

Tradition & Discovery

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PREFACE
The Revival of Bukharin'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 perestroika. Yevgeny Yevtushenko has composed a powerful poem, "Bukharin's Widow." Contrary to this optimism, Polanyi reminds us that it was Bukharin that in 1935 described pure science as the morbid symptom of a class society and led Polanyi toward a philosophy critical of Bukharin's views. Despite Gorbachev'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 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.

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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, 3/4 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. It appeared that there is interest in more Polanyi papers at the meeting next year. For possibilities contact M.ELIZABETH WALLACE, 1880 Whitcomb Court, Salem, OR 97304.

UN-CHOL SHIN, Prof. of Interdisciplinary Humanities at Eastern Kentucky University has published on Solzhenitsyn, 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 Polanyian critique of Erich Jantsch's analysis of INTERDISCIPLINARITY. His article, "The Structure of Interdisciplinary Knowledge: A Polanyian View" is in Issues In Integrative Studies, No. 4, 1986.

BOB 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 hierarchies postulates a noosphere, an intangible level of reality wholly comprising socially constituted knowledge that is both the creature and the creator of individual intellectual 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 one of these foci.

THE POLANYI VISITING LECTURESHIP in the History and Philosophy of Natural Science at the University of North Carolina at Chapel Hill was established through the gift of Dr. Waldo E. Haisley, Jr. The lecturer this February is Herbert Simon. Chair of the Committee is Robert G. Parr, Chemistry.

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

ANDY F. SANDERS 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 Neue Zeitschrift Fur Systematische Theologie Und Religionsphilosophie, 27. Band, 1985, Heft 2. His address is Nw. Kijk in't Jatstraat 104, 9712 SL Groningen, The Netherlands.

DONALD W. MUSSER contributed a paper to Soundings, Winter, 1986 for the PAUL TILLICH centennial. The paper is entitled "Tillich's Epistemology: An Assessment From A Post-Empiricist Framework." 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. Apczynski
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 our manner of 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 Harry 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 appear to me to cohere with 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 adumbrated by Prosch I had encountered elsewhere, but without the framework of the Polanyian epistemology.

What allowed a meaningful pattern of interpretation to emerge from these puzzling difficulties and vague intimations was a surmise on my part regarding the manner in which Prosch had come to dwell in Polanyi's theory of knowledge. Once I was able to read Prosch in this way by trying to dwell in an appropriately modified framework, his interpretation of Polanyi surprisingly 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 any 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 further 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.

I

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 by extension all knowing. That even our sensual, perceptual stimuli are selectively ordered and structured by our tacit integrations is basic to Polanyi's position. It almost appeared, 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. 66ff). 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. 69). While the thrust of this claim has a defensible interpretation, the disjunction ("only in the mind" vs. "detached, objective 'thing'") seemed 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 (pp. 70-71). 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 show 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 creative mental capacity 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 projections because they were natural integrations of comprehensive entities that would manifest themselves to us in unthought of 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 insofar 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 man understand, as never before or since, the pathos 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 experience, particularly when it is connected to a sense of the whole. The whole, however, which may be expressed in a heighten 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 Polyanian 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 view 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 stance 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.¹³ Such assumptions would be tacit in the sense that they would form the pre-articulate, meaningful, 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 indwelling 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.¹⁴ 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 indwelling, within which he understands the Polyanian 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 beliefs. I should 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 thematize 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.¹⁵ 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 acknowledgement 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.¹⁶ Even though a technically precise explanation of this point is not to be found in Polanyi, his basic claim that all knowledge is grounded metaphysically on a contact with reality I believe is fairly clear.¹⁷ 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 analyses of Christianity as a heuristic vision fostering a sustained effort at breaking out and of mystical practice as attempting to break out of the normal controls our minds exercise to shape our perceptions¹⁸ both point to the character of transcendent reality as it is encountered in human experience. It is the intelligibility of reality at its infinite source that sustains this heuristic vision and the mystical form of contemplation.¹⁹

