# Tradition & Discovery

## The Polanyi Society Periodical

INCORPORATING CONVIVIUM
THE UNITED KINGDOM REVIEW OF POST-CRITICAL THOUGHT

Vol. XVI, Number 2, Spring, 1988-89


CONTENTS

## PREFACE
### Polanyi and Kuhn

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We also welcome in this issue other major concerns: the relation of Polanyi to Kant, Polanyi in Poland, analysis of Prosch's view of Polanyi, and a very helpful glossary for reading and teaching Polanyi. This variety indicates the continuing liveliness of our Society.

Richard Gelwick

### CONTRIBUTORS TO THIS ISSUE

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## NEWS AND NOTES

The coordintion of The Polanyi Society and the Convivium in Great Britain have both been undergoing major changes. Please notice on page 2 the new address of Richard Gelwick at the University of New England and the new editor of the Convivium, R. T. Allen.

R. T. Allen is part of a project with Claridge Press of London to publish in the Spring of 1990 a new series, THINKERS OF OUR TIME, which will include a volume on Polanyi. The series counters the assumption of Fontana press that to be a modern master one has to be a modernist. Other thinkers to be included in the series are Oakeshott, Maitland, Schmitt, Voeglein, Chesterton, Santayana, Wojtyla, Scheler, and Wyndham Lewis.

Centennial preparations are starting in both North America and in Great Britain. Persons with ideas, papers, plans, and proposals should contact either Richard Gelwick or R. T. Allen.

Raymond Wilken at Kent State University is being assisted by his students in the planning of a major centennial celebration with international representation. Prof. John C. Polanyi is planning to participate and other speakers will be chosen later. In addition to invited presentations, there will be a call for papers. Everyone who attended the Kent State Conference in 1984 will remember the excellent program and facilities there. The tenative dates are April 11-13, 1991. If anyone sees any major conflict or has ideas contact immediately Raymond Wilken, Ph.D., Educational Foundations, Kent State University, Kent, OH 44242; telephone (216)678-0417.

The Religious Studies section of the Polanyi Society met during the annual meeting of the American Academy of Religion in Anaheim, California. David Oyler of Phoenix. Arizona presented a paper "The Intentionality of Feelings in Religious Self-Transcendence." Coordinator Phil Mullins gave up the chair and presented "Polanyi and Peirce: Some Points of Comparison." Both papers evoked a good discussion; we will hope to see them published.

The session held at the Modern Language Association meeting in December of 1988 on "Polanyian Perspectives on the Teaching of Literature and Composition" has been edited and prepared for publication by Elizabeth Wallace of Western Oregon State College. We hope to have it in the next issue of TRADITION & DISCOVERY.

William T. Scott is reported to have reached the period of Polanyi's Gifford Lectures and expects to have completed the biography in time for the Polanyi centennial.

# The Heuristic Circularity of Commitment and the Experience of Discovery

A Polanyian Critique of Thomas Kuhn's Structure of Scientific Revolutions

Dr. Aaron Milavec

My essay will be divided as follows: (I) Kuhn's analysis of the dynamics undergirding scientific revolutions; (II) Critical soft spots found in Kuhn and Polanyi alike; and (III) Upgrading Polanyi's analysis of the reliability of scientific knowing.

## PART I: KUHN'S ANALYSIS OF SCIENTIFIC REVOLUTIONS

### A. KUHN'S ANALYSIS OF TACIT KNOWING: COMMON GROUND WITH POLANYI

When Kuhn first published The Structure of Scientific Revolutions in 1962, he coined the term "paradigm" to refer to the habitual operative perceptions and operations which distinguish the scientific community at any given time. In his extensive postscript of 1969, he amplified his use of the term and explicitly acknowledged his indebtedness to Polanyi for the notion of "tacit knowledge" (K:191). In this postscript, Kuhn emphasized that a paradigm is not so much a theory (as understood in the philosophy of science) but more of that "disciplinary matrix" (K:182) imposed upon novices in science which enables them to routinely perceive and judge according to the shared patterns which define the existing scientific community (K:176). In their training, for instance, novices reproduce for themselves a classical set of laboratory and pencil and paper problems . . . .

> After he [the student of science] has completed a certain number [of these problems] . . . , he views the situations that confront him as a scientist in the same gestalt as other members of his specialists' group. For him they are no longer the same situations he had encountered when his training began. He has meanwhile assimilated a time-tested and group-licensed way of seeing (K:189).

Once the initiation process is completed, Kuhn emphasizes that neural patterns have been established which insure certain habitual recognitions. These recognitions, Kuhn claims "must be as fully systematic as the beating of our hearts" and "may also be involuntary, a process over which we have no control" (K:194). Thus, Kuhn emphasizes that the trained scientist perceives the world differently than does the layperson:

> Consider the scientist inspecting an ammeter to determine the number against which the needle has settled. His sensation probably is the same as the layman's . . . . But he has seen the meter (again often literally) in the context of the entire circuit . . . . For the layman, on the other hand, the needle's position is not a criterion [i.e. a clue] of anything except itself (K:197f).



In sum, Kuhn notes that the tacit knowing powers of the trained scientist, informed as they are by his paradigm, operate instinctively and stubbornly. And, since this knowing is locked away within the knowing organism, Kuhn acknowledges that, in the end, "we have no direct access to what it is we know, no rules or generalizations with which to express this [tacit] knowledge" (K:196). Kuhn's self-expression here is sometimes awkward and unrefined; yet, the common ground shared with Polanyi is quite evident.

### B. THE PROBLEM POSED BY THE HEURISTIC CIRCULARITY OF SCIENTIFIC COMMITMENTS

Once one allows that tacit powers of knowing operate habitually and stubbornly, one is inevitably faced with the heuristic circularity that surrounds every scientific commitment. There is no hiding place. Rational appeals serve to draw attention to what passes for "reasonable" within given circles of commitment. Pragmatic appeals, meanwhile, fail to note that every belief has some degree of workability in the eyes of the believer. Appeals to given authorities disguise the fact that one's prior apprenticeship(s) serve to accredit certain authorities to the exclusion of others. Appeals to the austerity, the virtue, the passionate sincerity of our mentors cannot disguise the fact that systematic errors are compatible with any and all virtues. Even such phrases as "responsible conviction" and "warranted assertability" (Emmet:5) cannot disguise the fact that our particular tacit commitments shape what we habitually perceive as "responsible" and "warranted." In the end, to assert something as true is to be caught red-handed affirming what one has been trained to perceive within a commitment situation.

Polanyi's solution to the heuristic circularity of the scientific enterprise is found principally within his phenomenology of discovery set within a sociological matrix. Kuhn's solution to the same difficulty is found principally within the sociology of discovery set within a historical matrix. What this means in practice will gradually become clear.

### C. KUHN'S AGREEMENT WITH POLANYI ON THE INADEQUACY OF EXPERIMENTAL TESTING

Kuhn joins with Polanyi in calling upon the history of science by way of demonstrating that the scientific community does not change its mind on the basis of any simple set of rules governing prediction and experimentation. In Kuhn's own words: "There is no neutral algorithm for theory-choice, no systematic decision procedure which, properly applied, must lead each individual to the same decision" (K:200). In practice, this means a repudiation of the norms that were widely accepted by positivist philosophers of science relative to the unique role which experimental verfication and falsification played within the scientific enterprise.

### D. KUHN'S GENERALIZED ANALYSIS OF SCIENTIFIC REVOLUTIONS

For Kuhn, the history of science demonstrates that the growth of knowledge does not take place by virtue of the steady accumulation of more facts and theories. From time to time, the stubborn

instincts of scientists are changed and their operative paradigms change. In this process, some new theories and their attendant facts displace formerly held theories and their attendant facts. In so doing, scientific knowledge improves, i.e., the understanding and control which scientist's exert over natural processes advances.

A scientific revolution has three phases. In the initial phase, Kuhn analyzes what he calls "normal science" within the framework of an initiation which trains the participating members to uphold a set of commitments which are functionally circular and provide "considerable resistance to paradigm change" (K:64). The accumulation of anomalies (i.e. instances wherein theories fail to account for some of the experimental data) within the conduct of normal science leads to the transitional stage wherein the sense of intellectual crisis prompts some members of the community to shift their energies away from modifying an existing theory so as to explain away anomalies to groping about for a viable alternative outside of the normative system. Kuhn uses the term "paradigm shift" to describe the alteration of commitments and habitual perceptions which the discoverer of a novel theory undergoes as the intellectual dissatisfaction connected with the "crisis" is relaxed. In the final phase, the community is ideologically split by the existence of two incompatible modes of understanding -- both functionally circular and both determined to persuade the other side of their truth. This revolutionary situation only subsides when one side succeeds in converting the other and the return to normal science is again possible.

### E. KUHN'S ANALYSIS OF THE COPERNICAN REVOLUTION

Before going on to identify the soft spots within Kuhn's analysis of scientific revolutions, I want to briefly elaborate upon these three phases using the Copernican revolution. Since both Kuhn and Polanyi have repeatedly used this instance as the principal case study whereby to illustrate and confirm their account of scientific revolutions, the use of this material helps to reveal both their common ground and their differences.

How does Kuhn account for the Copernican revolution? The remote cause, for Kuhn, was the sense of "crisis" which circulated within the community of astronomers as they became increasingly aware of minor discrepancies between prediction and actuality within the Ptolemaic system. The immediate cause, however, was the activity of discontent astronomers who try "to push the rules of normal science harder than ever to see, in the area of the difficulty, just where and how far they can be made to work" (K:87). Relative to the Ptolemaic system, this consisted in attempts to adjust or to add epicycles in order to achieve a better fit between predicted and actual citings of the planets:

> Given a particular discrepancy, astronomers were invariably able to eliminate it by making some particular adjustment in Ptolemy's system of compounded cycles. But as time went on, a man looking at the net result of the normal research effort of many astronomers could observe that astronomy's complexity was increasing far more rapidly than its accuracy and that a discrepancy corrected in one place was likely to show up in another (K:68).



Faced with such a situation, some scientists despaired of ever attaining a perfect fit and decided to tolerate the discrepancies (K:81). Others, however, convinced that the key has not yet been found to correctly situate the revolving spheres, redouble their efforts to find a solution. When success was not forthcoming even after many generations, what had previously been only a vexation turned into a "crisis" (K:82). Kuhn identifies the crisis mentality as weakening the hold that the tradition has upon the intuitive powers of the researcher at just the time when he has set his mind to deliberately "magnifying the breakdown" (K:87). "The scientist in crisis will constantly try to generate speculative theories that, if successful, may disclose the road to a new paradigm" (K:87).

Out of this situation, the discovery of Copernicus is born. For Kuhn, "The decision to reject one paradigm is always simultaneously the decision to accept another" (K:77). Which other? That which relieves the "crisis" which brought the discontented Copernicus to grope around for an alternative in the first place. As soon as such a viable alternative is worked out by one of their members, the general strain within the community surrounding the old system functions to prompt others to accept the Copernican alternative and simultaneously let go of the Ptolemaic bridge which originally brought them to it. In Kuhn's own words:

> Copernicus' more elaborate proposal was neither simpler nor more accurate than Ptolemy's system. Available observational tests . . . provided no basis for a choice between them. Under those circumstances, one of the factors that led astronomers to Copernicus . . . was the recognized crisis that had been responsible for the crisis in the first place. Ptolemaic astronomy had failed to solve its problems; the time had come to give a competitor a chance (K:75f).

A community in crisis, however, does not immediately embrace an alternative system which demonstrates some marginal gains at the price of upsetting long-standing presuppositions regarding the place of the earth in the cosmos. As a consequence, for the time being, there was a split between those who continued to stubbornly believe that some solution would yet be forthcoming within the old system and those who commited themselves to perfect and to prove the worth of the new system. Since each side of the debate embraced incompatible commitments, there was no neutral ground to which either side could appeal by way of convincing those who perceived the reality of things from the other side.

> Like the choice between competing political institutions, that between competing paradigms proves to be a choice between incompatible modes of community life. Because it has that character, the choice is not and cannot be determined merely by the evaluative procedures

> characteristic of normal science, for these depend in part upon a particular paradigm, and that paradigm is at issue. When paradigms enter, as they must, into a debate about paradigm choice, their role is necessarily circular. Each group uses its own paradigm to argue in that paradigm's defense (K:94).

