

Tradition & Discovery

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PREFACE

POLANYI IN NOVELS

One of the benefits of being a general coordinator for the Polanyi Society is seeing the growth and vitality of Polanyi's influence. This summer in Chicago, we had an experience of "indwelling" the thought of Polanyi in papers by philosophers, theologians, a writing and literature teacher, and a multidisciplinary business man. The topics of papers covered computers, ethics, pedagogy, mysticism, humor, and theology. Four members of the seminar are or have been chairs of their academic departments and one is a Dean of a school. The afternoon periods devoted to research in the Polanyi archives opened up new perspectives on the meaning and development of Polanyi's thought. Ten years earlier this exploratory experience would not have been possible to this extent. The University of Chicago archives were just starting to organize the Polanyi materials. The burgeoning of articles and dissertations on Polanyi was just appearing. By the summer of 1985, we find ourselves rich with quality scholarship and publications to the extent that we now need complex organization to keep up with the pace of Polanyian scholarship. Almost daily in a university context, one can encounter allusions in references or in concepts to Polanyi's thought. Yesterday a colleague specializing in teaching writing told me about the use of Polanyi's concept of tacit knowing in helping students overcome the mistaken belief that you know it all explicitly before you write it on paper. A few days earlier another colleague in semiotics showed me the acknowledgments to Polanyi in her textbook. Most telling about the spread of Polanyi's thought is its inclusion in a popular American detective novel, HAPPY ARE THE MEER. The author, Andrew Greeley, says describing the work of the leading character, detective Father Blackie Ryan:

Then, for no reason connected particularly to the conversation, the formless image of the evidence I needed leaped into full consciousness—perfectly delineated. As Michael Polanyi observes, every intellectual breakthrough requires faith, works, and grace. Faith that there is a solution, hard intellectual work to search for it, and then a moment of blinding illumination. (p. 147)

Nobel laureate Saul Bellow also had his hero in HERZOG allude to Polanyi in one of Herzog's professorial problem solving letters. Polanyi has become a part of our major intellectual heritage.

Richard Gelwick

SUBMISSIONS FOR PUBLICATION

Please send news of publications, bibliographical notices, and activities as well as articles seeking publication. Our next issue will be in the winter of 1986, and we need materials by the end of February. Articles should be within 10 pages, single spaced, and elite type. They should also have 1 1/4 inch margins and be sent camera ready so that we do not have to retype it. The other items for our exchange of news we will type, but it is very important that references be accurate and complete.

NEWS AND NOTES

Carol R. Fox, an ordained minister in the American Baptist Churches and a Ph.D. candidate in Psychiatry and Religion at Union Theological Seminary in New York has an article "Modesty and Mystery: An Essay on Coming to Know the Real Other," UNION SEMINARY QUARTERLY REVIEW, XXXIX (No. 4, 1984) in which she uses Polanyi to show how we can become more open to knowing a person or God. She begins with the psychological concept of projection as understood by Carl Jung and others and moves to the need for an epistemological "upheaval" that helps us become more modest and more realistic about our conceptual abilities. She then employs tacit knowing as a way of altering our assumptions about the other (person or God) and a way of affirming the reality of the other. She says: "The focus here is not on what we know but on what we do not know. While seeing as clearly as we can what we do know, it is important to recognize, see, gaze at, attend to, that which we do not know.... Modesty is a loosening of our preconceptions, a recognition of our not-knowing, which aids our knowing. We do not give up trying to understand, but we do not limit ourselves to that which we can understand either." (pp. 307, 308).

Thomas F. Torrance's theology is the subject of an entire issue of the REFORMED REVIEW, 38 (Autumn, 1984). Polanyi chose Torrance to be the literary executor of his estate, and Torrance is one of the foremost proponents of Polanyi's seminal contributions to scientific understanding. The opportunity to gain a synoptic view of Torrance's vast work is, therefore, very useful. The major article is by Robert J. Palma of Hope College, a member of the Polanyi Society and a former student of Torrance. Among the many facets of Torrance's theology developed by Palma is the importance of science in doing theological work and ways that Einstein, Maxwell, and Polanyi have suggested their interrelations.

William H. Potat writes that Duke University Press expects to publish his major work POLANYIAN MEDITATIONS. Polanyi Society members will want to watch for the publication notice. As soon as the book is available, we shall be eager to review and to discuss its contributions.

A SECOND CHICAGO POLANYI SUMMER SEMINAR will be held. The unanimous view of those taking part July 29-August 3, 1985 was that they would like to return for another session. In addition, we expect others may wish to have this opportunity for study with other Polanyi scholars and exploration in the Polanyi archives. The date for the second seminar is not yet determined. It could be in 1986 or 1987. Please let Richard Gelwick or Gene Reeves, Meadville Lombard School of Theology, 5701 S. Woodlawn, Chicago, IL 60637 know which summer would interest you most. The accommodations and meeting rooms, the convivial evening activities, the libraries and cultural events were all so excellent that we anticipate that future seminars will definitely succeed. The group of seven was smaller than we at first expected, but the size was very helpful and we now hope that future groups will not have to be much larger. Participants this summer were: John Apczynski, Richard Gelwick, Walter Gulick, Jere Noorman, Phil Mullins, Gene Reeves, and Shirley Thomas.

Walter R. Thorson, Department of Chemistry, University of Alberta gave two lectures, "Christian Faith and Science in Society" and "Realism and Reverence" for the Joint Meeting of the American Scientific Affiliation, Canadian Scientific and Christian Affiliation and Research Scientists' Christian Affiliation July 26-29, 1985 at St. Catherine's College, Oxford University. The first paper uses Polanyi extensively to show the role of faith in science. The second paper argues for the advantages of Polanyi's approach over Owen Barfield's, which though helpful in intention Thorson finds to be too Kantian by separating the phenomenal and noumenal, among several difficulties. We hope to have a paper on this in a future issue.

AGASSI ON POLANYI: COMMENTS ON JOSEPH AGASSI'S
SCIENCE AND SOCIETY

John V. Apczynski and Michael Chiariello

I

One element of Michael Polanyi's theory of personal knowledge is that one's antecedent assumptions and presumptions, one's operative oversights and insights, in short one's fundamental commitments shape a person's perception and understanding of reality. Hence what a person notices and fails to advert to, what counts as a meaningful datum and what is ignored as inconsequential, what the significant relationships of possible elements in one's perceptual field are, in short one's "picture of the world" or "vision of reality" are all determined by a person's prior commitments and experiences. While all this is practically a truism in the contemporary discussion of the philosophy of science, it is worth recalling that a major factor

The following notes are the result of a series of discussions between the two authors during the winter and spring of 1985 which were prompted by Joseph Agassi's Science and Society: Studies in the Sociology of Science (Boston: D. Reidel Publishing Company, 1981). [See The Polanyi Society Periodical, vol. XI, no. 1 (Fall, 1983), 8-10 for an earlier announcement.] What began as an attempted collaboration on a conventional book review soon became an open-ended dialogue on a wide range of topics raised by this provocative volume. We decided to publish our views on this volume--and on each other's views--in the form presented below. We are colleagues at St. Bonaventure University: John Apczynski, who wrote parts I and III, teaches in the Department of Theology and is a long-time student of Polanyi's thought; Michael Chiariello, who wrote part II, teaches in the Department of Philosophy and was a doctoral student under Agassi.

in the recognition and acceptance of this insight has been the pioneering work of Michael Polanyi himself.

Joseph Agassi's Science and Society is a remarkable--or perhaps, in his terms, dislocating (91)--illustration of this commonplace, particularly insofar as it contends that there is a certain complementarity between Polanyi's portrayal of the workings of the scientific community and Karl Popper's version of "the logic of scientific discovery." Moreover, Agassi offers his analyses as a peculiar sort of homage to Polanyi, one that takes the form of an emphatic dissent. I shall begin these reflections by taking up the former question regarding Agassi's dislocating reading of Polanyi, and shall return to his efforts to pay him homage later.

With respect to the former point, then, I mean that Agassi's reading is provocatively distorted. He reads Polanyi as a "sociologist of science" (the subtitle of the work is "Studies in the Sociology of Science"). This is, undoubtedly, an interesting perspective on Polanyi. But it is equally a truncated view which is signalled by Agassi's contention that Thomas Kuhn's view of science is a vulgarization and popularization of Polanyi's theory. I have no doubts that somewhere in the publicly unacknowledged background of Kuhn's theses regarding the "structure of scientific revolutions" lies the groundbreaking work of Polanyi. At this level Agassi is clearly correct, and it is to his credit that he is willing to declare this publicly. But that Kuhn has represented the thrust of Polanyi's theory of knowledge, even if concessions are granted for "vulgarization," is not readily

granted.