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,²⁰ 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--"the world that lies beyond and under or through all its parts"²¹--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 as the focal point fusing meaningfully the incompatibilities of ordinary experience.²²

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."²³

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.²⁴

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 unequivocally expressed in his writings. Even though it requires (at least) a temporarily empathetic shift in existential commitments toward the dwelling in a naturalist perspective, Prosch's exposition can be appreciated as a consistent reading of Polanyi whose textual statements could indeed bear the meaning Prosch 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 texts. Prosch 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

1. Michael Polanyi: A Critical Exposition. Albany: State University of New York Press, 1986. Subsequent references to Prosch's study will be indicated parenthetically.
2. Michael Polanyi and Harry Prosch, Meaning (Chicago: The University of Chicago Press, 1975), pp. ix-xi.

3. Polanyi was very reticent to speak about such highly personal matters. The available evidence suggests that, while he was attracted to elements of Christianity and for a period in his early twenties considered himself a "completely converted 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 communicant and regular churchgoer. See, for example, his letters 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 (4:11 and 7:1). 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," Zygon, 17 (1982), 86.

4. For example, when Prosch holds 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 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.

5. See, for example, "Tacit Knowing: Its Bearing on Some Problems of Philosophy," in Knowing and Being, ed. Marjorie Grene (Chicago: The University of Chicago Press, 1969), p. 178 or Prosch's reference (p. 70) to The Tacit Dimension (Garden City, New York: Anchor Books, 1967), p. 13.

6. That Polanyi intended to restrict the ontological aspect of tacit knowing in this way, I think, cannot be defended in light of his explanation of it in "The 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 Prosch's reading.

7. It was only after reading Prosch's study that I noticed, for example, that Meaning did not include the ontological aspect in its 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 exclusion was due principally to Prosch's decision regarding the selection of Polanyian 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.

9. Reason in Common Sense (New York: Collier, 1962), p. 130.

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

11. Meaning, pp. 160, 162, 179, 180.

12. My notes from the version of the manuscripts in the Polanyi Collection at the Regenstein Library (39:6-11) 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 Prosch'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. 31-90. 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 atemporal 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 Doers of the Word (Missoula, Montana: Scholars Press, 1977), pp. 101-154. In Prosch'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 Pols, "Polanyi and the Problem of Metaphysical Knowledge," in Intellect and Hope, ed. Thomas A. Langford and William H. 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, Everyman Revived (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.

18. See Personal Knowledge (New York: Harper Torchbooks, 1964), pp. 196-9.
19. Note how Prosch cannot grant to the mystical vision any legitimacy for interpreting the truth of myth (p. 168). If reality were not ultimately intelligible and the source of the intelligibility we do find in the world, Prosch would be correct.
20. Meaning, p. 147.
21. Ibid., p. 124.
22. Ibid., p. 156.
23. Ibid., p. 160.
24. Personal Knowledge, p. 281. For a recent example of such reflective activity based on Polanyian assumptions, see R. Melvin Keiser, "Inaugurating Postcritical Philosophy: A Polanyian Meditation on Creation and Conversion in Augustine's Confessions," Zygon, 22 (1987), 317-37.

From Convivium

Harry Prosch, Michael Polanyi: A Critical Exposition, State University of New York Press 1986.

D. Scott.

I read Harry Prosch'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 perspective. I found in the first three parts - "Diagnosis-Prescription-Treatment" that I was often struck by a connection picked up and illuminated by Prosch among the strands of Polanyi's thought, which had not struck me so precisely before but now seemed important and clearly right. I would instance his account on pages 60 and 61 of how, while 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 true coherences from illusions; on the other hand we as persons "are performing one single mental act in seeing an object against a background". The physiological events in our bodies which are part of the skill of perception, are known to us only subliminally but they are part of the galaxy of clues of which we take account in our act of perceiving. This Prosch calls "a very important point for Polanyi. For if the factors in perception that lie entirely below the level of my possible focal awareness are not factors of which we are at least subsidiarily aware, then perception is not a single purposeful act, it is at bottom merely a caused event - and what we call knowledge, being rooted in our perception, is not then a result of 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 ever 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 operative intention in persons, we have lost our basis 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 inexact". "By comparison with descriptions in physics, he held, descriptions of chemical substances and the art of dealing with them lie 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 94, Prosch'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.

