather all the difference” (*Nichomachean Ethics* 1103b).

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THE EDUCATIONAL PREREQUISITES OF REHABILITATION

Jon Fennell

There is much in Polanyi's work that bears on all three of the questions whose treatment constitutes this forum. In what follows, I will focus on the third of these questions, "What remedies might Polanyi suggest for rehabilitating our experiment in democracy?" But, since it is scarcely possible to discuss remedies without at the same time reflecting on what it is that needs to be remedied, we will inevitably touch on the causes of our current disorders as well.

In "The Study of Man," a paper from 1961, Polanyi aptly cites *The Abolition of Man* by C. S. Lewis. What makes this citation apt is that Polanyi in this essay is principally concerned with the widespread tendency for the manifest success of scientific endeavor to be employed as justification for a reductionist conception of man—one in which man is reduced "either to an insentient automaton or to a bundle of appetites" (26) and thus incapable of moral responsibility—while Lewis in his book is focused precisely on the flawed ideas and associated moral and intellectual formation that engendered this disaster. Primarily responsible for the dangerously truncated conception of humanity, says Lewis, is a training (what we should appropriately call a "miseducation") that debunks moral sentiment and renders suspect any claim to knowledge of real and genuine incumbent value. This flawed pedagogy, rampant in English schools between the world wars (and, alas, prevalent in educational institutions, especially the universities, here and in other Western democracies during our own time), insists that judgments of value are intrinsically subjective, a function of non-rational forces. Under this view, such judgments, properly understood, are merely a concealed mechanism employed by one interest or faction to establish and maintain its advantage over others. Accordingly, subjugated groups remain dominated and oppressed to the degree that they believe that the true or the good in fact exists and they are bound by its authority. (Under this ideology, the fundamental actor is always collective: race, gender, class, etc. The idea that the individual person, with access to the universal, is primary, is viewed as an instance of hegemonic politics of consciousness.) Liberation thus consists in seeing through all of this and, after rejecting the clever universalist cloak of hegemony, asserting one's own conceptions in its place. Polanyi's primary contribution to the preservation of the liberal democratic order (and Lewis's as well) consists in revealing the terrible consequences of such skepticism and cynicism and pointing in its stead to the fruitful coherence of an alternative traditional understanding of value.

In "The Study of Man" Polanyi observes that, "Our age is racked by the fanaticism of unbelievers" (28). Stripped by skepticism and cynicism of any possibility of straightforward allegiance to universal principle or ideal, the angry protestor (satisfying an unacknowledged appetite by clandestinely yet fervently appealing to a moral universal) topples a statue of Abraham Lincoln or even of Frederick Douglass (both, after all, are committed believers in universal value), or defiles the Capitol building (the very existence of which points to something higher). Nearly all the rancor and violence of recent times is a product of the eclipse of commitment to, and thereby the reality of, the unifying ideals without which this nation, or any nation so conceived, cannot endure. This eclipse, in turn, is the product of a pervasive skepticism and cynicism that is the logical (and for Polanyi as well as Lewis, predictable) consequence of the influence of historicist-based reductionist ideology growing out of the Hegelian framework and achieving widespread currency through Marxism and its innumerable latter-day variations. In short, the root of the loss in vitality of the American

experiment is decay in the real presence of the defining principles of the Republic as a consequence of a miseducation rooted in neo-Marxist ideology in the guise of class, race, and other forms of identity politics and their underlying zero-sum reductionist power-based analysis and worldview. Only the rehabilitation of universal principle and ideal—indeed, of the very possibility of such—can sustain the regime (and Western civilization generally). The sole vehicle for such rehabilitation is a renaissance of education broadly understood. If we would have a return of the Republic of a healthier time, we must have a return to the character formation and associated moral and intellectual enablement of that healthier time. There is no better guide for what can and must be done than Polanyi's *Science, Faith and Society*, especially its elaboration and endorsement of "primary education" (above all, on pp. 71-72 and 83).

Polanyi offers additional guidance for rehabilitation in *Personal Knowledge*. Within the passionate crescendo with which the book closes, Polanyi refers to the accumulated knowledge and wisdom of the human race that "is wholly determined as that which we believe to be true and right; it is the external pole of our commitments, the service of which is our freedom" (404). Significantly, he adds that this knowledge and wisdom "defines a free society as a fellowship fostering truth and respecting the right" (404). It is no wonder, then, that Polanyi points us to Lewis and *The Abolition of Man*. For no one is more alert than Lewis to the price to be paid when people are either unwilling or unable to believe in a truth and rightness that exists beyond our petty divisions and trivial tribal identities and that, in its universality, is binding on each individual. Without the enablement afforded by appropriate initiation and apprenticeship there is no "man" and thus certainly no grounds for principled citizenship. The Republic is defined in terms of principle and ideal. Without securing the conditions under which these become real in the lives of the young who will tomorrow rule as adults, it can only be futile to speak of rehabilitation and, through it, preservation of the American experiment.¹

ENDNOTE

¹For more on the pedagogical prerequisites for rehabilitation, see Jon Fennell, "On Authority and Political Destination: Michael Polanyi and the Threshold of Postmodernism," *Perspectives on Political Science*, Vol. 42, No. 3 (July-September 2013), pp. 154-161 (esp. 158-59), as well as Jon Fennell and Timothy L. Simpson, "A Polanyian Rationale for a Liberal Arts Curriculum" (forthcoming in *Theory and Research in Education*).

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A POLANYIAN ACCOUNT OF WHAT CAUSES INCIVILITY IN PUBLIC DISCOURSE

Dale Cannon

There are many things in Polanyi's thought that help identify crucial conditions for civil discourse. Five Polanyian themes, central to his thought, stand out for me as essential. These five reinforce and, as it were, presuppose each other. Ideally they are pervasively embodied in any tradition of civic culture. They can, of course, be taught, but more in the manner of mentoring and apprenticeship than in any sort of straightforwardly didactic manner, and necessarily within a communal or community-building manner where each participant is allowed a voice, respected, and listened to convivially. The absence of them (it is hard to imagine any one of them being absent and the others not also being absent) directly results in uncivil public discourse.

The first is Polanyi's understanding that *reality transcends our (and every other) explicit conceptual grasp of it in inexhaustible and surprising ways, yet as something we nevertheless can make contact with in its very transcendence*. This is a paradox, but it is not a contradiction. For Polanyi, truth *is* contact with such reality, reality that is always more than what we have succeeded in grasping and representing or ever will have succeeded in grasping exhaustively.¹ In consequence, it draws ever onward to know it more fully. To the contrary, if reality is not understood to transcend our explicit grasp, then there is no basis for questioning a person's explicit claims, no basis for verifying or falsifying them, and no point to do so. So also there is no point to explore further to discover as yet uncomprehended aspects of reality.

Second, *our knowledge, insofar as it is truly knowledge, does indeed grasp reality in various ways and to various degrees, but its grasp is always perspectival, partial, and incomplete—that is to say, its grasp is always fallible*. All representations of reality fall short of capturing reality exhaustively. Our representations are always vulnerable to being found wrong or exposed to be in error in various respects, open to being legitimately questioned and challenged by other claimants to knowledge of the same reality, or of aspects of the reality we think we know but which we may have overlooked or missed. To the contrary, if representations of reality are presumed to capture reality exhaustively, they *must* be true. There is no possibility that they might be wrong. There is no basis for uncertainty or hesitation about them. They can be acted upon without second thought. And we are justified in silencing our adversaries, not just in not paying attention to them.

Consequently, third, *all claims to truth (claims of contact with reality) are to be understood always as affirmed with universal intent, never as actually attaining universality*. No one has access to, or occupies the place of, absolute, unchallengeable truth. This is not to say that there is no absolute truth; it is just to say that no one can rightly claim to possess it (i.e., lay claim to its definitive, final representation), or deny others access to aspects of it (and claims thereof) that lie outside the former claimant's representation. To the contrary, if universality can be presumed unproblematically to be attained, there is no need to consult other points of view. Serious discussion of alternatives becomes pointless, a waste of time.

Fourth, *all members of the community in which one stands are understood and respected to be (in principle) recognizers of reality in common*, to which any individual knower in pursuit of discovery of reality is answerable, which is to say responsible. Reality in its transcendence beyond our fallible grasp is thereby open to be discovered and recognized by other members of the community. No one has the right to claim a complete

knowledge of reality that would cut others off from recognizing and calling attention to other aspects of the same reality. Being open to and acknowledging these others as knowers of the same, common realities is what makes and keeps our knowledge responsible. To the contrary, if other members of the community are not regarded as in principle recognizers of the same reality, though they do not occupy the same point of view, then they can be dismissed as subscribing to some alternative “truth” or “reality”—a position of ignorance, lacking truth, and therefore not worth taking seriously. They have no standing. In such a circumstance our claim to knowledge is irresponsible.

In consequence of the foregoing, fifth, as person-knowers we have, in principle, *the capacity to learn through empathetic indwelling of the (ultimately tacit) knowing that others have* of aspects of the reality we are seeking for ourselves to know more fully. In other words, *we have special need of these other knowers to be coming at the reality in question (the same reality we are claiming to know) independently of us* via their uniquely distinct perspective, and authentically to meet with us and we with them so that mutually we can learn from each other aspects of the reality that is of concern. (My phrasing is drawn from what Hannah Arendt has to say about the nature of commonsense and the public or common world.²) They and our dialogue with them are, as it were, an indispensable, transcendental condition (a *conditio sine qua non*) of our claim to make contact with reality in its objectivity. A truly objective grasp of reality happens when this indefinite multiplicity of competent personal perspectives meet and mutually recognize each other’s insights into that reality as those of authentic person-knowers, above and beyond a mere exchange of opinion and information. To the contrary, if empathetic indwelling of the knowing that others have of aspects of reality we claim to know and understand is regarded as impossible, not worth the effort, or a waste of time, then there is certainly no point to include these others in reasoning publically about important matters. They stand outside the truth, they can be presumed as having no access to reality and no participation in truth in common with us.

These five themes—“truths” if you will—are essential to civil discourse. Lack of them is a guarantee that discourse will be uncivil.

A breakdown of civil discourse occurs wherever parties to a dispute adopt a “philodoxic/philodoxical” attitude (see Eric Voegelin on this concept which he derives from Plato) toward favored representations of reality, which conflates the favored representation with truth itself and no longer recognizes the difference (or distance) between the representation and the reality in question (and accordingly sees no point in looking into the reality further to find aspects that might be emphasized by the other parties to the community discourse).³ For such persons, their map of reality is indistinguishable from the reality in question; their map is territory. As a result, each of the above five points drop out of their understanding of community discourse.

How then is it possible to re-build an understanding, appreciation, and commitment to them? Polanyi doesn’t himself have much to say about such an endeavor once the tradition of civic discourse has been badly eroded or disintegrated.

Sociologist Robert Bellah’s *Habits of the Heart* and the body of work that it has stimulated has a great deal of light to shed on what practically is needed for civil discourse to be established and sustained. Bellah goes back to and builds upon Alexis de Tocqueville’s study of *Democracy in America* and his recognition of the indispensable role in American history of free and voluntary, local associations of diverse people involved in common, local tasks. *Habits of the Heart* traces the antecedents of much of the current breakdown in civility in our nation. I see Bellah’s work convergent with much of what Polanyi has to say. My point is that people need to become participants in free and voluntary, local associations of diverse people involved in

working together on common, local community needs that are not immediately connected with ideological controversies.

ENDNOTES

¹According to Polanyi, truth does not lie primarily in the accurate correspondence of a representation with what it represents but “truth lies in the achievement of a [person’s] contact with reality—a contact destined to reveal itself further by an indefinite range of yet unforeseen consequences” (*PK*, 147).

²See Hannah Arendt, *The Human Condition* (Chicago: University of Chicago Press, 1958), chs. 7 and 39, and p. 208f. Also see Dale Cannon, “Toward the Recovery of Common Sense in a Post-Critical Intellectual Ethos,” *Tradition and Discovery* 19:1 (1992-93), 5-15.

³The concept of *philodoxy* in relation to *philosophy* is discussed in various places within Eric Voegelin’s work. See his *Anamnesis*, trans. and ed. By Gerhart Niemeyer (Notre Dame and London: U of Notre Dame Press, 1978); Eugene Webb, *Erich Voegelin: Philosopher of History* (Seattle and London: U of Washington Press, 1981); and Eugene Webb, “Faith, Truth, and Persuasion in the Thought of Erich Voegelin,” in *Voegelin and the Theologian*, ed. John Kirby and William M. Thompson (Toronto Studies in / Theology, vol. 10; New York: The Edwin Mellen Press, 1983), pp. 356-369. Voegelin’s thought has much in common with that of Polanyi.

POLANYI'S TELIC VIEW OF TRUTH AND CONTEMPORARY POLITICS

Walter Gulick

In this brief essay, I will suggest that one factor leading to the democracy-threatening fracture in the American body politic has been a weakening and even corruption of the concept of truth. While the debasement of truth is by far most evident in the rhetoric of ex-president Trump, I believe Michael Polanyi would say that many of those who have opposed Trump have also embraced a deficient notion of truth. Ironically enough, the relativistic postmodern perceptualism characteristic of many anti-Trumpian commentators might well be a key factor motivating disaffected Americans to seek the authoritarian rigor of Trump's pronouncements.

Polanyi coined the notion of moral inversion to account for the rise of the totalitarian regimes and terribly destructive wars blighting the twentieth century. Moral inversion results when widespread cultural skepticism and anti-authoritarianism are conjoined with rudderless moral passions. When moral constraints are viewed as but contrivances manufactured to support the interests of those in power, terrorist opposition to prevailing social structures is sanctioned.

Does Polanyi's category of moral inversion illuminate why Trump was elected and has continuing appeal to many? Yes, to some degree, although in a more obvious way with respect to the insurrectionists than in relation to the ordinary people I wish to focus upon in this essay. But the factors in moral inversion now are quite different than the factors Polanyi countenanced. Demographically, Trumpians tend to be older white males, rural folks, those on the lower end of the economic scale, and those without any higher education. In contrast, those infected by moral inversion in the first third of the twentieth century tended to be drawn from urbanites and the most educated layer of society. Ordinary folks first attracted to Trump were usually not skeptical or antiauthoritarian; rather they sought an authoritarian leader who understood their plight. Subsequently, they were recruited by Trump's rhetoric to be skeptical of any sources that do not agree with him. They are certainly not passionate about a new form of government like the Marxists were. Their passions tend toward nostalgic yearning rather than political fervor. They tend to be anti-Democrat rather than anti-authoritarian. Indeed, the unrestrained pronouncements of Trump and his Tweets that do not conform to political correctness may seem like a form of honesty to them. It unites them.

What perplexes many observers is how completely Trump supporters have accepted the self-serving claims Trump has consistently made. Any criticisms of Trump's actions are dismissed as fake news. The ability of data-gathering organizations to monitor the choices people make on the internet and what they say and do on social media has produced unprecedented opportunity to manipulate the information people receive. Directed propaganda and ideology have created political silos. The early optimism that the internet would enhance democratic choice has proven cruelly misplaced. Thus, the scientific objectivism Polanyi saw as defining truth to many in the past century (and which undermined respect for universal values) has been replaced in our time by individualistic conceptions of truth and public political correctness. The same lack of respect for universal values Polanyi noted in positivism, romanticism, and nihilism is again the case in our times, although now dressed in different clothing. We seem faced with either (1) authoritarian declarations of truth that can even reject scientific truth if it is inconvenient, or (2) cultural sensitivity suspicious of any

universal claims such that statements of scientific truth tend to be processed in terms of possible exceptions or outright skepticism. Polanyi's claim that "The world needs science today above all as an example of the good life" (LL 7) would be regarded as peculiarly out of date by most persons today.

