 Tradition & Discovery
 The Polanyi Society Periodical

Vol. XV, Number 1, Winter, 1987-88

CONTENTS

Preface Concerning The Revival Of Bukharin's Image 2
Contributors To This Issue 2
Submissions Directions 2
News and Notes 3
Review and Discussion of Harry Prosch's Polanyi Book 4
Are Religion and Science Distinct or Dichotomous Realms? John V. Apczynski 4
Quality But Bristling With Difficulties On Polanyi's View Of Reality, Drusilla Scott 14
Nature And The Noosphere: Two Realities Or One? Joan Crowston 18
Postscript To Meaning, Prosch Replies To T. F. Torrance 24
More Moorman Humor 26
The Scientist And His Conscience: Michael Polanyi On Freedom Of Research As A Human Right, Terrence Kennedy 26
Review of Marjorie Grene Festschrift, Human Nature And Natural Knowledge, Robin Hodgkin 37
Subscription and Membership Form 39
PREFACE

The renewal of Buharin's Image

The acute insight of Polanyi's thought turns up again as we witness the revival of the importance of Nikolai I. Bukharin in Soviet history. Bukharin is being seen as a basis of political reform. Yevgeny Yevtushenko has composed a powerful

poem, "Bukharin's Widow." Contrary to this optimism, Polanyi reminds us that it was Bukharin that in 1925 described pure science as the morbid symptom of a class society and led

Polanyi toward a philosophy critical of Bukharin's views. Despite Gorky's favor and the hope for reform, Polanyi claims that Bukharin represents the kind of objectivist Marxism that produces moral inversion. This depth of Polanyi's
to look at our cultural predicament alerts us to the importance of reading Polanyi carefully to understand the import of his views. He was concerned about foundational issues in the structure of our society. As we probe

Polanyi's conception of religion, there is no doubt that he sought to preserve and to maximize the freedom of humans to be creative and in the service of the highest ideals.

Richard Sellick

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Cecilus (British Polanyi Periodical)

SUBMISSIONS FOR PUBLICATION

News and articles are welcome. If you send news items, be sure they are complete - date, author, source, etc. Articles should be within ten pages, single spaced, 2/4 inch margins, and 1 inch top and bottom margins. Put name under the title of the article. The article should be camera ready so it does not have to be retyped.

NEWS AND NOTES

MODERN LANGUAGE ASSOCIATION DECEMBER MEETING. The meeting organized by M. Elizabeth Wallace (see TAD, Spring, '86-'87, p.4) produced an excellent response. We plan to have more Polanyi papers at the meeting next year. For possibilities contact M. ELIZABETH WALLACE, 1060 Whitcomb Court, Salem, OR 97304.

UNCHOL SHIN, Prof. of Interdisciplinary Humanities at Eastern Kentucky University, and has published on Bolinheit, Ortega, and Taoist literature in ancient China. Educated at Seoul National University and Ph.D. in Chinese Literature, University of Minnesota, he has developed a Polanyi critique of Erich Fromm's analysis of INTERDISCIPLINARITY. His article, "The Structure of Interdisciplinary Knowledge: A Polanyian View" is in ISSUES IN INTERACTIVE STUDIES, No. 4, 1986.

BEB INKSTER completed in August at the University of Wyoming a Ph.D. in Education. His dissertation, "The Philosophy of Michael Polanyi: Implications for Adult Education," sees Polanyi in the idealist philosophical tradition. In his abstract, Inkster says: "Polanyi's theory of ontological hierarchy postulates a COSMOSCLE, an intelligible form of reality wholly comprising socially constituted knowledge that is both the creator and the creator of individual intellectural growth." He goes on to show how Polanyi's triad of knowing supports a philosophy calling for attention on the growth of the learner, the particular subject matter, and external social goals, not just some of these foci.

THE POLANYI VISIING LECTURESHIP in the History and Philosophy of Natural Science at the University of North Carolina at Chapel Hill has established through the gift of Dr. Walden M. Hildreth, Jr. The lecturer this February is Herbert Simon. Chair of the Committee is Robert S. Porr, Chemistry.

ALLEN R. Dyet, Coordinator of Medical and Psychological Studies for the Polanyi Society, has moved from Duke to the Albany Medical College. His book, Ethics and Psychiatry: Toward a Professional Definition is published this year by American Psychiatric Press, Washington, D.C.

ANDY E. SPARSOE has published an article bearing on the question of how Polanyi views reality and religion. Entitled "Religion and Science as Cultural Systems: Polanyi's View on the Problem of Meaning," it is in NEWSLETTER FOR SYSTEMSTHETICAL THEOLOGY Und RELIGIONSGHILINN, 27, Band, 1985, Part 2. The address is Mrs. K. Hjelm at Jatstraat 104, 7911 AL Groningen, The Netherlands.

DONALD N. MUSSENB contributed a paper to Soundings, Winter, 1984 for the PAMUL TILICH centennial. The paper is entitled "Tillich's Epistemology: An Assessment From A Post-

"KANTICAP Fermework." In it, he briefly proposes that Polanyi's epistemology provides complementary advantages for Tillich's concept of reason."
"Are Religion and Science Distinct or Dichotomous Realms? Reflections on Prosch's Interpretation of Polanyi"  
John V. Apgar
St. Bonaventure University
AAR Roundtable Session
December 7, 1987

The implications of Michael Polanyi's insight that all our thought is incarnate, in the sense that our mental lives and outlooks flow from the manner of our indwelling, had never been as effectively impressed on me as when I began to struggle to understand the major new interpretation of Polanyi's thought proposed by Barry Prosch.1 At first I was puzzled by what appeared to me to be a consistent misreading of Polanyi's understanding of the relationship of reality to the dynamics of knowing. How was it possible that Prosch, a collaborator with Polanyi,2 could miss what I took to be such a basic element of Polanyi's position? Even more curious was the fact that such an interpretation of Polanyi did not emerge from many of Prosch's otherwise correct claims about Polanyi's understanding of knowing and reality. Surely Prosch could not be expressing a view that was so patently inconsistent. What was it that I was missing? Furthermore an elusive recollection was lurking in the fringes of my consciousness that intrigued me. I had the suspicion that the substance of the position enunciated by Prosch I had encountered elsewhere, but without the framework of Polanyi's epistemology.

What allowed a meaningful pattern of interpretation to emerge from the puzzling difficulties and vague intimations was a surmise on my part regarding the manner in which Prosch had come to dwell in an appropriately modified framework, his interpretation of Polanyi's seeming reading by enough seemed plausible and my former perception of a serious inconsistency in his exposition had largely disappeared. Yet in the final analysis I could not judge this approach to Polanyi's thought adequate. All I can claim for the proposal advanced in this essay, then, is that it has been fruitful for my making sense of Prosch's exposition of Polanyi and may be helpful for others who are similarly encountering difficulties in understanding Prosch's interpretation of Polanyi. Whether it to degree accurately reflects Prosch's existential commitments remains to be seen.

Very briefly, then, my proposal is to expose some examples of what appeared to be a fundamentally problematic reading by Prosch of Polanyi, to suggest a frame of reference for understanding Prosch's interpretation coherently, and to indicate why I think this perspective is inadequate. My exposition presupposes a general familiarity with Prosch's overall strategy of situating Polanyi as a philosopher in the capacious sense of cultural physician to the diseases of the modern mind. Also presupposed here—and needing to be acknowledged since this essay will direct so little attention this way—is the valuable illumination of many fine points in the Polanyian textual corpus provided by Prosch's sympathetic and careful reading.

Before proceeding there is a preliminary observation I should like to make in order to avoid a potential misapprehension of the direction I am taking here. Even though I expect to conclude this essay with what I take to be a more adequate understanding of religion based on Polanyi's thought, the principal focus of this analysis is not on religion as such. Thus the case presented here does not turn on Polanyi's personal religious convictions.3 Nor in the first instance is it about Prosch's claims regarding the ontological status of the referent of religious expressions. In some respects he clearly has interpreted Polanyi's understanding of religious reference correctly.4 Rather my suggestion regards the fundamental level of basic assumptions tacitly used by Prosch to guide his reading of Polanyi's epistemology which perspective, in turn, guided him to his conclusions about religion.

The first signal that Prosch's intellectual orientation to Polanyi was different from mine involved what appeared to be nothing more than a matter of emphasis. As he began to expose Polanyi's philosophical "prescription" by introducing the elements of a "new epistemology," Prosch explained the dynamic and creative personal activity involved in the shaping of perception and the extension all knowing. That even our sensorial, perceptual stimuli are selectively ordered and structured by our tacit integrations is basic to Polanyi's position. It is almost as if, however, that Prosch's emphasis on the act of integration which we make is understood in such a way that it is placed as a polar opposite to sensory data being completely causative and determinative of our knowing (pp. 61-62), so that some middle ground of subliminal stimuli contributing to an active integration by the perceiver is not possible.

That something more substantial than emphasis was involved appeared to be more likely when Prosch began to explain the structure of tacit knowing (pp. 64ff). In his discussion of the semantic aspect of tacit knowing Prosch so identifies "meaning" with the intentional activity of the knower that meaning can only be understood as existing in a mind and cannot be "any sort of detached, objective "thing" existing independently of a purpose held by some mind" (p. 63). While the thrust of this claim has a defensible interpretation, the disjunction ("only in the mind" vs. "detached, objective "thing") seems overdrawn. Polanyi can quite comfortably speak of levels of meaning, the meaning of particulars, and the joint meaning of entities without such harsh dichotomies.5
Again in his discussion of the ontological aspect of the structure of tacit knowing, Prosch’s exposition implies that this dimension is applicable only to cases of perception (p. 97). The reason for this move appears to be that this allows Prosch to restrict an objective reference independent of our intentionality to certain sorts of tacit integrations, namely those that are “cases of immediately experienced, sensible experience.” Only in these cases would there be presumably a comprehensive entity which might stand itself in ways beyond our expectations and so continue to affect our perceptions.6 By now Prosch’s apparent restriction of the ontological dimension to cases of perception appeared to me to indicate a consistent pattern of downplaying the metaphysical implications of Polanyi’s thought.7

My growing confidence that I had come upon a deliberate (whether reflectively formulated or not) pattern of interpretation in Prosch’s exposition was confirmed for me in his discussion of discovery (pp. 93–105). The understanding of discovery primarily under the rubric of projection (p. 97) implies that the meaningful coherence affirmed in the discovery is created rather than discerned by the scientist. Further, the claim to have made contact with reality through the discovery, which I took to be foundational for Polanyi,8 is reduced to our belief in it. Apparently interpreting the guiding role of reality in scientific discovery in this intentional way is necessary lest Polanyi be understood to be claiming some sort of “mystical connection with reality established by an act of faith” that infallibly authenticates scientific truth claims (p. 98). That Polanyi maintained that reality has the power to draw our minds to it was more a possibility he entertained rather than anything about which he firmly decided (p. 98).