Why is it that Agassi reads Polanyi this way? Put very simply the reason is that Agassi's fundamental commitment is to a nonjustificatory epistemology, and he views Polanyi as attempting to ground science--in an epistemologically foundationalist sense--in the communally held assumptions of any stage of the historical unfolding of scientific theories. If this is so, then it follows that whatever the leaders of the scientific community uphold as "reasonable" or "scientific" is to be accepted, even if only provisionally. To portray the "foundations" of science in such a way is descriptively accurate in Agassi's estimation but prescriptively wrong and even immoral (85-6) since it is nothing more than an appeal to extrinsic authority.

This reading of Polanyi is epitomized in Agassi's reflections on "genius in science" (ch. 15), which were stimulated by Polanyi's essay of the same name. I find it particularly revealing that Agassi sees the crux of the issue raised by Polanyi to be the sociological function of "genius," which he places in a Romantic understanding of history. For Enlightenment thinkers, genius had little place in science since it was assumed that everyone began de novo by doubting past assumptions and establishing reasonably what was to be held. The Romantic reaction, on the other hand, emphasized continuity with the past as the repository of the wisdom of the sages to which ordinary mortals must be subservient, while it simultaneously legitimized progressive innovation in the extraordinary case of the immortal genius. Even though he admits that Polanyi is anti-Romantic in his views

of science, nonetheless Agassi contends that Polanyi's use of the notion of genius serves the same sociological function that it did in Romanticism, namely to provide some legitimacy for a severely restricted range of rebellion in an otherwise authoritarian system (201). From this sort of reflective process Agassi concludes that Polanyi grounds the rationality of science in a blind leap that consists in initiating oneself to a closed guild controlled by a group of ruling elders who preside over what is essentially an elitist, undemocratic, and authoritarian establishment. By contrast, what Agassi proposes is an egalitarian theory of genius (205-207), where all individuals act with full moral and intellectual autonomy in accordance with the degree of their abilities and circumstances.

I suspect that by now those familiar with Polanyi's essay, "Genius in Science," must be marvelling at the kind of spectacles Agassi is wearing. Had Polanyi's aim there been to offer a diachronic sociology of science (as Thomas Kuhn arguably does), then there might be some discernable relationship between Agassi's reflections on Polanyi and his attempt to move beyond in a more democratic fashion. In actuality, however, Polanyi's aim in this essay is to point to the role of personal judgment relying on tacit powers of integration for the grasping and resolution of scientific problems, including the weighing of any evidence that might "refute" the proposed solution. "Genius" is introduced explicitly as an exemplary, though certainly not exhaustive, case of "perception" in science. The point, in other words, is that the general cognitive processes involved in the ability to learn how to recognize a good problem and pursue it to some sort of

resolution are highlighted in cases of recognized genius. The community of scientists never legitimately exercises control over the individual scientist's intellectual or moral autonomy. This stance is clearly expressed in Polanyi's writings from his early distinction between general and specific authority to his mature admission, in Personal Knowledge that all his cherished assumptions drawn from Western culture could be wrong. He did not in fact accept this possibility because by dwelling in many of these assumptions, that is by accepting their authority, he believed he had made a more profound contact with reality. Furthermore he believed he knew these realities on legitimate grounds, even though he could specify explicitly only some of these reasons.

It is precisely at this point that Agassi's Popperian allegiance to a nonjustificationist position comes into play. Nothing can count as the explicit, ultimate criterion for any knowledge claim. In effect, Polanyi has seen this, but Agassi believes he simply transfers the foundations of science from the individual scientist to the society of scientists. According to Agassi, what Polanyi should have done upon his recognition of the inadequacy of logical positivism to provide foundations for science is to recognize that science was composed of hypotheses which are at best on the way toward truth. That is, scientific theories must be accepted as hypothetical and open to challenge, and the scientific community ought to foster (on moral grounds) as much novelty as possible (83, 100).

Most students of Polanyi would recognize this sociological

conflation of his thought as a half-truth which prevents Agassi from recognizing the more comprehensive elements of his theory. In our discovery of reality personal judgment operates in a historical matrix which includes, to be sure, the sociological context. For Polanyi literally everyone exercises such judgment, some more responsibly than others. In Agassi's reading of Polanyi, only the leaders of science do (70-71). Why such a discrepancy in interpretations of Polanyi? I would attribute it to my opening observations: Agassi's reading is so colored by a nonjustificationist epistemology that he sees any attempt to provide "reasons" for accepting the truth of some claim to be an implicit reversion to the illusory security of indubitable certainty sought by foundationalists of both the rationalist and empiricist stripe. This aim is not only impossible to fulfill, but of even greater consequence for Agassi is its tendency to stultify the growth of science. This moral commitment to radical openness, in other words, so colors his reading of Polanyi that he reads "authoritarianism" or "extrinsicism" everywhere any attempt is made to offer "reasons" for a judgment, even if those reasons are tacitly held by the person making the judgment. In the process of his argument, however, Agassi must gloss over his own recognition of the "necessity" for "some sense of discrimination" (49) over scientific claims. And in such glosses the clues appear which enable us to discern how Agassi tacitly honors Polanyi.

As we turn now to Agassi's attempt to pay homage to Polanyi, I should like to offer a reading of Agassi that may be as

dislocating as Agassi's is of Polanyi. My proposal, offered simply as a conjecture of course, is this: Agassi's homage to Polanyi is much more profound than he suspects. His fundamental stance on the issue of rationality is precisely the same as Polanyi's with the exception that Polanyi's position is more generally stated to take into account all human endeavors to relate intelligently to reality.

This can be indicated, I believe, by a consideration of Agassi's response to the "tu quoque argument" in his defense of rationality. The argument runs that, since the rationalist must make a prior commitment to rationalism and since this prior commitment is beyond explicit justificatory procedures, even the rationalist must start out with an irrational choice. Hence the conclusion appears to follow that a commitment to rationality is no more justified than (or is just as irrational as) any other sort of commitment.

Agassi contends that Polanyi's and Popper's philosophies both accept this argument and that Polanyi opts for an irrationalist version of rationalism (465). This contention would be correct only if all knowledge were explicit for Polanyi. What Polanyi in fact holds is that by the time we can discover ourselves thinking we already have a fund of tacit assumptions for ordering our lives and relating to reality. And while we can question or even reject any explicit formulation of these assumptions, we can do so only in light of others that we are simultaneously assuming on the tacit level. Clearly one such tacit assumption might be formulated as a transcendental imperative, "Be reasonable!" To question this or to explore its

implications is possible only on the condition of its prior and concurrent operation in our lives. Hence for Polanyi the tu quoque argument in its stark form cannot arise except in the illegitimate formulation which tacitly presupposes rationality while ostensibly and explicitly questioning it absolutely.

At its core Agassi's response is identical, though expressed differently and with more limited application. He contends that rationality is a part of our lives and the more appropriate question concerns what we wish to do about it. He sees, in other words, that the bald statement of the question is artificial. "The very ability to ask it tells us we are [rational]" (475), he affirms correctly. Agassi's major concern upon appreciating this insight is that we do not revert to some form of naiveté that rigidly ascribes to some dogmatic assumption an unquestionable status. While this may happen, it clearly need not, indeed ought not. Rather, to use Paul Ricoeur's expression, what might emerge is a "second naiveté" purged by the hermeneutics of suspicion. This, I submit, is the intent of Agassi's view of living in a tradition of critical inquiry. Such a process should turn into a life project or, as Polanyi would put it, a calling where freedom is in perfect service.

II

John Apczynski is disturbed by Agassi's reading of Polanyi. I am, in turn, disturbed by Apczynski's reading of Agassi. I will return to the latter, but first I offer my own account of Agassi and his reading of Polanyi.

For Agassi, epistemology becomes sociology with the collapse of the radicalist program of classical epistemology. The latter, as advocated by such writers as René Descartes and Francis Bacon, urged each person to think his beliefs afresh, breaking with tradition and consensus, and to find the unbiased truth. Now, rather than ask "What should I believe?" the problem is better stated as "What should we believe?" Nonetheless, sociology is incomplete. It serves well enough to answer descriptive questions, i.e., what are the conventional norms governing belief in this or that community? Yet, unless the norms are looked at critically--should these norms be accepted? How may these norms be improved?--the individual within the community is left with a heteronomous will. So, it is our moral responsibility, as members of the community of learning who agree to be governed by its norms, to raise critical questions (to preserve our autonomy) and to act on the basis of such criticism (to improve the positive norms of that community).