Under such circumstances, Kuhn comes to the conclusion that the grounds whereby each astronomer makes his choice are "ultimately personal and subjective" (K:199). Hence, one must wait for the verdict of history to reveal which side of the debate will win out over its contender.

## PART II: CRITICAL SOFT SPOTS

### A. FOUR SOFT SPOTS IN KUHN'S ANALYSIS

From the vantage point of my personal immersion within Polanyi's thought, I would identify the following soft spots within Kuhn's analysis:

1. Kuhn provides no satisfactory explanation as to how or why a crisis situation weakens the hold that the normative paradigm has upon the knowing apparatus of the inquirer:

> All crises begin with the blurring of a paradigm and the consequent loosening of the rules for normal research (K:84).
>
> Crisis simultaneously loosens the stereotypes and provides the incremental data necessary for a fundamental paradigm shift (K:89).

Most probably, Polanyi's own critique of doubt (PK:269ff) moves him away from giving any formal role to "dissatisfaction" within the discovery process. I will come back to this later.

2. Kuhn offers no explanation as to how an explorative quest can turn up attractive alternatives without being sent off into a maze of dead ends. At one point, Kuhn suggests something akin to a phenomenology of discovery:

> The new paradigm, or a sufficient hint to permit later articulation, emerges all at once, sometimes in the middle of the night, in the mind of a man deeply immersed in crisis. What the nature of that final stage is -- how an individual invents (or finds he has invented) a new way of giving order to data now all assembled -- must here remain inscrutable and may be permanently so (K:89f, K:122f).

Here Polanyi's analysis of how deliberate straining, imagination, and guiding intuitions function within problem solving serves to insure us that, even though the creative process cannot be exhaustively delineated, at least it can be perceived as having an internal direction.



3. Kuhn seems quite satisfied that "perceptual transformations" which take place in Gestalt experiments have something to indicate about (a) how the existence of one paradigm blocks its alternative and (b) how the jump can be made from one paradigm to another (K:112ff). He rightly notes that paradigm shifts are irreversible (K:114) but does not have the analytical apparatus to determine precisely why this should be the case. Again, Polanyi's analysis of the phenomenology of discovery provides a plausible solution to this difficulty.

4. Once Copernicus does come forward with his novel paradigm, it appears to me that Kuhn fails to provide any credible grounds whereby any other astronomer might want to join him. If, as Kuhn suggests, Copernicus has just about the same complexity (in terms of epicycles) as the Ptolemaic system and if Copernicus also fails to overcome the general discrepancies between prediction and observation noted in the Ptolemaic system, then it would appear that the choice of one system over the other is simply a matter of personal taste or, as Kuhn himself suggests, somewhat like commiting oneself to one political party over another. In this case, persuasion seems to be reduced to who can manage the media most effectively and gain the support of recognized leaders in the field. According to Berger and Luckmann, alternative symbolic universes in conflict often resort to raw power when they believe that open persuasion may not suffice (Berger:109). Perhaps it is with this in mind that some philosophers have exaggerated this point and accused Kuhn of supporting the use of irrational mob rule in science.

### B. POLANYI'S APPEAL TO THE DISCOVERY PROCESS AS "REVEALING A HIDDEN REALITY"

When Polanyi spoke of "objective knowledge" in association with "a theory on which I rely," philosophers of science like Ernest Nagel, Karl Popper, and Thomas Kuhn could hardly object. But Polanyi wanted to go beyond this. In Personal Knowledge, he spoke of the Copernican novelty (a) as having "an inherent quality deserving universal acceptance by rational creatures" (PK:4) and (b) as having "prophetic powers" in the sense of "show[ing] forth its truth through future centuries in ways undreamed of by its authors" (PK:5). Five years later, Polanyi spoke of the decisive importance of reaffirming "belief in the reality of emergent meaning and truth" (SFS:17). As such, Polanyi wished to accredit dedication within an intellectual community as being more than just a self-serving adherence to a shared ideology (as the analysis of Kuhn would sometime seem to imply). To this end, Polanyi prepared The Tacit Dimension as a working statement which draws attention to the discovery process itself as marginally responsive to a reality which is there at hand making its presence felt:

> The pursuit of discovery is conducted from the start in these terms; all the time we are guided by sensing the presence of a hidden reality toward which our clues are pointing; and the discovery which terminates and satisfies this pursuit is still sustained by the same vision. It claims to have made contact with reality: a reality which, being real, may yet reveal itself to future eyes in an indefinite range of unexpected manifestations (TD:24).

## C. INADEQUATE INTERPRETATIONS OF POLANYI'S INTENT

Even though Polanyi used phrases such as "contact with reality," he never wanted to imply that the discoverer has some direct or indirect access to reality as epistemological realists have implied. Nonetheless, one finds interpeters of Polanyi who dress up his post-critical philosophy in the clothes of critical realism. T.F. Torrence, for instance, in his address to the Polanyi Society meeting in 1975, repeatedly commited this mistake. In some unfairness to Torrence, I offer only a single instance of this:

> This [universal intent] means, on the one hand, that the scientist conducts his inquiries in acknowledgement of the universal jurisdiction of reality over him so that his contact with reality necessarily legislates for him how he must think and speak about it, but, on the other hand, it means that the conceptions that he forms and the statements he formulates under the authority of reality he must affirm with a claim for universal recognition from all others . . . (Torrence:26).

R.J. Brownhill effectively interprets Polanyi such that "truth" tends to be equated with the sociological consensus associated with Kuhn (Brownhill:369). When he comes to interpret how new theories are accepted which alter that sociological consensus, he effectively interprets Polanyi to be saying that a "new interpretative framework" recommends itself in so far as "it is instrumental in revealing reality for it leads to new problems and their eventual solution" (Brownhill:370). This notion of "contact with reality" effectively clothes Polanyi's post-critical philosophy in clothes which are better worn by Ernest Nagel, Gilbert Ryle, and Stephen Toulmin.

John Brennan interprets Polanyi with great sensitivity and insight. Yet, even he tends to link "contact with reality" closely with prophetic confirmations and to overdraw the contrast between reality and illusion. In unfairness to his whole argument, I present only a telling conclusion:

> That Copernicus had got hold of an aspect of reality, whereas the Ptolemaic vision was illusory, is evident to us now . . . . [How so?] Ptolemy's system provoked no substantial problems, let alone any important discoveries. Copernicus made contact with reality because the relations which he claimed to have discovered were real relations, as evinced by the indefinite (still unexhausted) number of consequences which have revealed to those who have investigated them (Brennan:149).

Brennan rightly asserts that "Polanyi's theory is, neither in intention nor in fact, a 'fruitfulness' theory" (Brennan:150). Yet, it is difficult to discern, on the basis of Brennan's interpretation of Polanyi, how Copernicus was to accredit his discovery as having made "contact with reality" at the time of his discovery, i.e., before the prophetic consequences of his system had been revealed and



tested. Did not the Ptolemaic system also originate out of a passionate quest which, at the moment of its first appearance, was likewise crowned with "a tacit foreknowledge of yet undisclosed things" (TD:23)? If so, it would seem specious to dub one insight as an "illusion" and, in contrast, to dub the Johnny-come-lately as "reality."

## D. POLANYI IS FLAWED EVEN WHEN ADEQUATELY INTERPRETED

Perhaps the treatment of Harry Prosch in Michael Polanyi: A Critical Exposition is most honest and satisfactory. Prosch effectively notes that Polanyi offered many coefficients of scientific value and pressed home many insightful critiques of experimental testing; yet, in the end, one is left with only a handful of indeterminacies which plague the very process of verification. The second and fifth indeterminacies are especially telling:

> (2) The rules for deciding whether a discernable pattern in nature is due to chance or to reality can never be rendered determinate. The decision is made by an act of personal judgment . . . .
>
> (5) A fifth indeterminacy is entailed by "the existential choices involved in modifying the grounds of scientific judgment" (Prosch:116f).

Polanyi would seemingly favor Prosch's interpretation. In his 1967 article, "Science and Reality," in which he probes the Copernican discovery in great depth, Polanyi explicitly asks: "But was Copernicus himself, when expressing his belief in the reality of his system, in fact asserting that it had anticipatory powers, which the Ptolemaic system had not?" (Polanyi, 1967:190). This is just the key issue that I suggested above in response to Brennan. Polanyi's response:

> It is not clear how anticipatory powers can be known at all, apart from relying upon them as clues to inquiry. Copernicus obviously did not know that his system represented an aspect of Kepler's laws and of Newton's theory of general gravitation; indeed, being wedded to an explanation of the planetary system in terms of steady circular motions, he would have strictly rejected Kepler's laws and Newton's theory based on these laws (Polanyi, 1967:190).

In the end, therefore, Polanyi's appeal to "contact with reality" appears to have vanished. Ptolemy's Almagast was accepted by 11th century Europeans (after it was discovered among Arab scholars) on the grounds that it opened up a "fruitful solution" to the procession of the equinoxes and the retrograde motions of the planets. "A good theory is objective because of its intrinsic rationality; this means that it claims to uncover a rational structure in nature -- to have made contact with reality" (Brennan:149). If this is the case, Ptolemy's system was surely "objective" and could claim to have "made contact with reality." At

one point, Polanyi grants this, but then turns around to say that "it becomes legitimate to regard the Copernican system as more objective" (PK:4).

On what grounds can "more objective" be claimed? Is it that Copernicus "relies to a greater measure on theory" (PK:4)? Hardly. Is it that Copernicus demonstrated larger "prophetic powers" (PK:5)? Yes. But isn't it entirely specious to project "intimations of an indeterminate range" upon the winners and to withdraw such claims for the losers? Chesterton said to his contemporaries, "Christianity has not been tried and found wanting; it has never really been tried." Anyone could have made a similar claim for Ptolemy: had it been tried more earnestly, its true worth would have overwhelmed all contenders!

### E. THE CONSISTENCY OF KUHN'S ANALYSIS OF REALITY CLAIMS

In some ways, Kuhn is more consistent than Polanyi. He would allows that scientists habitually make reference to Copernicus as having made some "fresh contact with reality" or as being "closer to the truth"; yet, in point of fact, every affirmation of "truth" or "reality" is bound up with the theoretical commitments that each has accepted as one's own. In Kuhn's own words: "There is, I think, no theory-independent way to reconstruct phrases like 'really there'" (Kuhn:206). In the case of the Copernican revolution, the paradigm of the winner is habitually used as the criterion for judging the losers; hence, Ptolemy will always be instinctively judged as wanting. But had it been otherwise . . . .

## PART III: UPGRADING POLANYI'S ANALYSIS

### A. BRITISH EMPIRICISM AND POLANYI'S LEGITIMATION OF PROJECTED MEANING

The empirical school of British philosophers took great delight in undermining the reliability of the senses. They did this under the mistaken conviction that science had disclosed the actual nature of reality. According to this norm, the senses all suffer the terrible inadequacy of projecting bodily sensations onto things to which they do not properly apply. The vinegar is not "sour"; the acidic interaction on the surface of the tongue simply registers this "sour sensation." The bottom of the well is not "black"; the absence of reflected light makes any object appear black.

Polanyi allows that all bodily perceptions are projections of interior states but, at the same time, he insists that such projections are spontaneous, necessary and appropriate. Heuristically, such projections are sense-giving and productively guide human interaction within one's environment. Working scientists who project the meanings which they discover while indwelling in their paradigms are similarly functioning spontaneously, necessarily and appropriately. Due to the "semantic aspect" of embodied knowing, the integrated meaning of the clues which originates within the organism appears "out there," i.e., at the focus of one's attention where the clues are originating. Hence, every mental integration, like its perceptual counterpart, discloses what appears to be really "there at hand" quite independent of my knowing of it.