These are just a few examples of a quality I found all through these parts of the book, of what might be called clear and connected ideas. But then, I have to admit, in later chapters I came to a lot of difficulties, all connected with Prosch's insistence on saying, and on attributing this view to Polanyi, that the realities we come to know through science are different from the realities we come to know through art, religion, mathematics. Prosch is very determined about this and spends a lot of time arguing against the various people who disagree, such as Richard Gelwick, Thomas Torrance, Ronald Hall, Sheldon Richmond, and Marjorie Grene. This is a very puzzling area; to start with it is strange that Prosch and Gelwick, who both spent a good deal of time with Polanyi in his last years, came away with opposite impressions of what Polanyi intended to say on this matter. (In this review I have not discussed the treatment of this distinction between different realities in Meaning, since I cannot tell how much of that book is Polanyi and how much is Prosch.) Prosch has given quite a large proportion of his book to this controversial area, and it does seem extremely important for our whole understanding of Polanyi. In attempting an answer I will first ask what exactly is the distinction Prosch is making, and says Polanyi made, between the realities known by science and those known through religion, poetry and the arts? Then, can this distinction 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 Prosch says Polanyi made in the subject matter of these two kinds of knowing is stated in his book on p 249 (and in other places). It is this: "For Polanyi...reality is defined univocally as that which we expect to show itself in indeterminate ways in the future. Yet according to Polanyi there is one subset of realities which exist independently 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 mean as time goes on - as in great works of art and religion. They are comprehensive entities whose 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." (My italics.)

Prosch expresses the indications by which we distinguish these two kinds of reality in other words too. It depends on whether the realities exist independent of our thought (p 256), or whether "it was man'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 Pirsig made play, asking what it meant to say Newton discovered the laws of gravity. Did it mean that "the disembodied words of Sir Isaac Newton were sitting in the middle of nowhere billions of years before he was born, and that magically he

discovered them?" (Pirsig, *Zen and the Art of Motorcycle Maintenance* p 34) That would of course be absurd, but it would be equally absurd to say Newton invented the laws of gravity; that they did not operate before he thought of them. In that case Newton would have been in no position to invent or discover anything.

These paradoxes about inventing and discovering arise, Polanyi says, when we look from outside, without commitment, at things that belong together as parts of a commitment. "If we ask whether Euclid's theorems existed before they were discovered, the answer is obviously No, in the same sense as we would say that Shakespeare's sonnets did not exist before he wrote them. But we cannot therefore say that the truths of geometry or the beauty of poetry came into existence at any particular place or time, for these constitute the universal pole of our appreciation which cannot be observed noncommittally like objects in space or time." (IK p 396)

Polanyi has a lot to say about the relation of creation to discovery. He has taken us with great care through the evidence for the creativeness of discovery, and then through the evidence for the discovering quality of creativity - as when he points out (IK p 309) that a judge dealing with a case where the explicit framework of the law leaves open alternatives, must find the law, supposed to be already existing though yet unknown. In doing so the judge is under the compulsion of his obligation to the principles of justice, and what he says is the law will be accepted as part of the body of law - he has both created and discovered it.

Prosch's distinction bristles with difficulties. He says Science is part of the noosphere, but its objects are not. But the objects of science are both created and discovered by the disciplined human imagination; there is no way of studying the physical universe untouched by human mind, as though all the discoveries of modern science had never happened. Newton's laws, Einstein's, Planck's, are part of the noosphere but they have changed the objects of science and we certainly believe that if they apply now, they always applied. And what about history - a subject which Polanyi treated at length but which Prosch hardly mentions. No doubt the facts with which history deals existed before we thought about them, but history is not simply a recording of facts, any more than science is. Historians are always selecting and interpreting 'the facts', indwelling in the minds of the historical characters so as to feel their situation and intention as they felt it. It is a creative study. It clearly has a relation to the 'facts' of the everyday world different from the relation which poetry or art has; different also from the relation which physics has. It does not fit into Prosch's simple two-way division of studies whose subject matter existed before and those where it did not.