Before going further, let me point out that Agassi is a student and sometime follower of Karl Popper, as well as an admirer of Polanyi, and that he believes he has followed his teacher's advice to the bitter-sweet end, which is apostasy (18). And this is not surprising: the philosophy of the Open Society should encourage dissent among its followers. Indeed, says Agassi, dissent is a tribute (xvii). In this spirit, Science and Society is a tribute paid to Popper's respected intellectual adversary, Michael Polanyi.

Polanyi, says Agassi, shares the honors with Popper as

philosophers of the avant garde who abandon the psychologism of classical epistemology--especially empiricism and its heart, inductivism--and who break ground for sociologicistic approaches to science and knowledge (xvii & 85ff). Moreover, in many respects, Polanyi is correct in his description of the norms which govern the social reality of scientists and of all thinkers who seek a fair hearing for their views by the community (86 & 207). Yet these norms are far from ideal: they can and should be improved. Agassi concedes that Polanyi would accept this while insisting that improvement only come from within the scientific community (123 - 125) and its leadership (97). But such a view is "self-verifying," to use Agassi's term, which means that its truth is established by its acceptance (131). At the same time, much of Polanyi's description ignores the degree to which defiance of the scientific leadership exists both inside and outside of the scientific establishment (205ff.). Yet we can and should reject this view and the injustices and conservatism which it justifies (131). Moreover, Popper's utopia can serve as a model towards which to move and, especially, where it might not (yet) correctly describe the community. (Again, this might even apply to the master's teachings [see xx, 76, 82-83, 205-208].)

Agassi's criticism of Polanyi's views, therefore, is at the same time a critique of science as it stands. The critique of science is, briefly, that it operates too often as a closed guild with all the authoritarianism and conservatism of its medieval antecedents. The criticism of Polanyi is that his theory of science tends to legitimate the guild system and protect it from

such criticism (70-71). Science is not open enough, not accessible to beginners, amateurs and the man and woman on the street (204). Nor does it respect the autonomy of its common practitioners, those followers of the scientific fashions which are dictated by the elite of scientific leaders (207).

We must now ask: Is Agassi's criticism of Polanyi too harsh? Is the reading of Polanyi--as the ideologist of the scientific guild system--fair? I am no expert on these important questions, and I must admit that my own introduction to Polanyi's views was as a student of Agassi. I was present when Polanyi first presented his paper, "Genius in Science," to the Boston Colloquium with Agassi as commentator--at Polanyi's request I am told, and I do not recall Polanyi complaining about being misinterpreted. So perhaps the greatest service I can provide the readers of this journal is to let Apczynski's criticism of Agassi's reading of Polanyi stand unchallenged except, I would trust, by our critical readers, and to direct my comments to his reading of Agassi.

Apczynski claims that Agassi's Popperian spectacles distort his reading of Polanyi in a way which confirms the latter's thesis of the theory-ladenness of observation. Such a claim, it could be argued, would corroborate Popper's hypothesis that justificationism leads to "reinforced dogmatism" where criticism is explained in such a way that it is transformed into confirming evidence for the criticized view (12). Yet I would rather not pursue this intriguing variation of the tu quoque argument for reasons I hope will be apparent from the remainder of my note.

Rather, let me take up the question of Agassi's nonjustificationism which is crucial for an understanding of his work, particularly his critique of Polanyi and of science.

According to Agassi, both Popper and Polanyi employ skeptical arguments against the radicalism of the Enlightenment epistemology (98). The latter, however, does not reject the very idea of justifying science. That is accomplished, at the level of the individual scientist, through a process of apprenticeship by which one becomes committed to the living tradition of scientific research. But such a theory, says Agassi, could be "short-circuited" if a tradition were created which disagrees with it. The "only alternative visible," in Agassi's words, is "the idea of science without a shred of justification, with no confirmation or corroboration of any kind, with no Archimedean point, no foundation, no anchor, in nature or man--in psychology or sociology--science as a search rather than as an achievement" (100). This is nonjustificationism.

So Agassi is a proponent of a nonjustificationist epistemology. This means that he advocates abandoning the futile search for the final truth in justified beliefs and replacing it with the search for errors in our beliefs through criticism while hoping for the progressive improvements of our always imperfect knowledge. Our focus here should not be on the skeptical rejection of justification. Admittedly, for many people this rejection creates a barrier to appreciation which is difficult to overcome. Perhaps this is because of the uncritical assumption that the justification of our beliefs is a necessary condition of their rationality and that, in the absence of alternatives, the

rejection of justification is an invitation to irrationalism. Yet, I agree with Agassi that rather than discount the validity of the skeptical challenge to justification, we should seek rational alternatives. And this brings us to the proper focus of Agassi's concerns which is with our moral responsibility: Popper's identification of justificationism with authoritarianism prompts Agassi's rejection of both as heteronomy or the violation of moral autonomy (207).

In the view of many critics, including John Apczynski, the above identification is narrow, and the moral judgment brought to bear upon it is blinding. There are, such critics contend, ways of supporting our beliefs which do not violate our autonomy, and therefore the identification is refuted. Apczynski argues that Agassi himself acknowledges such forms of justification, indeed even their necessity, yet fails to see the utopianism of his position. Thus is he blinded by his nonjustificationist biases.

Let's look more closely at these arguments: Are there ways of justifying beliefs which leave intact the moral autonomy of the believer? Is the nonjustificationist morality impossible to abide? Does life force us to justify our beliefs on occasion? And would this gainsay the allegedly utopian standards of the nonjustificationist's anarchism? In other words and finally, does Agassi's work provide its own refutation?

In a later chapter, Agassi presents two theses concerning the rationality of belief which may be supposed to be an elaborated version of nonjustificationism or critical rationalism: ". . . we accept any doctrine which (a) admits the inability to

support or justify any belief, and (b) allows any faith on the condition that it be held tentatively," which means open to a possibly fatal criticism (470). Two lines of criticism of these theses are considered: (1) Isn't such a view as (b) too indiscreet? Aren't there some views we should not hold, even tentatively, if we wish to retain our rationality? Agassi suggests that many beliefs, such as the fantasies of paranoiacs and certain religious doctrines, which may be "impervious" to criticism, raise such a problem, and he suggests Popper's proposal that "publicly we should hold only the most criticizable theories" as an additional restraint while admitting this to be an "open question" for critical rationalism (*ibid*). (2) Yet, on the other hand, there are certain views which do not seem fatally criticizable in the sense that they are truisms of common sense or axioms, and which seem unreasonable to deny: Agassi's own choice is the Biblical "I am a man born of a woman" (476). Does such an admission support the claim of critics who would deny either the possibility of a comprehensively critical attitude, or of completely dropping justification from our epistemology or both? Agassi rejects any such corollaries of these claims to certainty, admitting as correct only the following "last word" on the subject: ". . . that it is very difficult to criticize claims at certain times, but that we are in a tradition of criticism that at times makes progress and so raises the degree of rationality" (*ibid*).

Is this view incompatible with Polanyi's theory of science? Agassi says it is, and both in theory and in blocking the social reforms which make "boldness and flexibility more acceptable and

experiment more rewarding" and "science [that is] free for all" (100). Moreover, it is ironic that although Agassi also sees two very different yet valid readings of Polanyi as possible (97), he claims they both attempt to offer a legitimation for science which is detrimental to its growth (82).

It appears that Agassi does polarize philosophies of science and brands "all justificationism as conservative" (100). If Apczynski's claims are true this polarization is falsified by the work of Polanyi which would present a more rational, democratic and progressive philosophy than Agassi can see. If so, I think Agassi would appreciate such a correction and I would join him in welcoming such a broadened base for the effort to democratize science and scholarship.

III

In light of this exchange, what, finally, might students of Polanyi find of value in this work dedicated to his memory? On a less direct level Agassi's tome contains a wealth of information dealing with the scientific and intellectual history of modern times, all of it spiced with his provocative analyses. In my estimation, however, the more immediate significance of Agassi's study is precisely his dislocating reading of Polanyi that pictures him as an irrational rationalist.

Why would this be so? Consider the following questions. Is it possible for a student of Polanyi to derive an extrinsicist or authoritarian reading of Polanyi's thought? If Agassi is any indication, then clearly this is a possibility. Would a student

of Polanyi be tempted so to short-circuit his theory of personal knowledge? I think we must acknowledge the possibility, particularly for those of us engaged in developing his thought for philosophy and religion. There is more than a tinge of fideism in the academic climate of today and what amounts to variations of the *tu quoque* argument is rampant among our students and is found often enough even in the professional literature. I believe that when it is examined closely, Polanyi's thought never succumbs to the temptation that would truncate the quest for truth by the acceptance of an easy dogmatic posture. Joseph Agassi's tribute to Polanyi stands as a powerful reminder to assist us in our own reading of Polanyi.