What are the concerns of the complex group I am calling Trumpians? The lack of significant policy proposals in Trump's 2016 and 2020 campaign literature makes it evident that his appeal was largely emotional in nature. My home state of Montana changed in the last election from being purple to being uniformly red, so here, at least, that emotional appeal has not been assuaged. "Make America great again!" and freedom from constraint are two of the explicit values Trumpians affirm. The term "again" in MAGA suggest that the emotion is attached to retrieving something that was lost. The emphasis on freedom suggests that what is perceived to be lost are such freedoms as the right to say what one thinks (versus political correctness) and freedom from (federal) governmental control and burdensome change. These concerns are reinforced by the dominant media in Montana's rural areas: talk radio and Fox News. What I heard a woman from a declining rural town say illustrates, I think, what many Trumpians feel: "We hear all the time that 'Black Lives Matter,' but what about us? We don't seem to matter anymore." The combination of resentment and felt abandonment is further stoked by the change in national demographics that seems to many Trumpians to threaten their sense of what it is to be an American with its traditional social values.

Polanyi was quite explicit about how to counter the malaise of his time. "The general foundation of coherence and freedom in society may be regarded as secure to the extent to which men uphold their belief in the reality of truth, justice, charity and tolerance, and accept dedication to the service of these realities; while society may be expected to disintegrate and fall into servitude when men deny, explain away, or simply disregard these realities and transcendent obligations" (LL 57). I believe this statement still holds true for our age. However, the nature of the values Polanyi affirms has been seriously questioned in our age. Because the notion of truth's reality has been especially attacked, let us turn to the details of Polanyi's understanding of truth to see on what Polyanian grounds, if any, its reality may be reaffirmed.

Polanyi's notion of truth is complex and many-faceted. In his 1952 article "The Stability of Belief," he proposes to substitute the term 'belief' for 'knowledge' with "the intention of keeping always open in our minds a broad and patent access to the personal origins of our convictions. By this conceptual reform I hope eventually to eliminate the difficulties inherent in the various theories of truth, whether they rest on correspondence, coherence or utility" (Polanyi 1952, section 3). But is adding "I believe" before stating a scientific theory adequate ground for rejecting any of the traditional theories of truth?

He rejects the correspondence theory of truth insofar as it follows Russell's description of it as requiring identity between one's subjective state and objective reality (see PK 304 for further elaboration). Yet he also claims that "truth lies in the achievement of a contact with reality" (PK 147; see also PK 5, 64, etc.). The theory or formula that adequately expresses this contact sounds very much like it expresses what is meant by the correspondence theory of truth.

He also rejects the coherence theory of truth. He states that "what earlier philosophers have alluded to by speaking of coherence as the criterion of truth is only a criterion of *stability*" (PK 294). Yet he seeks the stability of reliance upon tradition and committed belief. Would he not align his thought to those aspects of tradition that seem coherent and true?

While so far as I know, Polanyi does not discuss the pragmatic theory of truth, his notion that what is true has indeterminate future manifestations has pragmatic overtones. Copernicus's theory is accepted as true because it formed the basis upon which Kepler successfully illuminated the nature of Copernican

planetary orbits—a pragmatic outcome. Yet Polanyi rejects calling a scientific claim truthful if its only virtue is that it has practical applications (*PK* 169).

How, then, is one to understand Polanyi's notion of truth? In his scientific work, Polanyi relied upon the prior discoveries of scientists and his belief in the *coherence* of the scientific worldview. His discoveries of hitherto unknown relationships in the external world, when expressed, manifest a *correspondence* view of truth. But I would argue that that his turn to philosophy was motivated in large part because the coherence and correspondence theories of truth alone were not ultimately satisfying to his sense of significant meaning. His view of truth became multi-faceted, sensitive to purpose and context. Within his "ontology of commitment" (*PK* 379), he affirms an idiosyncratic confessional view that is a variant of a pragmatic theory. On the one hand, he seems to hold that any claim made committedly with universal intent is per se truthful. "Within the framework of commitment, to say that a sentence is true is to authorize its assertion. Truth become the rightness of an action" (*PK* 320). Yet, on the other hand, Polanyi acknowledges the possible fallibility of his or any knowledge claims. Were the confessional view just quoted all he said about truth, then his view would not be significantly different than that held by a serious Trumpian. Polanyi distinguished his science-based view from the Azande worldview by its contact with reality. That is a view based on observation. In contrast, the confessional view is sensitive to meaning and significance. It is founded on "acceptance" (see *M* 149ff). To qualify as true, all claims should be made with "universal intent." However, some claims made with universal intent may ignore truth in order to privilege other values such as compassion, loyalty, or courage. "Truth is the highest object or intention in science—the greatest standard motivation. In political persuasion the highest standard of motivation, perhaps, is what is right or fair in a distributive sense" (*M* 211). He views the political realm as filled with the competing interests of persons seeking power. Nevertheless, the ideal realm of truth, justice, and love is only made possible because its adherents depend on power-seekers and the material basis of civic institutions that also need appreciation (*PK* 215, *M* 213).

If human existence must serve many often-competing values, is there some overarching structure or highest value that brings them into unity and wholeness? Polanyi sought within philosophy a comprehensive vision that would remediate society and avoid the disasters of the twentieth century. Consider the following passage written in 1949 while Polanyi was busy trying to consolidate his diverse thoughts into some coherent order for the Gifford Lectures. He asserts:

our right to proclaim, without loss of intellectual self-respect, beliefs which are admittedly not inescapable. Let me illustrate the point by my own belief in the existence of a common sense of justice between the citizens of this country, which enables them—and will continue to enable them—to solve their conflicts peacefully by *persuasion*. This belief is contrary to the class-war theory, which denies both its premises and conclusions. Both of these conflicting beliefs may be compatible with the facts. Indeed, the first may be less plausible on the face of experience than the second. Yet I shall choose to believe the first, from *loyalty* to the *free society*, which will be strengthened by my holding of this belief, while it would be weakened in the opposite case. It is conceivable that I may prove wrong in the sense that eventually factions and mutual suspicions will prevail and freedom will be overthrown in Britain. Yet my belief will remain the *truer* one. For it is better to have proved wrong while upholding the free society, than to prove right in having helped to destroy it. Such a belief may be called uncritical. But the holding of a belief is an action which, though it must be

decided upon in due consideration of the facts, cannot be determined by the facts alone. An action can ultimately be judged only by *conscience*. (Polanyi, 1949, 359, my emphases)

In this passage, the telic nature of Polanyi's thought is clearly stamped. Truth is understood as belief which advances his moral aim, the establishment of what he terms "a free society." Here the confessional, pragmatic theory of truth, subservient to larger purposes, assumes dominance. Polanyi's career changes from natural science to social science to philosophy can be understood as expressing his transition from a disciplinary emphasis on facts to an emphasis on significance, that is, from a focus on a traditional view of truth to his confessional, post-critical view as that which matters most. His resultant novel understanding of truth is entwined with his interpretation of reality: both are purposive in nature, emphasizing significance such that problems with future manifestation can be said to be more real than stones (*TD* 33). The correspondence and coherence theories of truth provide evidence from the senses and society in support of the larger purpose of living well in a society of mutual respect. This is his vision of a free world in which persuasion based on evidence is prevalent.

For democratic persuasion rather than force to rule in society, trust in the integrity of one's interlocutors must prevail. In turn, trust is nurtured when participants speak truthfully in service to conscience. In addition, all participants must feel that they are heard. More directly put, democracy flourishes when participants speak honestly and listen empathetically. In recent decades, previously *excluded* voices have been heard. This is good. But previously *heard* voices must not be forgotten in the process. If one of the factors generating Trumpian belligerence is its adherents' feeling that they are not heard, attention to their grievances is paramount. All the participants in our democratic conversation need to step back from their favorite form of managed media and listen, in person if possible, to other people's real hopes and fears. Maybe then the real thwarted goals and exaggerated fears prevalent today may be acknowledged and addressed. Maybe then the common values that are woven into our life together, truth included, may once again shine forth and be respected.

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REBUILDING RESPONSIBLE FREEDOM

D. M. Yeager

“Defendant’s Mask Mandate not only deprives over a million Palm Beach County residents of the right to breathe, it also jeopardizes the spirit of the sturdy and self-reliant philosophy of individualism which underlies and supports our entire system of government through arbitrary and autocratic power to invade vital rights of personal liberty.”

—Josie Machovec et al. v. Palm Beach County, June 30, 2020

“Christians who had been paying attention had seen a trend where legal activists at all levels of government had been aggressively expanding their regulatory and ideological attacks on religious liberty.”

—David French, “Yes, American Religious Liberty Is in Peril,”
Wall Street Journal, July 26, 2019

Claims of absolute freedom and absolute individual rights have featured prominently in the public square over the past few years. This entitled but embattled construal of individual liberty and Christian religious freedom, exempt from legitimate constraint, figures in what many have lately called a crisis for democracy—and it paradoxically also explains why the enemies of democracy really believe, however erroneously, that they are democracy’s rightful heirs and defenders.

Such claims to unconditional freedom are generally wrapped in references to the U.S. Constitution and are properly met by informed analyses of what the Constitution actually says and how its provisions have been interpreted by the courts. However, our new and sudden sense of the fragility of democracy does not rest solely on the realization that millions of Americans lack a sophisticated understanding of legal issues, nor does a reduction of the problem to legal education convincingly resolve the paradox of insurrection that passionately believes itself to be restoration.

From Michael Polanyi’s point of view, this destabilizing of liberal democracy is the predictable result of the loss of the essential distinction between public liberty and private liberty. Far from being simply evidence of a gap in citizens’ understanding of the nation’s founding documents, the growing infatuation with absolute self-determination represents one of the most important ways in which liberal societies evolve, as it were, against themselves, putting at risk liberal democracy itself. The distinction between private liberty and public liberty, which Polanyi developed in his early social and economic theory, makes the paradox less puzzling because his differentiation of the two freedoms is simultaneously an analysis of authority. He holds, of course, that the morally and socially worst authority is that of the totalitarian state: a crushing central authority amasses to itself the use of (often lethal) force, dictates what people must do, sets rigid limits on what they may do, and goes to great lengths to control what they may say and to define what they are able to think. When tyrannical power is brought down by revolt, leaving authority dispersed among myriad individuals, the situation is, to Polanyi’s mind, equally bad in a different way. While Polanyi has no doubts that tyrannies must be resisted, this potentially anarchic liberation from all actual forms of authority too often

resolves into what Polanyi calls private freedom—the simple absence of constraints, but also of responsibility and shared purpose. The vacuum left by toppled authority is typically populated by private desire and pursuit of self-referencing, immediate goals.

Public freedom (which Polanyi binds tightly to tradition) is the alternative to *both*. The term is, therefore, perhaps misleading, and around the time he wrote *Personal Knowledge*, he allowed the private liberty/public liberty terminology to lapse, though he did not abandon what he had used it to name. By the time he composed *Meaning*, he had shifted entirely to the signifier “mutual authority,” and if we work back from that, we can see more clearly what the original distinction was meant to flag.

Tyranny (central authority)	Public Freedom (mutual authority)	Private Freedom (individual authority, which is, in effect, the absence of authority)
The absence of freedom; oppression and servitude; but also the absence of self-organizing social systems	The distinguishing mark of a free society; the hallmark of self-organizing social systems	“Negative” freedom; individualistic, self-centered, centrifugal—and therefore destructive of a free society
One central authority with absolute power	Authority resides in an established and organic social system that makes voluntary social cooperation possible; a self-constituted community is the authority	All individuals are their own arbitrary authorities; “absolute self-determination”
All social coordination from the central authority	Organically developed systems are self-coordinating and self-governing (or self-maintaining)	The absence of social cooperation; conflict; anarchy
Consolidated arbitrary power backed by physical force	The power of expertise wielded in the name of commonly shared goals and commitments.	Dispersed arbitrary power; social Darwinism
Social responsibility perverted by moral inversion and the fantasy of central control.	Responsible and disciplined freedom	Irresponsible, undisciplined, and at its extreme, nihilist illusions of freedom
Driven by moral aspirations, subverted by perfectionism, and corrupted by absolute power	Morally rooted in the self-set standards of the tradition, guild, community	Cut off from communal moral roots; cut off, that is, from the very moral ideals and value commitments that set limits to our private freedom.

“Public liberty,” inseparable from Polanyi’s notion of self-organizing systems, is the great achievement of liberal democratic governments, but it is also the institutional foundation on which a democratic

government can be maintained. “Public liberty” is thus the form of liberty that is “socially significant.” It has at least two manifestations. (1) In contrast to the centrally planned state, public liberty is instantiated where a state allows the emergence and constant evolution of self-organizing social systems (“free associations of persons”) at multiple levels. (2) Whatever shape those systems take at any given time, individuals should be maximally at liberty to figure out their own way of adjusting their lives to these social realities, responsibilities, and expectations (here public and private liberty to some extent intersect, but with public liberty setting limits to private freedom). “Private liberty,” according to Polanyi, is not tied to any particular form of government. Although benign forms of private liberty ordinarily flourishes most easily on a democratic platform of public liberty, there can be a considerable degree of private liberty (at least for some) even in the worst of tyrannies because tyrants do not actually care what people are doing privately so long as they otherwise conform to the requirements of the government.

It seems almost fanciful to suggest that a populist public who so completely misinterpret their legal constitutional rights could be brought to appreciate Polanyi’s social theory or would be tolerant of his celebration of tradition and elite expertise. Yet perhaps we should not cynically dismiss Polanyi’s confidence in the ability of persons, when approached with respect, to absorb and assess complex accounts of their own experience. Toward the end of “The Republic of Science,” in *Knowing and Being*, he responds directly to those who deny that the electorate can grasp the nuanced and complex understanding of science that he advances:

Those who think that the public is interested in science only as a source of wealth and power are gravely misjudging the situation....Universities should have the courage to appeal to the electorate, and to the public in general, on their own genuine grounds” (64).

It may be that Polanyi’s firmest contribution to rehabilitating our “great experiment” in democracy and in a pluralist free society is his call to commit ourselves courageously to it, fragmentary and elusive and fragile as it no doubt is.

Moreover, (some) people are tired now of clearly dangerous extreme forms of polarization, but find it difficult to articulate an alternative. Polanyi meant public freedom to be a third way between the arbitrary power of a collective’s total control and the arbitrary power of individualist irresponsibility, as well as between the hammerlock of dead forms of inflexible practices and an idol smashing (individual or group) self-will. In that same essay, he notes that what makes a free society free is not “the right of men to do as they please,” but rather their “right to speak truth as they know it” (70). And he offers his account of mutual authority in dynamic social systems as social analysis that “transcends the conflict between Edmund Burke and Tom Paine. It rejects Paine’s demand for the absolute self-determination of each generation, but does so for the sake of its own ideal of unlimited human and social improvement. It accepts Burke’s thesis that freedom must be rooted in tradition, but transposes it into a system cultivating radical progress” (71).

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THE ROOTS OF TACIT KNOWLEDGE: INTUITIVE AND PERSONAL JUDGMENT IN POLANYI'S EARLY WRITINGS (1939-1946)



Alessio Tartaro

Keywords: Autonomy of science, intuitive judgment, personal judgment, planning of science, positivism, problem solving, scientific discovery

ABSTRACT

Polanyi says that the concept of tacit knowledge is “necessarily fraught with the roots that it embodies” (TD, xviii). This paper demonstrates that these roots can be seen in Polanyi’s early writings between 1939 and 1946. In particular, the concepts of “intuitive judgment” and “personal judgment” have some peculiar features that flow subsequently into the idea of tacit knowledge. In this regard, they can be considered ancestors of Polanyi’s best-known concept. In the present paper, I propose a historical reconstruction of the two concepts. In particular, I focus on the problems from which they stem, namely Polanyi’s criticism of research planning and his account on the functioning of science and its institutional and social arrangement. Besides this historical reconstruction, I draw a comparison between the concept of tacit knowledge and its early predecessors.

The Autonomy of Science and the Planning of Science

After having retired in the mid-thirties from the professional pursuit of science in the field of physical chemistry, Polanyi began to take an interest in social sciences and economics. The concerns raised by the revolutionary events in the USSR and the spread of USSR-like ideas in the United Kingdom were two of the main reasons for this transition (see Nye 2011, 183-222 and Scott and Molesky 2005, 171:210).¹ More particularly, economic planning and the planning of scientific research were the most compelling problems for Polanyi because they were considered as a severe threat to a free society (Polanyi 1941). Although the two problems are tightly related, I shall only focus on the latter.

Polanyi argues that science can flourish and produce its valuable results only if it is autonomous. If so, each attempt to put science under a heteronymous rule cannot but lead to a frustration of scientific research. Consequently, since the planning of science is precisely an attempt to lead scientific research externally, it

necessarily frustrates the scientific pursuit, and it can potentially lead to its clumsy distortion or even to its destruction.