Already in Personal Knowledge, Polanyi had devised the rule that all knowing relies upon the organismic integration of particulars into self-satisfying wholes. Only at the time of preparing The Tacit Dimension, however, did Polanyi fully explicate the repercussions of bodily indwelling. For our purposes here, the "semantic aspect" of this process is most important:

> To see more clearly the separation of a meaning [as the integration of bodily clues] from that which has this meaning, we may take the example of the use of a probe to explore a cavern, or the way a blind man feels his way by tapping with a stick . . . . Anyone using a probe for the first time will feel its impact against his fingers and palm. But as we learn to use a probe, or to use a stick for feeling our way, our awareness of its impact upon our hand is transformed into a sense of its point touching the objects we are exploring. This is how an interpretative effort transposes meaningless feelings into meaningful ones, and places them at some distance from the original feeling . . . (TD:12f).

Polanyi chooses the term "semantic aspect" because he rightly notes that anyone who hears or reads a message rightfully projects the meaning arrived at interiorly onto the source of the clues. The same thing happens when "sourness" is projected as being in the vinegar or when, through the use of the Copernican paradigm, "movement" was mentally projected onto the earth (even when, sensually and experimentally, for more than three centuries, no such movement was registered).

### B. THE KINSHIP BETWEEN A SCIENTIST USING A THEORY AND A MOTORIST USING A MAP

The nature and function of theories within the scientific enterprise needs to be understood if one is to understand correctly how theories are to be accredited or discredited. In this section, first, bodily and mental indwelling will be compared and contrasted, and then a theory-using scientist and a map-using motorist will be compared and contrasted.

Bodily indwelling functions analogously to mental indwelling. By virtue of indwelling in our bodies, the clues provided by sensory interaction are integrated and enhanced in order to provide meaningful human perceptions which enable us to function in our environment (e.g., making a cup of coffee or soldering a resistor into an electronic circuit). By virtue of mentally indwelling in our scientific paradigms, the clues provided by our experimental observations are integrated and enhanced in order to provide meaningful scientific understanding which enable us to function in our specialized environment as working scientists (e.g., isolating a malfunction in an electronic circuit or designing an experiment to confirm an expected pattern of proton-proton interaction).

Upon reflection, however, mental indwelling has features which distinguish it from sensory perception. Sensory perception is a first-order integration. Theoretical understanding is a second-

order integration which begins with a particular set of observational data obtained through first-order integrations. Such sensory perceptions may be gathered by the unassisted use of the senses or, what is more usually the case, observational data is gathered by scientific instrumentation which extends both the precision and the range of naked bodily perceptions.

When theoretical understanding is recognized as a second-order integration, then a scientist using a theory becomes akin to a motorist using a map. Accordingly, by examining the more familiar case, one can come to understand important elements respecting the reality claims and testing which are appropriate for theories. Typical insights would be as follows:

(a) Maps, like theories, can only be properly understood when they are in use. When a skilled map-reader consults an appropriate map in order to navigate his car to a given address in an unfamiliar part of town, this is akin to a trained scientist making use of specialized theories for the adjustment of an electronic circuit or the design of an experimental apparatus. Both maps and theories are oriented toward human action and, as a result, the correspondence between theoretical anticipations and practical consequences serves to accredit both the map and the map-user at the same time. This is why only trained scientists can use and test properly theories which are designed by other scientists.
(b) Maps, like theories, cannot be directly evaluated on the basis of some "correspondence with or approximation of reality." In the first place, maps are designed by human conventions and rules of logic which are distinctively different from the chemical and engineering principles governing road construction. In the second place, a focal inspection of the "reality" of the map (i.e., lines on a sheet of paper) is distinctly different from a focal inspection of the "reality" of the road (i.e., a band of asphalt with scattered potholes). Finally, when maps are in use, the lines on the map function subsidiarily as clues which enter into the focal intent (namely, to get to the address in question).
(c) Maps, like theories, all have a limited scope of application. Each serves to integrate certain clues while leaving the driver entirely blind to others. Thus a truck driver hauling an extra-wide or an extra-high load needs a specialized map designed for his specialized need. In parallel fashion, theories of chemical valence are very helpful in predetermining what substances might combine and in what proportions; yet, such theories are quite blind to melting points or to neutron scattering or to such an everyday phenomenon as color. As a result, a scientist has to cultivate the skill of rightly selecting the "map" which fits the phenomenon under investigation.

Map-reading is different from theory-using in a decisively important aspect. Map-readers can always dispense with their maps and drive their cars somewhat successfully using visible landmarks to guide their conduct. Theory-users can never do this. All "observing" in science is "theoretically informed observing." In consequence, every time a technician takes a voltmeter and begins to use it to trouble-shoot an electronic circuit which is



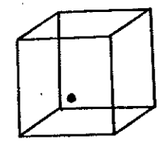
malfunctioning, he cannot even begin to meaningfully connect his meter to the circuit unless he has first gained an theoretically informed perception of how the maze of parts before him provides a nexus of functionally interrelated electronic pathways. In this regard, Einstein is quite correct: "Whether you can observe a thing or not depends on the theory which you use. It is the theory which decides what can be observed."

The parallelism between maps and theories is defective in yet another way. Maps can always be suspected as merely summarizing, in codified form, an immense amount of empirical data pertaining to the length and disposition of streets relative to each other. As a result, they can, in principle, be tested exhaustively (e.g., by driving to unknown addresses in every part of town). Theories, in contrast, do sometimes summarize some limited data but the integrative meanings that they offer always outstrip the given observational data and, in principle, an exhaustive testing is not only impossible but not even desirable (since it would be a routine waste of time).

Finally, maps differ from theories relative to the degree to which they exhibit a "surplus of meaning" (Brennan:151) or "prophetic powers" (PK:5). Maps have a well-defined capacity to lead to exploration and discovery. As an example, consider how a map-reader can easily determine a novel alternative route to his or her destination when a known route is blocked by fire trucks. Theories, in contrast, exhibit a more complex relation to a deeper reality and, as a consequence, their capacity to lead to exploration and discovery is generally much more complex and much more rewarding. Consider, for example, how astronomers were aware of perturbations (i.e., periodic straying) in the orbits of the outer planets for sixty years before Leverrier finally recognized that these minor discrepancies from the predicted Newtonian orbits could be used to predict theoretically the size and orbit of "a hitherto unsighted planet." Using the calculations of Leverrier, Galle in 1846 successfully sighted and tracked the new planet, which came to be called "Neptune." Prior to this, however, "Neptune" had been sighted by numerous observatories, but it had been mistakenly classified as a star. Galle was able to recognize "Neptune" for what it really was only because the prophetic explorations of Leverrier had altered his perceptions of what it was that he was looking for (Polanyi, 1926:8). In the end, therefore, it becomes apparent that map-reading can serve only to approximate the processes involving the use of theories by scientists.

## C. HOW PRESENT INTELLECTUAL SATISFACTION RESTRICTS PIONEERING EXPLORATIONS

Once a given recognition is developed, it positively impedes an alternative. Polanyi made use of simple Gestalt experiments to demonstrate this. For example, when the edges of two partially overlapping squares are joined with straight lines (as shown), bodily enhancement quickly recognizes the design as that of a transparent cube. The corner with the heavy dot appears either on the forward or the rear



surface. In order to perceive the cube in its alternate mode, one must look away for a while or blink one's eyes. In a parallel way, the Ptolemaic paradigm positively integrated the clues offered by the planetary tables and positively impeded any alternate. In this case, however, months are required to digest the sophisticated studies in spherical geometry and Aristotelian metaphysics which form the foundations for a mental comprehension of the Ptolemaic paradigm. During this process, one reproduces within oneself in a shortened period of time the very enhancement of one's intellectual powers which greeted Ptolemy when he first made his discovery. At the same time, one has vicariously tasted the intellectual satisfaction which surrounds the Ptolemaic system as a resolution to the puzzling movement of the planets. In the end, therefore, one is intellectually committed by virtue of the intellectual satisfaction which one feels when one reenters into the problematic data and, almost immediately, senses the satisfaction of the intellectual solution that one knows so well.

Now, to upset this tacitly binding intellectual vision, one has to provide an alternative vision which overreaches the current one in terms of its inherent intellectual satisfaction. To do this, one needs more than to turn one's mind away or to blink, for one's tacit powers have been stubbornly programmed over months and, all things being equal, months would be required to undo them. But commitments are not undone directly! Both Kuhn and Polanyi are keenly aware of this.

But commitments can be weakened. And, at this point, Kuhn is our best guide because he is rightly aware that the first and necessary ingredient for discovery is that some of the members of the community are dissatisfied that the paradigm in question does not predict with sufficient accuracy the planetary locations. This "slippage" between prediction and observation must, in Kuhn's view, even generate a "crisis" before commitment to the prevailing paradigm is sufficiently shaken. Once the "crisis" is in place and groping for a more satisfactory alternative is evoked, then Polanyi is our best guide. Guiding intuitions insure that this groping is not entirely random (i.e., trying everything which is imaginable). Meanwhile, heightened standards insure that nothing less than a <u>better</u> solution will be allowed to count as <u>an</u> alternative.

In the end, the discovery process itself stands as a sober witness that a rigorous and prolonged initiation into science does not so absolutely condition one's knowing powers as to render them immune to perceiving or thinking anything else for the duration of one's life. Moreover, the fact that scientists do change their minds and do accept what they themselves did not discover stands as a witness to the fact that the community of scientists has the practical art of tempering the enforcement of conformity with the inducement to dissent.

### D. NEW COMMITMENTS ARE EMBRACED DUE TO THEIR SUPERIOR SATISFACTION

When Copernicus first accredited his solution, it must be granted that this was because the intellectual satisfaction that it



afforded far outweighed the satisfaction afforded by his former commitment to the Ptolemaic system. Kuhn's analysis in <u>The Copernican Revolution</u> brings this out quite clearly and is the better guide here. Polanyi asserted this initially in <u>Personal Knowledge</u>, but, in his later writings, he favored such troublesome concepts as "tacit knowledge of yet undiscovered things" (TD:23), "universal intent" (TD:78), and "gradient of understanding" (TD:81) -- notions which I have now come to regard as obscuring what he ought to have developed by way of affirming the <u>comparative intellectual satisfaction</u> which the pioneer uses to accredit his novel insights.

### E. HOW "TRUTH" AND "CONTACT WITH REALITY" ARE TO BE INTERPRETED IN SCIENCE

At the end of this endeavor, what sense does it make to speak of the pursuit of truth within a community which experiences a growth in understanding through intellectual revolutions?

(a) In the first place, truth needs to be recognized as a relational "act of assertion" (PK:255) which only finds itself correctly understood and evaluated by those who share the same community of inquiry. This is not to advocate pure relativism, for each one is bound to the truth by virtue of being bound to the operation of his/her particular body. From within the committed situation, Copernicus could rightly say, "Here I stand. I can do no other."
(b) When Copernicus published his theory of the universe, he fully expected that those who shared his "crisis" situation would find the same superior intellectual satisfaction within his system that he himself had found. He had to acknowledge, however, that his system would be considered as "absurd . . . by those who know that the opinion that the Earth rests immovable in the middle of the heavens . . . had been confirmed by the judgment of many ages" (<u>De Revolutionibus</u>, preface). Meanwhile, it would hardly do to have Copernicus label his former views as "entirely false," since it was only by virtue of his commitment to the Ptolemaic system that he was set upon a course to remedy its deficiencies.
(c) Sometimes a new theory has clear advantages in terms of its actual or potential scope of application. Sometimes pragmatic advantages clearly decide for one theory in opposition to a contender. In the case of the Copernican system, however, no such evident advantages were forthcoming. As a result, aesthetic appeals became dominant.
(d) Even aesthetic standards maintained within a convivial community of scientists, however, undergo progressive transformation within the dynamics of history. Those who initially were converted over to the Copernican system, it will be remembered, did so with the understanding that the new system retained the aesthetic gratification of accounting for the eternal motion of the planets in terms of epicycles which featured circular movement at a uniform speed. The aesthetic gratification of Copernicus' contemporaries would hardly serve to accredit Kepler theories which came later. Within the scientific enterprise, aesthetic standards of one generation serve to accredit theories which, in the course of time, go on to modify the very aesthetic standards by which the next generation of scientists will decide what theories it will rely upon.
(e) In practice, every scientific apprentice regards the standards of

evaluation exhibited by his or her living masters as normative. The novice assimilates the current scientific worldview as to what is "there at hand" worthy of his attention and dedication even while the history of science clearly demonstrates that the current consensus in science was arrived at through historically and culturally determined processes in which human weaknesses, power politics, and ideological biases played some role. The presumption is that scientific knowledge has improved over the course of time since existing theories are credited with affording a superior understanding and experimental control than those upheld by past generations of scientists.