Polanyi in 'The Study of Man' makes no such distinction, in fact he expressly disowns it, expounding instead a continuous range of knowledge from physics to the study of man, marked by more intense personal participation of the knower as he ascends the scale. He speaks of "the important fact that you cannot discover or invent anything unless you are convinced that it is there, ready to be found. The recognition of this hidden presence is in fact half the battle, it means that you have hit on a real problem and are asking the right questions. Even painters speak of solving a problem, and the writer's work is a quest following an endless succession of literary problems." (p 35) Polanyi makes no distinction here between the painter's or sculptor's 'reality already there' and the physicist's, so the "already there" factor implies no division for him.

Prosch makes his most revealing statement of his distinction in criticising Ronald Hall's 'aestheticising' of science, where he says (p 263) that "if we think of science as another art form - if we aestheticise it -

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

So here we see the basic view on which Prosch's bisection 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 are 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 free associations within the democratic society - "These circles, these professional associations, are feared and 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 such 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 to some extent 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 measurement 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 review 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 Prosch'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 powers 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 oneness of knowledge, the indwelling found in all knowledge, the continuous advance to deeper personal participation as we go up the scale from physics to man as a moral being, to God? Harry Prosch understands Polanyi so well, how can he do a George Washington and 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 Noosphere: Two Realities or One? - Some Thoughts on Harry Prosch's Interpretation of Polanyi.

J.O. Crewdson.

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 noosphere?¹ This issue is raised already in *Meaning*,² published under the joint authorship of Polanyi and Prosch, but which, in fact, is the work of Prosch alone, who used unpublished material from lectures given by Polanyi towards the end of his life. In his new book, however,³ Prosch gives a great deal more attention to the problems raised in *Meaning*, and a careful reading of his arguments in this later book make it easier, in my view, to pinpoint the confusion which, in the view of others besides myself, underlies his interpretation of Polanyi on the question of reality. What I am going to argue is that the confusion arises because Prosch does not apply the triadic structure of tacit knowing correctly to the artistic and religious quests, though his application of it to the scientific quest is unexceptionable. This article is an attempt to explain what I mean.

Any discussion of how Polanyi sees the distinction between the realities of nature and those of the noosphere must start from his analysis of the structure of knowing, which Prosch rightly makes his own starting point. He starts, in other words, from Polanyi's 'tacit triad', which draws - to quote Prosch's own words - that all knowing is

a sort of doing or creating...the creation of a meaningful integration of subsidiary clues, dwelt in as a projection of perceptual objects and of the sciences.

For Polanyi, therefore, the meaningful integrations achieved by man in the noosphere form a continuum with those achieved in perception and knowledge, in the sense that they are all examples of the tacit triad: (1) a mind (2) dwelling in subsidiary clues and (3) creating a meaningful integration of these clues into a focally known whole. Perception does this, ordinary knowing does this, poetry does this, religion does this. These various kinds of integrations 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'.⁴

So far, so good. Prosch then draws attention to "the difference between the integrations and realities forming the noosphere and those existing prior to the noosphere".⁵ 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 *Moses*, Eliot's *Wasteland*, and so on, "that they are creations of man does not rob them of their reality". He says, "if reality is understood as Polanyi understood it", namely, as something that "will exhibit to us a presently indeterminate range of future manifestations", unpredictable by us on the basis of our present understanding.⁶ The problem arises when Prosch 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 "(a)ll the rest of the noospheric realities engendered 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 recognises that science itself is part of the noosphere and its theories are man-engendered. He argues, however, that the theories of science differ from the realities of the arts and religion, because the doctrines of science "refer themselves to those realities supposed to exist from origins that are not man-engendered".