Basically, the autonomy of science consists of its being governed by an efficient mechanism of “scientific opinion” (Polanyi 1943, 143). The main task of scientific opinion is to impose scientific standards to which scientists have to conform so that their results could be accepted. These standards affect research in several ways. First of all, scientific opinion determines what counts as science in each particular branch at a given time. By doing so, consequently, it provides a set of previous discoveries on which new ones have to be based. Moreover, scientific opinion can either encourage those lines of research considered particularly promising or discourage other lines. In this way, scientific opinion determines standards of scientific interest. However, this is not the only kind of standard determined by scientific opinion. The criteria of reliability and precision, the traditional methods of science, and the particular procedures of each branch are defined by scientific opinion as well (Polanyi 1941, 437 and 1943, 24-5). That is the reason why each scientist needs to submit her new discovery, based on thousands of previous discoveries, to the judgments of her colleagues in order to gain acceptance.² The ruling of scientific opinion is, of course, mostly informal. Nevertheless, it is also partially formal, for example, in the system of peer review (Polanyi 1943, 23-25). In conclusion, the main functions of scientific opinion are in general “to preserve and disseminate in approved form the past achievements and accepted principles of their special field; to stimulate new individual contributions and to judge their value: discussing, and either rejecting or accepting new additions to the body of the heritage under [its] care” (Polanyi 1941, 441).

The planning of science is an attempt to replace the authority of scientific opinion with political control of science. In this perspective, science is no longer the disinterested search for truth; rather, it becomes a means by which political power can improve the condition of the people, addressing the right direction of scientific advance so that science can fulfill its duty to the community. Consequently, scientific research is no longer an end in itself, but it is instrumental in the advancement of the good of society and the satisfaction of its needs.³

Planned Order and Dynamic Order

Polanyi’s main argument against this conception is based on the idea that science is “an organism of ideas” (Polanyi 1939, 180), or a “dynamic order” (Polanyi 1941, 437).⁴ He points out that we can observe, both in nature and in society, two different kinds of order, i.e., “one resulting from the exercise of authority *over* a group, the other from the enjoyment of freedom by the individuals *in* a group” (Polanyi 1941, 431). Although an in-depth analysis of this distinction between “planned order” and “dynamic order” is beyond the scope of this article, we can provide two useful examples: a marching troop is an instance of “planned order”, while the order we can observe in a crystal is an example of “dynamic order”. The two kinds of order exhibit a substantial difference. Indeed, while the marching troop behaves according to a prearranged plan, the order displayed by a crystal is the result of “spontaneous mutual adjustment” (Polanyi 1941, 432) of the constitutive particles of the crystal. Thus, the main point of the distinction is that a planned order is achieved by limiting the range of action of the components because, in principle, soldiers could go in every direction, but they must go straight, synchronizing their steps. In contrast, a dynamic or spontaneous order is the result of free interactions of the elements of the ordered whole, since the order of a crystal is accomplished by the internal forces acting between a group of particles. Moreover, it is crucial to stress

that whenever an order generates spontaneously, any attempt to recreate it through an external agency or a plan is ineffective, and the opposite holds as well. The examples proposed above clearly support this claim.

Since science is a kind of order and its basic units are the individual scientists, then it is easy to demonstrate that science is a spontaneous order and not a planned one. In fact, the relationship between each scientist and the system of scientific opinion is a kind of mutual adjustment. Indeed, the activity of individual scientists continuously modifies scientific opinion and the general understanding of science as whole because they make new discoveries, spread new methods, find new interests, etc. Thus, any attempt to plan science cannot reproduce the great achievements that science reached in the last centuries, because these were the result of free interactions between scientists. Consequently, Polanyi concludes that the growth and dissemination of science is the result of dynamic order, and this is the reason why it cannot be planned.

Three Stages of the Growth of Science

So far, we have only focused on the institutional arrangement of science, i.e., the system of scientific opinion. However, this is only a third of Polanyi's exposition. Indeed, according to Polanyi, the forces contributing to the growth and dissemination of science operate in three stages (Polanyi 1943). The mechanism of scientific opinion that controls each scientist by imposing the standards of science is only the second stage. The third one is the decision of the public whether or not to accept scientific theories as to the real explanation of a given phenomenon through public discussion. Nevertheless, the crucial stage for us is the first, when "the individual scientists take the initiative in choosing their problems and conducting their investigations" (Polanyi 1943, 29). Indeed, in his reflection about this first stage, Polanyi stresses the role played by "intuitive judgment", i.e., the ability to embark on original lines of inquiry, to guess the right direction of its development and eventually to find the solution of the problem. Intuitive judgment would appear to foreshadow the concept of tacit knowledge.

Intuitive judgment

One of the main functions of intuitive judgment is "to discover the opportunities in the given state of science" (Polanyi 1943, 20). Exploiting their own intuitive judgment, scientists can identify the most promising lines of research. In this case, the first stage contributing to the growth of science is not distinguished clearly from the others. Instead, they are tightly connected. Indeed, when at the first stage individual investigators embark on a particular line of inquiry, they do not exercise their own personal wishes because "at any particular moment the next possibilities of discovery in science are few" (Polanyi 1943, 21). On the contrary, they cannot but exploit the opportunities provided by the current state of their own branches. Consequently, scientists' personal wishes are deeply constrained. In particular, since what counts as science in a given time is determined by scientific opinion, the opportunities of new discoveries available at any time are sketched precisely by scientific opinion. Thus, scientific opinion constraints scientists' exercise of intuitive judgment. The main point is that scientists do not exercise their intuitive judgment in a vacuum, but in the given context of the current state of their branch of science. Even though embarking on original lines of inquiry seems to be paradoxical because it seems to amount to guessing something hidden according to personal wishes, the task is nonetheless definite enough because the current state of the subject defines a range of possible impending discoveries.

The exploitation of the possibilities provided by the current state of science relies on intuitive judgment as well. In this regard, it is worth quoting Polanyi at length:

Scientific research is not less creative and not less independent, because at any particular time only a few discoveries are possible. We do not think less of the genius of Columbus because there was only one New World on this planet for him to discover. Though the task is definite enough, the solution is none the less intuitive. It is essential to start in science with the right guess about the direction of further progress...All the time the scientist is constantly collecting, developing and revising a set of half-conscious surmises, an assortment of private clues, which are his confidential guides to the mastery of his subject (Polanyi 1943, 22).

Here, Polanyi briefly describes the process leading from the knowledge of a scientific problem to its solution and so to a possible discovery. From the beginning of this process, intuitive judgment plays a crucial role. Not only does it enable scientists to choose the right problem among the few opportunities disclosed at a given time, also it provides the best strategy for attacking the problem. In both cases, the use of intuitive judgment is not equal to the exercise of personal wishes. Indeed, when the scientist seeks the solution of the problem, she has to apply the traditional methods of science and adopt its standard of reliability and precision (Polanyi 1941, 441). However, within this framework, her ability to collect, develop and revise that “set of half-conscious surmises” still remains the determining factor leading to discovery. As Polanyi states:

There is in him [the scientist] a hidden key capable of opening a hidden lock. There is only one force which can reveal both key and lock and bring the two together: the creative urge which is inherent in the faculties of man and which guides them instinctively to the opportunities for their manifestation...all the essential decisions leading to discovery remain personal and intuitive (Polanyi 1943, 22-23).

Thus, the state of knowledge and the existing standards of science define both the range within which the scientist must find her problem and the methods she can employ to seek its solution. Nevertheless, the decisive steps still are a matter of intuition, creativity, instinct, and personal commitment. As we shall see in the next section, the analysis proposed by Polanyi in the article “The Autonomy of Science” anticipates the considerations on the scientist’s ability to pursue research and make a new discovery relying on tacit knowledge.

Before developing this comparative theme, it is important to point out another interesting trait of intuitive judgment: it consists of a “loose system of intuitions [that] cannot be formulated in definite terms” (Polanyi 1943, 22). Unfortunately, Polanyi does not analyze this claim in-depth. He only says that since this system of intuitions cannot be formulated, it can only be transmitted through practice.⁵ This is a crucial point. Indeed, saying that it cannot be formulated implies that we cannot provide a set of definite rules for replacing the use of intuitive judgment (assuming the rules as a kind of exact formulation of something). Thus, only through personal collaboration with people skilled in the use of intuitive judgment, the apprentice can learn to employ her own intuitive judgment. Therefore, since intuitive judgment is crucial in the process leading to new discoveries, we can conclude that we cannot formulate rules for making discoveries. Even though Polanyi does not formulate this conclusion explicitly, this insight is remarkable because he comes to it in 1943, a long time before he develops a full theory of scientific discovery and tacit knowledge.

Intuitive Judgment and Tacit Knowledge

This early reflection about intuitive judgment reveals in advance some features of tacit knowledge. In this section, I briefly compare what Polanyi says about “intuitive judgment” to his later account of tacit knowledge. As I shall show, its reflection in the early forties has some analogies to his analysis of problem-solving and the role played by tacit knowledge in problem-solving. Indeed, recognizing a good scientific problem and solving it employing intuitive judgment is just a particular case of a more general ability to know and solve a problem using tacit knowledge.

In *TD*, Polanyi exhibits the knowledge of a problem as a paradigmatic case of tacit knowledge.⁶ He begins by pointing out that the preliminary step for solving a problem is, of course, the recognition of a situation as problematic. Even though this is a platitude, Polanyi notices that it raises a paradox proposed initially by Plato. As Polanyi states:

It is a commonplace that all research must start from a problem...we take it for granted, without noticing the clash of self-contradiction entailed in it. Yet Plato has pointed out this contradiction in the *Meno*. He says that to search for the solution of a problem is an absurdity; for either you know what you are looking for, and then there is no problem; or you do not know what you are looking for, and then you cannot expect to find anything (*TD*, 21-22).

According to Polanyi, Meno’s paradox raises a serious issue. Indeed, although we generally recognize and solve problems, the paradox prevents us from explaining how this advance in knowledge is possible. However, this contradiction arises only because of some assumptions about the nature of the knowledge and the knower. In particular, Meno’s paradox rests on three assumptions. The first one concerns the epistemic status of the agent: she can either completely know or completely not know. The second one concerns the nature of knowledge: each instance of knowledge is a piece of information separated from any others. The third one concerns the meaning of learning: learning is just the transfer and the acquisition of these pieces of knowledge. These assumptions establish a mechanistic (or in Polanyian terms, an “objectivist”) conception of knowledge, according to which all knowledge is always explicit. As Polanyi states: “the *Meno* shows conclusively that if all knowledge is explicit, i.e., capable of being clearly stated, then we cannot know a problem or look for its solution” (*TD*, 22). Indeed, if all knowledge were explicit, we could not know a problem because a problem is something hidden, still undiscovered and thus we cannot have explicit knowledge of it. Nevertheless, everyday experience, scientific and not, shows that in effect we know problems. Consequently, the objectivist conception of knowledge is wrong.

Polanyi’s solution, or dissolution, of the paradox, rests on the complete rejection of this conception of knowledge. Indeed, the fact that “to see a problem is to see something that is hidden” or that “it is to have an intimation of the coherence of hitherto not comprehended particulars” (*TD*, 20) is paradoxical only in this perspective. However, if we refuse this conception, then we can account for the fact that we know problems, surmising “the presence of something hidden” (Polanyi 1967, 188). Indeed, as Polanyi’s states, “this would of course be nonsensical, if we had to know explicitly what was yet undiscovered. But it makes sense if we admit that we can have a tacit foreknowledge of yet undiscovered things.” (*TD*, 23). Consequently, we can account for the recognition of a problem only if we reject the idea that all knowledge is explicit and accept that the knowledge of a problem is an instance of tacit knowledge. As Polanyi concludes: “the *Meno* shows,

therefore, that if problems nevertheless exist, and discoveries can be made by solving them, we can know things, and important things, that we cannot tell.” (*TD*, 22).

Tacit knowledge also explains how we can find a solution to a problem. Although both the discovery and the solution are unknown, tacit knowledge enables us to find the solution to a problem, as intuitive judgment leads the scientist in all the essential steps towards the discovery. A complete analysis of Polanyi’s reflection about problem-solving is beyond the scope of this article (for more, see *PK*, 135-136). However, what we are told is enough for establishing Polanyi’s conclusion: “Tacit knowing is shown to account (1) for a valid knowledge of a problem, (2) for the scientist’s capacity to pursue it, guided by his sense of approaching its solution....” (*TD*, 24).

Of course, Polanyi’s later account of the role of tacit knowledge in the process of problem-solving is much more developed than his early considerations about intuitive judgment in scientific discovery. However, the aim of this comparison is not to anachronistically claim that in 1943 Polanyi had already elaborated his concept of tacit knowledge. Rather, this comparison aims to show some links between Polanyi’s idea in 1943 and his better-known ideas about tacit knowledge. Indeed, these links support the conclusion that Polanyi gained his basic insights about tacit knowledge while dealing with the problems displayed in the previous section. The value of these remarks, thus, lies in making clear that Polanyi didn’t develop the concept of tacit knowledge to simply clarify the maxim “we can know more than we can tell”.

Personal Judgment

In the following years, Polanyi developed further his insights about the “tacitness” of some kind of knowledge. In *SFS*, in particular, he elaborates the concept of “personal judgment”, which is a development of the “intuitive judgment” and a more elaborated draft of the concept of tacit knowledge. In the following section, I propose an analysis of this concept.

Polanyi’s Criticism of Positivism

Polanyi’s reflection about personal judgment could not be separated from his criticism of “positivism”. Since I analyze in-depth Polanyi’s criticism of positivism in a forthcoming paper, here I just sum up the burden of this criticism to provide the context within which the concept of personal judgment is developed. Polanyi describes the positivist account of science as an attempt to base science only on radical empiricism and skeptical doubt. In this perspective, the essence of scientific objectivity would lie in establishing rigorous mathematical relations between measured variables employing fixed rules (Polanyi 1950, 2). Indeed, only in this way could science satisfy the requirement of both empiricism and skepticism. Polanyi’s criticism, on the contrary, aims to show that science cannot rely just on these two principles because scientific practice exceeds the mere application of rules. Indeed, each rule has to be interpreted, but any further rule cannot determine the very interpretation. Thus, rules have indeterminate content, and so they cannot provide unambiguous prescriptions for scientific discovery, verification, and falsification. For this reason, we need to find another factor on which these scientific processes are based. To provide an alternative account of scientific discovery, as well as of verification and falsification, Polanyi resorts to the concept of “personal judgment”.

Scientific Discovery and Personal Judgment

To overcome the positivist view, according to which scientific discovery can be reduced to the mathematical articulation of observations and measurements through fixed rules, Polanyi sets an example aiming at showing how we can make a discovery in everyday life. “Suppose we wake up at night to the sound of a noise as of rummaging in a neighbouring unoccupied room. Is it the wind? A burglar? A rat?... We try to guess. Was that a foot-fall? That means a burglar! Convinced, we pluck up courage, rise, and proceed to verify our assumption.” (Polanyi 1946a, 8-9).

According to Polanyi, the ordinary case of a sound attracting our attention may reveal aspects of scientific discovery that are concealed in the positivist view. In particular, Polanyi focuses mainly on the way the research starts, then is conducted, and eventually, the “theory of the burglar” discovered:

Curious noises are noticed; speculations about wind, rats, burglars, follow, and finally one more clue being noticed and taken to be decisive, the burglar theory is established. We see here a consistent effort at guessing and at guessing right. The process starts with the very moment when, certain impressions being felt to be unusual and suggestive, a ‘problem’ is presenting itself to the mind; it continues with the collection of clues with an eye to a definite line of solving the problem; and it culminates in the guess of a definite solution. (*SFS*, 8).

We find here all the chief moments leading to discovery. The first step is, of course, the recognition of a given situation as problematic, an issue that we already dealt with in the previous section. In *SFS*, Polanyi restates that a scientist’s guesswork relies, at its first step, on her “largely undisclosed abilities”, and that each further attempt to guess right must be based “on a sufficient foreknowledge of the whole solution” combined with “an intimation of approaching nearer towards a solution” (*SFS*, 18). As an artist, the scientist is “guided by a fundamental vision of the final whole”, a vision necessarily not explicit because it “can be definitely conceived only in terms of its yet undiscovered particular” (*SFS*, 18). The idea that the knowledge of a problem is non-explicit, not rule-based knowledge is already outlined in the forties. No rules can determine if a given situation is or not a problem, or if it is or not of scientific interest.