The rough outline of the pattern for the interpretation of Polanyi’s position by Prosch had emerged sufficiently so that I could make this preliminary description of it. The core of the meaning, or the mental context of human subjects projected meaning onto the world of natural experience by means of the universally operating structure of tacit knowing. Some of these meanings, which were the correlates of the comprehensive objects of our acts of perception, referred to realities existing independently of our constructor. But these were natural integrations of comprehensible entities that would manifest themselves to us in unthought ways in future perceptions. Other meanings were projections whose reality consisted solely in the mental satisfaction they engendered. These were transnatural integrations whose meanings were not integrations of perceptual objects (except incidentally as an artifact or symbol might be involved) but of incompatible qualities producing a mental satisfaction. Their reality thus consisted in this enriched form of mental existence for the knowing subject so that such meanings had no existence independent of the minds that created and continued to sustain them.

The meaningful realities projected by science and religion thus have a common ground in the structure of tacit knowing sustaining them. But since two radically different or distinct kinds of tacit integrations were involved, the realities projected had no ontologically common ground: in science the realities referred to perceptual objects existing independently of our knowing them, whereas in religion they were integrations of incompatibles existing only in the mind.

II

Prosch’s interpretation of Polanyi now had a coherent appearance to me. What became puzzling now was how Prosch had arrived at this position in the first place. My reading of Polanyi was informed by such different assumptions that, were it not for the fact that I agreed with nearly everything Prosch said beyond this fundamental level, it almost appeared as though we were talking about two competing intellectual systems instead of the thought of the same person. Understanding this question required the identification of some form of indwelling which might account intelligibly for the shaping of Prosch’s interpretation of Polanyi. An obvious candidate that would likely come to mind is what might be loosely called the philosophical tradition of American naturalism. This tradition has fostered a strong tendency, which certainly has not been universally practiced, to develop positive reconstructions of religious symbols and doctrines from within some version of a naturalist perspective. William James’ effort to indicate the potential “pragmatic” consequences for psychological well-being that might be derived from holding religious beliefs is one well known example. More fitting for this inquiry might be George Santayana’s attempt to explore religious doctrines as poetic metaphors upholding the ideals necessary to sustain authentic or meaningful forms of life. He explained that religious doctrines...

... beguiled the intellect, no doubt, and were mistaken for accounts of external fact; but they enlightened the imagination; they made men understand, as never before or since, the passions and nobility of life, the necessity of discipline, the possibility of sanctity, the transcendence and the humanity of the divine, for the divine was reached by the idealization of the human. The supernatural was an allegory of the natural, and rendered the values of transitory things under the image of eternal existence.9

Even though Santayana denies the reality of any sort of transcendent reference to doctrine, he does try to reappropriate its meaning positively.

Quite a different perspective, but still within an underlying naturalist approach, is provided by John Dewey. His emphasis on knowing as continuous with the activity of biological life led him
in his mature period to view the normal institutional patterns of religious beliefs and practices as distractions working against intelligent human activity. Yet there is a religious "quality" to Polanyi's thought, particularly when it is considered in the context of the whole. The whole, however, which may be expressed in a heightened and most captivating way through a work of art, is never the object (since it is always a "quality") of an experience and so has no transcendent or ontological counterpart.10

This brief sketch should at least point to what I have called the naturalist tradition in American philosophy and also should indicate why I found it potentially helpful. Is there any evidence, though, that Prosch approached Polanyi's theory by dwelling in this philosophical heritage? There is, of course, the obvious surface similarity that Prosch has used Polanyi's theory of tacit knowing to provide an essentially positive and naturalist reconstruction of art and religion.

Circumstantially there are further hints. Meaning clarifies its understanding of religion by way of both James' and Santayana's positions on religion.11 I am not aware of any such use of a naturalist author on religion elsewhere in the Polanyian corpus.

Were these textual clarifications contributed by Prosch?12

Furthermore Prosch's portrayal of Polanyi as a philosopher speaking out of and to the broader, dominant issues of culture is quite like the actual role Dewey performed for much of the first half of the twentieth century in the United States. This similarity evidently was on Prosch's mind when he was working on his exposition. The comparison was so strong in his mind that he felt the need to distinguish how Dewey and Polanyi situated the dynamics of knowing very differently (pp. 7-8). This suggests at least that Dewey's philosophical position had some influence on Prosch's thought, even if only by providing a background from which to distinguish Polanyi's distinctive contribution. But could this point to an even deeper connection?

I believe so. In order to indicate it, however, we would need to extract something like a basic set of assumptions that runs through the naturalist philosophical tradition. Such assumptions would be tacit in the sense that they would form the pre-attitudinal, meaningful, and existential stance out of which the naturalist philosopher raises questions and discerns possibilities for relevant responses. At this level one feature that emerges is the simple acceptance of existence as an unquestioned and unquestionable fact of experience. Whatever exists is dependent on its material conditions, and this is as far as we can carry questioning. Why existent things require no explanation is never explained, as though inquiry could be arbitrarily cut off. This seems to require the additional assumption that ultimately being is not intelligible, and that all we can know of the real are aspects of the material world that we experience through our imaginative constructions. That such intelligible experiences might direct us to the ground of intelligibility seems disallowed from the outset. Keep in mind that the claim here is not that these assumptions are reflectively held and defended by argument; rather they more accurately can be described as shaping the manner of dwelling of a philosophical perspective, permitting some questions to emerge in a particular way and others not at all.

Such assumptions, I believe, are still fairly predominant in the contemporary American philosophical climate.13 To the extent that one of Prosch's major aims is to present Polanyi's thought in a favorable light to the contemporary intellectual world (see, e.g., p. 273) and to the extent that Prosch, who is a respected member of the philosophic guild, has been imbued with many of the assumptions of this community, then to that extent might his reading of Polanyi been shaped in this way. The hypothesis that I should like to propose now is that the primary reason that Prosch holds that science and religion do not have a common ground in some ontological sense is not primarily due to textual evidence (although it clearly is dependent upon this) but that it is due to his starting point, his manner of dwelling, within which he understands the Polanyian corpus.

III

What I have tried to do so far is to offer a plausible account of how Prosch might have come to his reading of Polanyi and how Prosch's version of the underlying pattern in Polanyi's thought might appear to be coherent. Nonetheless, I am still convinced that this approach to Polanyi's thought is too restrictive in its underlying assumptions to allow the full scope of his insights to be developed, especially with regard to religious belief. I would like to indicate briefly why I believe this to be true, no so much to persuade those who approach Polanyi as Prosch does to change their stance as to clarify or bring to light some of my own less frequently noticed assumptions.

By the time I had come upon the writings of Michael Polanyi some twenty years ago, I had undergone a transition from a form of religious consciousness that might be described as somewhat closed, self-assured in a rather rationalistic way, and doctrinally rigid to one which was open to all manner of new thought forms while maintaining a critically informed commitment to the tradition that originally had engendered my religious self-awareness. In epistemological terms I think it legitimately could be said that I had come to realize that a religious faith did not need (as my prior form of dwelling in the tradition implied) indubitable foundations whether of a scriptural, ecclesiastical, or doctrinal sort in order to be faithful to the reality disclosed through the tradition.

I recall this autobiographical event only because it places my reading of Polanyi in a context. I turned to the thought of Polanyi at this time in an effort to help myself theorize how the process of breaking out of one's assumptions to a more adequate
understanding of reality can be performed even though one does not formulate explicit, indubitable criteria which could impersonally legitimate such a transition. I thought, and still do, that Polanyi's account of personal knowledge offered a conceptual framework for understanding our ability to develop intellectually—even in radically novel ways—without requiring such developments to be mere chance or arbitrary caprice.

What I discovered in Polanyi's theory is the acknowledgment of a tacit orientation to reality in all our efforts to make sense of our environment, an orientation which functions by guiding us throughout the entire range of our knowing activity. Even though a technically precise explanation of this point is not to be found in Polanyi, his basic claim that all knowledge is grounded metaphorically on a contact with reality I believe is fairly clear. Assumed throughout this interpretation are the implicit claims that reality is intelligible and that the human mind, through its creative efforts, can discover aspects of this intelligibility to the extent to which its forms of indwelling would permit. The functioning of such a tacit orientation to reality sustaining all our intelligent activity could then offer an account of the original problematic that led me to consider Polanyi's thought.

This ontological reference tacitly guiding all knowing also provided a basis for understanding religious forms of knowing. Polanyi's marvelous analysis of Christianity as a heuristic vision fostering a sustained effort at breaking out of and mystical practice as attempting to break out of the normal controls our minds exercise to shape our perceptions both point to the character of transcendent reality as it is encountered in human experience. It is the intelligibility of reality at its infinite scope that sustains this heuristic vision and the mystical form of contemplation.

Polanyi's later efforts to explore religious meaning are fully comprehensible in this light. Religious symbols, myths, and rituals require a form of indwelling that permits a breaking out toward transcendent reality. The truth in such symbols and myths does not consist in their factual substratum (if any at all) but in the way they allow us to experience the significance of the elements of the world, namely in light of their transcendent reference. The ritual performance of myth similarly can carry us away through its transnatural integrations into the sense of the whole—not the world that lies beyond and under or through all its parts—because of its tacit ontological reference. Unless one participates in the act of worship, one cannot perform the transnatural integration that allows God to be seen at the focal point fusing meaningfully the incompatibilities of ordinary experience.

This was simply assumed, according to this reading, in Polanyi's later explorations of religious meaning. The major focus of these efforts with respect to religious symbols is to defend their plausibility by challenging the false conception of the universe that ultimately rendered all human activity meaningless. If the culturally dominant picture of the universe that reduced the meaning of everything to its material substratum could be challenged intelligently, Polanyi believed that people might once more seriously entertain those [religious] meanings as representation of the way things could indeed be.