IN THE SHADOW OF THE ENLIGHTENMENT
THE PLIGHT OF THE HUMANITIES IN AN AGE OF SCIENTIFIC OBJECTIVISM -
A CAVEAT TO A POST-CRITICAL RESCUE

Ronald L. Hall
Francis Marion College

We, even we who would fashion ourselves as "post-critical", are, like it or not, children of the Enlightenment. The Enlightenment, of course, is the name we give to that period of our history when human beings awakened to the seemingly infinite powers of the critical rational mind. Such an unbridling of rationality was made possible by a rebellion against what was taken to be the strangling bind of the regnant structures of religious authority. This break with religious authority, which was in effect a kind of Nietzschean *deicide*, gave way to skepticism and this in turn inverted religious moral passion into a secularized moral passion which ignited man's desire to take God's place and to assume the occupancy of an Archimedean, universal standpoint from which to grasp the world *omnisciently, sub specie aeternitatis*, and control it with an omnipotent hand. It is not surprising that it was the Enlightenment that arrogantly called the Middle Ages dark.

Rationality's resurrection from darkness and its ascension to a universal standpoint from which to survey the world, issued in the rise of modern science and its concomitant epistemological model of the rational inquirer as a cool, aloof, observer guided at every point by an ideal of strict objectivity. According to this ideal, scientific (that is, rational) method is an emotionless, logical, detached, discarnate and mechanical process of sensory observation conceived basically as a passive reception of data striking open eyes. Modern science then, began with the dual assumptions that experimental observation is the only source for gathering data and establishing truth, and the assumption that that process is strictly mechanical. These assumptions form the heart of what can be called scientific objectivism.

The heart of Michael Polanyi's philosophical agenda is found in his radical critique of scientific objectivism. An important consequence of this critique is that it provides the grounds for healing the split between the sciences and the humanities. At the same time, the post-critical attempt to rescue the humanities from the shadows of the Enlightenment harbors a liability of falling prey to the lingering snares of Enlightenment ideals. The ultimate aim of this paper is to point out and hopefully ward off one such snare.

The penultimate purpose of this paper is to present a brief intellectual gloss of the origins of scientific objectivism in the Enlightenment, the consequences of that for the humanities as a discipline, the

Romantic reaction to the displacement of the humanities, and Polanyi's post-critical alternative. For Polanyi's, what I will say is familiar, but may be of rhetorical use as a way of introducing Polanyi's thought to the uninitiated; it has proven useful in that regard to me, especially in conversations with colleagues in the sciences.

According to the critical rationalism of scientific objectivism, no non-empirical knowledge of reality is admitted. Even though scientific method involves the non-empirical tool of mathematics, we must not be misled about its role. Identifying the scientific objectivist with a naturalist, Professor E. M. Adams says this about the role of mathematics in scientific method:

To the naturalist it is only a tool or instrument to be used in science and not itself a part of the study of reality. "Empiricism" (in the modern restricted sense) is one of the chief tenets of the naturalist's position. All knowledge of reality is via the external senses or introspection. What is not verifiable by data obtained in either of these ways is not knowable; indeed, as extremists would insist, it is not even thinkable. Meaning, or cognitive claims in general, not merely knowledge, is restricted to the empirical. [Ethical Naturalism And The Modern World View (Chapel Hill: The University Press, 1960), p. 28.]

Polanyi has insightfully noted that the effect of scientific objectivism on the image of the scientist himself has been disastrous. On this model, the scientist has been reduced to a sort of calculating machine - he simply records the data and mechanically generalizes them. In this Polyanian vein, Ian Barbour has pointed out that Francis Bacon held such a view of the scientific inquirer. He says of Bacon that he:

believed that science consists of the accumulation and classification of observations. He insisted that induction is the easy road to knowledge: make observations summarize theory and generalize. Discovery can be a routine and automatic process, carried out, he said, "as by machinery", only patience is needed, not difficult or abstract thought. [Issues In Science and Religion (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1966) p. 25.]

As Polanyi notes in the opening pages of Personal Knowledge, the Copernican revolution had dislodged the earth from its center in the universe, but the rise of scientific objectivism radically displaced man from the confines of his own incarnate, earthly perspective as well. The telescope had emancipated vision from its confinement in embodied eyes, what we call naked eyesight, and allowed man to achieve a discarnate perspective much like the one we were all delighted at that Christmas a few years ago when the Apollo spaceship turned its

cameras back on us revealing what we all "knew", but secretly feared, that we were just a ball suspended in space. The irony of this liberation of man was that it opened the doors to his own self-mutilation and destruction. But he was so intoxicated with the delight of this new found perspective, that he scarcely noticed the danger.

Newton and Galileo added fuel to the thrusters of the Enlightenment perspective, reducing man to an irrelevant spectator passively observing the great world machine. As J. Robert Oppenheimer has written: "The giant machine was not only causal and determinate; it was objective in the sense that no human act or intervention qualified its behavior." [Science and the Common Understanding (New York: Simon and Schuster, 1954), pp. 13-14.] Galileo introduced a distinction between primary and secondary qualities which set for modernity the definitive conception of what is objective and by implication what is subjective. This distinction exacerbated man's conception of his own irrelevancy. Only primary qualities (number, figure, magnitude, position, and motion) are really "out there", independent of the influence of the observer; these qualities constitute what is real, what would remain if no observers were present. Secondary qualities, on the other hand, (all else contributed by the perceiver) do not "really exist" apart from the presence of an observer. The objective world, the world as it really is, the world of primary qualities is a world wholly determinate and independent of any qualifications by any observer. Objective knowledge, that is, knowledge of what is "really there" is ascertained by a passive spectator who has no constitutive role in the determination of what is known. All that is left for the knower to contribute, namely secondary qualities, is reduced to the realm of subjectivity and not accorded the status of reality, making man's place itself problematical. As Galileo puts it:

I think that these tastes, odors, colours, etc.... are nothing else than mere names, but hold their residence solely in the sensitive body; so that if the animal were removed, every such quality would be abolished and annihilated. [Quoted in The Limitations of Science by J.W.N. Sullivan, (New York: Viking Press, 1933), p. 130.]

It remained for Newton to remove the animal altogether in his attempt to further the cause of scientific objectivism. He removed the animal by turning it into an insensate body, a mechanism, a res extensa as it was called by Descartes, the Father of Modern Philosophy. As E. A. Burtt has noted, the authority of Newton

was squarely behind the view of the cosmos which saw in man a puny irrelevant spectator...The world that people had thought themselves living in - a world rich with colour and sound, redolent with fragrance, filled with gladness, love and beauty, speaking everywhere of purposive harmony and creative ideals - was crowded now into minute corners in the brains of scattered organic beings. The really important world outside was a world hard, cold, colourless, silent and dead... [The Metaphysical Foundations of Modern Science, (Garden City, N.Y.: Doubleday Anchor Books, 1955), p. 104.]

The spirit of man could not long tolerate this self-imposed mutilation and humiliation. Fired by a spirit of rebellion, a protest against the Enlightenment was launched by the nineteenth century romantics. The intoxication felt as a result of the emancipation of man's reason had now abated and in the cold sobriety of the morning after, the effects of its rampage on the human heart were beginning to dawn. Scientific objectivism had spawned and bequeathed to us a picture of the world in which human beings were not present. Staggered by this contradiction, the romantics rose up in protest. What science had called

unreal, the whole array of human subjectivity, was precisely what the romantics thought was most important. Science had de-humanized man, and the romantics sought to restore him again to his dignity and to his proper place in the cosmos. In this rebellious protest against science, I submit, our modern conception of the humanities was born.

In a chapter of Science and the Modern World, Alfred North Whitehead insightfully analyzes this "Romantic Reaction," as he calls it, to Enlightenment objectivism. Speaking of Wordsworth's Excursion and Tennyson's In Memoriam he notes: "Wordsworth in his whole being expresses a conscious reaction against the mentality of the eighteenth century... He felt that something had been left out, and that what had been left out comprised everything that was important." And further of Tennyson he says that he "goes to the heart of the difficulty," for "it is the problem of mechanism which appalls him," [New York: The Free Press, 1925, p. 77]. He quotes a line from Tennyson's poem, "The stars", she whispers, 'blindly run,'" (p. 77) and a line from Wordsworth's, "'Twas summer, and the sun had mounted high." (p. 81). Whitehead's comment about this last line seems to apply to the romantic movement in general. He says:

Thus the romantic reaction started neither with God nor with Lord Bolingbroke, but with nature. We are witnessing a conscious reaction against the whole tone of the eighteenth century. That century approached nature with the abstract analysis of science, whereas Wordsworth opposes to the scientific abstractions his full concrete experience. (p. 81).