The “theory of the burglar” allows disclosing a further point concerning the discovery, namely that a dialectic between observations and speculations characterizes it. Against the overestimation of observations supported by positivism, Polanyi argues that “the part of observation is to supply clues for the apprehension of reality” (*SFS*, 15). In the proposed example, finding a problem (i.e., a noise in a neighboring unoccupied room) is followed by speculations about wind, rats, or burglars. A further observation, i.e., hearing a footfall, provides a decisive clue, leaning the speculations towards the hypothesis of a burglar, a real burglar. According to Polanyi, this is precisely the kind of interplay between speculation and observation that we can point out in scientific discovery (see *SFS*, 16).

Polanyi’s account completely reverses the positivist story about the relationship between observations and theory. Since scientific propositions are like statements about the presence of a burglar in the next room, then these propositions cannot be derived directly from data because observational data as such do not arrange themselves mechanically in a definite manner, which determines an unambiguous theory. The presence of a rat or a burglar, or the effect of wind, all equally explain the noise. As Polanyi states: “The theory of the burglar—which represents our discovery—does not involve any definite relation of observational data

from which further new observations can be definitely predicted. It is consistent with an infinite number of possible future observations” (*SFS*, 9). Moreover, we can point out that observations as such are no longer the starting point of the research. Instead, it is an evaluation of a given fact as something problematic which sets the tone of scientific research. Actually, this point is not clear from the example of the theory of the burglar. However, we notice that noises as such don’t turn automatically on speculations. Indeed, it is easy to find cases when those kind of noises are not detected at all. Thus, it is precisely the evaluation of the noise as something problematic that pushes toward speculations about the origin of that noise. Of course, this evaluation of the observations is quite different from the observations as such.

The reassessment of the role of observation involves another positivist commonplace, that is, the idea that research is all about indiscriminately gathering new observations. Polanyi demonstrates that this is not the case. When the problem is stated, its solution is not a matter of collecting and organizing further observations, but instead treating specific observations as clues fitting a solution. If that is correct, the process by which scientific propositions come into existence excludes “the possibility of deriving these by definite operations applied to primary observations” (*SFS*, 11-12). Indeed, strictly speaking, observations are never “primary”, because they are never considered as such, and so they cannot be directly manipulated through rules and procedures. On the contrary, observations need to be treated as “clues for something”, namely clues for reality, or at least for something believed to be the reality before they can play any part in the research. For these reasons, Polanyi argues that “the process of their [of scientific propositions] discovery must involve an intuitive perception of the real structure of natural phenomena”, precisely because it is this intuition which allows seeing given observations not as such but as clues for something real.

This last point makes clear that the interplay between speculation and observation is not arbitrary, but subject to some constraints. Indeed, speculations about what observations stand for (or are clues of) are bound exactly by our intuitions about what reality is. Since “science is assuming something real whenever its propositions resemble the theory of the burglar” (*SFS*, 9), the intuitive perception of the real structure of natural phenomena sets the boundaries of speculations. Polanyi defines these intuitions as “premises of science”, and refers to them also as “the fundamental guesses of science concerning the nature of things” (*SFS*, 15).

What is Reality?

We cannot go into detail about Polanyi’s reflection on what reality is. However, we need to focus on some essential points to make Polanyi’s considerations on scientific discovery intelligible. As far as his reflection in the forties is concerned, I could provide a simple definition saying that reality is that which possesses a coherent outline. Polanyi develops this idea starting from “the process by which we usually establish the reality of certain things around us” (*SFS*, 10). For instance, Polanyi says, we can see a ball or an egg at a glance because we can perceive their coherent shapes against a background and consequently determine that they are a real ball and a real egg. According to Polanyi, we can extend this reasoning from the perceptive cases to cognitive ones (*SFS*, 10). Following this parallelism, which is a fundamental insight in Polanyi’s thought, we can look at scientific discovery as a process of aggregation and integration of data and observations in a coherent form. Indeed, scientific propositions are concerned with reality exactly because reality is defined as what possesses a coherent outline. The difference between the perceptive integration of the impressions in a coherent shape (e.g., seeing an object, listening to a melody), and the integration involved in scientific discoveries is only a matter of degree: “We can say, therefore, that the capacity of scientists to

guess the presence of shapes as tokens of reality differs from the capacity of our ordinary perception, only by the fact that it can integrate shapes presented to it in terms which the perception of ordinary people cannot readily handle” (*SFS*, 10).

Looking at the scientific discovery from the perspective of recognition of form, extending the Gestalt theory of perception provides a further reason to reject the positivist idea for which it is the outcome of an operative process. On the contrary, Polanyi argues, scientific discovery is rather the result of a process of emergence, in which observations are continually integrated according to the rules of the art of scientific practice in order to realize a more and more coherent outline:

We may follow up our parallel between discovery and Gestalt perception by regarding the process of discovery as a spontaneous coalescence of the elements which must combine to its achievement. Potential discovery may be thought to attract the mind which will reveal it—inflaming the scientist with creative desire and imparting to him a foreknowledge of itself; guiding him from clue to clue and from surmise to surmise. The testing hand, the straining eye, the ransacked brain, may be thought to be all labouring under the common spell of a potential discovery striving to emerge into actuality. The conditions in which discovery usually occurs and the general way of its happening certainly show it in fact to be a process of emergence rather than a feat of operative action (Polanyi 1946a, 19).

The Integrative Function of Personal Judgment

Understanding scientific discovery as a process of emergence, characterized by an interplay between speculation and observation that enables us to make contact with a part of reality, finally allows us to point out the role played by personal judgment. Since “the propositions of science thus appear to be in the nature of guesses” (*SFS*, 17), scientists are supposed to evaluate evidence according to their personal judgment at each step towards discovery. Since this evaluation involves an intuition about the real structure of natural phenomena, it cannot be fulfilled by any formulated precept, but is the outcome of a delicate and personal art. This guesswork, however, is not unfounded. As we already showed in the first section, the individual scientist’s research is constrained under various respects by the authority of scientific opinion. In this section, moreover, we touched on the fact that scientist accepted the premise of science as a broader framework within which she develops her research. While the rigorous fulfillment of any set of critical rules would completely paralyze discovery and the unconstrained intuitive speculation would lead to extravagant conclusions, personal judgment transcends both creative impulse and critical caution, allowing us to realize a successful integration of observations in a coherent shape. Although Polanyi does not here describe in depth this integrative process, he foreshadows the basic operation of tacit knowledge, namely the integration of proximal particulars into a distal whole. Indeed, we can “translate” Polanyi’s account of scientific discovery in *SFS*, employing the categories developed subsequently. For example, we should say that scientists move from particular observations to discovery, or that they are subsidiarily aware of observations as clues to reality and are focally aware of discovery as an expression of a natural order. Thus, this non-explicit ability firstly spotted in scientists’ activity serves as a model for a broader account of knowledge developed by Polanyi from *Personal Knowledge* onward. Polanyi himself prefigures this extension saying that the same process leading to discovery can be found in other mental efforts; for example, the recovery of a lost recollection, the solution of riddles, the invention of practical devices, the recognition of indistinct shapes, the diagnosis of an illness, the identification of a rare species, and also the prayerful search for God (*SFS*, 20).

Conclusions

This analysis has shown how some essential characteristics of the concept of tacit knowledge can be found in the writings of the period 1939-1946 in response to problems that are not strictly epistemological. Indeed, both the idea that intuitive judgment enables scientists to recognize and solve problems and the idea that personal judgment integrates scattered particulars in a coherent form are analogous to the not explicit and not rule-based nature of tacit knowledge. At the same time, however, these intuitions do not stem from a clarification of the maxim “we can know more than we can tell”, but rather from a criticism of the planning of science and an alternative account of scientific discovery.

As shown in the first section, Polanyi elaborates his criticism of planned science by sketching an explanation in three stages of the growth and functioning of science, although I only touched on the second and the third one. I focused extensively on the first stage, in which scientists rely on “intuitive judgment” to identify problems and solve them. In that context, I pointed out how intuitive judgment anticipates some characteristics of the concept of tacit knowledge, in particular the role of tacit knowledge in problem solving and scientific discovery. Eventually, we examined the concept of “personal judgment”, which lays the groundwork for Polanyi’s alternative account of knowledge. Indeed, personal judgment anticipates the idea that knowing is a non-explicit activity by which we integrate many scattered particulars into a coherent form.

Although I did not consider them, many other aspects of Polanyi’s reflection are already outlined in this period, besides the ones concerning tacit knowledge. Among them, the concept of reality, the continuity between perception and cognition, the fiduciary foundation of assertion, the personal participation of the knower in the known. A diachronic and historical approach to these concepts, as the one here proposed, would be significant for a better understanding of Polanyi’s ideas.

ENDNOTES

¹The discussion about scientific standards will be proposed again and further developed in *Personal Knowledge*, in particular in chapter 6 dealing with “Intellectual passions” (*PK*, 140-215).

²In this regard, according to Polanyi, scientists act both as a judge and as a businessman. When they rely on previous discoveries, “they resemble a judge referring to a precedent”. When they make a new discovery and try to gain acceptance by other scientists, they act like a businessman “first seeking the most profitable application of his resources and then soliciting the consumers’ approval for his goods” (Polanyi 1941, 437).

³See Polanyi (1939, 186-189; 1941, 428; 1943, 19; and 1945, 2-3) for an extensive reconstruction of this doctrine, mainly based on J.D. Bernal’s book “Social function of science”.

⁴Organicistic metaphors recur in the writings of this period and the idea of “dynamic order” too has an organicistic flavour if we stress the fact that the embryonic development (Polanyi 1941, 432) is proposed as an order of this kind. Elsewhere, after having described the process of growth of science, Polanyi concludes, “We have here an organic process before us which is in many ways comparable to the growth of a living being. The branches of science appear, as it were bent on increasing their body through incorporation of new materials which they find suitable for assimilation; and these efforts, like the processes of growth in a living being, are rigorously dominated by a characteristic vital context; which, while retaining its essential identity, keeps developing further every time another parcel of new material is added to the body under its control” (Polanyi 1944, 3).

⁵Strictly speaking, these intuitions cannot be transmitted at all. Polanyi himself recognises that its transmission, even through practice, is “very imperfect” (Polanyi 1943, 22). As Polanyi makes clear in later writings, there is not any “content” passing from the master to the apprentice in the process of teaching and learning. The transmission of knowledge is rather a process of intelligent and creative imitation stemming from conviviality, in which the learner picks up this knowledge while he watches the master and emulates his effort. See also *PK*, 55, 206, and 219.

⁶See also *PK*, 126-131 for a deeper analysis on problem-solving.

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MICHAEL POLANYI'S UNDERSTANDING OF FIELD THEORY

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Keywords: Michael Polanyi, fields, discovery, problem solving, comprehension, ontogenesis, phylogenetic emergence, aesthetics

ABSTRACT

Michael Polanyi introduced the concept of fields in the last several pages of Personal Knowledge. In this essay I examine whether the last-minute addition of fields advances his explanation of anthropogenesis. Polanyi's view of the role of fields in solving problems and discovery plus their place in ontogenesis and phylogenesis is examined and found not to be wholly satisfactory. Alternative explanations of the factors advancing discovery and problem solving are advanced.

[Editor's note: the Zoom conference mentioned at several points in this essay refers to a session sponsored by the Polanyi Society held on 6 March 2021. The materials are available at <http://polanyisociety.org/2021Zoom/Zoom-Sessions-Mar.5&6-final.pdf>.]

In *Personal Knowledge*, Michael Polanyi introduces the notion of fields in the process of bringing his discussion of personal knowing to a climax. Only in the last seven pages of the 405-page text do fields play a significant role in his comprehensive philosophical vision. Nowhere else in his corpus of non-scientific work are fields mentioned in such detail. What does Polanyi gain by bringing the notion of fields into play at the conclusion of his investigation into how we come to knowledge? More specifically, are fields useful concepts for illuminating how humans make discoveries, solve problems, and achieve comprehension? A second question follows: do fields play a role in other aspects of Polanyi's epistemology?

As an organizing scheme to address these and subsequent questions about fields in Polanyi's philosophy, I will make use of R. G. Collingwood's "logic of question and answer."¹ Collingwood thought much philosophical discussion was otiose because the interlocutors talked past each other. The question one discussant was attempting to answer was frequently different than the question the other discussant was attempting to answer. To try to minimize this sort of misunderstanding, I will list questions I am attempting to answer with respect to the nature of "fields" and their relation to Polanyi's philosophy.

1. How does Polanyi understand the notion of fields?

The term “field” has many interrelated meanings, but I would like to focus on what appears to be its etymological root plus two derivative meanings that would seemingly relate to Polanyi’s thought: (1) A field is an open area of land, such as a field of wheat. Field in this basic sense is characterized by continuity and an extensiveness that generally is bounded by something different. (2) A disciplinary field is a category designating a common pursuit or complex of forces, such as the field of chemistry. Fields in this sense often have sub-fields and sub-sub-fields. Note that this notion of field functions as a non-perceivable organizational term with components characterized by thematic commonality and interconnectedness. (3) A field in the physical sciences denotes a force that acts at a distance like a magnetic, electrical, or gravitational field. Like fields in the second sense, such fields are not directly visible. Rather they are known by their effect as an attractive force.

Polanyi finds fields to be useful in illuminating how problems are solved. Problems, he suggests, attract intellectual effort. Thus, the third sense of “field” indicated above serves as the model for Polanyi’s intuition that forces play a role in discovery, problem solving, and other ways of coming to comprehension. After addressing how fields support the process of reaching knowledge, he expands the reach of fields beyond his experience as a scientist to address broader philosophical and religious issues. He introduces the notions of a “generalized field,” a “heuristic field,” and a “cosmic field” as he builds toward the climax of his theory of anthropogenesis in Part IV of *PK*.

2. Is the analogy between physical fields and problem-solving fields convincing and fruitful?

Polanyi believes that intellectual problems exhibit field-like qualities. Fields have the property, unlike mechanical models of force, of action at a distance. In attracting thought toward a solution, problems function much like gravitational fields attracting material objects toward the field’s material center. The model of a gravitational field seems more apt in thinking about discovery and problem solving than electrical or magnetic fields. Electrical fields have positive and negative poles, while magnetic fields have north and south poles. They serve to align electrical and magnetic objects into dipolar patterns rather than attract objects to a center the way gravity does.

However, gravity is a fundamental ontological feature of the physical world, whereas problems seem to be the products of human conception originating at certain times during a particular phase of cultural and intellectual history. When problems are solved, the field would seem to disappear, as the problem no longer exists. Similarly, when a person makes a discovery through an investigation, the person’s founding curiosity and probing inquiry are sated, and what is discovered becomes part of what Polanyi calls “reversible” or routine knowledge (*PK* 75-76). The originating field of attraction would dissolve.

During a Zoom conference discussion of the above description of physical fields, Eduardo Beira suggested that a mathematical model would provide a more accurate understanding of Polanyi’s notion of fields than a physical model. In calculus, a nonlinear equation can specify how a rate varies over time. Both differentiation, which calculates the rate of change at a particular point in time, and integration, which determines the total achievement accomplished during an indicated period, proceed to solution by imaginative use of ever closer approximations. This approximation process is analogous to experiencing “the approach of a recollection for which we have been racking out memory” (*PK* 400). In sum, mathematical procedures, such

as mapping vector fields by differentiation, can model how solutions are found, while physical fields like gravitation can model a solution's attractive power.

Furthermore, what is a problem for one person may not be such for anyone else. Does the very formulation of a problem create a field between an investigator and the problem? Or does a field connected to a potential problem exist whether or not a human recognizes its existence? But what sense would it make to say a field exists before recognition since it would seem to have meaningful existence only once a human is concerned about it. Human intentionality seems inextricably connected to problem solving in Polanyi's model of the attraction exerted by a problem.