(f) The detection of anomalies (i.e., clearly defined areas wherein theoretical expectations do not match experimental observations) indicates to scientists that their theoretical "maps" are inadequate to and transcended by what is "there at hand." Kuhn is correct in noting that the intellectual dissatisfaction attendant upon the presence of stubborn anomalies leads to investigations directed toward altering the theoretical "maps" so as to remove these inadequacies. Since scientific theories are second-order intellectal integrations, no amount of direct inspection of the first-order observational data (e.g., the planetary tables) can serve to reveal how to correctly integrate the clues into a more satisfying whole. Hence, the investigator must deliberately grope toward reconfiguring his theoretical "map" until such time as it affords some expanded satisfaction at accounting for the troublesome data at hand.

(g) Polanyi can speak metaphorically of this groping process as being "guided by sensing the presence of a hidden reality" (TD:24); yet, it would do just as well to note that Copernicus was guided by a supreme confidence that the planetary configurations were obeying some mysterious systematic mathematical patterns which, if he applied himself to it, he would be able to discern just what they might be. In any case, both Polanyi and Kuhn agree that the advent of a discovery is confirmed by the intellectual or aesthetic satisfaction which relieves the straining or crisis which promoted and sustained the pioneering investigation both toward and beyond the many false leads which were set aside during the process of investigation.

(h) The increased intellectual satisfaction which a new discovery affords an investigator serves to transfer the interest and commitment from the old to the new system. The new paradigm appears, in the eyes of the pioneer, to hold more promise for unlocking yet other mysteries of what is "there at hand" independent of the knower. This prophetic promise may come to pass or, alternately, the whole new system may prove to be an illusory projection. The human dilemma is that only by yielding to a new commitment, by habitually dwelling within it, can an investigator establish its true worth.

> The anticipation of discovery, like discovery itself, may turn out to be a delusion. But it is futile to seek for strictly impersonal criteria of its validity . . . . (TD:25).



## CONCLUSION

Epistemologically speaking, one can erode confidence in our senses in the way that the British empiricists did during the last century. In the same way, one can erode trust in theories on the ground that, after all, they are humanly designed instruments which allow us to project the meaning of clues upon an extramental world which can be regarded as quite indifferent to such projected meanings. Nonetheless, despite the anthropomorphic content which is present in every enjoyment of a flower and in every investigation of the planetary orbits, the truth remains that sensory and intellectual perceptions routinely must rely upon the bodily enhancement of clues, the bodily integration of these clues, and the projecting of the consequent meaning-for-us into the locus where the clues originated. As long as we continue to be embodied spirits, we cannot know things as they are for themselves. We know all things as they are for us -- bound up within tacit skills which are historically, culturally, and organismically conditioned. As such, Polanyi and Kuhn are effective guides in allowing us to both accept the heuristic circularity of all knowing at the same time that the phenomenology of discovery is offered as the route to change and, within the human condition, to improve our knowledge. Improved knowledge enhances the human powers to be and to do. But here again, what is worth being and worth doing changes both for individuals and for societies. Hence, even the phenomenology of discovery as put forward in this paper only serves those who have been previously lured by Polanyi or by Kuhn into a mindset of being dissatisfied with the time-honored solutions to the time-honored questions surrounding human knowing.

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## THE *CONVIVIUM* GROUP

R.T.Allen

As our subscribers know, *Convivium* has merged with *Tradition and Discovery*. This does not mean that the *Convivium* Group has been disbanded and its activities have ceased. While we no longer produce *Convivium* as a separate journal, we continue to meet as a committee and to pursue our aim of encouraging interest in Polanyi and post-critical thinking, as we have done since the group was formed in 1974. All that has changed is that our members will receive *Tradition and Discovery*, incorporating *Convivium*. Thus there will still be two organisations, one in the USA and one in Britain, but now sharing the same journal.

Having edited and published *Convivium* almost single-handedly for nearly ten years, Joan Crewdson had to call it a day, and so, after asking for our subscribers' suggestions, the decision was taken to merge with *Tradition and Discovery*. (There was already a considerable overlap of content between the two journals). We all



owe a great deal to Joan for her work during her editorship in keeping *Convivium* alive. As her friends know, that work was done at the expense of completing The Book, which, we hope, she will now be able speedily to finish.

*The new arrangements for those who formerly subscribed to* Convivium.

We suggest that those of you living outside Europe who formerly subscribed to *Convivum* should now write to Professor Gelwick, if you have not already done so, and arrange a direct subscription with him for *Tradition and Discovery*. If you also wish to keep in touch with the continuing activities of the *Convivum* group, please let me know and I shall put your names on the mailing list for the Newsletter which we hope to be able to send out at least once a year.

I now co-ordinate matters for this side of the Atlantic: e.g. I receive subscriptions, items for publication, and distribute *Tradition and Discovery*.

You should already have received from me a copy of our questionaire. Can you please complete and return it, if you have not already done so. We are especially looking for people willing and able to referee articles. As before, we still need articles, reviews, notes and news, for *Tradition and Discovery* and for our own Newsletter. We also need more subscribers. I have a short leaflet which I can send to you for you to distribute to friends, at conferences, among your colleagues, and so on. Please write to me for copies.

We hope to organise a conference to mark Polanyi's centenary in 1991, and welcome suggestions as to place and speakers.

# Personal Knowledge in Perspective: A Reply to R.T. Allen's Questions

S. Palmquist

The October 1987 issue of **Convivium** (#25, pp.48-54) contains an article by R.T. Allen entitled "Polanyi and Truth" (hereafter PT), in which the author claims to "take up the challenge posed by Mr. S. Palmquist's 'A Kantian Critique of Polanyi's "Post-Critical Philosophy"' (**Convivium**, #24, March 1987, pp.1-11)." In that article (hereafter KCP) I intended to "use Kant's philosophy as a sounding board to help pinpoint some unfortunate misunderstandings contained in PK (KCP, 2). I presupposed, for the purpose of that rather modest task, an interpretation of Kant's philosophy which I had developed in full elsewhere. In deference to any readers who questioned or failed to understand this interpretation as summarized in KCP, I referred in the footnotes to seven of the articles I have written in its defense (see KCP, 10-11).

Mr. Allen states at the outset of PT that "I shall not comment upon Kant but shall try to clarify what Polanyi said" (PT, 48). He does this by discussing seven of the "problems" which KCP raised about Polanyi's position. In the course of his discussion he addresses a number of questions directly to me and calls for a public clarification of my position. I will do my best in the present article to respond to Allen's queries. However, I must make quite clear at the outset that he has to a certain extent asked for the impossible. KCP was openly and explicitly based upon Kant's critical philosophy, not on Polanyi's alleged post-critical philosophy. A full appreciation of the weight of my argument therefore requires some understanding of Kant. The role of Kant's ideas in my critique of Polanyi is not an optional extra that can be "bracketed out," even for the purposes of a reply. Such an illegitimate supposition is at the heart of my most weighty criticism of the very "post-critical" method which Polanyi and his followers advocate: it is the (quasi-positivist) supposition that we can go beyond something or someone merely by ignoring it (or them). Saying "I'm going to object to a Kantian critique of x without mentioning Kant" is like trying to explain our knowledge of objects without ever mentioning the participation of the subjects -- and this is something which neither Kant nor Polanyi would condone! My suggestion to Mr. Allen, then, is that if he finds my criticisms of Polanyi difficult to understand, he should read my published articles (offprints are available upon request). This is particularly important because in the remainder of this article I will be unable (given the aforementioned intentions of KCP) to follow his lead; although I will concentrate on clarifying my attitude towards Polanyi, I will again be unable to do so without making some reference to Kant. The following comments correspond to Allen's seven numbered sections (1-4 and 6-8; no section 5 appears in PT).

1. In KCP 2-3 I criticize Polanyi for failing to make an adequate distinction between "I believe p" and "p is true." I suggest that what is missing in his account is the recognition that, as Kant argued, objective criteria for truth do not preclude, but rather make possible, our



personal (i.e., empirical) involvement in knowledge. Allen addresses this issue by noting the importance of recognizing "the difference between the abstract distinction between...truth and error, and the application of that distinction to oneself" (PT, 48). Against Russell, Polanyi argues (according to Allen) "that science aims at a reality beyond itself, and...that our beliefs are (or should be) anchored by a commitment to a reality beyond them" (PT, 48). I quite agree with Allen that this marks an advance over the two alternatives he cites: "all denials of the possibility of truth and...all 'Objectivist' claims that truth can be impersonally attained...without the exercise of our (largely tacit) powers of judgment and decision" (PT, 48). However, this in no way precludes or goes beyond Kant's position. On the contrary, a Kantian reference to non-empirical objective criteria is the only way such a position can be upheld (consistently). Allen is right: Polanyi does say that science aims at a transcendent reality, and that beliefs are all grounded in our faith in such a reality. My point in KCP was that Kant says much the same thing, only he goes a step further! Polanyi's position just cannot stand on its own. If he says that science can actually reach its "aim," that we can actually attain reliable knowledge of reality "as it is" (PT, 49), then he would land right in Russell's lap. But Allen rightly sees that this is not an adequate interpretation of Polanyi, inasmuch as I can never compare my own beliefs "with 'facts' which I do not believe to be facts" (PT, 49). On the other hand -- the hand Allen decides to ignore in PT, but to which KCP was devoted to elaborating -- if Polanyi admits to the impossibility of ever "knowing" this transcendent reality, then he is still left with the problem of distinguishing between knowledge (or truth) and belief. Allen says nothing (in section 1 of PT) about this issue.

Kant's solution is that "reality" can be viewed in two distinct ways: if we view reality empirically, then we can (and do) attain knowledge of it, knowledge which we can distinguish from mere opinions by its agreement with certain transcendental conditions (or "criteria for truth"); if we view reality transcendentally, then it is unknowable, except that such a point of view enables us to establish just what the objective criteria for empirical knowledge are. (Note that these criteria, though "objective" when viewed empirically, are actually subjective -- perhaps we could even say personal -- when viewed transcendentally).

2. Allen thinks Polanyi would probably admit "that some of the conditions (for truth, i.e., for empirical knowledge) can be outlined," but not all of them (PT, 49). This is unobjectionable (see e.g., PK, ch.5). But Polanyi's "conditions" are one and all empirical, and as such they miss the whole point of Kant's transcendental revolution: no set of empirical criteria, no matter how important a role they happen to play in the way we actually gain knowledge, can possible define how we must gain knowledge. Allen also points out that Polanyi would insist that objective (impersonal) knowledge is impossible because there is always, in every act of knowing, at least an "implicit exercise of faith," and because regarding something as true requires an explicit commitment to some system of beliefs (PT, 49). Once again, Polanyi and Allen fail to recognize the difference between two quite distinct types of belief and commitment. In fact, the very examples Allen raises in objection to the notion of objective knowledge can illustrate the distinction between the

transcendental and empirical perspectives: "In using a calculator, computer or marking scheme, I commit myself to its truth....Of course, I can operate it mechanically and impersonally but not in order to make correct calculation, draw correct inferences and award valid marks. Once I do that, I personally...commit myself..." (PT, 50). But the first commitment (i.e., to the system -- e.g., the marking scheme) is transcendental: without that commitment there wouldn't be any marks at all, to say nothing of valid marks. Such a commitment is a necessary condition for the possibility of using the marking scheme, just as space, time and the categories are for Kant necessary conditions for the possibility of experience (and hence, transcendental). But the function of my transcendental faith in such a system is to create a situation in which it is not just possible, but proper to view the results "mechanically" or "impersonally," insofar as their empirical validity is concerned. Everyone who has ever used a calculator would surely agree, upon serious reflection, that there is nothing morally, scientifically, or even epistemologically wrong with approaching it with explicitly mechanical intentions. After all, that's what it's for! Our faith in its accuracy is a transcendental presupposition of ever using it, not an empirically significant "fact" about how and/or why it works. (Indeed, many a psychiatrist would be interested in talking to anyone who honestly believes that the correctness of the calculations done on a hand calculator are correct primarily because of the personal relationship which the person establishes with it! If this is not the sort of thing Polanyi means by "personal," then he should be more careful in narrowing down his use of that term -- or perhaps just choose a more suitable one). This is the point being made in KCP: commitment to a system is fundamentally different from commitment to a fact implied by that system. The former is transcendental (and in a sense "personal"); the latter is empirical (and in an equally legitimate sense "impersonal," though of course it too is personal insofar as it is dependent upon a transcendental foundation).