The romantic proposal to correct the Enlightenment's dismemberment of man was at best Kantian. Immanuel Kant's Critique of Pure Reason was certainly a conscious attempt at articulating an epistemology and metaphysics based on Newtonian mechanics. Yet Kant was ultimately interested in morality, perhaps the most distinctively human trait. Since human morality and Newtonian mechanism don't easily mix, Kant proposed a bifurcation of the world into a world of nature and a human world of morality. Kant explicitly says that he wrote his first Critique to make way for The Critique of Practical Reason where he deals with morality. The distinction we currently make between naturwissenschaften, the sciences of nature, and geisteswissenschaften, the sciences of man, the humanities, is based on nothing less than such a Kantian bifurcation of the world. In this scheme, the sciences deal with the objective world of nature and humanities are freed to deal with the subjective world of the human spirit, and never the twain shall meet. Having sealed the human spirit safely off from the grasp of a Newtonian reduction to particles in motion, the romantics let the sciences alone and found a place for the human in an autonomous realm of subjectivity, different from, but not in opposition to, the objective realm of science. This two-world solution to the problem of man's humiliation by the Enlightenment proved reassuring, at least for a while.

This bifurcation approach was a temporary tourniquet that kept life in the humanities for a while, but did not suture the wound inflicted by the Enlightenment. There was no way for this policy of isolation to work: conflict was inevitable. Scientists were raising questions that could not be ignored by the humanists. For example, Darwin's conception of the origin and nature of man was bound to spark controversy in the theological world. There is something fundamentally schizophrenic about trying to hold one view of oneself and the world in the lab, and quite another in the church pew. It is inevitable that an internal war will flair unless some integration and equilibrium can be attained. We simply cannot endure the unrest of a life like Mr. Spock's, that officer on the Starship Enterprise, whose hybrid personality is split between his Vulcan father who epitomizes the cool, detached, and logically calculating rational mind, and his earthly mother who is "flawed" with human passions, emotions, and feelings.

The problem however is deeper than this. The romantic's attempt to forge a place for man in a world of particles in motion was destined to skid on its own assumptions. From the very beginning the romantic never questioned the premises of Enlightenment science, they were, in his mind, beyond question. Even from the romantic's point of view, the sciences were privileged disciplines. It was never questioned that they were dealing with "reality," that they were the objective disciplines. The romantic readily acknowledged that his world was subjective, perhaps even unreal; he protested that even so, this subjective world is very important and not to be ignored. The legacy of his capitulation to science abides with us today, however: in the world of academia, the sciences clearly are dominant in prestige, commanding more respect than the humanities. If we are told that something is so, and it has been established scientifically, it is second nature to us to assume that it must be true; just as it is second nature for us to assume that humanistic proclamations amount to no more than subjective opinions, one of which is just as good as another. In order to avoid this stigma of second-class citizenship, there has been a growing clamor in academic circles to "become scientific", which usually means adopting a quantitative methodology and an appropriate detached and impersonal posture as "scientist." Indeed, the humanities are not untouched by this mandate to "be scientific", and as a consequence we have recently witnessed an exodus of a number of disciplines usually classed as humanities to what we call the social sciences. The upshot of all of this is that the romantic protest against scientific objectivism, which gave us our present conception of the humanities, was itself an offspring of that objectivism, and it is in this sense that the humanities today still live in the shadow of the Enlightenment.

Can the humanities come out from under this shadow, stand on their own, and no longer have to play themselves off of the sciences for their own sense of identity? The answer is definitely "no", unless we can do what the romantics failed to do, namely, undertake a radical critique of the assumptions of science concerning objectivity. The humanities can no longer sell their birthright in search of respectability in an age of scientific objectivism; they can no longer rest content to simply swallow, without question, the Enlightenment model of objectivity, for clearly, as history has shown, if the humanities accept it, and fashion their identity in terms of it and make it their model, they will sink into the quagmire of subjectivism.

How do we attack the ideal of strict objectivity in science? The best way, I believe, is to do what Polanyi has done, to wit, to look at the actual practice of science to see if its professed ideal of detached, mechanical, and impersonal observation is consistent with that practice.

In examining the actual practice of science, Polanyi, a scientist himself, came to see that its avowed ideal of strict objectivity is a delusion, and moreover that it exercises a destructive influence within science and "falsifies our whole outlook far beyond the domain of science." [Personal Knowledge (Chicago: University of Chicago Press, 1958), p. xiii.] The basis for his rejection of this ideal lies in his observation that scientific inquiry is determined at every stage by the exercise of undefinable powers of thought. The actual procedures of scientific inquiry resist mechanization at the most significant places, e.g., in discovery, in the applications of formalisms to the facts of experience, in the discernment of a problem and the intimation of its solution, in the process of verifying or refuting a hypothesis, and even in the very process of sensory perception. Polanyi's innovative insight is his recognition that all of these activities are grounded in nothing less than the personal participation of the scientist himself. At every stage of the inquiry, the scientist's mind/body is caught up in the exercise of undefinable skills and connoisseurship, the employment of intellectual

tools and formalisms, and in the process, the scientist gropes through the maze of inquiry to discovery, guided by hunches, feelings, emotions, intellectual passions, commitments and decisions.

Polanyi finds that even in the methods of the most exact of the sciences these elements of personal participation and judgement are indispensable. We can begin to grasp this when we examine the most basic of scientific tools, observation itself. Sensory observation, while it may become routine, is never simply a matter of just opening one's eyes to become transparently aware of the facts as they are in themselves. In the first place, the very act of seeing something is a skillful act--children must acquire the skill of seeing things. Moreover, as a skill, sensory perception defies exhaustive formalization and mechanization; it is an art, the mastery of which must be acquired through practice. Scientific observation is an extension of the art of seeing things, though here the art is highly specialized and the required skill to master the art much more refined than in routine perception. A scientist must learn to see things of scientific significance, and he must learn to use the tools and instruments of science to that end. It is common knowledge that observation through a microscope, or telescope requires a great deal of skill to be of value. Not just anyone can walk into a laboratory and see in the microscope what the scientist sees, and this is so even if the scientist tells the novice what to look for. It is only through intensive bodily efforts guided by commitment and practice that a good scientific eye is acquired.

Not only does perception, like all artful skills, involve unformalizable, tacit components, Polanyi claims that it also is guided by a passionate craving to see things correctly and as such sets standards of correctness to itself and appraises itself according to those accepted standards. Perception thus is not simply a passive, passionless, and value-free mechanism as the objectivist would have us to believe.

The picture of scientific inquiry that Polanyi presents us with is radically at odds with the Enlightenment picture. Indeed the picture that he presents of the scientist concretely participating in his inquiry is compatible with the picture we have of the self-involvement indispensable to humanistic inquiry. By revealing the absurdity of the objectivist ideal of science without a scientist, Polanyi has provided us with a framework for uniting the sciences and the humanities, for on his view, both are inherently personal. In place of the Enlightenment ideal of objectivity, Polanyi introduces an idea of perspectival objectivity. Such an objectivity is personal, and qualifies the sciences no less than the humanities. Polanyi puts it this way:

...as human beings, we must inevitably see the universe from a center lying within ourselves and speak about it in terms of a human language shaped by the exigencies of human intercourse. Any attempt rigorously to eliminate our human perspective from our picture of the world must lead to absurdity. (Personal Knowledge, p. 3)

Hopefully, this sketch has some rhetorical merit for all of us who are concerned to rescue the humanities from their plight of having to live in the shadow of the Enlightenment. The post-critical approach Polanyi has provided is truly a profound and promising alternative to Enlightenment ideals.

And yet there is danger here, especially for Polanyians. Because we are all children of the Enlightenment, it is very easy to slip into a misinterpretation of Polanyi's position. This misinterpretation is very likely and measures the extent to which the Enlightenment picture of objectivity continues to hold us captive. It is very easy to think that Polanyi unifies the sciences and the humanities by dragging the sciences down into the subjectivism of the humanities--misery how it loves company! In other words, when it is realized that science involves indispensable personal elements, it might be concluded that the sciences are just as subjective as the humanities. But this brings the whole house of knowledge crumbling down around us. The problem with this interpretation is that it still clings to the Enlightenment ideal of objectivity. The only shift is that recognizing the personal elements of scientific inquiry, it is now held that that ideal is impossible to attain. When one says that even the sciences can't be objective, it is still the Enlightenment ideal that informs the disclaimer.