Everyday experience suggests that Polanyi's model of attractive fields, based on his scientific experience, does not apply to all the types of problems we encounter. Does it make sense to postulate fields for such evanescent and common processes as indecision about what is right to wear for the theater or how to address an alienated friend? Low-grade discoveries emerge and often surprise us in everyday life. Similarly, solutions to problems are often found without intentional effort. In any case, the subjectivity inherent in human discovery and problem solving makes any scientifically valid correlation between relatively stable physical fields and protean mental fields seem, at best, to be strained, if not fatally flawed.

But maybe I am taking Polanyi's use of "fields" too literally. Perhaps there is enough in common between a gravitational field and problem solving to sponsor a metaphor or simile, such as, "In attempting to solve a problem, we feel an attraction to a solution similar to the pull a gravitational field exerts on physical objects." This still raises the question as to whether attractive power is always resident in problems, or whether even when attraction exists, it is human curiosity that generates the attraction. From a phenomenological standpoint, some problems are seen merely as irritants that one wishes to dispose of and forget. The resolutions of daily life's little dilemmas are subject to conflicting desires, changing circumstances, social conventions, ambiguous assumptions, and much else such that a seeming resolution one moment may well be undermined by new evidence moments later. Do such problems still exist in fields, but in some hidden form?

Jon Fennell, in responding to this paper, wrote that "discovery is an act of cooperation in which essential activity occurs on both sides. It is a joint exercise in achieving meaning." Of course, much discovery results from previous discoveries and from the joint activity of fellow investigators. But Fennell asserts that the objects of discovery somehow aid in the solution. I disagree. How did the world actively contribute to Einstein's general theory of relativity? Fennell further states that "the personal alone has never been sufficient" for discovery. True. The discoverer certainly relies upon integrating all kinds of environmental clues in making a discovery; she is not locked into her intellect alone. Serendipitous events can aid discovery. My complaint is with saying the clues *actively* contribute to new knowledge. I am comfortable saying that in its dynamism, aspects of the world reveal themselves—but not as fellow agents in a cooperative venture.

Rather than getting lost in niggling questions, let us see if understanding Polanyi's larger purpose in writing *Personal Knowledge* is helpful in seeing the place of fields in his thought.

3. What factors motivate Polanyi to conduct his epistemic investigations?

Some background information about Polanyi's interests will help us answer that question. Born in 1891, Polanyi considered the world he encountered prior to World War I to be a period of cultural excellence. Then the Great War initiated a period of catastrophe after catastrophe. Polanyi became a distinguished scientist in the field of physical chemistry during the 1920's and early 1930's, but he was increasingly troubled by the human toll of the traumas of war, economic depression, and tyranny in Western civilization.

He felt impelled to shift his attention away from scientific to normative issues. He started trying to comprehend the reasons for the century's disasters and on that basis find solutions that would return Western civilization to the status it enjoyed prior to the first World War. Thus, he shifted his attention from the hard sciences to the social sciences and then later to philosophy.

In 1941 Polanyi published an article entitled "The Growth of Thought in Society." The title describes an important motif that came to drive Polanyi's thought. Ideas, individually and in fields, provide the scaffolding upon which social movements grow and have power. Much attention has been devoted to his view that a misrepresentation of science as the only true knowledge undermined the traditions and values that held society together. They were seen as merely subjective and arbitrary. So, part of his mission was to deconstruct the putative objectivity of science and retrieve the significance of the arts, humanities, and religion. The problem was not with science itself, but with scientism that sees the hard sciences as the solution to all problems. Personal knowing was shown to underlie all the disciplines, science included. Thus, a basic aim of Polanyi's philosophy is to describe how reliable and significant knowing can take place. The notion of fields is introduced to aid understanding about how comprehending, discovery, and problem solving arise.

If scientific problems could be solved with the intellectual support of field theory, then perhaps social problems with their ideological underpinnings could be as well. Polanyi rejected "Mach's principle of 'mental economy,' according to which science is the simplest description or the most convenient summary of the facts" (PK 166). Science uncovers physical facts and relations. Accordingly, Polanyi seems, at least initially, to intend that his field theory articulate epistemic and ontological truth. Assessing the adequacy of his account of how fields function thus is a facet of evaluating the cogency of his epistemology. Ideally then, the niggling questions raised above may be shown to be irrelevant if it can be shown that fields contribute helpfully to Polanyi's larger intentions in writing *Personal Knowledge*.

4. How successful is Polanyi's epistemic use of a field to explain the processes of comprehending, problem solving, and discovery?

In *Personal Knowledge*, part IV, Polanyi makes the bold claim that *all* skillful acts of comprehension or knowing can be brought to completion because their striving takes place within fields offering guidance,

All the operations of the 'tacit component' (whether self-centered or seeking universality, whether conscious or unconscious) will be subsumed under this field conception. All mental unease that seeks appeasement of itself will be regarded as a line of force in such a field. Just as mechanical forces are the gradients of a potential energy, so this field of forces would also be the gradient of a potentiality: a gradient arising from the proximity of a possible achievement (PK 398).

Does Polanyi's claim that *all tacit operations* have a field character move the discussion to a more inclusive arena that satisfactorily overcomes the niggling concerns? Since tacit operations underlie all thought, fields should be ubiquitous. But in what sense might the complex, shifting array of various influences and processes operative in the tacit dimension constitute a field? Polanyi seems to be struggling here to articulate the subsidiary-focal distinction and the from-to structure of consciousness that he developed subsequent to writing *Personal Knowledge*. In his later understanding of tacit knowing, fields have no place. His theory

is compelling without tacit fields. Hence he sets aside his earlier claim that all tacit operations have a field character.

What about the more restricted role of fields within Part IV of *Personal Knowledge*? Do they make useful contributions to understanding how we know? Most pointedly, does a problem have attractive power within a field? Power seems evident in two components of the analogy: in gravitational force and in the person seeking a solution. The power resident in a solution is but a projection of the investigator's interest. The process of discovery has even less need to ascribe power to some center of attraction. A problem to solve has a known center of attraction, whereas a person seeking a discovery does not know what the desired outcome is like. The inquirer is the lone center of power.

Alas, the importance of a striving personal center is partially muted in some of Polanyi's statements. For instance, he appeals "to the evidence provided by various fields of biology (including psychology) which seem to cry out for the acknowledgement of a field as the *agent* of biotic performances" (PK 402, my emphasis). Along this line, he equates the process of coming to comprehend a solution with the process of physical development of an embryo and a child. "Comprehension and the somatic process which accompanies comprehension, represent therefore a kind of equilibration that can be defined only in terms of *intellectual rightness*. Morphogenesis, operating under the direction of a morphogenetic field, is a somatic process of the same kind, but following *morphological rightness* as its standard of achievement" (PK 398). The process of reaching comprehension is seen as a somatic process equivalent to the process of developing the right body form. Next, he claims, "The morphogenetic field (or its organizer, if there is one) is then defined as the agency of this success [of reaching the right body shape] and as that which has failed if success is not achieved" (PK 398). It follows from his analogy that the *field of comprehension* (or its organizer, if there is one) is the agent responsible for reaching comprehension.²

To be fair to Polanyi, however, it is important to note, as Jean Bocharova suggested in the Zoom discussion, that most often Polanyi speaks of the quest for intellectual solution to be an affair in which the lure of a solution *evokes* effort by a living agent. He states that "unformalizable regulative functions, linked to the animal's mental processes, are the predominant, comprehensible agency of animal life (PK 401).

I wholly affirm the importance of evocation in the search for meaningful solutions. Nevertheless, I find Polanyi's use of fields in *Personal Knowledge* to be rather muddled. Take the parallelism he suggests between comprehension and morphogenetic development. The latter is an expression of an orchestrated program of genetic expression and regulation carried out by DNA and RNA. As we saw, he claims morphogenesis follows a pre-existing "directing field." Unlike morphogenetic development, though, the solution of a problem or the coming to comprehension need not (and generally does not) follow some pre-existing program. Different investigators might bring unique assumptions and procedures to a problem, yet still be able to reach a solution.

Problem solving seems best understood as a skill orchestrated by a person as agent who both formulates the problem and attempts to solve it. The factors that make up the problem constrain the scope of investigation and in this sense help guide one to a proper solution. Ingenuity and originality are evoked in relation to the details of the problem. I find it surprising that occasionally Polanyi reverts to the apparent objectivity of a field to explain comprehension when his basic theme of personal knowing is that knowing is an *unformalizable* skill carried out *by a person*.

Polanyi recognizes the crucial importance of originality for problem solving. He asserts that a "generalized biological field" includes three stages of originality.

5. Do the three stages of originality that Polanyi claims are fostered by biological fields reveal the usefulness of field theory?

Previously Polanyi spoke as if each problem existed in its unique field, but on *PK* 398 it appears that these little fields exist within the purview of a generalized biological field. How is one to understand a biological field when, it will soon be evident, it includes species that are different in kind? A biological field seems to be a disciplinary field as defined in the second definition offered above. What the three subfields have in common is embodiment and its physiological processes.

First, “there is the originality of a resourcefulness manifested in achieving something clearly foreseeable” (*PK* 399). I take it that by “clearly foreseeable,” Polanyi means problem solving within a framework in which knowledge is reversible. He states, “An inference guided by a fixed framework can always be traced back to its premises, and such ‘reversibility,’ Piaget points out, may be regarded as a characteristic feature of disciplined thought” (*PK* 75). A mathematical solution resulting from skillfully manipulating numbers and relationships according to previously defined mathematical rules would be an example of rule-based discoveries. Wisdom employed to solve everyday problems in our complex non-linear world would also seem to be an example of this type of problem solving insofar as wisdom is based on applying the lessons of previous experience. Such wisdom, drawing upon disciplinary fields, is a step towards solving social problems. Polanyi describes such wise regulative performances as “a purely skillful knowing, a connoisseurship” (*PK* 342).

6. Within this first stage of originality, does Polanyi adequately cover the diverse types of human intellectual ingenuity that might solve significant problems?

In short, the answer is “no.” Richard Gelwick quite appropriately terms Polanyi’s comprehensive thought a “heuristic philosophy.”³ Discovery is a central theme in Polanyi’s thought, so it is surprising that the full range of intellectual discovery is truncated when he summarizes ways thought may be original within the biological field of embodied activity.

The first and most dramatic form of discovery Polanyi does not discuss is that which alters the frameworks through which we perceive reality. This radical change does not occur through ordinary foresight within normal frames of reference. Copernicus and Einstein may be referenced as among the few thinkers who initiated such new frameworks of understanding. The notion of a framework shift (a Kuhnian paradigm shift) seems more apt for describing their achievement than a broad reference to fields.

Newton’s formulaic description of the factors governing force, $F=ma$, would be a second additional type of discovery not described by Polanyi. Its formulation represents the discovery of a law-abiding relationship that was vaguely sensed beforehand. That is, it does not exactly represent a new vision of reality such as provided by Copernicus and Einstein, but neither is it clearly foreseeable as described in Polanyi’s first type of originality. Rather, this type of scientific discovery articulates a previously unrealized fit between human understanding and the phenomena of matter-energy activity. But this type of ingenuity need not be restricted to the sciences; novel social theories and artistic creation would sometimes fit as well. The course by which these types of discovery arise seems most adequately described by the description of the alternating ventures of imagination and intuition Polanyi offers after the publication of *PK*.

Technological innovation and the creating of machines represent a third type of originality not discussed by Polanyi in this summary statement, although he describes them earlier in *PK*. Contriving and

experimenting expand thought beyond what is foreseeable. Ironically, technological contrivances seem more liable than the other types of originality to benefit from analogy to gravitational fields because technological innovations are usually designed to fulfill a telic target and thus have a stable center of attraction comparable to the center of a field.

7. What does Polanyi's second type of biological originality tell us about the usefulness of fields for improving life?

The second type of biological emergence described by Polanyi takes ontogenetic maturation, not intellectual discovery, as its model. This type of emergence, already discussed above in terms of morphogenesis, is different than the first type of originality because it is not discovered; it is biologically pre-programmed. Ontogenetic maturation, he states, "represents a series of achievements, each producing a new field by which the next higher achievement will be performed. Such emergence—defined as an ordering principle capable of producing operational principles which the system had not previously possessed—has been adequately illustrated by the process of ontogenetic maturation" (*PK* 399). This claim raises three questions. First, while each adult matures into a unique personality, it stretches the concept of originality to say the biological program inscribed in DNA and RNA to produce adult human bodies from egg and sperm represents a stage of originality. Physiological maturation occurs again and again in roughly the same way. Second, to postulate the creation of a new field for each step of maturation seems unnecessary, adding nothing to existing biological explanation. Third, why does the embedded program of maturation require the existence of an ordering principle—an abstraction—to facilitate the emergence of each step of the programmed process? These unanswered queries lead to Polanyi's third stage of biological origination.

8. Does Polanyi's third stage of originality, phylogenetic emergence, provide support for the concept of fields in relation to contemporary evolutionary theory?

Polanyi's third type of emergent originality, phylogenetic emergence, is in many respects the most problematic of his three stages. He calls the origination of new species to be the product of a biotic field following a gradient of achievement (*PK* 399-400). He states that "we are *driven* to assume that the maturation of the germ plasm is *guided* by the potentialities that are open to it through its possible germination into new individuals" (*PK* 400). In these formulations, Polanyi seems to grant a degree of intention to the highly complex, temporally extended process of speciation. It is called an achievement. The embodied memories and skills an individual relies upon when achieving comprehension are quite different than complex environmental circumstances and genetic adjustments responsible for speciation. The notion of a common biological field linking the three stages of origination tends to obscure some very important differences between them.

An implication of Polanyi's explanation of evolution as taking place in a telic field involving unprecedented leaps across logical gaps between levels is that he rejects Neo-Darwinian thought. He thinks the incremental gradualism generated by mutation and selection is incapable of explaining how evolution is responsible for ever "higher" biotic achievements (*PK* 382-385). If Polanyi had said that natural selection and mutations are not solely responsible for evolutionary change, that would be accurate. Such factors as geographical isolation, genetic drift, horizontal gene transfer, response to catastrophe, and gene flow contribute to evolutionary change and speciation.

Unfortunately, Polanyi's attempt to explain evolution relies on extrapolating from his concept of dual control and its related concept of ontological levels. Again, for any comprehensive entity, he claims there is a logical gap between its principles as a higher-level entity and the rules governing its lower-level components. True enough; comprehensive entities are not mere aggregations of parts that are subject to the same rules as govern the whole. He denies "that any entirely accidental advantages [from natural selection] can ever add up to the evolution of a new set of operational principles, as it is not in their nature to do so" (PK 385). But is the language of unique "operational principles" and levels, language that is helpful with respect to machines and physiology, appropriate for describing the evolution of a new species from its ancestor?

In cases of geographical isolation over time, response to distinct ecological pressures may result in speciation, that is, the loss of the ability of the isolated species in a different environment to reproduce successfully with its ancestor species. Yet the two species may have DNA and physiological processes that are 99.99% the same. Similarly, the related species may have operational principles that are essentially the same. True, over vast periods of time, an emergent species may become quite different from its ancestor species. Take *homo sapiens* in contrast to their ape ancestors of 6 million years ago. However, if one applied dual control theory to interpret the difference between "higher level" human ability and "lower level" ape ability, one would artificially eject the two species from the vast temporal, ecological, and genetic processes that provide the basis for explaining their difference.

Polanyi acknowledges that selection plus mutations can produce changes over time, such as producing protective coloration of a species, but he denies [augmented] neo-Darwinian evolution can produce the differences in kind typical of separate species. "Lower levels do not lack a bearing on higher levels: *they define the conditions of their success and account for their failures, but they cannot account for their success, for they cannot even define it*" (PK 382, Polanyi's emphasis). To account for speciation, Polanyi thinks an "ordering principle" attuned to novelty is needed, just as a similar ordering principle was responsible for the origin of life. But surely there is a difference between the dramatic origination of life, perhaps best understood in terms of autopoiesis and self-organization, and the temporal process of life's evolution.⁴ I understand the human desire for explanation that makes an abstract principle attractive, but I think actual explanation needs to refer to the tiny, multi-faceted actual events occurring over vast eons of time—actual causality that is far, far too detailed to make for comprehensible explanation. Complexity theory, rather than an ordering principle, would seem to provide the abstract set of processes that would best supplement the needed microsteps that would fully explain evolution.