I trust this answers Allen's main query in section 2 of PT. With respect to the three specific questions he asks at the end of that section, I will add the following remarks: (a) I hope it is now clear that I do not think Polanyi is wrong in claiming that many judgments are personal. Rather, he is wrong in not distinguishing between those personal judgments which are epistemologically significant (i.e., transcendental) and those which are not (i.e., those which are only empirically personal, and therefore irrelevant to the necessary conditions for knowledge). The fact that a scientist has to make numerous decisions in performing any experiment, for example, is certainly true. But for a good scientist such decisions will be irrelevant to the validity of the outcome (though, of course, if he had not made them, he would not have discovered that particular objective fact). One obvious proof of this is that other scientists, with other personal decisions, hopes, fears, etc., should be able to reach the same conclusions as to the validity of the purported fact. (b) Once again, Polanyi is very right about tacit knowledge, etc.. But he is wrong to think that such (empirically) personal elements have anything to do with constituting authentically scientific knowledge; they may indeed regulate how we perceive such knowledge, but they do not define what it must be -- that can be done only by transcendental conditions. (c) For anyone familiar with Kant, it goes without saying that "the authentic examples of strict criteria for knowledge" (PT, 50) are space, time and the twelve



categories, united together by means of a transcendental synthesis of intuitions and concepts. (Incidentally, such criteria do not "relieve us from all responsibility for the holding of our beliefs" (PK, 323, quoted in PT, 52); rather, they merely enable us to view that responsibility from its proper perspective).

3. Allen points out, quite rightly, that for Polanyi a phrase such as "personal meaning" is "almost a tautology" because "all knowing is personal, and is accomplished by the 'personal coefficient'" (PT, 50). As a result Allen is unable to understand how the terms "objective meaning" or "impersonal meaning," as used in KCP, 3, could make any sense. First, we must remember that KCP is a Kantian critique of Polanyi, not a commentary on Polanyi's position. This then frees us to adopt Kant's distinctions, such as that between transcendental and empirical. Even though Kant's "transcendental conditions" are not the same as Polanyi's "personal coefficient," they do serve a similar function (viz., that of defining fundamental presuppositions). The key difference (aside from Polanyi's above-mentioned failure to distinguish between empirical and transcendental types of personal involvement) is that Polanyi refuses to admit that the epistemologically interesting fact about the "personal coefficient" is that is enables us to act as if it were not always present. That is, the personal aspect of our knowledge -- in particular, our set of personal (cf., transcendental) presuppositions -- is not always (and should not always be) the focus of our attention, nor is it always the key factor in what justifies us in regarding a given statement as true. Thus, when I imply in KCP, 3 that the physicist's description of a grandfather clock is "objective" in a way that, for example, an antique dealer's description might not be, I am not denying that the physicist's knowledge of the clock also has a "personal" element. Nor am I denying Polanyi's interesting point about the importance of levels (as Allen thinks I am -- see the last paragraph of section 3 of PT). Rather, I am claiming that what the physicist does say about the clock, however inadequate it is for a complete description) will be true (or false) regardless of whether the clock was made by his own grandfather, whereas we might not be so sure about this in the case of the antique dealer. The physicist's knowledge of the clock obviously has a meaning -- indeed, a very clear, mechanical meaning -- but the meanings of the statements he makes about the clock are not validated or invalidated by the personal element which inevitably plays a part in the physicist's knowledge. Thus it can be said to have an "objective meaning" (in a non-Polanyian sense of the word). As I defined it in KCP, 10, objectivity in this sense implies "true for everyone."

Allen defines "meaning" in PT, 51, as something which is "by or for consciousness of some sort." Unfortunately, he does not provide a corresponding definition of "personal;" rather, he seems to imply that the same phrase can define both words. If "personal" means "by or for consciousness," then obviously there can be no impersonal knowledge, since knowledge is expressed in propositions, which are always intended for conscious use. Polanyi clearly has something like this is mind. I would reject it, however, because of its misleading implications. Do we really want to say, for example, that logical truth is personal? That would imply (to anyone with little or no expertise in Polanyian thought) that a logical truth is valid because we believe it is valid. Now in one sense this is admittedly true. We believe (i.e., commit ourselves in an

act of transcendental faith in the supposition) that certain fundamental principles, such as the laws of identity and noncontradiction, are true. There is nothing that forces us to accept them (except perhaps that we'd have a hard time thinking without doing so), so in this sense they are personal. Yet when we examine a particular logical truth, such as "All bachelors are unmarried," do we really want to claim that we accept the truth of this statement because of our own personal involvement with it? No. If we know what the words mean, then there is no need to go around interviewing as many bachelors as we can to see if they all turn out to be unmarried: we can be certain of its truth without taking into consideration anything else which could be called "personal" (i.e., anything besides our understanding of the words and our faith in logical structures). Such a statement therefore has an "objective meaning" because it is something which is "by or for a consciousness," and it has an "objective meaning" because its validity is in no way dependent upon which consciousness it is presented to (assuming, of course, acceptance of the presuppositions -- unconscious for most people -- of logical systems as such).

4. Allen reminds us that Polanyi's use of the word "personal" is an attempt to overcome the illegitimate dichotomy between "objective" and "subjective," viewed as exclusive categories (PT, 51; see also PK, 300, quoted in KCP, 4), and asks whether or not I accept such a distinction. Yes and no. I certainly reject the validity of any attempt to do away with these categories altogether by blurring them beyond any intelligible recognition. So in that sense I accept the categories. However, with Kant and Polanyi, I strongly disapprove of the belief that this categorization is exclusive. For Kant, empirical objectivity is defined in terms of its participation in transcendental subjectivity; the two are inextricably intertwined, and are both distinguished from transcendental objectivity (which is an impossible ideal) and empirical subjectivity (which is the merely contingent element in our experience). (Ironically, Allen himself employs a fairly exclusive subjective-objective dichotomy in PT, 52)!

The word "objective" implies for Allen a kind of guarantee of truth. Thus he says in PT, 51: "There is nothing that guarantees that we are correct in what we believe and judge and do." But I have argued above (and in KCP) that this just isn't true! The thing that guarantees that the calculations we make on our hand calculator are correct, or that the particular marks on each exam paper are fair, or that this particular bachelor is unmarried, is our commitment to, or faith in, some higher-level principle. These principles, even though they often, or perhaps always, have a personal character, nevertheless define for us what we can in general regard as objectively true. Without adopting some view of this sort -- as Polanyi and Allen insist we must not -- I still (even after consulting the index to PK, as Allen suggests!) cannot find any convincing explanation (given the ambiguous ubiquity of Polanyi's understanding of the 'personal coefficient') for why Polanyi feels justified in rejecting alchemy and astrology with such brash confidence. The most I can see is that Polanyi has his own personal reasons; but how can these constrain anyone else to agree? This would not be problematic if it were not for the fact that Polanyi treats such matters as if every rational being should agree with such a rejection.



6. Allen excuses Polanyi's emphasis on natural science and empirical psychology and his consequent neglect of transcendental inquiries by claiming that "Polanyi was describing science from within, from within the commitment situation" (PT, 52). Fair enough. But in that case Polanyi should not have claimed (e.g., in the subtitle of PK) to be doing philosophy and, in particular, should not have claimed for his conclusions the kind of universal validity that only transcendental enquiry can establish. Allen goes on to assert that Polanyi "rightly" rejected "any attempt at transcendental critique," because "we cannot but start with acceptance of the facts established by science" (PT, 53). Unfortunately, he never explains why this is true. Instead, he quotes a naive "standard objection to Kantian critique," namely "that you cannot validate knowing without first knowing something of what you seek to validate" (PT, 53) -- a criticism which could only hold weight for someone who has not read (or at least not understood) the first two paragraphs of the Introduction to Kant's first Critique!

Allen concludes section 6 with a statement which unwittingly backs up my charge in KCP that PK adopts a kind of "personal positivism." He insists that Polanyi would reject "any 'critical,' 'justificatory' or 'foundational' ambition" (PT, 53); yet Polanyi himself attempts to provide such a justification in the form of a "post-critical" (personal) foundation for knowledge -- a predetermined prejudice not unlike the logical positivist's rejection of metaphysics by means of the (ironically, metaphysical) principle of verification!

7. By now I hope it is clear that by "objective knowledge" I do not mean "knowledge without personal involvement," as Allen assumes in PT, 53. Nor do I mean "knowledge without any possibility of error" (PT, 54). Rather, it is knowledge considered apart from that which our personal involvement supplies.

Allen complains (PT, 54) about my charge that Polanyi's "critique of doubt" ends up merely defending "a newfangled version of Cartesian doubt" (KCP, 9). Nevertheless, Allen himself ends up implicitly substantiating my point. I did not say Polanyi adopts the same type of doubt, but a new version -- one which is in fact more radical in some respects. Allen supports this when he affirms that, for Polanyi, "we have just got to accept the fact that we could...be mistaken, and not allow this in general to unsettle us." Yet it is unsettling to the philosopher to be told that nothing can be known for certain. Rather than passively and dogmatically doubting that certainty can ever be reached (a la Polanyi), Descartes adopted an active method of doubt as an attempt (though perhaps unsuccessful) to find something which is certain. By contrast, Kant's philosophy was, in part, an explicitly anti-Cartesian attempt to settle this quandary, without appealing to the dubious method of doubt.

8. I was rather surprised to find that Mr. Allen is unable to remember any of the occasions in PK in which Polanyi says that his ideas should be read as his own opinions; perhaps it is time he refreshed his memory by rereading PK. Of course, I fully agree that Polanyi's use of "I" is intended to be read as an "invitation to the reader to verify (Polanyi's personal position) in his own experience" (PT, 54). Nevertheless, his usage still exemplifies his tendency to shy away from the universal in favour of the personal.

## The Janowice Conference
October 1-5, 1988
W. T. Scott

An International Seminar on the topic "Popper, Polanyi, and the Notion of Rationality" took place in Janowice, Poland, near Krakow, October 1-5, 1988. It was organized by a committee of four Krakow philosophers, J. Misiek, Z. Piatek, J. Plazowski and J. Wolenski, and brought together 21 persons. Thirteen Poles attended, two Soviets, two Americans, and one each from India, Italy, Korea, and Turkey.

The aim of the conference was to evaluate the new perspective in the philosophy of science created by the work of Michael Polanyi in contrast to the traditional style of thought represented at its best by Karl Popper. The hope was to show that Polanyi's ideas can be instrumental in solving some notorious problems, particularly including the problem of rationality. Of the 13 papers presented, some attempted to use Polanyi's inspiration, and the others discussed particular problems in the traditional approach. Three participants were working physicists and six participants graduated in physics before switching to philosophy.

The lovely nineteenth-century marble-floored manor house near the little village of Janowice was a charming and comfortable place for the leisurely conference. With the presentations spread out over five days, there was plenty of time for conversation and walking through the sunny countryside and for study and rest. The University authorities who owned the building and provided the room and board without charge to the attenders deserve the thanks of all concerned.