Polanyi is more radical than this. He does not wish to drag the sciences into subjectivism, but to redefine objectivity as perspectival, or personal. In this sense, he would have us recognize that both the sciences and the humanities are equally objective. A key element in Polanyi's position that keeps it from falling into subjectivism is the notion of universal intent. For Polanyi, all responsible claims, not only empirical claims, but value and intentional claims, whether made in the sciences or the humanities, are intended towards and, if true, reveal an aspect of a reality largely hidden to us, and forever showing itself to us in an indefinite range of unpredictable ways. By trying to say something true about reality our commitments, evaluations, and observations are externally anchored in universal intent. Polanyi writes:

It is the act of commitment in its full structure that saves personal knowledge from being merely subjective. Intellectual commitment is a responsible decision, in submission to the compelling claims of what in good conscience I conceive to be true. It is an act of hope, striving to fulfill an obligation within a personal situation for which I am not responsible and which therefore determines my calling. This hope and this obligation are expressed in the universal intent of personal knowledge. (Personal Knowledge, p. 65.)

According to the logic of perspectival objectivity then, it is persons, regardless of whether the inquiry is in science or in the humanities, who in relation to other persons take final responsibility in the acquisition and upholding of knowledge. Further, there is no knowledge without some actual knower who exercises the full range of his epistemic powers including his commitments, emotions, hunches, and intentions, who makes his claims to know with universal intent and who continues to bear witness to those claims to others in view of the ever present risk that he may be wrong. On these matters, the sciences and the humanities stand together on an equal footing: both the sciences and the humanities involve personal elements - the tacit, the passionate, the evaluative, etc. - and for both, these personal elements are modes of epistemic encounter intended toward an aspect of a temporarily unfolding reality and issue in claims in the humanities no more and no less than in the sciences that bear a universal intent.

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'LORD OF HEAVEN AND EARTH'

Some Reflections on Michael Polanyi's Approach to Science and Morality

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Perhaps you have never asked yourself what part of the Creed is of greatest interest and importance to a scientist. Rudolf Bultmann has certainly taken possession of the popular mind with his demythology. He asserts that the classical model of a three storey universe - heaven, earth and under the earth - is quite incomprehensible to the modern scientific mind. In other words, the myths that validated the classical world-view and along with it the language and expressions of the Creed, have long lost their powers of interpretation for the modern mind. The Creed, because it is a mythological formulation of belief, has simply become incredible. In particular, the Resurrection of Christ, His Ascension into Heaven, the Descent into Hell, and His Coming to judge the living and the dead, all need demythologising and rephrasing in the terms of the modern positivistic approach to science.

I shall not argue Bultmann's case here, except to use the issues he has raised as a platform for my consideration of Michael Polanyi. Like Bultmann, Polanyi was thoroughly modern. Yet, in his last book, 'Meaning', his approach, without entering into polemics and apologetics, is just about completely contradictory to that of Bultmann. Most commentators on Polanyi would attribute this to the fact that his post-critical and therefore realist, as opposed to positivistic philosophy, had released him from the bind of faith versus science, that ensnared Bultmann.

But have we considered sufficiently what his personal way of knowing released him FOR: what was the new area or sphere of reality into which he entered? It was an intuition that transcended the use of words in science, and which could only come to expression through a symbol which somehow comprehended the space-time unity of the whole universe to which man belongs.

The Universe and Its Meaning. Now such an intuition is more a matter of mysticism, of the perception of truly ontological depths in our space-time world and its history, than of a purely scientific theory or hypothesis. Yet to Polanyi, without such a mystical fire guiding a scientist through the dark night of research, insight as an enlightening indwelling in reality would never be achieved (PK 64). Enlightenment needs more than scientific method for its illumination. It has been noted how Polanyi passes so easily from scientific to mystical language in order to give some verbal shape to his deepest convictions and experiences as a scientist. In 'Meaning' he invokes symbol as the only way of incorporating this experience of the awesome order of the universe in human language (M 178-9).

I believe that at this stage we do not have the end-point of his development. What we have is a revelation of the vision, the unifying experience that underlies all the tacit premises of his convictions.

So it is only at the end that the guiding hand of his development is revealed. Once this factor is recognised, all the previous stages of his development should be interpreted in relation to it. It is the end which determines the stages of development and uncovers what was implicitly and potentially contained in the starting-point or origin.

Polanyi discussed the representative power of religion in the chapter 'Meaning'. He shows that religion is accepted precisely on the ground that its myths, rituals, ceremonies and doctrines give a unified order and meaning to the whole universe, as well as inserting man into that order, thus endowing him with personal meaning (M 153). In one way these representations open the mind of man and point it upward in prayer, adoration and in a feeling of trust that makes us dwell in the Kingdom of Heaven. It is by prayer, reverence and by gratitude for the goodness we share, that man relates to God through an indwelling in His action in the world. 'The contents of a religion will have as their import the story of a fundamentally meaningful world (M 159). But since we find meaning in the universe, therefore religion is not only possible but real. Our experience does lead us to a relationship with God. "The whole experience of mankind has surely been that in general men do have such a 'will to believe' (M 160).

Science and religion are ultimately founded on acts of belief. It is here that the positivist view of the universe comes to grief precisely because it can not preserve the integrity of meaning. "If we do believe in such a 'value-free' universe, then as James said, the 'religious hypothesis' is not a viable one for us and we cannot entertain it." (M 160)

What can we say then of a scientist's approach to religion and hence to God as set out by Polanyi in his post-critical philosophy? Firstly, he does not accept the rationalism of the proofs of God's existence - although it might be shown they are coherent with his own vision and even demanded by it. But the spirit of such proofs goes against the fiducial and Augustinian approach of post-critical philosophy. Secondly, he uses experience as a pointer to meaning. Hence his conception of God grows out of the scientific myths that have taken possession of the modern mind. By breaking with positivism, Polanyi opened the way to scientific myths as the key to order in the universe, and order in the universe is the symbol that reveals God to us through worship, wonder, prayer and adoration.

We could say that Polanyi finds himself related to God through the givenness of the experiences that arise in him in the course of his work as a scientist penetrating into the structure and content of the universe which give it meaning. Since this is a given, it cannot be denied, but it can be understood - if we have faith. St. Augustine again! 'Religious belief cannot be achieved by our deliberate efforts and choice. It is a

gift of God.' (M 180) Unless you believe, you shall not understand.

A properly formed scientific myth that embodies the order of the universe, seems to be a necessary condition for the gift of faith today. Without such a myth the mind cannot make enough sense of our type of world to make contact with God. Polanyi proves this assertion by a negative strategy - by showing how its denial destroys the religious experience that is the form of our involvement with God.

It is beyond much doubt that this representational content of the religious myth is at least one of the serious stumbling blocks to the acceptance of religion in our day. So much is this so that a whole school of theologians has become busily engaged in demythologising our religions. But, if it is true that myths are an essential part of any religion, the success of such a movement can mean only the total demise of religion. (M 158)

In the end it is the ecstasy and mystical experience of religious celebration that validate our approach to God - not a rationalistic and absolutely coherent conceptual proof of His Being and Existence. This is personally involving - through a personal acceptance of religion - and shows that God is personally involved with us through his gift. This insight is in no way original, and Polanyi finds no need to dwell on it at any length.

However, if we make a comparison with other scientists who have treated the same issue some remarkable results appear.

Werner Heisenberg has emphasised how the abandonment of the positivist position has opened up the question of God for physicists. Knowledge of the real and its profundities has forced physicists to interrogate the structures that bear the real. So for Heisenberg what was formerly understood under the rubric of God is considered under the key term of 'central organisation' and behind this tentative conception lies the question: Is this organisation capable of asserting itself beyond the fact that it exists? Has this organisation a quality that should be thought of in a manner that is analogous to how we perceive the human person: 'Can you - or can we - approach very closely the central organisation of things and facts whose existence we cannot doubt at all? Can we enter a relationship with it as closely as we can with the soul of another person? If you ask me this question, I shall reply, Yes.' (TG 293) It follows that to reject creation as meaningful is to reject the Creator.

Heisenberg described the central organisation as a magnetic compass that provides the pathway through life that we seek (TG 291, 294). Here he re-echoes Polanyi's abhorrence of nihilism:

Once the magnetic attraction that has guided the compass comes to a halt - and it is clear that such an attraction can only arise from the central organisation - I fear that dreadful things may take place, things that go beyond even the concentration camps and the atomic bomb. (TG 295)

So Christian faith is not against reason, but protects reason from manipulation and exploitation by any philosophy that would empty it of content. At the same time faith forms a synthesis or a symbolic whole with

scientific reason by placing this central organisation within the Christian Mystery. The central organisation then becomes transparent to this higher light that incorporates it into the story of Creation and Redemption in Christ. The Creed may be considered as a myth that integrates the three great symbols of the Christian religion - the Father as absolute source and Creator; the Son as the incarnate image of the Father and embodiment of His Love and the Spirit as the Unifier or Integrator of the Trinity's inner life. It seems that the intellectual life of the scientist is appropriated by and embodied in our belief in God the Father who, as absolute origin is Creator of heaven and earth, of all things visible and invisible.