I conclude that Polanyi's version of evolution fails not only in its reliance upon some active phylogenetic field, but also for his inappropriate generalization of dual control and his inappropriate attempt to account for the many factors driving evolutionary change with an abstract principle. I do not mean to depreciate his heroic attempt at explaining anthropogenesis; I am merely suggesting its culmination falters in some respects.

9. If field theory as developed in *Personal Knowledge* has little explanatory power with respect to the processes for solving problems and achieving discoveries, in his later work does he offer a more successful account?

Let me make clear that, although I have been critical of Polanyi's philosophical explanations at the conclusion of *Personal Knowledge*, I find most of Polanyi's epistemology uniquely insightful.⁵ In later writings

he fine-tuned his thought about how discovery and problem solving should be understood in two major ways. Later I will describe an additional resource he often suggests but never fully explicates.

First, already in *Personal Knowledge* Polanyi argued that the key to expanding scientific understanding is relying upon tacit sensitivities, intimations of coherence, and imagination rather than explicit logical reasoning, which explicates what is already known. His account of how discovery takes place relies upon tacit intimations that cannot be reduced to rules. “[D]iscovery, far from representing a definite mental operation, is an extremely delicate and personal art which can be but little assisted by any formulated precepts.”⁶ The initial step in establishing a scientific research program is honing in on an appropriate problem, one that is significant but appears neither too simple nor too complex to solve. “[W]e may describe the obstacle to overcome in solving a problem as a ‘logical gap,’ and speak of the width of the logical gap as the measure of the ingenuity required for solving the problem” (*PK* 123).

Crossing of the logical gap to a scientific discovery relies, Polanyi avers, upon a delicate dance involving imagination and intuition as partners. “Guided by our intuition, our imagination sallies forward and our intuition integrates then what the imagination has hit upon.”⁷ Tacit clues are felt that may originally have influenced the scientist to feel the problem is a candidate for solution. These inspire an imaginative thrust. In formulating a possible solution, the imagination creates a vision evoking a further intuitive act, namely, the spontaneous integration of the particulars that would render the vision coherent. *Voilà*, a discovery!

Second, in *The Tacit Dimension*, Polanyi’s thought can be interpreted as allowing a shift of the notion of a field away from imputed similarity to a physical field, the third definition.⁸ “This part of the universe, in which man has arisen,” he states, “seems to be filled with a field of potentialities which evoke action” (*TD* 90-91). The “field of potentialities” denotes a comprehensive collection. It thus echoes aspects of both the first and second definitions of a field. Human cognition exhibits the capacity of grasping potentialities that produce discovery and solve problems. Deeper grasp of beneficial processes and structures of reality grant humans the satisfactions of expanded meaning.

To be sure, in *TD* Polanyi still clings to the notion of a problem’s field, but it can be shown that fields are not essential to his explanation. He states that the field evoking and guiding discoveries “is not that of a more stable configuration but that of a problem” (*TD* 89). But isn’t the point of seeking discovery or the solution to a problem to find the stable state of mind—the more inclusive meaning—that insight or solution brings? Any striving for discovery or solution must take into account the configuration of things that comprise the problem. Those factors are what evoke and guide a search. There is no need to include the notion of a field of attraction. The search for deeper meanings and resultant satisfactions is sufficient for explanation.

In this later account, Polanyi deflates the power of fields found in some of his statements in *PK*. Fields are grounded in focused human inquiry into more illuminating possibilities of meaning. They can be envisioned in either epistemic or ontological terms. Their function when located is to evoke and guide rather than control. Shared insights tend to endure and may evolve into disciplinary fields. Potentialities for insight exist in the arts and humanities as well as in science. In their humbler role, fields of potentialities can focus and guide thought to resolution. They can support Polanyi in his battle against the skepticism about values and reliable knowledge that contributed to the twentieth century’s calamities.

Moreover, when the role of dual control is no longer generalized into a stratified universe, no ordering principle is needed to explain evolutionary change, nor need Neo-Darwinian thought, as augmented in recent years, be rejected. In the dynamically changing world, familiar habitats disintegrate, and novel niches

become manifest. These new niche conditions can function as open boundary conditions. Those animals with the traits that best take advantage of the new conditions will most likely thrive, and their distinctive traits will tend over time to become dominant within the niche. To use in a less abstract form Polanyian language I have criticized, it's as if newly altered niche conditions function as novel lower-level boundary conditions evoking slightly changed operating principles that allow resident animals to survive.

10. When possible solutions are elicited in the process of inquiry, are there standards of intelligibility that help guide thought to meaningful culmination?

Polanyi speaks of mental unease concerning an unresolved issue to be a motivating force in leading a person to seek a solution. True; we humans seem often to have a distaste for disorder and chaos. We feel more secure when we understand our surroundings. When we achieve greater order in our lives and in our thoughts, we feel a sense of satisfaction. A primary marker of intellectual order is coherence. We have seen that following a gradient of increasing coherence is essential to Polanyi's theory of discovery. Coherence is a kind of relational standard used to assess a situation's adequacy rather than an empirical item. It functions as a judge of how well parts fit together, and as such it is at core an aesthetic term. Consequently, I see the search to solve puzzles, to gain new knowledge, or to understand a problem as being guided in large part by an aesthetic sensibility.

Polanyi writes that "whether thought operates indwellingly within a universe of its own creation or interprets and controls nature as given to it from outside...there is present a personal component, inarticulate and passionate, which declares our standards of values, drives us to fulfil them and judges our performance by these self-set standards" (*PK* 195). An experience of coherence arises from a judgment of proper fit, whether occurring within thought or in relating thought to the perceived world. It is therefore expressible in an articulate judgment. Judgments of harmony and proportion are also largely relational, although perhaps imbued with greater subjectivity than judgments of coherence. Judgments of beauty, however heuristically pregnant, are less subject to precise explanation. They are not so much judgments of the relationships of parts to meaningful whole, as they are immediately attentive to the quality of the whole. Thus, in the visual arts, the quality of color alone can sometimes give birth to an uplifting experience of beauty. "The affirmation of a great scientific theory is in part an affirmation of delight. The theory has an inarticulate component acclaiming its beauty, and this is essential to the belief that the theory is true" (*PK* 133). Even the identification of a species of worm by a scientist is affirmed as an instance of "aesthetic recognition" (see *PK* 351). Judgments of beauty, coherence, harmony, and proportion—such aesthetic judgments are what bring imagination and intuition to satisfying conclusions regarding a discovery or a theoretical solution.

11. In conclusion, are fields useful concepts for illuminating how humans solve problems, make discoveries, and achieve knowledge?

I started by arguing that Polanyi's use of physical fields is limited in its ability to illuminate how discovery, problem-solving, and comprehension in general take place. Close examination of the analogy between the attractive power of a physical field and human response to a solution reveals problems of fit. Moreover, the notion that either the solution's winsomeness or the field itself is the agent producing a solution seriously overlooks the role of a responsible person as the truly active agent in identifying and solving problems. When intellectual prowess is demanded for solution, as in science, Polanyi convincingly shows that researchers

typically reach a discovery or solution with the aid of imagination, intuition, and aesthetic concepts. The metaphor of a field of attraction has some purchase within this arena. However, problems are cloaked in many forms, and it is doubtful that fields, physical or metaphorical, have much to do with such dilemmas as resolving interpersonal tensions or overcoming bureaucratic blockages.

In speaking on ontogenetic and phylogenetic fields, Polanyi endows fields with powers that seem at best superfluous and at worst misleading. Perhaps technological inventions have stable centers of achievement such as fields may exhibit. However, even in this case, introducing the notion of a field seems to add an unnecessary metaphysical claim to a process that can be more simply explained. A similar comment is applicable to Polanyi's use of "ordering principles." Occam's statement that one should not multiply entities without necessity seems to apply in these cases.

When Polanyi introduced fields at the end of *Personal Knowledge*, it seemed that he believed he had identified a force that could help illuminate how investigations reach a satisfactory conclusion. If that was his hope, it was not clearly realized. Eventually he used "field" in all three of the senses originally discussed, and the physical notion of field seems to have issued in the most ambiguous tangles. In *Meaning*, I believe Polanyi (and Prosch) describe a factor that augments solutions achieved by imagination and intuition and indeed illuminates what motivates the search for solutions as a whole. In the following quotation, I will replace the notion of "becoming converted" with the notion of why we seek solutions, discoveries, and greater knowledge in general. My paraphrased insertions are indicated in italics.

It seems clear that we do not *value solving problems or gaining insights*—whether to a political party, a philosophy, or a religion—by having the truth of what we *have discovered* demonstrated to us in a wholly logical or objective way. Rather, what happens when we *find a true solution or insight* is that we see at some point that the *solution or insight* or epistemology or world view (or even scientific theory) in front of us holds possibilities for the attainment of richer meanings than the *previous view* we have been getting along with. (*M* 180)⁹

ENDNOTES

¹R. G. Collingwood, *An Autobiography* (London: Oxford University Press, 1939), 37.

²Although I will not here develop this notion, I have wondered whether attractors within complexity theory have the potential to better take into account, at least analogically, the incredibly diverse factors influencing decision making than field theory does. Like any mathematical theory, though, attractor theory can consider only influences that can be identified and ideally translated into qualitative terms. Furthermore, because attractors are so sensitive to initial conditions, and the initial conditions of a person's thought process fluctuate so readily, attractor theory may be of little use. Anyway, Polanyi's proper insistence that discovery has inarticulate and indeterminate influences effectively demonstrates the limitation of attractor theory or any other accurate mathematical rendering of such embodied processes as thinking and learning.

³Richard Gelwick, *The Way of Discovery: An Introduction to the Thought of Michael Polanyi* (New York: Oxford University Press, 1977), xv.

⁴See Walter B. Gulick, "On the Adequacy of Neo-Darwinism: A Reply to Daniel Paksi," *Tradition and Discovery* 38:2 (2011-2012), 56-60 for further details of my critique of Polanyi's rejection of Neo-Darwinian thought.

⁵Among the articles in which I emphasize different aspects of Polanyi's theory of knowing as based on tacit processes are the following: "Polanyi's Theory of Meaning: Exposition, Elaboration, and Reconstruction," *Polanyiana* 2:4 & 3:1 (double issue, 1992-93), 7-42; "Signals, Schemas, Subsidiaries, and Skills: Articulating the Inarticulate," *Tradition and Discovery* 33:3 (2006-07), 44-62; "Polanyi and Langer: Toward a Reconfigured Theory of Knowing and Meaning," *Tradition and Discovery* 36:1 (2009-10), 21-37; "Polanyian Biosemiotics and the From-Via-To Dimensions of Meaning," *Tradition and Discovery* 39:1

(2012-13), 28-33; and “Understanding, Not Knowing, as the Core of Polanyi’s Philosophy,” *Polanyiana* 26:1-2 (2017), 83-115—all available online.

⁶Michael Polanyi, *Science, Faith, and Society* (Chicago: University of Chicago Press, 1946), 34.

⁷Polanyi, “Creative Imagination” in Michael Polanyi, *Society, Economics & Philosophy: Selected Papers*, ed. R. T. Allen (New Brunswick, NJ: Transaction Publishers, 1997), 260.

⁸Polanyi (and Prosch) make much the same points as found in *TD in Meaning* (Chicago: University of Chicago Press, 1975, 175-178). Polanyi seems to revert to an ordinary discipline-based notion of fields that is found in his thought prior to the ending sections of *PK*. For instance, in the concluding lecture of his Gifford Lectures in 1952, “Intelligence and Responsibility,” p. 17, Polanyi states, “If something is said to be an organ this implies that it can function rightly, which sets up a field of enquiry, namely physiology, studying the principles of operation in healthy organs.” In this passage a disciplinary field is established in response to a human need for understanding. It no longer has a kind of autonomous power.

⁹In his written response to the Zoom version of this paper, Jon Fennell suggests that “without fields there is no meaning.” As indicated in this last quotation, I agree with Fennell’s emphasis on the importance of meaning, but I do not understand why he thinks meaning is necessarily dependent on fields.



PROBLEMS AND POSSIBILITIES OF GLOBAL TECHNO-SCIENTIFIC CULTURE: AN INTERVIEW WITH SHELDON RICHMOND



Phil Mullins and Sheldon Richmond

Sheldon Richmond. *A Way Through the Global Techno-Scientific Culture*. Newcastle-upon-Tyne: Cambridge Scholars Publishing, 2020. Pp. 197 + xxiii. ISBN (10): 1-5275-4626-8. ISBN (13): 978-1-5275-4626-4. Hardback £61.99.

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ABSTRACT

In this interview, Phil Mullins questions Sheldon Richmond about the main ideas developed in his 2020 book A Way Through the Global Techno-Scientific Culture.

Mullins: I have been looking for a fitting general rubric under which to place your new book, *A Way Through the Global Techno-Scientific Culture*, and it seems to be “philosophy and technology.” You did graduate work with Joseph Agassi and have written about aesthetics, Michael Polanyi, and Karl Popper, but you spent more than 30 years as a systems analyst working for a large organization. You were on the job in the period in which what I term “digital culture” began emerging. Your book shows that you have digested much of the rather large and daunting theoretical literature in computer science that charts some of the fateful twists and turns taken leading to the contemporary digital world. But you also analyze digital culture using ideas of Popper, Polanyi, and a host of other philosophical thinkers and social critics. As your title suggests, your book’s agenda is to outline a way to transform what you term “global techno-scientific culture.” Let me give you a chance to respond to my very general characterization of your book and your background as an author.

Richmond: *To be honest, I was unsure what to call our current era and how to title my book so that it would be descriptive of our era. I hit upon the name “global techno-scientific culture” after eliminating various other labels for the era. What is of real importance is the recognition that we are now in an unusual moment in human history: we have developed a socio-technical culture that is global, and monopolistic, and is a misfit for humanity. Worse, we condemn ourselves to serve the computer technology that is bound up with the global techno-scientific culture that we have developed. How do we get through this subservience to our own tools and institutions, and the anti-humanism of tools and institutions of our own making, of our own decisions and choice? That I think is*

the global problem we now face. What can we and must we do now, immediately, to make our way through the global techno-scientific culture?

Before I fell into work in the field of computer technology, I was a philosopher who knew “everything” from a very abstract, impersonal point of view. I was a philosopher who regarded grand theoretical systems as the ultimate answers to the fundamental questions. I wrote essays and a book from this impersonal point of view. But the accidents of life took me to work in IT. During this time, there was no moment of enlightenment, but, through a gradual process of writing about my situation in the giant beehive of a corporate socio-technical structure where I was a worker bee keeping the technical part of the structure functioning, I assembled the picture in this book. I only saw what I thought was a book with a single focus after I exited the IT world: I recognized that I knew the insides of the corporate computer machine, and had helped make it operational and this work, unwittingly and unintentionally, assured that many people, including those at the top, became servants of computer technology.

Mullins: One more preliminary remark on your book’s structure: there are six chapters but from the beginning, you work to overcome the linear organization common in printed literature. Your table of contents is annotated, showing the modules in each chapter and providing a summary. Your Prologue provides a general summary, and, somewhere in this forematter, you invite the reader to skip to the Epilogue which also provides an overview and modules with a general summary written from a slightly different angle of vision. In a word, your book emulates electronic text; it is a hypertext. You assume enough pieces can be picked up by the reader in whatever way he/she wants to approach the book and you suggest a variety of approaches.

Richmond: *Exactly. Hypertext was invented by Ted Nelson who does not get the attention he deserves as a philosopher or as a technology designer. Indeed, hypertext is the core idea of the World Wide Web invented by the engineer and computer scientist, Tim Berners-Lee, who used the concept of the hypertext for developing the protocol called, “HTTP,” as the basis for linking documents on the internet. Also, not enough attention is given to Paul Baran, a RAND engineer who developed the technology of decentralized and distributed networks, a core idea for the structure of the internet. My son Elken did the graphic for the book cover, which is based on the drawing by Paul Baran for representing how decentralized and distributed networks work. The guiding idea for the structure of my book is decentralized, distributed networks. Start anywhere in the network, and you can still achieve your goal: an infinite and recursive network of ideas, always returning to itself.*

Much of the reading I did was during my commutes by bus and subway. I appreciated hard to find books that told their story, even if long and deep, repeatedly, concisely, and in short versions and variations. This, in part, is responsible for how I designed my book. Cognitive psychologist George Miller’s theory of how working memory functions also influenced me: working memory functions best with chunks of seven, plus or minus two, elements. Also important was Claude E. Shannon’s mathematical theory of communication, which boils down to the practical principle that we increase the probability of receiving information by repeating the information. The longer the message is, the less probable it is that it will be received.