Theological reflection, accordingly, has as its aim not the establishment of facts somewhat in the manner of the natural integrations of scientific inquiry; nor does it populate the universe with "ghostly beings" (p. 257) without relationship to the world of ordinary experience. Rather it attempts to clarify, purify, and formulate the implications of the meaningful integrations of the whole that is discerned while being carried away.

If we grant, then, that reality is ultimately intelligible and that it always is a tacit component of every act of knowing, then the transnatural integrations of religious symbolizations not only share with science a common dimension in the structure of tacit knowing; they also have in common a tacit orientation to reality appropriate to their respective manners of indwelling.

What can be concluded from these reflections? Most significant, I believe, is the recognition that Polanyi's stance with respect to the ultimate intelligibility of reality and our ability to be aware of it in some way is not unambiguously expressed in his writings. Even though it requires (at least) a temporary empathetic shift in existential commitments toward the dwelling in a naturalist perspective, Proesch's exposition can be appreciated as a consistent reading of Polanyi whose text suggests that he indeed bears the meaning Proesch claims to have discovered in them. Furthermore the manner of indwelling through which an interpreter comes to understand the significance of Polanyi's writings now appears to be constitutive (in some respects at least) of this understanding. If this is so, then it would appear that any analysis of the implications of Polanyi's thought must take into account reflectively the fundamental assumptions of the interpreter and how they enter into the reading of the text. Proesch has shown us, in brief, that Polanyi's is not a settled system, and that to be faithful to Polanyi requires going beyond him.

Notes


3. Polanyi was very reticent to speak about such highly personal matters. The available evidence suggests that, while he was usually and often considered himself a 'completely convinced Christian along the lines of Tolstoy's confession of faith,' he did not consider himself to be a Christian in the fully committed sense of a sacramentary and regular churchgoer. See, for example, his letter to Karl Mannheim, 19 April 1944, and to Gilbert Doan, 3 June 1968, in the Collected Papers of Michael Polanyi, Joseph Regenstein Library, University of Chicago (411 and 71). Perhaps his stance is best captured by William Scott's conviction that he considered the Christian religion at its best to involve an encounter with and surrender to a preexisting reality and that he must have had some visions himself, however ineffable, of this reality. "The Question of a Religious Reality: Commentary on the Polanyi Papers," Sympo, 17 (1982), 86.

4. For example, when Proch claims that it would be a mistake to interpret religious myths or sacred stories as representing ordinary facts in the world (pp. 174 and 237), he certainly presents Polanyi's claims accurately. Whether or not he situates this insight in an adequate understanding of the overall context of Polanyi's thought is, of course, another matter which we shall take up shortly.


6. That Polanyi intended to restrict the ontological aspect of tacit knowing in this way, I think, cannot be defended in light of the expression of his logic of 'tacit inference' in Knowing and Being, p. 141. Here he explains that the ontological claims to reality in the sense of the indeterminate range of manifestations is implied in any knowledge bearing on reality. Only the insertion of a qualification such as 'empirical' or 'natural' before reality would support Proch's reading.

7. It was only after reading Proch's study that I noticed, for example, that Proch did not include the ontological aspect in his discussion of the structure of tacit knowing (cf. pp. 34-5). Since this chapter was not part of the central lectures forming Meaning, I take it that its omission was due principally to Proch's decision regarding the selection of Polanyi texts to use for this chapter and thus is an indication of his judgment concerning its relevance.

8. I do so because of the sorts of claims exemplified in "The Republic of Science" and "The Unaccountable Element in Science" in Knowing and Being, pp. 55 and 119.


10. For samples of Dewey's reflections on art and religion, see Art as Experience (New York: D. P. Putnam Company, 1934) and A Common Faith (New Haven: Yale University Press, 1934).


12. My notes from the version of the manuscripts in the Polanyi collection at the Regenstein Library in Chicago (I: 6-13) on which Meaning was based contain no such references. Since I was not analyzing the manuscripts with this precise question in mind, it is possible that I have simply missed them. See also Proch's explicit attempt to relate our transnatural integrations to James' "will to believe" in his exposition (p. 150).

13. This has been attempted by William M. Shea, The Naturalists and the Supernatural (Macon, GA: Mercer University Press, 1984), pp. 31-98. I am essentially following his conclusions here.

14. Consider, for example, how Richard Rorty interprets Dewey as instructing philosophers not to be so serious as to escape into the aperceptual through metaphysical speculation, yet at times "coming down with the disease he was trying to cure." "Dewey's Metaphysics," in Consequences of Pragmatism (Minneapolis: University of Minnesota Press, 1982), pp. 72-89.

15. This is, of course, the same structural problem, mutatis mutandis, which led Polanyi to the eventual formulation of his theory of tacit knowing. See Marjorie Grene's recollection of this in "Tacit Knowing: Grounds for a Revolution in Philosophy," Journal of the British Society for Phenomenology, 8 (1977), 165.

16. Since the argument here is on the level of fundamental assumptions about reality and the extent of its role in knowing the strategy of compiling textual references from Polanyi will not contribute to a clarification of this question. It is a matter more of how one orchestrates the texts and allows certain dimensions of meaning to emerge. For the way I have done this, including the references to Polanyi's works upon which I have based this interpretation, see my Days of the Word (Mishima, Montana: Scholars Press, 1977), pp. 101-154. In Proch's case, there is more of a tendency simply to avoid any references to 'reality' in context I would consider crucial (e.g., pp. 101-4, 114, 124, 232).

17. For an exploration of technical difficulties connected with this claim, see Edward Polanyi, "Polanyi and the Problem of Metaphysical Knowledge," in Intellect and Hope, ed. Thomas A. Langford and William N. Poteat (Durham, N.C.: Duke University Press, 1968), pp. 58-90. For another description of the general intent of this claim in Polanyi, see Drusilla Scott, Everman Revisited (Lewes, Sussex: The Book Guild Limited, 1985), pp. 63-68. For a representative statement on this matter from Polanyi's works, see "Knowing and Being" in Knowing and Being, p. 133.
19. Note how Prough cannot grant to the mystical vision any legiti-
macy for interpreting the truth of myth (p. 160). If reality
were not ultimately intelligible and the source of the intelli-
gibility we do find in the world, Prough would be correct.
21. ibid., p. 124.
22. ibid., p. 156.
23. ibid., p. 160.

For a recent example of such reflective activity based on Polynesian assumptions, see R. Helnon
Reiser, "Inaugurating Postcrtical Philosophy: A Polynesian
Meditation on Creation and Conversion in Augustine’s Confessions,"
SYNONYM, 42 (1967), 317-37.

From Convinction
Harry Prough, Michael Polanyi: A Critical Exposition, State University of

I read Harry Prough’s book on Michael Polanyi with eager interest. It
is a work of devoted study, written from a wide knowledge of Polanyi’s
work, and a background of philosophical knowledge which sets it in perspec-
tive. I found in the first three parts - “Diagnosis-Prescription-Treatment”
that I was often struck by a connection picked up and illustrated by Prough
among the strands of Polanyi’s thought, which had not struck me so prece-
dently before but now seemed important and clearly right. I would instan-
tialize his account on pages 60 and 61 of how the basic mechanisms of visual
perception are structured to function towards the attainment of a stable
coherent view of the world, they work mechanically and so cannot sort out
time coherences from illusions; on the other hand we as persons “are per-
forming a single mental act in search of an object against a background”.
The physiological events in our bodies which are part of the skill of per-
ception, are known to us only subliminally but are part of the galesy
of chaos of which we take account in our act of perceiving. Prough calls
as a very important point for Polanyi, and if the factors in perception
that lie entirely below the level of any possible focal awareness are not
factors of which we are at least subliminally aware, then perception is not
a single purposeful act. It is at bottom merely a casual event - and what
we call knowledge, being rooted in our perception, is not then a result of
its purposeful efforts. But then of course it could not have the quality
of being right or wrong. It must intend to be right, in order never to
be mistaken. If perception and knowledge were not intentional acts then
truth could not be understood to be an ideal towards which we really
aspire... having lost our respect for the ideal of “truth” as a truly oper-
tive one. In persons, we have set up for a respect for each other’s opinions.”
I had not before so clearly connected Polanyi’s account of perception
with the basis of a free society and I found that exciting. Other instances I would give of points I found illuminating: on page 19

the account of how Polanyi came through chemistry to appreciate “the value of
the formal”. By comparison with descriptions in physics, he held,
descriptions of chemical substances and the act of dealing with them are
quite near to human behaviour.” As chemistry would suffer if chemists were
frightened by physicists into applying exact laws to their subject, so
with the study of persons. And on page 49, Prough’s account of how Polanyi
dealt with our understanding of classes and classification, his application
of the idea of tacit knowing to formal induction, seemed to me very clear
and helpful.

There are just a few examples of a quality I found all through these
parts of the book, of what might be called clear and correct ideas. But
then, I have to add, in later chapters I came to a lot of difficulties,
all connected with Prough’s insistence on saying, and in attributing this
deviation to Polanyi, that the realities we come to know through science are
different from the realities we come to know through art, religion, auth-
netics. Prough is very determined about this and spends a lot of time
arguing against the various people who disagree, such as Richard Gelbick,
Thomas Kuhn, Ronald Hall, Sheldon Richardson, and Marjorie Grene. This
is a very puzzling area; to start with it is strange to Prough and
Gelbick, who both spent a good deal of time with Polanyi in his last years,
case away with opposite impression of what Polanyi intended to say on this
matter. (In this review I have not discussed the treatment of this distinc-
tion between different realities in knowing, since I cannot tell how much
of that book is Polanyi and how much is Prough.) Prough has given quite
a large proportion of his book to this controversial area, and it seems
extremely important for our whole understanding of Polanyi. In attemp-
ting an answer I will first ask what exactly is the distinction Prough is
asking, and says Polanyi made, between the realities known by science and
those known through art, religion, and the arts? Then, can this distinc-
tion be found in Polanyi’s earlier works? And lastly what effect does it
have on our understanding of Polanyi’s main lines of thought?