### The List of Participants

1. Adelino Cattani (Italy)
2. Jan Czerniawski (Krakow, Poland)
3. Teresa Grabinska (Wroclaw, Poland)
4. Ahmet Inam (Ankara, Turkey)
5. Alexander Ivin (Moskow, USSR)
6. Wladyslaw Krajewski (Warsaw, Poland)
7. Jozef Misiek (Krakow, Poland)
8. Prabir Mitra (Krakow, Poland and India)
9. Zdzislawa Piatek (Krakow, Poland)
10. Igor Petroff (Moskow, USSR)
11. Tomasz Placek (Krakow, Poland)
12. Janusz Plazowski (Krakow, Poland)
13. William Taussig Scott (Nevada, USA)
14. Sang Yong Song (Korea)
15. Andrzej Staruszkiewicz (Krakow, Poland)
16. Klemens Szaniawski (Warsaw, Poland)
17. Barbara Szlabowska (Gdansk, Poland)
18. Jan Tarski (Berkeley, USA)
19. Jan Wolenski (Krakow, Poland)
20. Miroslaw Zabierowski (Wroclaw, Poland)
21. Jozef Zycinski (Krakow, Poland)



## Abstracts

W. T. Scott (Reno, Nevada, USA), in "On Polanyi's Notion of Rationality", surveyed Polanyi's ideas on rationality in terms of Gestalt perception and the derivative concepts of embodiment, commitment, and trust, the central idea being belief in contacts with reality. The materialistic conceptions of deductivism and determinism are of limited value, and those of positivism and reductionism are wrong. Polanyi's view of stratification justifies the independent existence of the several sciences and a corresponding variety of rationalities. Overlapping judgments throughout science create a single great web of scientific knowledge, and scientific discovery generally consists of filling in gaps at the growing edge of the web in a rational fashion.

The paper was concluded with an account of Polanyi's development of the basis for chemical reaction rate theory, primarily in terms of a picture of the mechanism whereby reactions occur and some indication how approximate rates are found from this picture. Saturday evening.

J. Zycinski (Krakow, Poland), in "Tacit Knowing and the Rationality of Science," defended the search for rationality in science from the many efforts to treat scientific claims as relative to the social context. He discussed in detail the way in which the inarticulate beliefs that take part in tacit knowing form part of Polanyi's own critical realism. Sunday afternoon.

A. Inam (Ankara, Turkey), in "On the Character of Tacit Rationality," considered whether theories about rationality in science could be themselves rational, and argued that they must be non-rational. He spoke of limits of the logical extent of any theory and the value of the criticism of one theory by another in terms of illumination rather than inference. Several maxims were suggested for seeking more light on any given theory. Sunday afternoon.

J. Wolenski (Krakow, Poland), in "In Defense of Induction," gave a defense in Carnap's spirit of induction in opposition to Popper's position, combining standard logical arguments with some others borrowed from metamathematics. Monday morning.

K. Szaniawski (Warsaw, Poland), in "Formal and Substantial Rationality," discussed the many different representations of rationality among philosophers and scientists which tend to be formally similar but to differ widely in substance. The speaker restricted himself to rational believing as contrasted with rational action, and in terms of classification rather than the metric of probability. Three properties are needed for rational acceptance of a belief: (A) articulation, (B) consistency and (C) validation. (B) is formal and easy, (A) and (C) are

controversial; different philosophies have different procedures, but in practice we accept on trust by personal decision. Monday morning.

J. Misiek (Krakow, Poland), in "Einstein's Method of Discovery," discussed Einstein's method of discovery that involves seeking to develop the inner perfection of a theory before any substantial evidence was available for the innovation. According to the speaker Einstein practiced his method from the very beginning of his research activity but attempted its description only in his later years. The use of this method clearly presupposes M. Polanyi's distinction between knowledge and tacit knowledge. In the technical part of his prsentation J. Misiek trid to explain how Einstein's method worked in the course of discovery of Special Relativity. Monday afternoon.

W. Krajewski (Warsaw, Poland), in "Rationality of Science and Irrationality of Art," discussed the topic in terms of the intersubjective criteria for rationality: commmunicability and testability. These do not apply to works of art, though the arts do try to convince and enlighten us concerning human motives and moral dilemmas. Comparisons were made in terms of what is advantageous and what disadvantageous for science and art. A comment was made on the central role of the person in art as compared to the role of the universal in science. Monday afternoon.

J. Plazowski (Krakow, Poland), in "The Mirage of Rationality," discussed the mirage of rationality in reference to the metaphysical outlook of rationalists from medieval times to the present. He suggested a Freudian scheme for science: Popper's third world of knowledge and culture represents the rational "ego" of science, Polanyi's tacit knowledge constitutes its "subconscious," and the metaphysical conception of rationality with its background of creativity and order represents the "super ego". Tuesday morning.

T. Placek (Krakow, Poland), in "The Myth of Rationality Versus the Quest for Rationality," discussed M. Polanyi's philosophy in the context of the ancient myth of rationality (logos). He was able to draw some similarities between them. For instance, both philosophical theories maintain the personal character of rationality and also its objectivity. Going further the speaker tried to answer the question to what extent Polanyi's philosophy could be seen as a solution of the contemporary problem of rationality. Tuesday morning.

W. T. Scott (Reno, Nevada, USA), in "Ongoing Research Program on the Problem of How Rain Happens," presented an account of the study of how warm rain occurs as an example of an ongoing research program with successes and difficulties. In contrast to



Lakatos' view, the program coheres out of attention to the reality of entities and processes now known to exist rather than to propositionally formulated theories under test. Verified data were described on the rate of condensation growth of cloud droplets, on the rate by which larger droplets fall and collect smaller ones, and on the thermodynamics of cumulus clouds that prove the mixing of dry air into the clouds. Experimental evidence thus provides verification of formulas for the boundary conditions for the rain theory. An attempt at an analytic mathematical theory was described that predicted rain in an expected way but used inaccurate formulas. Accurate computer programs used on the same background failed to give rain production, so that substantial theory modification became necessary. The only alternative appears to be drying and recondensation cycles caused by turbulence that could give the necessary widening of the droplet distribution. The present state is of a theory assuming an unverified mixing rate that even if producing verifiable amounts of rain remains uncorroborated in the absence of a believable and verifiable mixing mechanism. The research program hangs together in terms of many established facts. Tuesday afternoon.

A. Cattani (Padova, Italy), in "Polanyi's Enthymematic Rationality," developed and illustrated a parallel between Polanyi's view of argument in which much is tacit, and the classical enthymeme of rhetorical argument which omits expressing a readily taken-for-granted premise or a conclusion that would be obvious to the reader. An example would be directing attention to a choice of a balance among the scientific values of accuracy, systematic relevance and intrinsic interest, or the insights behind a discovery. Scientific rationality is always only partially proved and generally seeks enthymematic expression in rhetorical form. Tuesday afternoon.

A. Ivin (Moscow, USSR), in "Universal and Local Rationality," gave an extensive analysis of types of rationality, putting the emphasis on rationality as a characteristic of scientific decision making rather than on particular features of theories. The focus was thus on the dynamics of science as contrasted with a static view. What is rational is a matter of historical relativity: which principal traditions are used, what milieu is involved. The tacit knowing of medieval scholastics is different from that of the classical period and from that of modern science; Ivin said that in any case the tacit bears 9/10 of the influence on choice, and made the interesting comment that scholasticism has been present in modern times with Hitler and Stalin. Logic is the hard core of rationality, but the important criterion is whether the concept of making the best rational choice is reducible to the concept of truth. Persons like Kuhn who do not connect rationality and truth may be called irrationalists. While rationality is an aspect of truth, it is

not the same thing as the logical foundation of a body of truth. To be rational is to belong to one's milieu and share its non-explicit knowledge. Other components of rational choice are the tacit knowledge of the scientific community, interdisciplinary principles, and the requirements of definite paradigms or of individual theories. The concept of rationality in the ends-means relation can be applied to the character of the end or to the best choice of means. Wednesday morning.

Z. Piatek (Krakow, Poland), in "What Does It Mean That Darwinism is a Metaphysical Research Program?" discussed the view of Karl Popper that Darwinism is metaphysical because unfalsifiable. If life on Mars were to consist only of three species of bacteria, it would falsify the theory because of the absence of the residues of millions of years that the theory says should exist; if the theory were tautological biologists would not knowingly deal in trivia in disrespect to their intelligence; the theory would not have gone through its extensive modifications; it explains far more than it predicts contrary to Popper's view of explanation---including its strictly creative character. Popper's insistence on treating competing theories cuts off study of the many implications of the theory itself. Wednesday morning.

## Harry Prosch's MODERNISM

Maben Walter Poirier

Those of us who have been following the controversy which has developed amongst Michael Polanyi's followers since the publication of Meaning in 1975 (a work produced by Harry Prosch, working in close co-operation with Michael Polanyi, and which made extensive use of material originally written by Polanyi) have been aware for some time that it inevitably would require of the disputants that they come to some conclusion about precisely who Michael Polanyi was, and what were his overall intentions in developing his epistemology. Hence, it does not come as a surprise to us that Harry Prosch should want to present us with his novel and well articulated picture of Michael Polanyi as evidence for his particular point of view, and in order to counter the emerging and more orthodox portrait being painted by his opponents. The conflict between these two pictures of Polanyi, it will be recalled, developed out of what some of Polanyi's disciples perceived to be a shift in the direction of Polanyi's thinking in Meaning relating to the question of the reality of the object known in the arts, religion and humanities. This disagreement was broached in a systematic fashion in a series of contradictory exchanges between the philosopher Harry Prosch, and the theologian Richard Gelwick. Parenthetically, it should perhaps be noted here that neither Prosch



nor Gelwick (and this is somewhat curious in the case of the latter) admit that there have been any changes made to Polanyi's thinking as a result of the publication of Meaning. Rather, it is the belief of each that the other has always been misinformed about the direction of Polanyi's argument (including the argument made in Meaning). Polanyi himself is seen to be consistent in all of his writings. Indeed, both understand Polanyi never to have deviated from his initial intention, and hence from their respective interpretations of his work.

Prosch, representing one side in the debate, criticized Gelwick's work The Way of Discovery, in a review article appearing in the journal Ethics (January 1979), for, amongst other things, misunderstanding the substance of what Polanyi had to say ab initio about the nature of the subject matter of the arts, religion and the humanities. Gelwick, representing the other side, responded in an article in the theological journal Zygon (March 1982), reproaching Prosch for misinterpreting the entire character of Polanyi's epistemology as it bears on issues of a cultural and humanistic character. In brief, it was Prosch's contention that Polanyi attributed no real existence, that is to say, independence to the objects of knowledge in the fields of the arts, religion and the humanities. Rather, it was his view that the known is these three fields was, as far as Polanyi was concerned, a function of the imaginative and creative intelligence of the thinker. Gelwick, on the other hand, supported the opposite and, in some sense, more traditional point of view, which saw Polanyi extending his belief in the real existence of the object of knowledge in the natural sciences to the domain of the arts and the humanities. (The complete issue of Zygon, on this occasion, was devoted to articles on the thought of Michael Polanyi.) Also participating in this debate, although at a very respectable distance, was the great Polanyi interpreter, Marjorie Grene, as well as a number of other interested scholars. (Cf. also Journal of the British Society for Phenomenology, [October 1977].)

With these introductory observations in mind, one of the first things which needs to be stated is that Prosch's Michael Polanyi: A Critical Exposition is not a work that is suitable reading for the uninitiated reader. This is so for two reasons. First, this work assumes a thorough knowledge of and familiarity with Polanyi's thesis, in as much as it frequently explains the various elements of this theory of knowing in an abbreviated and abstract fashion, and with an emphasis and/or orientation which is hard to reconcile with Polanyi's (e.g., induction, objectivity). This, needless to say, may cause the untutored reader to misjudge what Polanyi is about. Second, it is a work which, despite Prosch's contrary claim, is not restricted to being descriptive of Michael Polanyi's thought. Frequently, Prosch embarks upon what can only be described here as a somewhat curious approach to the material, the result of which is that he situates Polanyi's thinking in a philosophical context which, in our view, is too modern. The overall effect of this is to make Polanyi seem at times not quite in "sync" with his writings.