Another way of looking at the structure of this book is to say that its architecture mimics the message: distributed, decentralized social and technical architecture is a way through not only the book, but also through the global techno-scientific culture.

Mullins: Given the hypertextual way you think about communication and have organized your book, I turn directly to one of your longer, later chapters, “Philosophers,” where you challenge everyone with any philosophical interest to become engaged in transforming contemporary culture, to work on implementing a “socratic social architecture in all institutions” (77). What does this odd phrase mean? You also suggest that we should develop the approach of “client-server architecture” for social and cultural change. But before you respond, let me also note that in your chapter you roundly indict much mainstream philosophy as not responsibly oriented toward practice. Your sharpest criticisms are directed toward “computational philosophy” where a long-running debate continues about how much human minds are akin to digital computers. This discussion in computational philosophy (including the “transhumanism” spinoffs) is a distraction, in your account, since philosophers need to be attending to the question of “how is what is going on with digital processor technology affecting and transforming humanity, civilization and our humaneness” (103). You argue philosophers must turn to the everyday issues of emerging digital culture where the “failures and frustrations with digital technology” legitimize a techno-elite and trap and “dummify and mechanize techno-subjects” (104).

Richmond: *I will first explain “socratic social architecture” and second, outline my critique of some current philosophers.*

Let me illustrate how socratic social architecture functions by discussing the social architecture of the university. A lecture is a top-down situation where students transcribe notes on “smart” devices these days. Very little time is left for questions.

But a seminar or open discussion situation as opposed to the lecture is basically distributed and decentralized. The students often read their papers, and/or raise questions, and the professor and other students comment and may jump in with answers. Plato’s Symposium is the model for the modern-day social architecture of a decentralized distributed interactive teaching and learning system.

However, in the computer world, the von Neumann architecture is the basic top-down technical architecture for digital machines. The CPU (central processing unit) runs the show, through following the instructions or program(s) stored in memory. The CPU, running a stored program, transforms the input-data, and sends out the transformed-data to a printer, or screen. The person sitting at the screen is a passive receiver of the information, the output of the data. Where the interaction may occur between the human and the machine is the human acting as an input device for the machine: clicking on virtual buttons on the display, touching areas of a touch screen, tapping the keys of a keyboard, talking to the machine that uses voice-recognition software. Even those who play games on computers are input devices for the game software. Also, as users of digital computers, we are very versatile: people can be output devices as well. As output devices, we passively receive information on the monitor, or from the audio, or from the printer, and transfer the information to our brains, and may use that stored information for further computer-interaction, inputting other data for the computer. People may also act as communication devices for computers and transfer the information received from the computer to other people by speech, by email, by social media, by messaging apps; those people who have received the information or data from others, then use that information as input-data while functioning as input-devices for computers.

I see this form of computer-interaction as top-down where the CPU, with its software or apps, acts as our “lecturer” and we react to the “lecture”: our interaction is very passive, following the rules for interaction as an

input-device—posing “questions” or inputting data to the computer that the CPU and software transform into output-data, giving us our “answers” as transformed-data. Also, people follow the rules for interaction with the CPU and software, as an output-device. The sum and total of it is, concerning our interaction with “smart devices,” that we are basically peripheral devices for computer technology: both as input and output devices.

Fundamentally opposed to the top-down, centralized functioning of the technical architecture for computer technology, is the technical architecture and functioning of computer networks, such as the internet. The internet is distributed and decentralized and is akin to Socratic social architecture. One name for distributed and decentralized computer architectures is “client-server” where your home or office PC is a “client” PC on the network. Both the internet and private networks and PCs from which you access information on the network are called “servers.” Another name is “peer-to-peer”, where your home PC and other people’s home PCs function both as “servers” and “clients,” distributing information, files, and apps to each other on a distributed and decentralized network.

Basically, I propose that we refashion our social institutions, including our educational institutions, to mirror the Socratic Symposium where everyone takes turns as the lecturer, and fields comments and questions from the other students. This is what I call “Socratic social architecture.” The internet and those who designed the internet likely did not have implementing “Socratic social architecture” in mind; rather they were thinking of the most efficient and fail-safe method of communicating data and accessing information and programs from computers.

Secondly, my critique of some philosophers: I am a philosopher, but I have a very traditional, Socratic idea of philosophy, its practice and teaching. Namely, I think philosophy is a critical enterprise: Socratic philosophers are critical interpreters of ideas (and disciplines) developed by others, following Plato’s version of Socrates going into the marketplace to join with people in open discussion. Open discussion is hindered when philosophers use highly specialized and technical jargon, where most of the time spent in discussion with others who are non-philosophers involves explaining the jargon. Ordinary language philosophers, and Wittgenstein and his followers, argued that philosophical language is “language on holiday.” Rather than solve philosophical problems, philosophers have created a language that disguises, distorts, and deepens those very problems. I picked on the computational philosophers of mind as the prime example of such philosophers. Many of those philosophers, for the most part studied Wittgenstein and ordinary language philosophy, as well as analytic philosophy, where the analysis of language, and more lately, the use of language in an exact and precise manner, almost as mathematical formulae, is thought to be the tool for solving or dissolving philosophical problems. Ironically, these analytic and neo-Wittgensteinian philosophers have created their own jargon that keeps others not in their “school” in the dark. This jargon and mystique side steps the impact of computers by identifying minds with computers. The identification of minds with computers allows for the treating of humans by those in the technological elite (i.e., the “techno-elite”), as functions of computer systems. I think those philosophers who promulgate computational philosophy have become unwitting ideologues for the computer-machine and its domination of all cultures, turning our variety of cultures, globally, into off-shoots and subsidiary sub-cultures of the new global and monopolistic culture of digital technology.

Moreover, identifying mind with computation is based on three well-known philosophical errors or fallacies. The first error is a semantic error: philosophers who use predicates (properties) that apply to humans, to describe certain operations of machines, are applying predicates to the wrong category. The second error involves wrongly identifying certain behaviours of an object with the identity of an entity or object. It is the quack-and-walk-like-a-duck-is-a-duck error. Because we can get computers to simulate certain cognitive functions does not mean that they are cognitive entities; they are just machines that have certain functions or behaviours similar to cognition.

Simulating even “learning,” does not mean that the machine “learns” and thus is a “learning-machine.” The third error identifies a social decision with a real or natural happening: to treat how computer technology has developed and is used as something natural rather than as the output of various social decisions is a very old and deep-seated error that humans often make and have made with various cultural and social arrangements. For instance, bosses or managers are not required to control the operations of an organization in all cases, for all organizations. In other words, the top-down, hierarchical structures of organizations are the result of social decisions and not part of so-called “human nature”—not a result of the biological evolution of humans as supposed “naked apes.” Hierarchical institutions are not natural, but are the result of social decisions that are no different than the social decision to drive on the right side of the road; no different than the social decision to have lecture-based teaching and learning in universities, rather than to have symposium-based teaching and learning in universities.

Mullins: You argue a certain mystique about computer technology operates in emerging digital culture and this mystique has had social and political fallout. Please comment on this mystique and briefly sketch the contours of its fallout.

Richmond: *The mystique of computer technology and its institutions operates to keep people ignorant and subservient. Look at the language we use to talk about computers. I don’t mean the technical language and the acronyms used as short forms, such as RAM (Random Access Memory), CPU (Central Processing Unit), VLSI (Very Large Scale Integration) and so forth. Rather, I am talking about using the words “smart,” “intelligent,” and cognates related to thinking and intelligence, concerning computer technology. Calling mobile phones “smart phones,” has become the least of it since we also speak of “smart cities” and “smart watches.” Now there are so-called smart devices of all sorts. What the mystique does is disguise what is going on: our intelligence is not merely transferred to computers (such as doing complex financial calculations), but our intelligence is removed from us, in that decision making, and many other activities requiring intelligence are being progressively transferred to computer systems, eventually without the intervention of humans because we have begun to think those machines are “smart” (even without yet having “artificial intelligence”). Moreover, many philosophers of mind and computer scientists with their computational theories of mind, uncritically talk about how computers form “mental models”, “think”, “learn”, have “sensory-input” or “perceive”, and “recognize” faces. Those philosophers and computer scientists function unintentionally as ideologues for computer technology, and also become subservient functionaries of the global computer-machine.*

These processor-embedded devices are not “super-intelligent” machines. They have no intelligence whatsoever. They are just ordinary machines that operate as all machines do: “wind them up” and they go according to human design, such as ordinary self-winding watches, which mechanically wind when one moves one’s arm during normal activity. Computer technology is no smarter than self-winding watches; no more “intelligent” than humans even when we allow them to make decisions for us. We just transfer a function to them, that we think is intelligent, and we label the machine—if it has micro-chips that use algorithms and data—“smart”.

The outcome is to keep people in the dark about what is going on globally with computers: we serve computers, including the techno-elite who benefit from our ignorance due to the mystique of computers. In other words, we are undergoing a role-reversal between us and our own technologies. We have ended up increasingly serving our computer technology and the institutional systems surrounding our computer technology.

Mullins: Your analysis adapts both C. P. Snow's "two cultures" account, and Polanyi's modified account positing a continuity between science and the humanities.

Richmond: *Snow was insightful in realizing that science is a culture, with values, with tradition, with special rites and rituals, with a language or dialect or vocabulary or jargon, with a process for teaching the values, tradition, rites and rituals to those who enter the culture; and the Humanities are also a culture. However, as Polanyi argues, the culture of science is also humanistic, even though the Humanities are foreign to many scientists. Moreover, the culture of science with its humanistic aspects, along the lines most keenly recognized by Polanyi, has been transformed. The social conditions have changed to the degree that the humanistic aspects of science, and of technologies previous to computer technology, have shifted. The shift involves a complete transformation of science into an instrument, an app if you will, for computer technology. The humanistic aspect of science that Polanyi emphasized has been excised and replaced with the practice of reducing scientific understanding to algorithmic processes and unexplained formulae that even scientists do not understand. Nobody understands quantum mechanics, according to Richard Feynman.*

Mullins: So-called information has proliferated, and significant human understanding seems to be declining in global techno-scientific culture. You provocatively suggest computer technology is making knowledge extinct. Real knowledge is about something other than itself (and you sometimes dub this "objective knowledge") but in the information economy we generate primarily "nominal knowledge" (31), which is preoccupied largely with massaging and manipulating symbols currently valent in the milieu, and nominal knowledge is indifferent to the truth. With this general cultural diagnosis (which draws on figures like C. P. Snow but also Neil Postman), you combine analysis and criticism of the social choices made in modern society in developing computer tools. You argue that machines are really not intelligent, but the social choice has been made to regard them as smart. Further, the average user is now under the control of IT staff. What you bring together into this broad macroscopic account of our cultural situation is shocking. Can you unpack a bit more your claims about the extinction of knowledge and the enslavement of most end-users of computers?

Richmond: *Shocking but not new! Reading Plato's account of Socrates on the technology of writing (which I did as an undergrad, a graduate student, and even taught) but shoved into the back of my mind, this again became focal to my understanding of how computer technology has transformed knowledge. I am talking about knowledge that is about something, that has real-world, real-life reference, and I label that knowledge "objective" knowledge that is about something or other. When studying say psychology, physics, or philosophy, or any subject matter, we think we are learning something about humans, the world, the conditions of our lives, and about past lives, and past societies, and even about what people in the past thought, and how they experienced the world. When we have gained this knowledge, whether we call it as I have "objective" knowledge, or "substantive" knowledge, or "real/genuine" knowledge, we think we know about something other than the symbols we use when discussing our knowledge, or teaching our knowledge to others. Instead, we are doing what Socrates said that technology would do: the use of writing technology, according to the Socratic critique, gives people a semblance of knowledge through using the words, symbol systems, without even realizing to what those symbols refer. This is what our use of computers does: manipulates symbols without reference to anything outside symbols, as mere tokens. It is a game without meaning: even chess as a game with arcane rules for moving the chess pieces has a reference (purportedly, war with battles, and strategies). Once we buy into the pretense that computers produce knowledge, as I realized*

by reflecting on and extending to our current writing technology the Socratic critique of writing-technology, we will lose “authentic” knowledge: knowledge about something other than how to play the games of symbol-system manipulation. Losing authentic or objective knowledge is part and parcel of our role reversal with computer technology: we serve computers and that is what I see as our enslavement to computers. We think computers have the knowledge, and we seek knowledge from computers. By seeking knowledge from computers, we get nominal knowledge, not objective knowledge, and we entrench ourselves in slavery, as servants to computer technology. As slaves to computers, we exile ourselves not only from what is central to humanity, objective knowledge, but also we exile ourselves from our own humanity. That is indeed shocking.



Elizabeth Grosz, *The Incorporeal: Ontology, Ethics, and the Limits of Materialism*. New York, NY: Columbia University Press, 2017. Pp. xi + 322. ISBN: 978-0231181631. Paper. \$25.00.

Keywords: Elizabeth Grosz, critical theory, materialism, immaterialism, metaphysics, ontology, normative and non-normative ethics, ontoethics, Stoicism, Spinoza, Nietzsche, Deleuze, Simondon, Ruyer, Plato, Aristotle, Michael Polanyi, moral inversion, immanence, transcendence, history of ideas

ABSTRACT

Critical theorist Elizabeth Grosz moves beyond the New Materialism she previously espoused and argues for a monism that avoids reductive materialism, holding that materiality is inconceivable without its immaterial frame. She also argues that this position ought to serve as the basis for an immanent and non-normative ontoethics. I give a summation and review of the book before offering an argument against such an approach to ethics. I also offer a related critique of the tendency, widespread within critical theory, to consider all transcendence oppressive.

Martin E. Turkis II

Elizabeth Grosz is an established feminist philosopher working in the area of cultural theory. She is often credited as a leading voice in the movement known as New Materialism, a perspectival shift within the world of critical theory which questions the traditional dominance within that field of linguistic and social constructivism, tempering such concerns with an increased attention to corporeality—the role of embodiedness, material objects, and matter generally construed—in the matrix of philosophical, social, and political concerns that are the core subject matter of critical theory. As an evolution within this milieu, the “new” marks the movement off more from the dialectical materialism of Marxism (which often tends to treat material objects as purely *economic* entities) rather than from the sorts of physicalisms that one finds in analytic philosophy.

I mention this as prelude because it sets the stage for Grosz’s latest book, *The Incorporeal*, in which she moves beyond the New Materialism by arguing that, in her lovely phrase, “materiality exceeds materialism” (5).¹ By this she means to draw attention to “the framing conditions of materiality that cannot themselves be material” (5), “the subsistence of the ideal in the material or corporeal” (4), or, alternatively, “an extra-materialism [understood as] the inherence of ideality, conceptuality, meaning, or orientation that persists in

relation to and within materiality as its...incorporeal conditions" (5). She explicitly disavows both idealism and dualism and as the text proceeds makes some positive gestures toward some forms of objective idealism. Nevertheless, one of her principal aims is to avoid privileging "ideality over materiality," preferring to "think them together, as fundamentally connected and incapable of each being...without the other to direct and support it" (12), a position which could potentially align with a Polanyian or post-critical orientation. Ultimately, she hopes that such an ontology will open the way for the development of a non-normative ontoethics "that addresses not just...interhuman relations, but relations between the human and an entire world, both organic and inorganic" (1).

The bulk of the book is dedicated to a historical and genealogical project of sorts, in which Grosz articulates an alternative, extramaterialist minority report existing within the larger Western philosophical tradition, which, on her reading, tends too much towards dualisms that favor the immaterial over the material or (later) become too reductively materialist as the fray moves to Quinean desert landscapes. The readings Grosz offers are rich, informative, generally fair to her subjects, and serve as an important resource to those interested in alternatives to reductive materialisms of any stripe.