The essential distinction that Prough says Polanyi made in the subject
matter of these two kinds of knowing is stated in his book on p 269 (and in
other places). It is this: “For Polanyi, reality is defined ontologically
as that which we accept to show itself in its expression as the world being in
itself. Yet according to Polanyi there is one subset of realities which exist inde-
pendently of our knowledge of them and which science seeks to uncover or
disclose, as well as another subset of realities, those of the noosphere,
brought into being in a sense by our creative efforts through them to
achieve meaning in our own lives. The realities of this second subset are
real in that we may expect to see more of what they show as time goes on
as in great works of art and religion. They are comprehension entities
those depths may surprise us. They are also real in being valid. But it
would be an illusion to think they existed before we discovered them.” By
Italics.

Prough expresses the indications by which we distinguish these two
kinds of reality in other words too. It depends on whether the realities
exist independently of our thought” (p 256), or whether “It was men’s mind
that created...the principles of truth and beauty and morality” (p 139). But
the basic form of the distinction is - did these realities exist before we
discovered them?

This is exactly the paradox with which Robert Firey makes play, asking
what it means to say we have lost our sense of God. In persons, we have
set up for respect for each other’s opinions. But what of “the disembodied
words of Sir Isaac Newton were sitting in the middle of modern billions of years before he was born, and that magically he

J. Scott
we must suppose that science, like art, has ascended to a position outside the 'historical', day to day experiences of men and really has nothing to do with them, which indeed well does assert. However, this conclusion is surely extravagant. Our technologies grow directly...from our sciences. What the chemists and the physicists do discover and interrelate into systems are interesting but that structure our daily experiences, and which we use to understand them more fully and to control and redefine our existential situations. No such technology applicable to our everyday existence arises from art."

So here we see the basic view in which Proust’s distinction of knowledge is established. He believes that the only knowledge we can use to understand, control or structure our daily experiences is technology. Art, poetry, history, philosophy, religion - they all castles in the air, beautiful dwelling places for the spirit, adding to our dignity, but of no relevance, no power, in our everyday life. Such a belief can have nothing to do with the Michael Polanyi who set out to show how a false philosophy had plunged the world into violence and destruction - who wrote of the false associations within the democratic society - "These circles, these professional associations, are feared or hated by modern totalitarian rulers. They are feared more than are scientific associations, because the truth of literature and poetry of history and political thought...of philosophy, morality and legal principles, is more vital than the truth of science. This is why the independent cultivation of truth has proved an intolerable menace to modern tyranny." How could such truth be a menace if it has no effect in our daily lives? I have wandered too soon into my second point - can this distinction be found in Polanyi’s earlier writings? I do not believe it can, though I agree the distinction between verifying and validating can be found in Personal Knowledge. But this I think is simply an obvious distinction between the methods of various enquiries and does not imply that these studies have different realities for their object. I can verify the school’s assessment of my child’s height with a tape measure; I can validate the school’s assessment of his character and progress by thinking about my own experience of him; but he is one entity and I am sure that he exists in all his aspects, independently of my thought. As Polanyi says: "The bearing of natural science on facts of experience is much more specific than that of mathematics, religion or the various arts." It’s the tape measure rather than the informal reviews of experience. But they both bear on the facts of experience.

I have also mentioned some ideas in Polanyi’s earlier works which are incompatible with Proust’s distinction - his belief in the power of thought, of ideals and moral truth; his insistence on the oneness of knowledge and the presence of creative power throughout its range. Obviously much more evidence could be brought about this. But in the end one must appeal to Polanyi’s great work as a whole - what was it if not to show the creativity of discovery, the knowledge, the inquiring found in all knowledge, the continuous advance to deeper personal participation as we go up the scale from physics to man as a mental being to God? Henry Proust understands Polanyi so well, how can he do a George Washington chop the cherry tree in half with his little hatchet? For that is what I think he does - and that is all that really needs to be said about the effects of his distinction on our understanding of Michael Polanyi.
Nature and the Non-Mere: Two Realities or One? Some Thoughts on Harry
O. Proch's Interpretation of Polanyi.

J. O. Crowlick

Are there two different kinds of reality, those that belong to nature and those that are the creations of the human mind and belong to the
non-sphere? This issue is raised already in Heeding, published under the
joint authorship of Polanyi and Proch, but which, in fact, is the work of
Proch alone, who used unpublished material from lectures given by Polanyi
before the end of his life. In his new book, however, Proch gives a
different view, and in a careful reading of his arguments in this later book one
meets a different issue. In my view, the confusion arises because Proch
does not apply the trichotomous structure of tacit knowing correctly to the
artistic and religious questions, though his application of it to the scientific
question is unexceptionable. This article is an attempt to explain what I
mean.

Any discussion of Polanyi's views on the distinction between the
realities of nature and those of the non-sphere must start from his
analysis of the structure of knowing, which Proch rightly seized on in his
earliest book. Proch begins, in other words, from Polanyi's 'tacit triad',
which always - to quote Proch's own words - that all knowing is
underlying any interpretation of subsidiary clues, dealt in as a projection of perceptual objects
and of the sciences.

Polanyi, therefore, the meaningful integration achieved by
men in the non-sphere rests on a continuity with those achieved in perception
and knowledge. In the sense that they are all aspects of the
'tacit triad': (1) a mind (2) dwelling in subsidiary clues and (3)
creating a meaningful integration of these clues into a locally known whole.
Pronotion does this, ordinary knowing does this, poetry does this, religion does this. These various kinds of integration are all
the same also in making use of the creative imagination and in that
there is no way to establish their truth or their reality in a
thoroughly detached, impersonal, objective way - even though they are all
created with universal intent, not as subjective entities whose
status is understood to be merely 'true for me'.

So far, so good. Proch then draws attention to the 'difference
between the integrations and realities forming the non-sphere and those
existing prior to the non-sphere'. He is referring, of course, to the
difference between the observable realities of nature, which are studied by
science, and those realities which are creations of the mind. He does not
question such realities as man's political, legal and economic systems, his
languages, Michelangelo's Norse, Eliot's Whaled, and so on, "That they
are creations of men does not rob them of their reality. In fact, if
reality is understood as Polanyi understood it", namely, as something that
will exhibit to us a presently indeterminate range of future manifesta-
tions, is indeterminate by us on the basis of our present understanding.

The problem arises when Proch begins to discuss the question of origins.
He does this when he speaks of the realities to which science refers as
having their origin in nature, and contrasts with "all the rest of the
non-sphere realities organized by man", implying that these cannot claim
to have any origin elsewhere than in the mind. He is not, it must be noted,
making a straight contrast between the realities of nature and those created
by the mind, because he recognizes that science itself is a part of the
non-sphere and its theories are non-synthesized. He argues, however, that
the theories of science differ from the realities of art and religion
because the doctrines of science "refer themselves to those realities
supposed to exist from orginies that are not non-synthesized".

This argument from origins seems to take us to the heart of the
confusion. Proch seems to be suggesting that, despite the fact that science is
itself part of the non-sphere, we have to make a distinction between the
realities studied by science, which are part of the non-sphere, and the
rest of the non-sphere realities organized by man, which "therefore, a validity differently based from that of science". He is
saying, in other words, that the creation of art and the doctrines of
religion do not refer to anything outside the mind that created them
and that this is why they cannot be verified, though they can be validated
on some other basis.

In arguing that the arts and religion do not claim to refer to anything
existing outside men's thought world (the non-sphere), Proch seems to be
no longer working with the trichotomous structure of tacit knowing.
In science, the triad is formed by the scientist, his theory and the observed
reality. The scientist's theory shapes his apprehension of the reality
observed and represents the intellectual element in his knowing. Together,
the reality and the theory about it constitute the objective and subjective
axes of the framework of commitment within which the scientist works.
In the artistic quest, the triad is formed by the artist, the work of art
and the meaning or experience of reality he wishes to communicate by
his work of creative art. In comparing the two triads, the scientific theory
about facts of nature corresponds to the work of art, which may be a
symphony, a painting, a poem, a sculpture or some other form of creative
expression. Both science and the pursuit of the creative arts represent
mind's creative activity and form of engagement with reality. The
scientist articulates his findings in words or mathematical symbols.
Artistic creation of different kinds are also means of articulating
the meaning or experience of reality, which the artist wishes to express or
'make manifest'. Similarly, religion has its own way of articulating religi-
ous experience, though hymns, prayers, the reading of Scriptures, creedal
statements and the use of sacraments, all of which, as Polanyi says, are
able to worship, and help the worshipper to focus his thought on the infall-
ible realities to which these religious symbols point, while functioning
as 'signals of transcendence'.

The scientist's quest is usually concerned with highly specific
assertions of observable facts and with the truth or falsity of statements con-
cerning these facts. The artistic quest is concerned with less specific,
and possibly undecidable matters, which count in no less as facts of experi-
ence. The facts of religious experience are the least specific and the
most difficult to verify or validate, and, as Polanyi says, we may be unable
to give a straight 'Yes' or 'No' to the truth or falsity of statements
concerning them, because answers of this kind are only appropriate when
explicit doubt can be set by explicit evidence. Religion, says Polanyi,
should not be viewed as an infallible rather than as an affirmation, because
god, like truth and beauty, can be known only in serving him. We are back
here with the paradox of responsible commitment to self-standing
truths, which figures so prominently in Polanyi's discussion of how we come
to believe what we cannot prove.
None of the meanings we achieve, or the beliefs we hold, are wholly objective or wholly subjective; they are personal, which means that they have both an objective and a subjective aspect or pole. The scientist, generally speaking, confines himself to the study of the physical facts of nature, which are observable and measurable. He is not directly concerned with judgments of value or meaning. But only if he is a strict materialist would he suggest that the truth about a world as real as facts and events is inherently valuable, can be adequately studied by the canons of strict empirical method. It is because we live in a world that is 'real' that our universe is 'miscellaneity' that reality means so many aspects, which need to be handled and explained in different ways. This is also why it is necessary to articulate our experience of these realities in different kinds of language.