This argument from origins seems to take us to the heart of the confusion. Prosch seems to be suggesting that, despite the fact that science is itself part of the noosphere, we have to make a distinction between the realities studied by science, which are not part of the noosphere, and "all the rest of the noospheric realities engendered by man", which "have, therefore, a validity differently based from that of science."⁷ He is saying, in other words, that the creations 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 originating outside man's thought world (the noosphere), Prosch seems no longer to be working with the triadic 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 poles 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 through 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 are forms of engagement with reality. The scientist articulates his findings in words or mathematical symbols. Artistic creations of different kinds are also means of articulating the meaning or experience of reality, which the artist wishes to express or 'body forth'. Similarly, religion has its own way of articulating religious experience, through hymns, prayers, the reading of Scriptures, credal statements and the use of sacraments, all of which, as Polanyi says are aids to worship, and help the worshipper to focus his thought on the ineffable realities to which these religious symbols point, while functioning as 'signals of transcendence'.⁸

The scientist's quest is usually concerned with highly specific matters of observable fact and with the truth or falsity of statements concerning these facts. The artistic quest is concerned with less specific, and possibly unobservable matters, which count no less as facts of experience. 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 where explicit doubt can be met by explicit evidence.⁹ Religion, says Polanyi, should be viewed as an inbelling 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-set standards, which figures so prominently in Polanyi's discussions 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 judgements of value or meaning. But only if he is a strict materialist would he suggest that the truth about a world in which values are as real as facts, and facts are inherently valuable, can be adequately studied by the canons of strict empirical method. It is because we live in a world where 'quality' is built into 'quantity' that reality manifests so many aspects, which need to be handled and experienced 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 itemized way. 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 thought world we already inhabit, and be accepted as part of our experience of reality, or as bringing us in some way into deeper contact with the values and meanings of our universe. The word 'cat' 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 word with the reality. But our experience of reality covers a great deal more than physical objects, and our languages reflect this fact. If we accept Polanyi's definition of reality, we can take as real any experience we find as meaningful by our own active integration of relevant clues, providing that what we recognize as a meaningful coherence has an existence that may exhibit itself to us in future in indeterminate ways. This definition represents a repudiation 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 with 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 'non-noospheric' aspect. But the scientist has the capacity 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 its physical workings. As a scientist, he must submit to the canons of scientific procedure and concern himself only with nature as a system of physical relations and order. But the actual thought world of science is his creation, made possible by his power to work with symbols that have an intentional 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 elucidate and express true 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 triad. There is first the active mind, which makes sense of experience by recognising significant pattern; there is the theoretical or intellectual component, which is part of the noosphere and represents mind's creative activity; and, thirdly, there is the hidden meaning which we strive passionately to understand and which, in some sense, seeks to disclose itself to us. By acknowledging the decisive part played by the intellectual passions in the natural sciences, Polanyi is able to show that the arts appear "no longer as contrasted but as immediately continuous with science, only that in them the thinker participates more deeply in the object of his thought."¹⁰ In both science and the arts, it is appreciation of different kinds of order and beauty that sustains our intellectual passions. 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 denotative. The language or symbols of art are more allusive than denotative, though its allusions may be plain as well as indirect. However remote 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 experience, as arithmetic would be to a person living in a gaseous universe. And again, however meticulously descriptive and plainly expressive a work of art may be, it must never come any closer in referring to experience than crystallography does to crystals; no closer than a representation of a conceivable experience, framed in its own harmonious terms, can come to actual experience. Precise statements of fact or exact expressions of sentiment contained in a work of art tend to flatten it out to a map, (or) a report....¹¹