The Structure of Symbols. Polanyi has noted what this religious integration does for scientific beliefs. The intellectual life of a scientist brings an integration to the ego that is self-centred. Scientific language indicates objects by their proper qualities.

Perception, for instance, is of things seen from the self as a centre. The self is never carried away in indication; it is never surrendered or given to the focal object...indications are always self-centred. (M 74)

The Creed and religion act otherwise by forming us into part of a higher meaning - in this case the Christian mystery. The point of using symbolism to represent mystery is that it can fuse incompatible elements into a higher meaning without contradiction. This is done by an embodiment of meaning in a wider frame of reference which relates all the subsidiaries to one focal object. The relation between the subsidiary meaning (the scientific world-view) and the focal object (in this case the Christian mystery) remains tacit; and so need not be articulated in explicitly logical relationships.

Symbolisations are self-centred. That is, the symbol, as an object of our focal awareness, is not merely established by an integration of subsidiary clues directed from the self to a focal object; it is also established by surrendering the diffuse memories and experiences of the self into this object, thus giving them a visible embodiment. This visible embodiment serves as a focal point for the integration of these diffuse aspects of the self into a felt unity, a tacit grasp of ourselves as a whole person, in spite of the manifold incompatibilities existing in our lives as lived. Instead of being a self-centred integration, a symbol becomes rather a self-giving one, an integration in which not only the symbol becomes integrated but the self also becomes integrated as it is carried away by the symbol - or given to it. (M 74-75)

The key question for a scientist is: what or to whom is he giving himself by the exercise of his science? In other words, what is his ultimate commitment? Science of itself cannot rise above itself, although it has an inner drive and orientation to fuller meaning. This orientation is fulfilled only in a new frame of symbolic reference, whose focal point is the self-giving of the scientist. One of the clear conclusions from this

Polanyi did not articulate his convictions in this theological form. He took his point of reference from the practice of scientists themselves. The net result was a liberation from the prison of the self-contained Cartesian ego, and a return to faith as trust in the intellectual premises which guide critical research. It cannot be passed over that here we have a return to Christian intellectual ideals by a re-evaluation of faith and the body.

Polanyi's life was, according to his repeated assertion, an attempt to re-establish the foundations of faith. Looked at from the point of view of the Creed as a guiding symbol, this project could be described as the redemption of the mind.

Corresponding to the redemption of the mind itself is the perception of the Redeemer, of Christ who took a body in order to save man in his total personality, body and mind. Salvation from Cartesian dualism means the preservation of the dogma of Christ the Saviour. By introducing scepticism into the Christian conscience, Cartesian philosophy invalidated our moral and religious traditions. Polanyi saw this state of affairs as a 'Fall', a sort of intellectual sin where the mind became sufficient unto itself.

'The modern critical movement destroyed the communion between the Christian conscience and the person of Christ.' (JP p43) Rationalism not only devalues all personal relationships by denying the I-Thou structure of personal knowing, it makes any personal contact with God unthinkable.

Redemption comes to science as a grace whereby it 'breaks out' of its old framework to make fresh contact with reality (PK 199). This conversion happens as an illumination discovering a new vision fostered by the beauty, symmetry and profundity of the reality touched, felt and perceived. It is no wonder that he viewed the darkness of the modern mind as a 'Fall' from which it could only be redeemed by grace 'so we are freed from worry about our insurmountable limitations'. (M 157)

In fact, Polanyi proposes grace precisely as the answer to the human paradox found both in religion and in science. Grace is a human necessity where our human resources fall short and call to be transcended by a greater power. This greater power, however, is not something operating outside us, but from within us. And he evokes the memory of St. Paul who felt the tension of being bound to an ideal he could not achieve.

The simplest expression that I know of the scientists' obligation can be stated in terms of the Christian paradox, that man is called upon to try the impossible but is not expected to achieve it. As scientists we must seek a truth which is unambiguous and universal, even though at the same time we must recognise this is impossible. (STSR 77)

The source of this impossibility and indeed meaninglessness is the naturalistic conception of the universe. It is grace that opens the premises of this naturalistic conception to the sphere of ultimate meaning. This is the work of grace which acts not through a chain of logical necessity but by incarnating this commitment into a set of ultimate beliefs. A commitment has two poles - the personal or subjective and the universal or objective. Science is ultimately a set of beliefs to which we are critically

committed.

Hence we can now discern the fundamental fallacy of the positive model of science. It tries to construct a machine which will produce universally valid results. But universal validity is not a conception that applies outside the commitment situation. Any reference to it is merely a manner of expressing our submission to an ultimate obligation and can appear only as part of a fiduciary declaration. The attempt to construct something universally valid, prior to any belief, is logically nonsensical. (STSR 80)

Faith enables scientific thought to make contact with ultimate obligations through commitment. It follows that scientific premises are open to obligations that go beyond the sphere of science, i.e., obligations on which they might not logically depend but to which they are open and in no way repugnant. Here is the radical possibility of religion as an integration of all aspects of life including the scientific work of the mind. If science is a penetration by intuition and critical reason into the structure and content of the universe, it must lead to a religious commitment in faith or collapse into a heap of meaningless details because there is no ultimate that holds it together in synthesis. Polanyi would say that this is the choice before our culture. It is grace that 'jumps' the gap between the plausibility of a religious account of the world and actual commitment to it. We cannot live in an eternal uncertainty of 'if not this, then what?' (M 159-160) Religion both transcends science and integrates it into ultimate meaning in the universe. Grace, for Polanyi, is not abstract but seems to reside in the tacit dimensions of religious experience.

We can assert quite confidently that religious symbols are the way grace acts to integrate scientific meaning into ultimate purpose in the universe. There is no need to emphasise that here we are well beyond any natural cosmology or ontology that leads to a natural theology. This is a celebration of the ultimate reality of life itself. To quote Polanyi at some length again:

We dwell in the hope that we may, by the grace of God be able somewhere, somehow, to do that which we must, but which we can at this moment see no way to do...

Dwelling in this religious frame of mind, we have not lost the tension, but it does not worry us nor do we become complacent. Our myths tell us of the Fall and of how and why we are excluded from Paradise. ... But they also tell us of the Redemption and of the power and grace of God that is to be dispensed to us as needed... we are humbled before God in the recognition of our utter dependence upon him for the ultimate victory through Christ. (M 157)

That an intuition of God, Creator and Saviour, is necessary to uphold scientific enquiry into the universe as a whole, is confirmed by a study of scientists and how their minds work in practice. Christianity stands on its own premises of God's Revelation in Christ. In our culture it is the Christian framework or myth that makes this intuition of the Creator possible for the scientist. It follows that Christianity by upholding reason has been very fruitful in the development of science as we know it. It is

only in a universe redeemed and graced by Christ that it is possible to believe in a heavenly Father who preserves and supports a rational order and purpose embracing the whole universe. Stanley L. Jaki bluntly asserts:

History clearly shows that it was only a Western world steeped in Christianity that was capable of creating science, economy and business on a scale never witnessed before. (TBE 151)

The road of science becomes a way to God. Faith and science continue as a tradition down the centuries of mutual help that is fruitful in new understanding of man and the universe. This tradition creates new insight from age to age because of the grace of the Spirit.

The Crisis of Culture. Science is a moral activity involving conscious commitments and deliberate decisions. If man creates his life project through his moral decisions, then our culture is the creation of the modern mind whose greatest boast and achievement has been the development of science. In fact science more than religion is the undisputed authority in Western culture.

The Cartesian model of self-consciousness has already been described. So has Laplace's mechanistic universe of atoms in motion. This is the scientific universe of the positivists that is closed both to God and real meaning. It cannot achieve truth as a conscious contact that grasps reality in its essential features.

Man's motives which move him in all his moral activities are described by Polanyi as moral forces or energies (PK 234). Their usual manifestation is a moral passion which guides our search for truth. They have direction and universal intent and are essentially heuristic.

Cartesian consciousness and a mechanistic world-view together serve to reduce moral values and passions to nothingness. Man is expelled from the world and science becomes a pattern of relationships without content. It is this reduction, 'this ascent, more than any other one intellectual factor that has set science and religion in opposition to one another in the contemporary mind'. (M 162)

A meaningful universe full of purpose implanted and embodied in it by the Creator has already been treated. But what of moral man? What price does he pay in this reduction? How is purpose and meaning restored to his life? He stands in need of a redemption from the intellectual framework in which man can live at peace within his own mind.

The first step has been a revolution from within science itself. T.F. Torrance has described how Einstein, Bohr and Gödel inspired Polanyi with an ideal of science as contact with the real world, a penetration into its inner structures (TFT). Within this model of science as 'Personal Knowledge' man's passion for knowledge can find a new home. The main postulate of this personal model of knowledge is that everything we know is full of meaning and leads to greater meaning. There is as Polanyi puts it a 'gradient of meaning' (M 178) operative in the Universe. To fail to grasp this is to fall into absurdities.