Language does not correspond, one for one, with experience in an literal sense. A word may denote a specific object or state of affairs in nature, but, equally, it may not do so. What is essential is that we should be able to interpret our words and symbols as meaning, and that this meaning should in some way be integrated into the thoughts we already have, and be accepted as part of our experience of nature, as bringing us in some way closer to the nature and meanings of our existence. The word 'exist' denotes a highly specific and observable fact of nature, and it is easy to relate to the reality observed. There is little problem in correlating the world with the reality. But our experience of reality covers a great deal more than physical objects, and our language reflects this fact. If we accept Polanyi's definition of reality, we can take as real any experience we find meaningful to our active integration of relevant clues, providing that what we recognize as meaningful lies in existence that any exhibits the form of reasonable ways. This definition represents a stipulation of idealist and materialist philosophies precisely because they try to construct a theory about reality in terms which fail to do justice to the reality of both physical matter and mental activity. Idealists treat philosophy as a theory of cognition; materialists as a theory about physical matter. But Polanyi's realist theory is constructed in terms of lived experience of meaning, interpreted by relying on self-set standards of rationality, which are set by our own intellectual passions. This realist metaphysic forbids any sharp separation between things that are purely physical, observable, or verifiable, and things that are non-observable but meaningful and which can only be validated by varying degrees of certainty. To make such a distinction implies a return to Cartesian dualism, or to a form of crypto-positivism.

Man himself is a physical reality immersed in thought, a unity of embodied meaning, who creates systems of belief about what constitutes reality and experiences it as embodied meaning, whether the embodiment is physical or conceptual. Science is one such set of beliefs. The sciences are intellectual systems, which claim to represent nature in its 'true' or objective 'aspect', and which are used to explore the realities of nature precisely because he lives in a world of thought and has devised appropriate symbols and language to express what he has discovered about the physical workings. As a scientist, he must submit to the 'propositional' aspect of the 'true' aspect, and try to explore what is true about physical relations and order. But the actual thought world of science in his creation, made possible by his power to work with symbols that have an instructional relation to himself as a being-in-the-world.

Outside the hard sciences, however, its strict methodological procedures do not apply, and the real world can be explored holistically, even if selectively. The artist, the poet, the religious seeker, even the mathematician are all motivated by a concern to articulate and explain the relations, and each believes himself to be in some sense exploring the truth about reality. We need to go back for a moment to Polanyi's tacit.

There is first the active mind, which makes sense of experience by recognizing significant patterns; there is the reflective component, which is that part of the mind which represents mind's creative activity; and, thirdly, there is the hidden meaning, which strivens passionately to understand and which, in some sense, seeks to disclose itself to us. By acknowledging the decisive part played by the imaginative passion in the natural sciences, Polanyi is able to show that the arts appear no longer as contrived but as immediately continuous with science, only that in them the thinker participates more deeply in the object of his thought. In both science and the arts, it is appreciation of different kinds of order and beauty that sustain our intellectual passion. We find always what we are looking for, guided by our intellectual passions, our self-set standards, and further assisted by training, which teaches us to ask questions, devise symbols and adopt methods appropriate to the subject matter and its articulation.

Scientific language is decorative. The language or symbols of our are more allusive than descriptive, though its allusions may be plain as well as indirect. However rich its allusions, art always has reference in some way to living experience and says something about our knowledge of reality, as opposed to being a mere expression of subjective feeling. However abstract, says Polanyi, art will echo some experience, and would be as meaningless to someone lacking any such experiences as to a person living in a gnostic universe.

Again, however, the science, and the science of the arts, of course, is not as univocal as that of the arts. The scientist's description of nature cannot be reduced to a single, univocal concept. If the same were true for science, the object studied and the scientific theory about it would also be indistinguishable. But a work of art, like a scientific theory, is a vehicle of communication, a means of conveying experience and of sharing beliefs or meanings believed to be true.12 Scientists and artists, philosophers and theologians are all in the business of saying something about the nature of reality, whether the vehicle be a theory, a poem, a novel, a symphony, or some other symbolic form. But artists existentially in two worlds; the receptive and the physical order, and can express himself in symbols that derive from either or both. Materialism defines reality only in physical terms, and the ultimate demands of scientists - if they are materialists at heart - is to be able to arti-
calsate the findings of science by means of purely mathematical symbols. Idealism represents the view that only mind or spirit is ultimately real, and that all physical objects are merely mental concepts. Both the scientist and the idealist have been equally successful and their theories are reasonable. But this does not mean that the scientist can be better equipped to know reality in its essential meaning than the nonscientific man, who merely enjoys physical participation in the observable world.

The truth, as Polanyi sees it, is that these two positions belong inseparably together. He idealist metaphysics takes the irreducible unit of reality as embodied meaning. This may have physical embodiment, or it may embody relations of a non-physical character. Either way, meaning and its embodiment belong irreversibly together and can be experienced as a significant pattern, both in thought and in the world. By his insistence that meaning can never be separated from reality, Polanyi establishes the preconditions for experience of the real world. Naturalism and idealism philosophies both effectively destroy our capacity to know reality as a fact of experience; the one, by reducing it to measurable, observable, meaningless physical forces and particles; the other, by reducing meanings to subjective notions that have no existence outside the mind. Both positions replace the polar structure of reality by a unipolar scheme, that offers us either meaning or its embodiment, but not both, and effectively disconnects reality from the alternative abstractions of disembodied meaning or meaningless bodies.

As Polanyi discovered, a valid epistemology has to work with the indissoluble unity of meaning and embodiment, which, as he also discovered, involves a triadic structure in which each component of the triad is accredited with full reality. It is no accident that Polanyi’s epistemology turns out to be also an ontology of mind and leads him to accredit the reality, not of the creations of nature, but also of the creations of the mind, which are symbols that enable men to articulate what he has conceived of reality. It takes a theology to see in this triadic ontology a parallel with the Christian doctrine of personhood, which was a fourth century elaboration of the doctrine of the trinity of God. This resulted from Christian experience of God’s revelation of himself in the person of Christ (also known as the Word of God). For the theologian, there is a sense in which the problem posed by God’s need to be known by men is the paradigm case for all epistemological problems. It is through reflecting that it became necessary to invent the doctrine of personhood, which means acknowledging the reality of each member of the Godhead in terms which affirm the presence of ‘all in each and each in all’, without separation or conflict.

In Polanyi’s epistemology, and with the help of his concept of ‘twin-lending’, he shows that members of the human, subjective and objective, are held together in an indissoluble polar tension, which makes them part of a single, self-conscious reality, yet not reducible to it. This polar tension establishes the inherent instability, rationality and meaning of all physical facts, but shows how conceptions formed in consciousness recreate, in the wider sphere, realities that are objectively there in the external world, waiting to be assimilated and experienced in the world of thought. On such an interpretation of Polanyi’s epistemology, French would appear to be wholly misguided in suggesting that we can distinguish between the realities studied by science and those which we articulate in our works of art or cultural symbols by arguing for a clear distinction between ‘natural’ and ‘cultural’, and by saying that the realities of nature pre-exist our knowing and can be verified, while those ‘artistic’ or ‘religious’ realities are expressed through art, poetry, music and the symbols of religion, have no existence prior to our creation of them. Such a suggestion, it seems to me, betrays a naive dualism of thought, a concealed assumption that the only true realities are measurable and verifiable realities, and that meaning, as such, belongs to the subjective world of cultures and the noosphere. In other words, the facts of nature are objective and real, though inherently meaningless, while those of the mind may be meaningful, but are objective and do not correspond to anything beyond the creative imagination. Surely, this is simply Daseinslogie updated.

The real world to which Polanyi points is one in which fact and value are inseparable; one in which the knowing subject is part of the reality he knows, and in which lived experience is the only experience of reality there is. Because the claim to know is always dependent on self-set standards of rationality, we can never escape from the circularity of knowledge, by claiming for true knowledge some kind of impersonal detached objectivity. All reality is, in the end, personal, which means that it has both a subjective and an objective pole. This is because the knowing subject can never be anything other than part of the total reality known, and represents, as has already been said, the universe in his knowing and self-referring aspect. In other words, we live in a personal universe, in which nature and the noosphere must be viewed, not as two different and separate entities, but as aspects of a single, personal reality.

Notes
1. The noosphere is a term Polanyi borrowed from Teilhard de Chardin and used as a synecdoche for the world of thought or cultural structure within which the human mind dwells. See The Study of Man p.60, HK p.388, et al.
4. Op Cit. pp 135/136. The passage quoted gives four footnotes, containing a large number of references from Polanyi’s writings.
7. Op Cit. p137.
8. See Personal Knowledge, pp 779-786.
11. Ibid.
12. A casual reading of some passages of Polanyi’s own writings may occasionally, and unfortunately, let him open to misunderstanding and give rise to confusion. I found one passage in Personal Knowledge where he might be argued that Polanyi distinguishes rather loosely between ‘artistic realities’ and ‘artistic realities’. French refers to this passage in his own book, and his comment is: ‘It is clear from the context that these are not the same kinds of “reality”’. On the other hand, ‘artistic’ p.250. Polanyi’s actual sentence runs as follows: ‘A scientific theory which calls attention to its own beauty, and partly relies on it for claiming to represent empirical reality, is akin to a work of art which calls attention to its own beauty as a token of artistic reality.’ (p.133, my italics.) My comment is that it is clear from the context that Polanyi is simply drawing attention to the power of a scientific theory to call attention to its own beauty, and partly relies on it for claiming to represent empirical reality, is akin to a work of art which calls attention to its own beauty. In my view, to
read into the passage something that is plainly not there and exists only in the mind of Harry Prosch. Yet Prosch builds on this passage to argue that Polanyi makes such a distinction between "empirical" and "articulate" and aligns it with the distinction between the facts of nature and the renaissance.

PROSCH REPLIES TO TORRANCE'S LETTER

Postscript to Meaning

Perhaps I should, in order to set the record straight, say a few things in response to the charges that Thomas Torrance seems to be making that I have "bowdlerized" Polanyi's work and that Michael objected to this. See Tradition and Discovery, Vol. XIV, #3, 1986-87. It is of no great importance that Torrance has apparently called into question my intellectual and moral integrity; but I do have (contrary to his opinion) an overwhelming commitment to truth, and I must try to express what I firmly believe it to be. Michael, I am sure, would want nothing less from me.