It is clear to me that, in the above passage, Polanyi assumes that the arts, as well as the sciences, have their objective reference, and are concerned to articulate an experience of reality. I do not believe it would be different if he were speaking about religious experience. He always assumes that our knowing has this triadic structure and involves (1) the creative mind, (2) the noospheric component, which gets articulated in language or symbols of some kind, and (3) the objective component, which represents the reality experienced. Prosch seems to me to collapse (3) into (2) and to speak of the work of art and the experience of meaning which the artist seeks to articulate into a single, unipolar concept. If the same were done 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. Man exists simultaneously in two worlds; the noosphere 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 dream of scientists - if they are materialists at heart - is to be able to arti-

culate the findings of science by means of purely mathematical symbols. Idealism represents the view that only mind or spirit is ultimately real, and a true idealist would presumably expect the philosopher immersed in thought to be better equipped to know reality in its essential meaning than the unreflecting person, who merely enjoys physical participation in the observable world.

The truth, as Polanyi sees it, is that these two positions belong inseparably together. His realist metaphysic 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 irreducibly 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. Materialist and idealist philosophies both effectively destroy our capacity to know reality as a fact of experience; the one, by reducing it to measurable, observable, but 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 dissolves reality into 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 in 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 only of the creations of nature, but also of the creations of the mind, which are symbols that enable man to articulate what he has experienced of reality. It takes a theologian to see in this triadic ontology a parallel with the Christian doctrine of perichoresis, 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 worth reflecting that it became necessary to invent the doctrine of perichoresis, which means accrediting 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 confusion.

In Polanyi's epistemology, and with the help of his concept of 'in-dwelling', knower and known, subject and object, are held together in an indissoluble polar tension, which makes them part of a single, self-referring reality, yet without confusion or separation. This not only establishes the inherent intelligibility, rationality and meaning of all physical facts, but shows how conceptions formed in consciousness recreate, in the noosphere, 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, Prosch 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 religious symbols by arguing for a sharp distinction between 'nature' and 'culture' and by saying that the realities of nature pre-exist our knowing and can be verified, while those 'artistic' or 'religious' realities we express 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 hidden 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 culture 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 subjective and do not correspond to anything beyond the creative imagination. Surely, this is simply Descartes 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 its 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 realities, 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 synonym for the 'world of thought' or 'cultural stratum' within which the human mind dwells. See The Study of Man p 60, HK p 388, et al.
2. Chicago University Press, 1975.
3. Michael Polanyi: A Critical Exposition. SUNY Press, 1986.
4. Op Cit. pp 135/136. The passage quoted gives four footnotes, containing a large number of references from Polanyi's writings.
5. Op Cit. p 136.
6. Op Cit. pp 136/137.
7. Op Cit. p 137.
8. See Personal Knowledge, pp 279/286.
9. Op Cit. pp 280/281.
10. Op Cit. p 194.
11. Ibid.
12. A casual reading of some passages of Polanyi's own writings may occasionally, and inadvertently, lay him open to misunderstanding and give rise to confusion. I found one passage in Personal Knowledge where it might be argued that Polanyi distinguishes rather loosely between 'empirical realities' and 'artistic realities'. Prosch refers to this passage in his own book, and his comment is: '(I)t is clear from the context that these are not the same kinds of "reality". One he was careful to call "empirical", the other, "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. To suggest that Polanyi is deliberately contrasting the empirical and the artistic and that, by doing so, he is implying that only scientific theories have reference to realities outside the mind, while artistic creations do not, is, 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 artistic' and aligns it with the distinction between the facts of nature and the noosphere.

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, #1, 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, 1975, 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 Magda, 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 repudiated our book during this time. Magda 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 between the 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 had become lost to the modern mind. This introduction was to be followed by his program for the restoration of meaning--his last lectures--edited for publication, but unchanged in substance.

I 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 a manuscript. I sent him the initial work I had done, chapter by chapter, for his suggestions or comments, and/or 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 hand-written 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 about Religion in the 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 I had pieced 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 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 (his idea), I sent the manuscript off to the University of Chicago Press. It went through their processes 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 there in the manuscript in hand-writing. Then he spot-checked a number of passages in the chapters on his 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, much 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 the very genuine 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 known well and fully to me. 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 accounts 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 accounts 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 those lectures on "Meaning" he gave at Texas and Chicago, and compare them 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.