Still, it must be acknowledged that Prosch's Michael Polanyi: A Critical Exposition is an ambitious undertaking in which the author seeks to demonstrate the correctness of his thesis about

Polanyi. The key to understanding this work in a critical manner rests with the approach which Prosch has adopted. The author has premised his work upon the belief that Polanyi saw his theory of knowing as a therapy for the serious disease that afflicts modern man. For this, the author is to be commended. Indeed this, in our estimation, is how Polanyi is to be understood -- namely, as a therapist. But, of course, it remains to be seen whether Prosch's Polanyi understands the pathology from which man suffers in the modern world in the manner in which Polanyi himself understood it, and whether he is up to the task which Michael Polanyi set himself. Unfortunately, it must be said that we think not, despite the fact that Prosch deftly leads us through what he thinks are the various stages of the Polanyian curative process in the hope that he who emerges will be restored to health.

Michael Polanyi: A Critical Exposition is divided into four parts entitled, respectively, Diagnosis, Prescription, Treatment, and Evaluation. In the three chapters of Part One, Prosch is concerned essentially to describe Polanyi's understanding of the psychic pathology that afflict contemporary man. We find the source of this pathological condition of the soul, Prosch and Polanyi tell us, in the history of modern thinking since the Enlightenment. Specifically, it is located in the growth of a form of corrosive skepticism which characterizes the modern era, and which in the end leads to nihilistic thinking. Prosch's development of this material, while somewhat condensed and reined in, follows closely, and perhaps too literally, Polanyi's words on the subject. In Part Two, Prosch gives us a highly personal account of Michael Polanyi's theory of knowing, which touches base with all of the aspects of the theory. It is frequently a particularly sensitive reading of Polanyi's theory, but it is also at times curiously off course. In Part Three, we are given an understanding of the implications of this theory of knowledge for the study of certain problem areas within various disciplines. In Part Four, Prosch is concerned with evaluating the importance of Polanyi's theory of personal knowledge. It is in this Part that Prosch speaks of Polanyi's abandonment of the standard which he set for himself in the investigation of the natural sciences when studying the arts, religion, and the humanities. Prosch refers to this as "Polanyi's Divarication." It is imperative for us to appreciate here that for Prosch this abandonment was not an unintended shift of direction in Polanyi's thinking. For Prosch, it is rather the case that from the start Polanyi always had this bifurcated understanding of how men know.

Since we cannot critically review all of the questions to which Prosch's work gives rise, let us focus our attention on three issues; a) induction, b) objectivity, and c) Polanyi's so-called "divarication."

Prosch's reading of Polanyi is frequently perplexing when seen from the perspective of one who adopts a more traditional understanding of the material. There is no doubt that one can find confirmation of, or support for, what Prosch says about certain aspects of Polanyi's thesis in the writings of Polanyi. However, frequently one must wrench a Polanyian argument out of context in order for it to say what Prosch claims it states. Indeed, it is



often the case that an aspect of Polanyi's thought which is viewed as pivotal by Prosch is seen as peripheral by Polanyi. This is not especially difficult to establish. In Part Two, which is divided into five chapters, Prosch is primarily interested in giving his readers an understanding of Polanyi's epistemology, and within the limits which he has chosen for himself, he has succeeded. However, throughout his exploration of the thesis, he attributes to Polanyi a concern for logic and the problem of induction, which, while important and perhaps even central to some aspects of Polanyi's thinking, was most certainly not the principle reason for which Polanyi sought to make known his theory of knowledge. In Chapter Four, entitled "A New Epistemology," for instance, Prosch reduces Polanyi's epistemology almost exclusively to an issue of induction and its attendant problems. "But, is this Polanyi?" we are inclined to ask. Was Polanyi driven to develop his epistemology as a result of a concern for the problem(s) posed by induction? Did he see his thought as an attempt to resolve the difficulties faced by the received-view in the area of induction? We think not. It should be noted that we are not claiming here that Prosch asserts that Polanyi was interested in induction in the way modern empiricists are interested in the issue. We are saying simply that in drawing attention to induction as an initial explanatory approach to Polanyi's epistemology, Prosch is inevitably deforming and limiting what he can propose as Polanyi's principal therapeutic concern, not to mention what Polanyi believed to have been the nature of the modern pathology. Furthermore, we must never forget that Polanyi was extremely critical of the received-view in all of its ramifications, and he ought not to be associated even inadvertently with it. On those occasions when Polanyi saw fit to speak of induction, it was almost always to condemn the received-view's fascination with and misinterpretation of the issue induction. Now, this is not to imply that Polanyi's theory of knowing does not bear on the issue of induction. It does. But it is not the aspect of his thought which most interested Polanyi, nor is it entirely fair to him to present his thought from this perspective. The feature of his theory which most intrigued him was the fact that all knowing is anchored in the subsidiary and the personal, and hence, that philosophical-psychology is more important than logic to the development of a credible theory of knowing. Indeed, the greatness of Polanyi, in our estimation, resides in the fact that he reminds us of the preeminence of ontology over epistemology. Since the time of Descartes, philosophers have, as a rule, given priority to epistemology. Michael Polanyi returns us to the ways of the ancients. He informs us that knowing depends upon being, and not just any being, but human being. What we know, and what we are capable of knowing, as well as how we know, is suffused with our way of being in the world, according to Polanyi. We cannot but conclude, therefore, that the problem which Polanyi sought to address was much more serious than the issue of induction (important as this issue may be), or any problem in logic. Unfortunately, in introducing us to Polanyi's thought by focusing on induction instead of the personal and psychological origin of knowing, Prosch has left himself open to the criticism which states that he misunderstands the severity of the disease which Polanyi's therapy sought to remedy.

The situation is much more serious with reference to the way in which Prosch chooses to treat Polanyi's interest in objectivity. On the subject of objectivity, Prosch appears to be of the belief that Polanyi frowned upon the possibility of our acquiring objective knowledge. Repeatedly, Prosch insists that Polanyi's theory of personal knowledge privileges a non-objective type of knowing (whatever that may be), which Prosch seems to feel is superior to objective knowledge. Although this is a view that is to be found throughout Prosch's work, the clearest statement of this matter is on p. 98, where we read: "...'personal knowledge' bridges the gap...between subjectivity and objectivity. There is no purely objective knowledge, because nothing can be called knowledge that is not personally accredited as knowledge." We, of course, agree that 'personally accredited knowledge' is important. In fact, it is central to Polanyi's thinking. But the question is: Is this entire statement consistent with Polanyi's position? Specifically, would Polanyi have said that his theory of knowledge is situated midway between subjectivity and objectivity, and mean what Prosch apparently means by these words? Would Polanyi have said that "[t]here is no purely objective knowledge," and meant that there is no objective knowledge as such, as Prosch seems to imply? As a statement of Polanyi's view on this question, this, we contend, is very misleading, and it will inevitably blunt the significance of Polanyi's contribution to the development of post-critical thinking. If Prosch is to describe Polanyi's theory of personal knowledge this way, little wonder is it that Polanyi's opponents are prepared to characterize him as a subjectivist. What Prosch should have said is that for Polanyi "there is no purely explicit knowledge." The important point which Prosch fails to note here is that the distinction which Polanyi drew between what is explicit and what is tacit in the knowing process is not equivalent to the distinction which Prosch makes between what is objective and what is subjective. Put very simply, for Polanyi, what is objective is not synonymous with what is explicit, as Prosch seems to assume, and what is subjective is not synonymous with what is tacit. The expressions tacit knowledge and explicit knowledge relate to how man experiences the activity of knowing, whereas the words objective and subjective bear on the question of where the content of our knowledge is deemed to reside -- outside the mind (extra-personally), or within the mind (intra-personally). Hence, it was conceivable for Polanyi that a man might have explicit knowledge of what is subjective, namely, inside the mind, and/or tacit knowledge of what exists objectively, namely, outside the mind. In fact, his claim was that scientists have tacit awarenesses and tacit knowledge of realities which exist objectively, and it is these awarenesses which bring about discoveries. Unfortunately, it seems that Prosch has confused these issues for his readers.

In our estimation, Prosch mistakenly uses the term "objective" in place of the words "solely explicit," "wholly distal" and/or "neutral." As a consequence, he frequently finds himself in the unenviable position of having to attack objective knowledge (which Polanyi never attacked) in the belief that this was Polanyi's target, in lieu of attacking epistemological neutralism and the modern belief in a completely distal knowledge, which was Polanyi's target. This distinction between "objective" and "neutral" as it



bears on Polanyi's thinking obviously is not of minor significance. It goes to the very heart of the issue of whether Prosch understands the nature and severity of the modern pathology that is nihilism -- the pathology which Prosch correctly claims Polanyi sought to remedy. We recall that the modern ailment, for Michael Polanyi, has its origin in man's recent rejection of self as the sensorium of truth, which, amongst other things, is a crucial element in the knowing process. In fact, it is this refusal to acknowledge the significance of self which results in man's enchantment with epistemological neutralism, and in his pursuit of a wholly explicit knowledge. It is not the search for objectivity which is the origin of our predicament, as Prosch contends. Man's quest for the objective is something which was entirely acceptable to Polanyi, and it was and is consistent with his epistemology. Polanyi was, after all, someone who was interested in attaining objective knowledge -- though it is true that he knew that it is not the product of fully explicitable reasoning. Discretionary reasoning and fiduciary thinking are always involved in attaining objective knowledge; of this Polanyi was certain. The objective was not something he shied from. How could it have been otherwise with him? He was a natural scientist before being a philosopher of science. And like all natural scientists, he knew that his was a quest for the "other" -- that which exists independently of us; in brief, the real. Furthermore, we must remember that knowing the real, according to Polanyi, did not mean having apersonal and neutral knowledge, which, in any case, man can not have. It meant having objective knowledge. But there is more to this matter. It is not just a question of Prosch confusing what is objective with what is totally explicit. Prosch's reluctance to distinguish between the "objective" and the "epistemologically neutral" in explaining Polanyi's thought is at the origin of his misunderstanding of who Polanyi was, and what his objectives were in presenting us with a new epistemology. Thus, here again, Prosch leaves us with a very confusing picture.

Prosch's is at his most questionable, it seems, when he deals with what he refers to as "Polanyi's Divarication." Prosch is convinced that Polanyi distinguished between the knowing process as it relates to the natural sciences, on the one hand, and the arts and the humanities, on the other, on the basis of the nature of the reality which each has made the object of study. The natural sciences investigate a reality which exists independently of the knower, Prosch tells us, whereas the arts and the humanities (including religion) explore a reality which is contingent. In Chapter XVII of Prosch's work, we read the following:

> ...according to Polanyi there is one subset of realities which exists independently of our knowledge of them and which [natural] 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 lives. These realities 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. (249)

Now, obviously we do not intend to discuss the question of whether this view is tenable in the abstract. It is, and, in a very important sense, it might almost be said to be the mainstream view today. However, this reading of Polanyi's thought converts him in a modern, and destroys the unity of the knowing experience as we move from the natural sciences to the humanities, a unity which Polanyi is deemed by many always to have defended. Hence, the question is: Is this Polanyi's view, and does Polanyi truly believe, for instance, that the Reality known by the religious person does not exist before the religious person discovers It? If this is Prosch's understanding, then it seems but one step removed from saying that it is the religious man who creates God. Can we accept this as Polanyi's stance? Clearly, if this is Polanyi's belief, then we have no alternative but to agree with Marjorie Grene who argues that to the extent that Polanyi held this point of view in later life, Polanyi was inconsistent with what everyone understood to be his original intentions. But does it make sense to say that this is Polanyi's position? We do not think so.

It seems to us that if this were Polanyi's understanding of these matters, he would have had either to disavow everything he stood for prior to the publication of Meaning, or to have experienced a terrible loss of direction towards the latter years of his life. Neither of these options seem credible in the normal run of events. Prosch himself provides us with the basis for doubting the verity of his thesis as it bears on what he calls Polanyi's divarication. If Prosch is correct in claiming that Polanyi's epistemology is not a general epistemology, in the sense that different standards apply to the study of the natural sciences than apply to the study of the humanities etc., and that the reality which is known by the arts and the humanities is contingent and a creation of man, whereas it is not in the case of the natural sciences, then how can anyone believe that Polanyi's endeavour was therapeutic in any serious fashion? In what sense can Polanyi's thought be seen as a remedy for the pathology from which modern man suffers, when we are given to understand that the pathology is synonymous with man's profound skepticism about his capacity to know the real and the true in all spheres of life, ...not as it is imagined, but as it is? It must either be the case that contemporary men are the victims of a very mild and insignificant disease, in which case Polanyi's social thought is little more than inflated moralizing, or the disease is serious, and Prosch, in his capacity as a doctor of the psyche, has misread its character, and is suggesting an inappropriate medicine.