I am at a loss to know when Michael so radically changed his mind (as Torrance claims he did) about what we together said in meaning. Meaning first saw print in December, 1971, only three or four months before Michael's death. And during this time, according to reports I had from John Brennan, who saw him frequently, and from Nagda, as well, he was confined to a sanitarium in a steadily worsening condition and unable to carry on intelligible conversations with anyone. We were all greatly distressed at his condition, knowing the great extent and depth of the mental powers that had been his. He obviously would have been unable to have repolished our book during that time. Nagda saw the first review of it and wrote me that she would read it to him and that she thought he would be very pleased. She never told me anything different. Nor did Michael give me any indication at that time he signed the contract and its publication that he was anything other than very satisfied with the manuscript we had prepared, nor did I hear from anyone else of any adverse feelings on his part. Indeed, I had a number of cordial letters from him during this time, before his final incapacitation. He seemed happy about our joint work.

Initially I had spent a month or so in England in the Spring of '73 talking with him about the format of the book which he had asked me to help him prepare, and which was to center about the last two series of lectures which he had given at Texas and Chicago. We had agreed that the book would begin with some selections from his writings which would introduce a reader to his general account of how meaning has been formulated from his own mind. This introduction was to follow his program for the restoration of meaning—his last lectures—edited for publication, but unchanged in substance.

Then came back to America and worked hard during the rest of my leave that spring and during the summer and fall, and half of the next year, preparing the manuscript. I sent him the initial work I had done, chapter by chapter, for his suggestions or comments, and for his approval. His letters had much to say favorably about our work and indicated no serious problems with what I had done. This was not surprising, since almost the whole of these chapters was, of course, in his own words found in his published and in his, as yet, unpublished typescripts of his last lectures.

As a matter of fact, with regard to the chapter "Acceptance of Religion," I was overjoyed to receive a handwritten note from him, saying

My dear Harry
This is just a line to tell you my delight about your section on Religion. I shall soon have more to tell you from many corners.

Michael

This was dated 24 August, 1974.

I was particularly pleased and encouraged by this note, especially since the typescript of his own lecture of that title was not fully developed and I had had to fill it out, using his hitherto published work on Religion, especially in Personal Knowledge, together with such intimations as he had made fragmentary in his preceding lectures on poetry, art, myth, and rites, and what I had learned in our conversations. I had not been present at his last lectures, so I did not know how he had actually filled these notes out in his delivery. I felt reasonably sure that what he had placed together was what was in his mind; but I expected he might want to make some changes or additions. He was, however, "delighted" with it. So I do believe that at this time he had found this chapter (apparently a crucial one for many people) to be expressing his views on Religion very well.

Having received word from him that he did wish us to be co-authors of the work (but that he sent the manuscript off to the University of Chicago Press). I went through their procedures and they accepted it for publication. They drew up a contract and I took it and the manuscript back to England for Michael's final acceptance of it (if he chose) and his signature.

I spent about a month there with him, talking every day, as usual, about many things. When we got down to the question of the publication he made a suggestion or two (in the early chapters only) which amounted merely to some re-wording—which I simply changed where in the manuscript I found. Then he spot-checked a number of passages in the chapters on his last lectures against the typescripts of these lectures, found them to be exactly the same, and signed the contract. This was very late summer or fall. I believe, of '74. He gave no indication at that time that he had any sort of reservations about the publication of that manuscript, such less that I had "bowdlerized" his thought! Nor did he later, as I said, between this time and the time when it appeared in print, imply in any way that he was not pleased. His letters, as I said, remained very cordial—indeed, grateful—to me for my help, and full of anticipation and hope for the future of the book.

If he changed his mind, I cannot imagine when it was, nor can I imagine at all that he would refuse friendship and affection (and respect) which he continuously evidenced for me could have turned to the bitterness which Torrance seems to imply it did.

I have nothing more to say about these matters. I think my views of what he meant on all his subjects, but especially Religion, are well documented in my most recent book. If this work is not convincing to others, I am sorry. But I don't think there is anything left to say, except what I have just now said: an account of the oral communications and written letters that passed between us and the factual events I have just referred to. These communications and facts are known and well known to both of us. But, of course, only to me. So they can add nothing in the first instance to others' views of what Michael meant about Religion, or anything else. I suppose—any more than Torrance's account of what he and Michael talked about can add, in the first instance, to the evidence I have found in his writings, and have published. And for me Torrance's account simply do not jibe with what I know personally about and from Michael Polanyi.

People who are troubled by the thought that I may have taken liberties with his lectures in Meaning should read his typescripts of these lectures on "Meaning" he gave at Texas and Chicago, and compare those with the relevant chapters of our Meaning, as Michael himself did before approving the manuscript for publication. They are among his Collected Papers in the Library of the University of Chicago placed there, as a matter of fact, by Thomas Torrance himself.

PHILIS

Harry Prosch
"Open' terms...lack any definite meaning; they may mean anything, unless some intervention is admitted which is competent to control the range of their meaning. (PK, 113)

Jere Moorman, A RUMOROUS DICTIONARY OF THE TACIT, Crane Publications, Box 90155, San Diego, CA 92109, $2.00.

From CONVICTION

The Scientist and his Conscience

Michael Polanyi on Freedom of Research as a Human Right

Terence Kennedy, CSSR

This essay addresses the question of a scientist's right to intellectual freedom in pursuing his vocation of original research. We are all too familiar with how the Szechvanyi and other dissidents in Eastern Europe have been persecuted for following their conscientious convictions. Perhaps we've never asked ourselves why scientists dedicated to objective impersonal truth should be the leading exponents of personal freedom and civil rights. Polanyi provided a response that rethinks the ideal of science and furnishes a firm foundation for freedom of thought in our technological society. Until his death in 1976 he continued to research into science, art and spiritual values. Raymond Aron has praised him as a "philosopher of reconversion" for he restored man's dignity by integrating his culture, science and art with the transcendent values of truth, love and beauty.

Polanyi's contribution to the theory of freedom is usually taken from the point of view of his social theory. Polanyi's point was more fundamental as it was recognized by Professor T. F. Torrance. He saw quite clearly that freedom was an inner constitutive of Polanyi's philosophy of science: "To the open universe disclosed by the advance of pure science there ought to arise something like the free society."

Professor Torrance has already drawn the systematic conclusions about the place of freedom in science from Polanyi's vision. This essay will limit itself to an exposition of how Polanyi perceives a scientist's conscience is constituted and functions. It will take one chapter of Science, Faith and Society, namely "Authority and Conscience", as its principal focus for reflection and analysis.

There will be four parts to this analysis:

1. "Moral Inversion" as the Context for a Discussion of Conscience in Science

2. Discovery is an Intellectual Act Demanding Conscience

3. Conscience Confronts Authority in Science

4. Acceptance of Science by the General Community

1. "Moral Inversion" as the Context for a Discussion of Conscience in Science

Science is a social activity in which many individuals co-operate in a common effort. Polanyi described personal and social relationships through the image of a field of moral forces filled with mental energy. Man is moved towards the goals he desires by his passions. It is appropriate, therefore, to visualize his moral passions as moral energies having direction and universal intent.

Because science was able to dethrone religious and philosophical authorities that had interpreted nature up to the Enlightenment, people began to turn to it for guidance. Even in ethical matters its way of reasoning was held to be the sole path to the truth. When objective science becomes a world-view or an ideology, it leads to either purely empirical enquiries of no ultimate significance, or to a pseudo-system of the world and of history. For our author, the first seems to be the predication of the Western thought dominated by reductionism; the second is that of the Communist countries. Either outcome is absurd.

The root cause of our cultural malaise may be discovered in Descartes' refashioning of knowledge and the knowing subject. Since the cogito has entered philosophy as its self-justification, man's capacities to know have not been directed outward towards reality so that he does not go out of himself to embrace it in union. Rather, there has been no "indwelling" to use Polanyi's term and man's capacities were turned back on himself. It is this misdirecting of the mind that is referred to as 'inversion'. This is no denial of the consciousness of the knowing subject. Knowing as indwelling is a bi-polar movement for Polanyi: from subject outward towards the object as a questioning of reality, as a searching to find its real structures; from object into the subject as the gift of intelligibility yielded to the subject in the act of understanding.

Now the passions follow the direction set them by the mind as it penetrates the real. The mind itself is moved by the passions to act in the direction it has turned. If the mind is misguided, it follows that our passions become displaced.

The deepest dimension of the crisis of contemporary culture is religious. It deals with man in his lived relationship to himself and to the person of Christ.

Christianity is a religion of moral passions... The modern critical movement destroyed the communion between the Christian conscience and the person of Christ, and in so doing it pent up a vast accumulation of unsatisfied moral desire. Barred from their openings toward eternity, the hopes and passions of Christianity overflowed
into the secular world, transforming themselves into a belief in historical progress and generating unlimited demands for political and social reform. The denial of absolute obligations does not destroy our passions. It renders them homeless. They easily become transmuted into some theory of salvation by violence. And this violence is then justified by a scientific ideology. Critical rationalism has thus completed the circle of reasoning which justifies the transformation of the world by violence for scientific reasons.

In such men, the traditional form for holding moral ideals has 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 invention. Polanyi goes on to view the soul of contemporary man as being eaten away by the cancer of nihilism which links false ideals to homeless fanatical passions in a culture bent on self-destruction. This is evident in the experience of two World Wars and in the super-power conflicts of today. This is the cultural context in which Polanyi sets out on his corrective analysis of science in his first major theoretical work, Science, Faith and Society, in which the conceptions of conscience and science are formulated in terms of each other.

2. Discovery is an Intellectual Act Demanding Conscience

Polanyi's first step is really a reformation of the positivist concept of science. Can we derive scientific propositions from experience by the simple application of explicit rules of procedure? The positivist says "Yes" because a rule induces a pattern, a meaning into the mass of data by induction. But, argues Polanyi, for any set of data there is an infinite number of functions that can represent it. "Never yet has a definite rule been laid down by which any particular mathematical function can be organized, among the infinite number of those offering themselves for choice, as the one, which expresses a natural law" (SFS p. 21). Even if we pick those that lead to right predictions of phenomena there is still an infinite series from which to make a selection. What is the additional factor that guides our choice, e.g., in establishing the trajectory of a star? The first fact is that the star is real. It is something we want to know and understand. Then there is the problem of how to relate all these phenomena into a pattern. It is here that the positivist would impose the enforced order of a mathematical law on to the observations. But why this mathematical pattern? Because the scientist in an act of creative understanding brings all the data together and recognizes a pattern or a shape that reveals the reality of the object of his enquiry. "Our principal clue to the reality of an object is its possession of a coherent outline." There is thus no pre-determined rule for making a discovery which is, on the contrary "an intuitive perception of the real structure of natural phenomena" (SFS p. 25).