FINIS

Harry Prosch

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'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)

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From Convivium

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 Sacharovs 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 reconciliation" 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 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".¹

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.² 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 moral 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 objectivistic 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 predicament 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.³ 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".⁴ 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 is turned. If the mind is misdirected, 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 opening 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.⁵

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 inversion*.⁶

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 content 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 refutation of the positivist conception 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*.⁷ 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.⁸

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 enigma: 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 premiss 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 on

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 coefficient 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 bore 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 reorganization 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 in 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 machine 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 criteria applied by its own judgments" (SFS p. 38). The scientist is no neutral referee but is passionately committed to the success of his search. He is deeply 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 discomfiting 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 enters 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 enhance and enrich the cultural heritage of society.

3. Conscience Confronts Authority in Science

According to Polanyi we acquire the premisses 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 premisses of science are therefore learnt implicitly with our acquisition of culture from our earliest experiences. We gain these premisses when experience mediates reality to us through certain structures or patterns that we usually do not avert 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 it conscience is alive forever choosing its direction of development in continuity with its past.

There is a three stage process of education to communicate the premisses 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 rationally 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 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 premisses of science. To become a scientist a person

must presume that scientific methods and teachings are sound and that they are to be undoubtingly 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 naïve form of faith diminishes. "His own intuition and conscience will take over responsibility in the measure in which authority is eclipsed" (SFS p. 45). This does not mean that he will no longer rely on the judgment of others or trust his instruments or the intellectual premisses of science. But it does mean that "such reliance will be entirely subject to his own judgement". From henceforth he is fully responsible before 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 premisses 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 monies 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 coerce 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 specific¹² 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 order¹³ 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 intimate 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 re-interpretation of the tradition that they will then present to the judgment of their fellows. When this new judgment is accepted the premisses 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.¹⁴ So the submission to scientific premisses 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 as 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 premisses 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 premisses 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 embodied 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 sours 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 denies 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 premisses 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."^{1,5} 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.^{2,6} 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, this 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 premisses 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 finds 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 judgement and make it possible for the scientist to be judge in his own case. Intuitive impulses keep arising 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 fulfilment of critical rules would paralyse 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 unfathomable mystery of the real. It is no wonder that Polanyi described discovery which is the climax of conscience's activity in rather mystical terms.^{2,7}

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 principle 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."^{1,8}

Notes

1. See T. F. Torrance, "The Place of Michael Polanyi in the Modern Philosophy of Science" (1974, unpublished) 27, and 28-38.
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, 299-316 where it is seen from an almost mystical angle.

3. This paragraph of the essay is dependent on PK, on doubt 269-294 and the structure of commitment 308-316.
4. PK 231-35.
5. M. Polanyi, "Jewish Problems", in *Philosophical Quarterly*, XIV (1943) 43.
6. M. Polanyi, *Beyond Nihilism*, Cambridge, Cambridge 1960, 20.
7. See T. F. Torrance, "The Integration of Form in Natural and in Theological Science", *Science, Medicine and Man*, I (1973) 143-169.
8. SFS 31. Polanyi gives many more examples in PK, London 1958. They are too numerous to cite being scattered throughout the whole volume.
9. See T. F. Torrance, "The Place of Michael Polanyi in the Modern Philosophy of Science" (1974 unpublished) 49 pp. and my "Lord of Heaven and Earth" in *Moral Studies*, edited by T. Kennedy CSSR, *Spectrum*, Melbourne 1984, 73-74.
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.
15. *The Logic of Liberty*, Chicago, 1951, 8-9.
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.
18. *Instruction on Christian Freedom and Liberation*, Catholic Truth Society, London 1986, 13.

R. Hodgkin

Human Nature and Natural Knowledge: Essays presented to Marjorie Grene on the Occasion of Her Seventy-Fifth Birthday. Edited: Alan Donagan, Anthony N. Petrovich and Michael Wedin. (D. Reidel, Dordrecht.)