Her genealogy begins with the Stoics, who come close to articulating a complete ontoethical system of the sort she wants to argue for by positing incorporeals that "are the modes...the conditions under which things exist, extend themselves, live in time, and come to produce effects or sense," and for whom the incorporeal, like the divine "is not of a different order than materiality but is coextensive with it" (32, 24). From there she dives into Spinoza, whom she argues is systematically "both a dualist and a monist simultaneously," advocating "a single substance that speaks in...two attributes," the corporeal and the incorporeal (80). In Grosz's view, Spinoza thus properly gathers together and mends the ontological damage done by influential dualists like Plato and Descartes. Furthermore, through his ethics of *conatus*—the striving toward self-enhancement of all things—his philosophy prepares the way for Nietzsche, the will to power, and *amor fati*.

While Nietzsche is often taken to be a materialist, Grosz argues that he is of a piece with Spinoza and the Stoics since wills, power, and the like are part of the incorporeal frame of materiality. Thus for Grosz, Nietzsche continues the development of an incorporeal position "which is both an ontology and an ethics inseparably" in which "the eternal return, Nietzsche's rewriting of the pre-Christian Stoic conception of providence" recovers Stoicism from its dualist appropriation by Christianity (112, 115). As will be seen later, however, it is not at all clear that right-minded people, Grosz included, will be pleased by the direction such a Nietzschean ethic may take.

Nevertheless, a critical element of Grosz's project is the emphatic claim that while there is indubitably an immaterial frame that suffuses material reality, this immateriality is not to be construed as transcendent or separate from the physical world. Thus, it should come as no surprise that the chronological end-point of the genealogy is Deleuze, whom she argues "is responsible for a new philosophy of presence (and...a new idealism) in which immanence is conceived as one" (136).

Before examining Grosz's treatment of Deleuze further, we must mention the last two chapters in her genealogy in which she explores the work of a pair of lesser-known French figures by whom Deleuze was influenced and who may well be of interest to scholars of Polanyi: Gilbert Simondon, with his concept of the preindividual and Raymond Ruyer, who conceptualizes the world as an embryo in the process of embryogenesis. Their role in the genealogy supports the more central figure of Deleuze; however, their presence is

helpful in making their work better known to Anglophone audiences working outside the sphere of continental philosophy. Simondon and Ruyer are fascinating in their own right.

Returning to Deleuze, Grosz argues that his plane of immanence, populated, as it is, “only by Spinozan/Nietzschean forces” (140), brings together the various incorporeal threads she has teased out of the interstices in the Western tradition and explains how “thought [and] concepts are possible both because living beings are capable of feeling, intuiting, perceiving and also because of the way the world is, the excess of order that also includes sense” (149). As with her analysis of the earlier thinkers on her list, this ontology of immanence purportedly gives rise to a non-normative ethical project in which the self achieves its highest good by first accepting its fate—that it (the self) is in essence an embodied will-to-power—and then by operating not under “a generalizable code of conduct,” but rather “a system of *self-assay*, in which one’s actions are undertaken and regulated according to principles *immanent to them...self-defined parameters* that individuals of all kinds may develop to regulate their encounters with others and the world in *the most positive manner*” (133, emphasis added).

Positive is the give-away, however, since it does not seem to be subject to the law of self-definition. There is always, as Polanyi recognized, a normative horizon tacitly at work in the ethical, even when the agent explicitly eschews normativity as a chimera. For instance, in Deleuze and Guattari’s *One Thousand Plateaus* a latent moral rage at hypocrisy is palpably, sometimes hilariously, present. Yet according to Grosz, “there is nothing prescriptive in [Deleuze’s] work, only an analysis...of what is and can become, nothing of the ‘should,’ but only the virtual ‘could’” (132). The ability of a formidable intellect of the stature of Grosz to overlook this latent normativity is important to consider, for it seems to indicate that the moral inversion that Polanyi saw as manifest in Nazi, fascist, Bolshevik, and other atrocities in the 20th century may yet be an imminent danger in the 21st.

Let us consider this from a somewhat different angle. Grosz’s book was published in 2017, which means that she was likely arranging the details of her manuscript at about the same time that Neo-Nazi Richard Spencer was working out the details of 2017’s white supremacist Unite the Right event in Charlottesville, the heinous rally where Heather Heyer, a woman participating in anti-fascist counter-protests provoked by Unite the Right, was tragically killed when another Neo-Nazi, James Alex Fields, Jr., drove his car into a crowd of people protesting the rally.

According to Spencer himself, he found the moral freedom to truly embrace Nazism and white nationalism by being “‘red-pilled by Nietzsche’” (Wood 2017). He then rebranded the white nationalist movement as the alt-right and proceeded to give it an aesthetic makeover (leather, spikes, and shaved heads were traded for suits and fashies—a high-and-tight haircut favored by hipster and *Hitler-jugend* alike). More seriously, reading *The Genealogy of Morals* sent him into a “vertiginous spiral of awakening and reassessment” whose “general effect, *an inversion of his moral universe*, was ‘shattering’” (ibid., emphasis added).

Participants in Unite the Right are often painted as uncouth roughnecks—and no doubt many are. However, Polanyi rightly noted that

It was [and is] a mistake to regard the Nazi as an untaught savage. His bestiality was carefully nurtured by speculations closely reflecting Marxian influence. His contempt for humanitarian ideals had a century of philosophic schooling behind it. The Nazi disbelieved in public morality the way we disbelieve in witchcraft. It is not that he had never heard of it; he simply thought he had valid grounds for asserting that such a thing cannot exist. If you

told him the contrary, he would think you peculiarly old-fashioned or simply dishonest... In such men the traditional forms for holding moral ideals had been shattered and their moral passions diverted into the only channels which a strictly mechanistic conception of man and society left open to them. We may describe this as a process of moral inversion. The morally inverted person has not merely performed a philosophic substitution of material purposes for moral aims; he is acting with the whole force of his homeless moral passions within a purely materialistic framework of purposes (*M*, 17-18).

This is an apt description of Spencer, a self-avowed atheist who dreams of a white, Christian ethno-state, a position whose coherence he defends by recurring to a Nietzschean ontoethics (Wood 2017). But whose Christianity would this be? It would most certainly not be recognizable to Dorothy Sayers, Archbishop Desmond Tutu, Pope Francis, or the Christian anarchists who founded the cooperatives of Mondragón, in Basque Country.

I do not want to spend much more time on Spencer, a figure whose media moment has (hopefully) passed, and I most certainly do not mean to insinuate that Grosz's own politics are in line with Spencer's—I have no doubt that she and I would be united in standing against the likes of Spencer and his ilk. Yet for all that, it is crucial to note that on Grosz's account of an immanent ontoethics there are no resources beyond competing wills-to-power and their attendant immanent aesthetic preferences to adjudicate between Spencer's self-defined vision of a white ethno-state and any other set of self-defined aesthetic parameters. All are equally immanent, all may be equally consistent aesthetically (and if not, then consistency be damned—it is simply an aesthetic parameter itself which, if not self-defined, can be unceremoniously jettisoned). What would be required to adjudicate between such options would, of course, be some kind of transcendence, yet in *The Incorporeal*, as generally in the milieu of critical theory, any sort of transcendence is *verboden*, the marginalized other in a simplistic and unscrutinized binary opposition which sets it off against immanence, the binary pole always to be preferred, as Graham Harmon has pointed out.²

The fact that the identification and deconstruction of such axiomatic binaries is one of the classic methodological tools of critical theory makes this a particularly disappointing pill to swallow since it effectively cuts Grosz off from serious dialogue with a range of positions that could potentially enrich her project. This is because any position which a) overtly affirms transcendence in some form or another, and b) forms a part of what critical theorists take to be the dominant trends in Western thought will be unlikely to be taken seriously.

For instance, Grosz asserts that “the ancients could not conceive of an order that is neither stable nor unstable, neither being nor nothing,” (172) but this is clearly not the case, and one does not have to dive deep into esoterica to find counterexamples. After all, Plato himself, in *Republic V*, describes opinion, the noetic power we exercise over the things that make up the sensible world, as the power set over “what is intermediate between what purely is and what in no way is...[that which] is...and is not” (477a).

When he appears, Plato is always the villain in this tale, yet there is never any clear reference to anything he wrote beyond vague gestures toward potted histories of the theory of Forms. There is no indication of any awareness of the open scholarly debates over the separation of the Forms—debates which are very relevant to her project—nor of the fact that ancient conceptions of the immanent and transcendent arguably tended more toward a symbiotic relationship of superimposition rather than a reified binary either-or.

Similarly, Grosz dismisses Aristotelian hylomorphism as “separation and privileging of form over matter” and “a significant conceptual obstacle to...thoroughgoing understanding” (170). This would be a surprise to Aristotle, who thought he was doing precisely the reverse, since in his view Plato had indeed gone too far in elevating the immaterial and was thus in need of a corrective that would “conceive of ideality and materiality...beyond their representation in binarized forms” (249)—ironically, precisely the task Grosz has set for herself. It is fair enough to offer concrete arguments to the effect that Aristotle’s hylomorphism fails to do the trick, but to fail to recognize that one’s own metaphysical project is, to a significant degree, the *same one undertaken by Aristotle* is problematic, to say the least. Relatedly, Grosz seems unaware of the wave of current Neo-Aristotelian scholarship and that some established contemporary hylomorphists take themselves to be nonreductive monists—again, one of the descriptions she gives of her own position.

There are likewise possible fruitful connections to currents in contemporary analytic philosophy that go unexplored. Some which spring quickly to mind would be the debates arising from David Chalmers’ proposed hard problem of consciousness—explorations of terrain including but not limited to (again) contemporary hylomorphism, nonreductive physicalism, and contemporary panpsychism (this last is especially unfortunate, since Grosz comes to a number of panpsychist conclusions herself and points out panpsychist tendencies in Simondon and Ruyer) as well as debates between constructive empiricists, scientific realists, and ontic structural realists in analytic philosophy of science. Admittedly, an academic gulf lies between analytic philosophy and Grosz’s own domain of critical theory, yet she also overlooks potential resources in the recent wave of continental metaphysics known as speculative realism, fertile ground which lies much closer to her own area of expertise.

Thus Grosz, in her haste to lay out a philosophical project which must be opposed to what she takes the dominant dualist tradition to be, overlooks the nuances and complexity of that “tradition” and perhaps misses some allies and resources in the process. Nonetheless, Grosz’s offering does significant intellectual work insofar as it helps to set the stage for a more rigorous and thoroughgoing dialogue between critical theory and other movements of thought that tend to occupy separate silos in the academy. This is an important step because dissatisfaction with reductive materialism is widespread across a range of disciplines, and we are in need of high-quality interdisciplinary work that makes and interrogates rigorous metaphysical and ethical connections between the ancients, analytic and continental philosophy, cultural theory, current science, orthodox and heterodox political economy, the arts, and music. There is, after all, much to learn from one another and to agree on, and at the end of the day, it is difficult to disagree with Grosz when she affirms that

The good life is a wise life in which we address what we can control with thorough preparation, through the cultivation of our virtues and the appropriate actions it engenders, extending further and further, through our own body, into the social and collective bodies we share with others and through to all the bodies that constitute the universe (51).

ENDNOTES

¹All references to Grosz 2017 unless otherwise noted.

²According to Harmon, one of the axioms of new materialism and closely related positions is that “the world is purely immanent, and it’s a good thing, because any transcendence would be oppressive” (2016 location 281).

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BOOK REVIEW

Essays in Post-Critical Philosophy of Technology.
Edited by Mihály Héder and Eszter Nádasí
(Wilmington, DE: Vernon Press, 2019). ISBN:
9781622734573. Pp. 172 + vi. \$42.00 Hardcover.
\$36.00 Paper.

Mihály Héder and Eszter Nádasí's collection, *Essays in Post-Critical Philosophy of Technology*, brings together the reflections of a range of authors working at the intersection of the philosophy of technology and post-critical thought. Drawn from the (now First) Budapest Workshop on the Philosophy of Technology (December 1-2, 2017), these essays collectively provide a fascinating and valuable set of insights for anyone considering this space.

Structured in four sections, the fourteen chapters of this book address *The Role of Technology*, *Post-Critical Philosophy of Technology*, *Aesthetic Approaches*, and *Applications of Philosophy on Technology*. The editors provide brief, helpful introductory chapters at the beginning of each section, orienting the reader regarding the theme of the following chapters. Since the editors have done an outstanding job of summarizing each subsequent essay in their introductory chapters, I take a more personal approach here, sharing my engagement with this collection of essays.

As one whose work often lies at the intersection of the philosophy of technology and post-critical (by which I mean Polanyi-influenced) thought, I find this volume timely and uniquely helpful.

Its timeliness is illustrated by just how often the philosophy of technology is, albeit tacitly, the topic of popular media. The classic *Matrix* film series and the more recent *Upload* series are only two examples

of how the public is, in some respects, setting out to consider such matters on their own, without the help of philosophers.

Its unique helpfulness is illustrated by just how often a post-critical philosophy of technology is explicitly the topic of philosophical meetings. Having participated in several outstanding workshops on the philosophy of technology, I find them either dominated by philosophers or segregated into friendly factions of philosophers on the one hand and technologists interested in philosophy on the other. Many of the philosophers address matters of ethics as it relates to technology, often taking the perspective that technology is 'merely' a tool, subordinate to science. And, in each case, I infrequently cross paths with others sharing my interest in post-critical thought. Differently, but none-the-less interestingly, having participated in, and benefitted from, several outstanding meetings of the Polanyi Society, I find a remarkably diverse group of participants present, including humanists, social scientists, theologians, and the stray scientist, engineer, technologist, and business executive. Similarly, I infrequently cross paths with others sharing my specific interests in the philosophy of technology.

While still heavily represented by those possessing a primary, rather than multiple, equally-strong domain expertise, the 2017 Budapest Workshop and, as a result, this collection of essays is unique in my experience in terms of what the organizers sought to unite. Lead editor Mihály Héder brings exceptional strength to this task; he is multiply deep in the two domains addressed here, technology (Masters in software engineering) and post-critical philosophy (a Polanyi expert who earned in Budapest a Ph. D. in the

history and philosophy of science). As an example and reminder for *TAD* readers, Héder's February 2018 *TAD* (volume XLIV, number 1) article on non-human tacit knowledge in animals illustrates this holistic grasp and expertise. His simultaneous indwelling of these two topics carries us all along as we consider the intersection of the philosophy of technology and post-critical thought.

Turning to some of the specifics of this book, I benefitted by personally engaging with it in that it brought visibility to, re-enforced or challenged, and helped me either strengthen or refine some of my previously unarticulated assumptions.

For example, I found László Ropolyi's (who, like Heder, is multiply deep, holding a doctorate in biophysics and a Ph.D. in philosophy) first section work, *Technology as an Aspect of Human Praxis*, relevant in that he considered the nature of the philosophy of technology and did so broadly. In the context of my perspective that business innovation is an authentic human act of discovery, I found Ropolyi's essay compelling in that he suggests that (1) "every human activity has a technological aspect or dimension" and that (2) "technology has primacy over intellectual practices such as doing philosophy or doing science. This is because being a human is prerequisite for being a philosopher or for being a scientist."

Bringing my interest in Polanyi's epistemology as it relates to business innovation to this collection, I found Mihály Héder's "Michael Polanyi and the Epistemology of Engineering," useful in helping me see how others apply Polanyi's insights to problems similar to those I address.

Further, while not directly aligned with my research interests, I found Phil Mullins' "Michael Polanyi on Machines as Comprehensive Entities" a valuable contribution to the literature. At a time when artificial intelligence and machine learning evoke questions about whether or how 'machines' might someday, or in some way, exhibit sentience,

framing such inquiry instead in terms of tacit knowledge seems an appropriate step.

And, as a final example, while also not directly aligned with my research interests, Jacopo Bodini's "The Screen: A Body without Organs" piqued my interest and intrigued me. Flipping the view that screens are prostheses of our bodies, he takes the position that the 'screen' itself might be a body, albeit one without organs, and, as such, requiring human bodies to serve as prostheses. So, while I might have previously seen the human as indwelling the screen or the human and screen as mutually indwelling, Bodini's work challenged me to consider yet another option and its implications.

Although choosing just four examples to illustrate the nature of this collection, I encourage those working at the intersection of the philosophy of technology and post-critical thought to explore this book for how it might guide your thinking as it has mine.

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