The scientist has a specially trained and cultivated power of perception whereby he recognizes those shapes in nature that are often invisible to the non-specialist. So scientists, and the whole of modern society, are guided by a conviction of the rationality of the universe. It is true that the same experience, e.g., the fall of a rock that strikes a man on the head and kills him, may be interpreted in many ways i.e. magically or scientifically. We decide in conscience for that interpretation of the universe which we believe leads us into the truth.

The positivist believes science advances because of new facts or observations. Sir James Jeans said that "Science advances in two ways, by the discovery of new facts and by the discovery of mechanisms or systems which account for the facts already known". The outstanding landmarks in the progress of science have all been of the second kind, e.g., Copernicus, Newton, Darwin and Einstein. Thus the scientists do not so much use hypotheses but rather hunches or guesses that they trust to put them in contact with reality and its inner structures. If a scientific law cannot be deduced from experience by explicit rules "we must therefore accept also that no explicit rules can exist to decide whether to uphold or abandon any scientific proposition in face of any particular new observation" (SFS p. 29). Verification of a scientific law is more susceptible to rules than discovery which rests on our mental ability to make contact with reality, rather than on rules of procedure. An experiment is an enquiry that is stimulated and driven forward by intuition and observation acting upon each other. Thus the scientist is drawn forward by a hope, by a vision of truth which he wants to establish by his reflection on the evidence. There is doubt and there can be error. It is here that scientific conscience plays its vital rôle: the scientist must decide whether to set aside a doubt as unreasonable or not. Our decision what to accept as finally established cannot be wholly derived from any explicit rules but must be taken in the light of our own personal judgement of the evidence" (SFS p. 30), e.g., the periodic table of the elements and the quantum theory of light are both good examples.

Polanyi then asks what mental process leads to discovery as the acceptance of these guesses as valid and truthful interpretations of the structure of the universe? It really starts with an awareness of inclination, of untapped ability and gifts in the researcher that attract him to this matter as the stuff for exploration. So as it were he travels through the dark guessing every step along the way. But he must at the same time be guessing all the future steps that will yield the final solution. He has a sense of nearing his goal without which the whole effort is futile. In all this scientific discovery is like a work of art. To achieve the final vision one must make the right decision at every stage guided by as yet undiscovered particulars in the picture. There are two points to note here. 1. Science shares Plato's exegesis: how can I have a problem about something which I do not yet know? Conscience plays a vital function in bridging the distance between known premises and the obscure mass of data and observations. It yields a conclusion only by way of an intellectual decision to trust the emergent shape as the arrival of truth. 2. Science differs from art and imposes a burden of
conscience in so far as "the final whole lies not within the powers of our 
shaping, but must give a true picture of a hidden pattern of the outer world" 
(SFS p. 32). Polanyi invoked Gestalt psychology to explain the hidden co-
efficient in our knowledge of physical nature. It was precisely the unitive 
aspect of the knowledge of real objects perceived by us that led Polanyi to a 
creative act, a conscience decision that the mass of physical observations all 
are on and pointed to one physical object or pattern in nature itself. 
Conscience, while it is a creative act and decision of man, is intentionally 
directed to the real and is measured by the structures of the real.9 

The skill involved in this type of decision goes beyond any operational 
skill or planned process in the techniques of research. "There are 
specifications for testing materials and rules for drawing up statistics. There 
are also manuals for triangulation and the drawing of exact maps. But there 
are no manuals prescribing the conduct of research; clearly because its method 
cannot be definitely set out . . . . The rules of research cannot usefully be 
codified at all. Like the rules of all other higher arts, they are embodied in 
practice alone" (SFS p. 33). Bacon's prescriptions for discovery are a travesty 
of what is meant by heuristics. The spontaneous process of mental 
oreorganization of data in view of their objectivity in the real world is not 
done by conscious effort and yet a four-phase sequence has been recognized in 
establishing originality in art, science and mathematics, namely, preparation, 
incubation, illumination and verification. It is here that Polanyi projects his 
paradigm example of St Augustine whose search for God in prayer culminated 
in religious conversion. Polanyi sees a personal dimension in knowledge which 
he calls conscience. It acts through faith to achieve discovery which is "the 
knowledge of a real thing never seen before" (SFS p. 39). While discovery 
cannot be precipitated by following a definite set of rules, it is not outside 
the laws of human behaviour but it is very limited by its dependence on the 
circumstances in which an investigator works. This may be seen by the fact 
that different scientists make the same discovery almost at the same moment, 
e.g., the splitting of the atom.10 Science is valid precisely so far as it 
does make contact with reality in discovery.

The impression could be given that the investigator might be replaced by 
a "truth-finding machines steered by intuitive sensitivity." This possibility is 
more pressing today than when Polanyi wrote since the challenge of artificial 
intelligence has become so real. However if we follow Polanyi's logic we will 
discern an important moral element in all personal statements that affect 
scientific judgments. To put the matter pithily the above model takes no 
account of the fact that the scientist is in fact the ultimate judge of what he 
accepts as true. His brain labours to satisfy its own demands according to 
crystallized by its own judgment" (SFS p. 39). The scientist is no neutral 
referee but passionately committed to the success of his search. He is 
deply involved in his work since without motivation he would never find a 
problem that begs solution or initiate the toil of patiently working through 
every stage of research, nor would he overcome the temptation to depression 
and to disregard disconfirming evidence or exceptions.

Polanyi has summarized the place of intuition and emotion in scientific 
decision in these words: "Problems of this kind can be solved by no 
established rule and (as I have said) the decision to be taken is a matter of 
the scientist's own personal judgement: we now see that this judgement has a 
moral aspect to it. We see higher interests conflicting with lower interests. 
That must involve questions of conviction and of faithfulness to an ideal; it 
makes the scientist's judgement a matter of conscience" (SFS p. 39). 

Polanyi has more in mind here than what we call conscientiousness in 
fulfilling procedures, cataloguing results, checking references etc. These are 
all matters of rule. But the rules themselves must be interpreted in view of 
the aims of science, i.e., truth through discovery. It is here that conscience 
caters to settle the conflict between inspiration and intuition on one side, 
and rule and tradition on the other. Without this dialectic of conscience science 
would not be a dynamic discipline in the mind of the researcher, nor would it 
be enhance and enrich the cultural heritage of society.

3. Conscience Confronts Authority in Science

According to Polanyi we acquire the premises and the viewpoint of 
science not by proving its principles like theorems of geometry but by a 
process of assimilative learning much as a child learns from its mother the 
language which will interpret the world around it. The premises of science 
are therefore learnt implicitly with our acquisition of culture from our earliest 
experiences. We gain these premises when experience mediates reality to us 
through certain structures or patterns that we usually do not advert to 
consciously. For example, a child before it ever goes to school has already 
assumed the rudiments of a naturalistic view of the world and not a magical 
one as might have happened in another age (SFS p. 42/43). So it is through 
skill and practice that the presumptions of what the world is about are passed 
on. This presumes a community with a living tradition. In conscience it 
always forever choosing its direction of development in conformity with its past.

There is a three stage process of education to communicate the premises 
of science. 1. The schools communicate the concepts and vision of science. 2. 
The university maps out the extent and methods of science. 3. Research is 
fostered by a system of apprenticeship. The new researcher is supervised by a 
master who initiates him into the skills and practice of research. It is at this 
stage that the scientific conscience is properly formed.11 Not only has the 
researcher learned the methods of scientific work but he has rationality 
accepted the standards that guide science.

The unknowing novice in the discipline is urged on by the certainty that 
realities beyond his knowledge are true and valuable. He therefore recognizes 
an authority in what is he is going to learn which is incarnated in his master. 
He never accepts his teacher's views except in so far as they are the 
embodiment of the valid premises of science. To become a scientist a person...
must presume that scientific methods and teachings are sound and that they are to be undoubtedly accepted as foundations for progress in understanding. Polanyi thus refers to the Patristic and specifically Augustinian axiom, that knowledge is achieved through faith, fides quaerens intellectum.

This process of education means that rationality grows while the naive form of faith diminishes. "His own intuition and conscience will take over responsibility in the measure in which authority is eclipsed" (SFS p. 43). This does not mean that he will no longer rely on the judgment of others or trust his instruments or the intellectual premises of science. But it does mean that "such reliance will be entirely subject to his own judgement". From henceforth he is fully responsible for his own conscience for his decisions in research and in organizing the community of science in its common effort. Of course there are conflicts among scientists. These are usually settled by appeal to the common premises they all share together. "Their consciences on which they have ultimately to rely for guidance harmonize sufficiently to keep them in concord" (SFS p. 46).

Mutual reliance and common standards are established among scientists in a number of institutions. This is the matter of administration of the scientific effort. Periodicals set a minimum standard that is communicated throughout the profession. Text-books make these contributions normative for the education of novices in the field. The awarding of a scientific post involves putting money and facilities at a scientist's disposal for the advancement of the frontiers of science. The lines of research, the methods and publication of discoveries is left to his competence and judgment, i.e., to his conscience. The authority of science is embodied in great scientists not so much because of their position but because of their competence. The scientific community as a profession enjoys autonomy in setting its own standards: no civil government is competent to intervene here except in case of incompetent administration of facilities or money etc. But the standards of science are a matter for the responsible scientists themselves. Polanyi argues this is necessary on the basis of the nature of the act of discovery itself. It is guided by the internalized standards of science in the skill and practice of the scientist. No exterior rule or authority can coerc the actual performance of research. If it does become forced the originality of science will die. This is the mistake of central planning as advocated above by the Soviets.

It follows that authority in science is general and not specific so that a consensus is maintained that allows new conclusions to be reached. Thus the spontaneous unanimity that prevails among scientists is a form of spontaneous order whereby each is a centre of initiative and all together form a polycentric system.