The second stage is to analyse the moral failure that spreads conta-

giously from a false ideal of science through every level of our culture. Polanyi's reasoning is direct and startling. If positivistic science achieves recognition as the ideal of knowledge, as in fact it has, then scepticism reigns over all our values, traditions and social institutions. Scepticism can dissolve values and void the edifices of authority, faith and tradition as indefensible acts of trust. The end result of this movement cannot be other than nihilism. 'Men are living in a spiritual desert' (PK 236) becomes the sad state of a culture where the ethical role of science has been misdirected.

If the moral passion for knowledge is displaced away from the truth, we have to ask where does its homeless energy go and what damage can it do. Moral passions become the fanatical fires that inflame immoral purposes. Polanyi lists many examples that convince him that the 'pathological morality of our time' (KB 18) is the attempt to remake society after the ideals of positivistic science. He cites the violence of Robespierre and his followers in the French Revolution, the Russian Revolution, Hitler and the modern totalitarian state as examples of this fanaticism (SFS 77-78).

Nihilism for Polanyi is the unholy marriage of positivistic scientific ideals and homeless moral aspirations and the union becomes a mechanism of destruction since the sceptical scientific mind turns man's vital moral impulses against himself.

In other words while a radical denial of absolute obligations cannot destroy the moral passions of man, it can render them homeless. The desire for justice and brotherhood can then no more confess itself for what it is, but will seek embodiment in some theory of salvation through violence. Thus we see arising those sceptical, hard-boiled, allegedly scientific forms of fanaticism which are so characteristic of our modern age. (LL 47)

It goes without saying that any organisation of the state based on a deterministic model not only has no space for liberty in theory but must arrive at contempt for freedom, both personal and social.

The immoral form of existence that corresponds with this denial of liberty is called moral inversion.

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. (LL 106)

Moral inversion is the direct result of inverted consciousness. It is the consequence of the application of the Cartesian model of thought to our moral drives. These forces have their direction set by the intentionality of consciousness. The scientific revolution of the twentieth century initiated by Einstein, Bohr and Gödel, caused Polanyi to rethink the direction taken by consciousness, or awareness as he prefers to call it. He postulated a vital thrust in knowing from the subjective pole to the objective pole. Awareness is directed outward, therefore, so that the subject and object become an inseparable unity in Personal Knowledge.

Our awareness of ourselves and our knowledge as directed outward to the real has momentous consequences for morality. It is the redemption of

the mind as it breaks through moral inversion. Our moral energies are then attracted to their true home - the universal values we believe in and to which we commit our lives.

Knowledge by participation, so firmly grounded, makes a clean sweep of the claim that in order to be valid, knowledge must be established objectively without relying on personal judgements. And this restores our confidence in moral principles that are ultimately known to us by our commitment to them. (PK 236)

A personalist view of science restores the worth of absolute obligations both in the life of the individual and the society. It preserves the relationship between Christian conscience and the person of Christ. Our moral desires are once again open to eternity (JP 43, M 9, 10). The Christian hope of life everlasting does not have to be reduced to social liberation and economic betterment. Radical secularization becomes quite an impossibility. Our concern for historical progress through political and social reform is now guided by a 'firmament of values'. (SM 41) Truth, love, beauty, honesty and justice become guiding stars that call man out of himself towards the absolute. This vocation finds its sole adequate and satisfying embodiment in the Christian mystery. There is a 'gradient of meaning' immanent in creation that leads us from lesser to greater truth. It is this spontaneous force that at once reveals an order founded on liberty and a purpose forever pointing to unity. It convinces us that a grace greater than the human mind must be at work in the world. For the believing Christian this grace can be nothing other than the Spirit who reveals Himself in the tacit dimension of all meaning. Polanyi never quite articulated his conviction in this form. It is an insight that is not only coherent with his thought but readily flows from it.

Polanyi had a mind naturally bent on synthesis, that is, on bringing diverse truths into unity. Science, faith and religion all find their unity in the great symbols of belief. Without a God who is Lord of heaven and earth, faith has lost its object and science becomes a set of empty mathematical relationships without a soul. 'A society refusing to be dedicated to transcendent ideals chooses to be subject to servitude.' (SFS 78-9)

Father Augustine Regan in his doctoral dissertation described the Trinitarian relations, and how the Divine Persons have a mission to us and our world. This essay shows that Christian faith in the Divine Persons can lead science to a meaning that it contains only tacitly, implicitly and in symbol. The illumination that overwhelms the mind of the scientist and sets him aflame with expectation is indeed a 'clue to God' (PK 324) that is necessary for the children of this scientific generation.

Abbreviations:

- M Meaning by M. Polanyi and H. Proach, London 1975.
 PK Personal Knowledge M. Polanyi, London 1958.
 TG Der Teil und das Ganze W. Hasenberger, Munich 1969.
 GJC The God of Jesus Christ J. Ratzinger, Chicago 1976.
 JP Jewish Problems by Polanyi in The Political Quarterly XIV, 1943.

- STSR Scientific Beliefs by Polanyi in Scientific Thought and Social Reality, New York 1977.
 TBE Ethics and Decision Making in Business by S.L. Jaki in Trends in Business Ethics, Leiden 1978.
 TFT The Place of M.P. in the Modern Philosophy of Science by T.F. Torrance, 1974 (unpublished) 49pp.
 KB Knowing and Being M. Polanyi.
 SFS Science, Faith and Society M. Polanyi, London 1946.
 LL The Logic of Liberty M. Polanyi, Chicago 1951.
 SM The Study of Man M. Polanyi, London 1959.

Terence Kennedy, C.S.S.R.

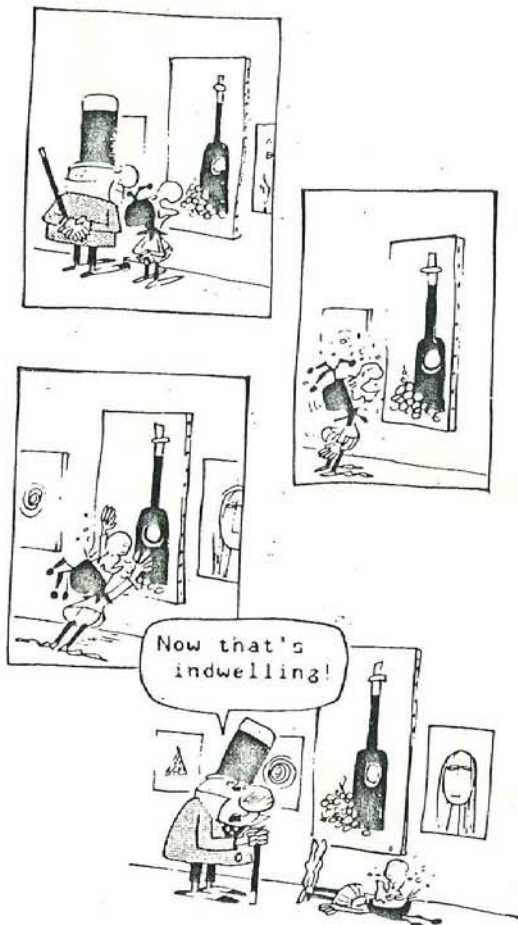
Announcement: Upcoming American Academy of Religion
 Annual Meeting Polanyi Session

The American Academy of Religion has again this year granted the Polanyi Society a three hour pre-session meeting to be held on the opening day of the AAR Annual Meeting. The Polanyi Society meeting is scheduled for Nov. 23, 1985, at 9 a.m. in Conference Room 9 of the Anaheim Hilton and Towers (Anaheim, Ca.). Professor Walter Gulick of Eastern Montana College will present this year's major paper titled "Critical and Post-Critical Correlations and Conundrums."

About half of the session will be devoted to Gulick's paper. In order to use time efficiently, it is very important that session participants read the paper before the meeting. The paper can be ordered for \$2.00 (duplication and postage fees) from me at the address listed below. I expect to mail papers around Nov. 1, 1985.

The last half of the session will be scheduled again this year to allow participants briefly to discuss writing-in-progress or other papers and publications related to Polanyi's thought. If you wish to make a brief presentation (10 minutes), please notify me immediately. I will schedule presentations on a first come, first served basis. In the past, it has proven helpful if presenters provide session participants with a brief written (no more than 3 pages) summary. Those who write such summaries should duplicate 20 copies for distribution.

Phil Mullins
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By Jere Moorman, author of A HUMOROUS DICTIONARY OF THE TACIT, Box 90155, San Diego, CA 92109.

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