I first met Marjorie Grene at Leeds University in 1958. We were there under the wand of Roy Niblett who has always possessed a magic for creating memorable encounters. For me, this one turned out to be crucial. It led, almost immediately, to Personal Knowledge and soon after, to Michael Polanyi himself. The times when Marjorie Grene and Polanyi had worked closely together were still fresh in her mind and she talked much about them - of their first encounter in Chicago and then in Manchester.

The exemplary index in Personal Knowledge is Marjorie Grene's most obvious contribution. But there were others which are less easy to evaluate. Some of Michael's enormous range and grasp - especially in the biological sciences - was due to her. I am not suggesting that she wrote any of those great passages on emergent life or gave them their cosmic sweep. But there is in Personal Knowledge a familiarity with the newly arising philosophical problems of biology, psychology and anthropology which must, in part, have been due to this intellectual comradeship. One often comes on names or ideas in Personal Knowledge, especially in footnotes, which only seemed to come into their own years after the book was published. Try the game yourself: by looking up, say Iris Murdoch or Eleanor Gibson. Marjorie Grene remarks (in her Partes, 1985) that we have not yet apprehended the message (about perception) which the Gibsons were offering in the fifties and sixties.

After Personal Knowledge had been completed Marjorie Grene's influence continued to be strong, though intermittent. Her two greatest works - A Portrait of Aristotle and The Knower and the Known - appeared in the late sixties. In Polanyi's Knowing and Being which she edited, her influence is very evident. One wonders if the existential title was hers. In the thirty years that have followed Personal Knowledge it could be argued that Marjorie Grene has been the most productive explorer of Polanyi's wake and that 'her' biological stream was the main stream, after M.P. had more or less ceased navigating in the early seventies. Human Nature and Natural Knowledge offers, in good measure, all the expected Festschrift features: an impressive and complete bibliography, an outline of academic offices and honours and a splendid, true photograph. This volume is No. 89 in the Boston Studies in the Philosophy of Science. Marjorie Grene's own The Understanding of Nature was an earlier ornament to the series (No. 23). Both books are beautifully produced by Reidel.

In a brief but exemplary preface the editors salute her achievement: ...far beyond [the historical studies] there is a central theme in Marjorie Grene's work that establishes her intellectual leadership....

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 many years, in Grene's relentless and persuasive critique of reductionism, whether in epistemology or in biology proper.... With Polanyi and against Aristotle, Grene places '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 Grene's work as a whole to balance the great range of exploratory themes which make up the book. These many forays, around the edges of the Grene pastures, are certainly juicy and are by a very distinguished group. Here are seven - (out of eighteen) which particularly impressed me:

Ian Hacking: The Invention of Split Personalities.

Alasdair MacIntyre: Positivism, Sociology and Practical Reasoning: Notes on Durkheim's Suicide.

Dorothy Frede: Heidegger and the Scandal of Philosophy.

Nancy Cartwright: Two kinds of Teleological Explanation.

George Gale: Anthropocentrism Reconsidered.

William C. Wimsatt: Form and Aggregativity.

Richard Rorty: Should Hume be Answered or Bypassed?

The Hacking and MacIntyre articles left me feeling a little light-hearted. They prise one out from one's cultural ruts. Cartwright and Gale offer another kind of freedom, beyond the ruts. Perhaps we are about to escape the old adversarial stances, 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 Human-ness being the essence of the universe. The theme has been magisterially elaborated in the much praised recent work by Barrow and Tippler, The Anthropic Cosmological Principle. In Gale's paper the idea is concentrated and discussed in eight pages.

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 colonnades of history. I can almost hear his partner asking: "Why not both?"

I remember when Marjorie Grene came and taught at Abbotsholme for two weeks in the fifties - unpaid, just for the interest. The biology lab was tiny but there she spent most of her time, sorting specimens, talking about the early model of DNA (cardboard) which hung from the ceiling and embarrassing the regular incumbent with her awesome 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 Grene was/is a very great teacher.

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