When each scientist largely relies for his views and information on the work of many others, and is prepared to vouch for their reliability before his own conscience, then the conscience of each is born out by that of many others. There exists then a community of consciences jointly rooted in the same ideals recognized by all. And the community becomes an embodiment of these ideals and a living demonstration of their reality (SFS p. 55/56).

The individual scientist within this community experiences intuitive impulses that instigate new discoveries. He therefore wants to transform the tradition. It is precisely here that the community relies on the consciences of individual scientists to control these impulses so that they can reach a reinterpretation of the tradition that they will then present to the judgment of their fellows. When this new judgment is accepted the premises of science have then been transformed and renewed. There is thus a dialectic of tradition and renewal in the conscience of the individual researcher and also in the community of scientists itself. So the submission to scientific premises leads to the practice of intellectual freedom.

4. Acceptance of Science by the Community at Large

The world of science is an organized social body. It also forms part of the larger organism, the social body of a whole nation. It is therefore a concern of the whole people and of the government in its political voice. How is it that they accept science as valid?

Every community has its predominant interpretation of nature to which it subscribes from among a number of rivals. Now the people and the government accept the consensus of opinion among scientists as the valid premises for an understanding of nature. This establishes the freedom of the scientist, his opportunity to use his gifts and capacities in the pursuit of truth. But this depends on a context of freedom in the whole community. The acceptance of science thus relies on the premises of freedom and truth that guide the whole society. Over the last few centuries Western societies have become convinced of the validity of science as a sound way to explore the structure of the universe. And in order to achieve this truth by new discoveries freedom of research was a necessary precondition. There is a deliberate decision taken by the society to support science. This is the type of society that will "give shelter to free discussion in a free society" (SFS p. 69). This is embedded in the democratic principles for a free discussion, namely fairness (objectivity and honesty about the facts) and tolerance (the capacity to listen to an opponent in a controversy in order to discover his sound points). In such a society freedom of conscience is a human right protected by the civil laws.

Polanyi presents this decision as a taking of a position in conscience on the part of the society itself. The switch to the modern naturalistic model of the universe from previous more organic and animistic models was an intellectual conversion, an act of faith that put the community in contact with the reality of a new universe (SFS p. 67).

When this ideal of conscience is lost, a sceptical spirit seeps and embitters the whole culture so that the impulses that were to lead to discovery turn back on man himself. The scepticism, the methodology of systematic doubt and denial of all faith following Descartes can only generate
a "complete metaphysical nihilism and thus deists the basis for any significant manifestation of the human mind". The consequence of reason without faith turning hostilely on the person himself is that the premises of science and all social institutions are denied and conscience as a great humanitarian truth dies. "Justice, morality, custom and law now appear as mere sets of conventions, charged with emotional approval, which are the proper study of sociology. Conscience is identified with the fear of breaking socially approved conventions and its investigation is assigned to psychology." Here is the ground of the lamentable breakdown of shared ideals for the guidance of a common effort in society, the loss of faith in the twin pillars of morality, love and truth.

How does Polanyi conceive of conscience then? It has functions of judgment at three levels:
1. In the mind of the scientist it is the series of judgments, not dictated by rules, that guides the course of research till it culminates in the illumination of discovery. Illumination as the point where reality is touched, where the formulation of laws is re-interpreted through their comparison with the structures of the real given in that moment, is the paradigm experience for Polanyi's scientist following his conscience.
2. In the community of scientists it is the judgment of scientific standards and worth which act as premises that build up a fiduciary consensus that found the community.
3. In the community at large it is the judgment of acceptance of science as a value that embodies freedom and truth as human rights.

Polanyi's model of conscience centres on conflict and its resolution. At first appearance it seems to be a continuation of the tranquility of conscience ideas so familiar to Catholics from the history of casuistry. The doubtful conscience arose from a struggle between law and freedom for control of the person's moral decision. The case was unravelled and peace restored by invoking a second order of rules, the so-called reflex principles which were very much like the legal principles for the interpretation of evidence etc., in a court of law. Polanyi however has not become lost in this type of abstraction. It is not really a conflict in that sense. It is rather a tension between the established laws of science and the reality to which they are directed. The person in his freedom stands above the conflict and passes creative judgment in his own right. This favors case solutions in the reality that we face and not in more complicated laws that only serve to distance us from the real situation. The intuitive grasp of reality that Polanyi calls "intellectual conscience" might well serve as a model for all research aimed at discovery as well as for the human right to freedom of thought in a scientific age.

Two different personal elements . . . enter into every scientific judgment and make it possible for the scientist to be judge in his own case. Intuitive impulses must arise in him stimulated by some of the evidence but conflicting with other parts of it. One half of his mind keeps putting forward new claims, the other half keeps opposing them. Both these parties are blind, as either left to itself would lead astray. Unfettered intuitive speculation would lead to extravagant wishful conclusions; while rigorous fulfillment of critical rules would paralyze discovery. The conflict can be resolved only through a judicial decision by a third party standing above the contestants. The third party in the scientist's mind which transcends both his creative impulses and his critical caution, is his scientific conscience. We recognize the note struck by conscience in the tone of personal responsibility in which the scientist declares his ultimate aims. This indicates the presence of a moral element in the foundations of science (SFS p. 40/41).

Conscience means that we so indwell the principles of our knowing that we can touch the real in such a way that we discover its intrinsic natural structures. In this experience the researcher breaks out of his old rules and mental framework and assumes the newly known structures and patterns (forms) of reality as the rule and standard of his knowing. Conscience is thus bi-polar: it is passion and the desire to know on the part of the knowing subject, it is also objective truth and the unassailable mystery of the real. It is no wonder that Polanyi described discovery which is the climax of conscience's activity in rather mystical terms:

"Conscience is necessarily 'judge in its own case' because it has the capacity for self-correction when it errs. At the highest level, freedom of thought and research becomes one with the quest for meaning in life and for religious truth. The crisis of contemporary culture is thus one of religious conscience because 'the modern critical movement has destroyed the communion between the Christian conscience and the person of Christ' as Polanyi said so powerfully above. It is only by a return to the Augustinian principles of faith as the foundation of critical knowledge that a true notion of conscience can be restored."

The same approach is reflected in a recent Catholic statement on freedom and liberation. "Freedom of thought, as a necessary condition for seeking the truth in all fields of human knowledge, does not mean that human reason must cease to function in the light of the Revelation that Christ entrusted to his church. By opening itself to divine truth, created reason experiences a blossoming and a perfection which are an eminent form of freedom."

Notes
2. Conscience seemed to fade as a theme in Polanyi's later works. In his early works the space devoted to it is small but important. M. Polanyi, Science, Faith and Society, Chicago 1964 (Hereafter SFS) 42-62, and then
in a broader context *Personal Knowledge*, London 1958 (Hereafter PK) 160-179, 259-316 where it is seen from an almost mystical angle.
3. This paragraph of the essay is dependent on PK, on doubt 265-294 and the structure of commitment 308-316.
4. PK 231-35.
8. SFS 31. Polanyi gives many more examples in PK, London 1958. They are too numerous to cite being scattered throughout the whole volume.
10. SFS 35. See SFS 55, "Before claiming discovery he must listen to his scientific conscience.
11. SFS 44, "The scientific intuition of reality henceforth shapes his perception".
12. SFS 59. After a long discussion of general and specific rules Polanyi distinguishes general authority as in science and specific authority which is typified by a central system of planning in which the ultimate judge in the system is the central authority.
13. It seems that this insight was Polanyi’s first systematic description of scientific society. See ‘Collectivist Planning’ in the Contempt of Freedom, New York, 1970, 27-61.
14. SFS 59. Contact of the scientist’s mind informed by tradition with the structure of reality is the basis of this dialectic.
16. See the development of this theme in PK 121, 123, 130, 172.
17. PK 198-201 shows how scientific discovery is part of the fabric of man’s mystical experience in art, literature, religion and worship, all of which are characterized by the fact that man experiences his own surrender to a greater, all-embracing truth.
This must be seen as philosophy of biology and philosophical anthropology and theory of knowledge... And as one focus, there is the profound teaching of Michael Polanyi, her colleague and friend for several years, In Greene's relentless and pervasive critique of indeterminism, whether in epistemology or in biology proper... With Polanyi and against Aristotle, Greene publishes 'potency before actuality'. With Plessner, she develops the idea of the achievement of personhood in its ordered relation to 'an artifact - the social world of culture'.

The whole tribute is brief but worthy. It makes me wish there had been a fuller, scholarly "placing" of Marjorie Greene's work as a whole to balance the great range of exploratory themes which open up the book. These many essays, around the edges of the Greene parables, are certainly judicious and are by a very distinguished group. Here are seven - (out of eighteen) which particularly impressed me:

Ian Bucking: The Invention of Split Personalities.


Dorothy Price: Heidegger and the Scandal of Philosophy. 

Nancy Cartwright: Two kinds of Teleological Explanation.

George Gale: Anthropocentrism Reconsidered.

William G. Wimsatt: Form and Aggregativity. Richard Rorty: Should Have Been Answered or Hypnotized?

The Bucking and MacIntyre articles left me feeling a little light-hearted. They prise one out from one's cultural roots. Cartwright and Gale offer another kind of freedom, beyond the roots. Perhaps we are about to escape the old adumbrations and our descendants may not be educated to put teleology against causation or imagination against logic. And perhaps they may come to see Man no longer as a clever "knower" but as a "known" by some greater mind. This thought was stirred by George Gale's Thesis about Humans being the essence of the universe. The thesis has been masterfully elaborated in the much praised recent work by Boney and Tippler, The Anthropic Cosmological Principle. In Gale's paper the idea is concentrated and discussed in detail.

Near the end of the book Richard Rorty takes his old Teacher on a gentle pas de deux. He tries to show her that the next dance won't be a biological spiral but a weaving in and out of the corridors of history. It can almost hear his partner asking: "Why not both?"

I remember when Marjorie Greene came and taught at Aboobole in 1952, two years in the fifties - unpaid, just for the interest. The biology lab was tiny but there she spent most of her time, teaching students, talking about the early model of DNA (cardboard) which hung from the ceiling and embarrassing the regular instructor with her numerous questions. One breakfast time she gave our teenage son a history of philosophy from Aristotle to Marx, with existentialism added, just slopping over into the washing up.

Marjorie Greene was a very great teacher.