However, Prosch holds that the entire structure of Polanyi's work was designed to demonstrate that Polanyi saw his theory of knowledge as therapeutic in the sense that it was intended as curative for the serious affliction(s) which ail(s) modern man. And, of course, in regard to this point, we believe that we must take Prosch seriously. Polanyi did think of his work as therapeutic. Consequently, it is not sufficient for Prosch to say that Polanyi's writings are therapeutic, and then imagine whatever he desires as the content of the prescription designed to bring about the cure. The prescription must be appropriate to the disease. Prosch must show how his understanding of Polanyi's therapy acts on the pathology, and how it is superior in its curative



capacity to, for instance, Gelwick's understanding of Polanyi's therapeutic endeavours. For this to take place, Prosch must demonstrate to us that he has 1) a correct understanding of what Polanyi conceived as the modern disease, and 2) the discernment required to show how the prescription proposed by Polanyi is therapeutic. Unfortunately, we suspect that he may have demonstrated neither.

Prosch appears to be in accord with Polanyi when he states that the pathology from which modern man suffers is the disease which is known as nihilism. He may even be said to describe the origin of this malady in a language which Polanyi employed. However, it seems to us that he cannot be said to take the disease seriously in as much as he does not appreciate that two of its symptoms are meaninglessness and subjectivism. It is largely because the reality known by the arts and the humanities is understood by our contemporaries to have only contingent existence, and not to have been prior to its creation by men, that modern man experiences himself as the author of his own meaninglessness. Polanyi knew this well. Forced to generate realities and meaningfulnesses out of his despair of ever knowing reality and meaningfulness, man, in the end, concludes that there is no reality and no meaning. All is nothing. Nihilism. At this point, one is almost inclined to question whether Prosch himself has not fallen victim to modern nihilism, when he claims that for Polanyi the object of knowledge in the arts, etc., is created by man, and hence has only subjective existence. Although Prosch has understood that Polanyi sought to be therapeutic, it seems that he has no clear appreciation of the widespread character of the disease for which Polanyi's therapy was intended as the remedy, nor is he prepared to show how his understanding of Polanyi's therapy treats the disease. Prosch has identified the disease which afflicts modern man by name, but he seems oblivious of its aetiology and symptoms. In the end, one is left wondering about the adequacy of Prosch's understanding of the nature of the pathology that is nihilism, and what might be a viable treatment.

Despite these serious shortcomings, Harry Prosch's Michael Polanyi: A Critical Exposition is a work which is deserving of attention by the serious Polanyi scholar. Although the uninitiated person may not obtain an accurate picture of what Polanyi was about from this work, the well informed student of Polanyi's thought will find much that is of value in this study. While he or she may not always agree with Harry Prosch on the broad questions, they will inevitably be in accord with him on many of the specifics. We have in mind here the many nuances and the extremely subtle exposition of certain aspects of Polanyi's theory of knowing provided by Prosch, not to mention the refined treatment of many of the associated questions to which this theory gives rise amongst advanced students of Polanyi's epistemological thinking.

# THE POLANYIAN IDIOM: A GLOSSARY

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## Introduction

Michael Polanyi was profoundly sensitive to the power of idiom in shaping our understanding. Indeed, the revision of our idiom was one of the major means by which he sought to help us revise our understanding of ourselves and our universe. "For," he said, "to modify our idiom is to modify the frame of reference within which we shall henceforth interpret our experience; it is to modify ourselves" (Personal Knowledge, 105). In an extended summary of the work of Evans-Pritchard with the Azande, Polanyi demonstrates how the idiom in which a belief system is expressed is itself a powerfully conservative force, protecting the system from incompatible ideas by disabling the expression of those ideas. And he goes on to argue that the idiom of objectivism has, like the Zande belief in oracle poison, operated to discredit opposing views of the universe by proscribing the vocabulary with which we may talk about the universe-- specifically, by its intolerance of any declarations of faith in knowledge claims. Hence, Polanyi begins Personal Knowledge by redefining objectivity in a way that permits--in fact, demands--the personal participation of the knower in objective knowledge.

Objectivity, then, like so many of the other terms in this glossary, has a special, enriched meaning. This glossary undertakes to bring the most important key terms in the Polanyian idiom together in a concise and systematic way. It provides an introductory view of the complex landscape that constitutes the idiom with which Polanyi interprets the world. To the extent that this glossary reduces that complexity, however, it also presents the risk of a reductionist understanding of Polanyi's thought. That risk is mitigated, but not eliminated, by the length of the discussion of some of the terms and by the glossary's providing direction to still richer sources of understanding contained in Polanyi's own work.

The abbreviations of references to Polanyi's work are as follows:

"Duke 1": Unpublished lecture delivered by Polanyi at Duke University on February 10, 1964, initiating a series of lectures in February and March, 1964. Compiled by Richard Gelwick as "Duke Lectures" in "The Collected Articles and Papers of Michael Polanyi." Microfilm, Graduate Theological Union Library, Berkeley.

K&B: Knowing and Being. Ed. Marjorie Grene. Chicago: U Chicago, 1969.

LL: The Logic of Liberty. Chicago: U Chicago, 1951.

PK: Personal Knowledge: Towards a Post-Critical Philosophy. Chicago: U Chicago, 1962.



SFS: Science, Faith and Society. Chicago: U Chicago, 1964

TD: The Tacit Dimension. Garden City: Anchor, 1967.

"Why?": "Why Did We Destroy Europe?" Studium Generale 23 (1970): 909-916.

## Glossary

**commitment:** Polanyi asserts, "To accept commitment as the only relation in which we can believe something to be true, is to abandon all efforts to find strict criteria of truth and strict procedures for arriving at the truth. A result obtained by applying strict rules mechanically, without committing anyone personally, can mean nothing to anybody" (PK, 311). Polanyi's concept of commitment as central to all our knowing is reflected further in his frequent citing of St. Augustine's maxim that we must first believe in order to know. In order to achieve any comprehensive vision at all, we must have faith--a commitment to that vision as it emerges from the specific data at hand. Polanyi argues that commitment is bipolar: "Responsibility and truth are in fact but two aspects of such a commitment: the act of judgment is its personal pole and the independent reality on which it bears is its external pole" (TD, 87). See also **fiduciary component, personal knowledge, and truth.** For further discussion in Polanyi, see especially PK, Chapter 10, "Commitment," particularly 308-316, as well as PK, 64-65, 379-80, and 395-97.

**comprehension:** Polanyi's theory of the **triadic structure of personal knowledge** gives a new depth to the literal, etymological meaning of the word comprehension: a holding together. Meaning or knowledge, in Polanyi's epistemological theory, is an affirmative act of pulling and holding together the discrete, atomized data in an emergent, comprehensive and comprehensible, meaningful pattern. For further discussion, see especially Study, 45. For an example of the loss of comprehension, see PK, 199.

**conviviality:** Polanyi's basic epistemological model postulates **indwelling** as essential to any knowing: in order to know any entity, we indwell its particulars, integrating them tacitly in order to know focally the comprehensive entity. When we seek to understand entities that are sentient creatures, our indwelling takes on the form of conviviality: we actually project ourselves into the being of the creature that we contemplate, judging that creature's behavior by rules of rightness that we infer from what we know about the creature. As we move up the biological ladder to creatures that are increasingly like ourselves, this indwelling becomes increasingly convivial, until, with fellow human beings, our understanding of one another is profoundly convivial. Conviviality, then, like commitment, is an essential element of knowledge, particularly that knowledge which is embodied in the **noosphere.** Polanyi devotes a chapter in Personal Knowledge (pp. 203-245) to conviviality. In brief, he defines

conviviality as "sentiments of trust and the persuasive passions by which the transmission of our articulate heritage is kept flowing. . . [and] the primitive sentiments of fellowship that exist previous to articulation among all groups of men and even among animals" (PK, 209).

**emergence:** Emergence is an important concept in both the epistemological and the ontological theory of Michael Polanyi. For further references in this glossary, see the discussion of **ontology, reality, tacit knowing**, and the **triadic structure of knowledge.** According to Polanyi's epistemology of **personal knowledge**, meaning emerges as a result of the heuristic effort of the knower in integrating, or making coherent and comprehensive sense of, the specific data to which the knower has access. Specific pieces of data are clues to the comprehensive topography of an idea, just as specific features of a physiognomy are clues to the identity of a person. Polanyi further finds that epistemology, the structure of knowing, mimics ontology, the structure of reality. More comprehensive levels of reality emerge from lower, more explicitly determinate, more tangible levels of reality. For example, the strategy of a chess game, which tends to be indeterminate and uniquely structured, emerges from the rules for movement of the various pieces on the board, which are determinate and are the same for all games of chess. In Polanyi, see especially TD, 44-46, 55, and 87-88. See also SFS, 33-34, and PK, 399-400.

**fiduciary component:** Polanyi's epistemology of **personal knowledge** may be summarized in the assertion that all knowledge has an inescapable fiduciary component: all knowledge entails **commitment** and risk. One Polanyian illustration is the following: "A child could never learn to speak if it assumed that the words which are used in its hearing are meaningless; or even if it assumed that five out of ten words so used are meaningless. And similarly no one can become a scientist unless he presumes that the scientific doctrine and method are fundamentally sound and that their ultimate premisses can be unquestioningly accepted. We have here an instance of the process described epigrammatically by the Christian Church Fathers in the words: fides quaerens intellectum, faith in search of understanding" (SFS, 45). Polanyi summarizes his fiduciary program as follows: "I believe that in spite of the hazards involved, I am called upon to search for the truth and state my findings" (PK, 299). The ubiquity of both the risk of error and the necessary fiduciary component is further illuminated in the following description of the relationship between knowledge and truth: "The assumption that the truth that we seek to discover exists by itself, hidden to us only by our misguided aprosch to it, represents correctly the feeling of an investigator pursuing a discovery which keeps eluding him. It may also express the ineradicable tension between our conviction that we know something and the realization that we may conceivably be mistaken. But in neither case can an outside observer of this relation compare another person's knowledge of the truth with the truth itself. He can only compare the observed person's knowledge of the truth with his own knowledge of it" (PK, 305).



**heuristic:** The word heuristic shares its etymological roots with the word eureka, and both have to do with discovery. A heuristic impulse is an inclination to seek new discoveries. Polanyi's philosophy is a heuristic philosophy: his whole program of justification of human existence is predicated on our convivial mutual struggle toward more coherent, comprehensive integrations of meaning, toward a more satisfying understanding of reality. Polanyi argues that this heuristic impulse is present throughout all sentient existence, finding its highest expression in the religious struggle to answer ultimate cosmic questions. See also discussions of **emergence, conviviality, the noosphere,** and **personal knowledge.** In Polanyi see, inter alia, Chapter 6 in Personal Knowledge, "Intellectual Passions," especially pp. 142-45, 150-60, 171-74, 195-202; see also PK 279-86, 316-17, 332-40, 364-73, 382-90.

**indwelling:** In Polanyi's epistemological theory, indwelling is essential to any knowing act. We know anything, he argues, by dwelling in clues to its meaning. This indwelling is a tacit process. If we focus explicitly on the clues themselves, we distance them from us and we lose sight of the comprehensive entity to which they point. Polanyi describes indwelling as follows: "Whenever we use certain things for attending from them to other things, in the way in which we always use our own body, these things change their appearance. They appear to us now in terms of the entities to which we are attending from them, just as we feel our own body in terms of the things outside to which we are attending from our body to include it--so that we come to dwell in it" (TD, 16). For related terms, see **conviviality, comprehension,** and especially **tacit knowing** and **personal knowledge.**

**noosphere:** Polanyi borrows the term noosphere from Teilhard de Chardin. We may think of three spheres, all located topographically or physically in the same place, but conceptually concentric, with outer spheres emerging from the inner spheres. The innermost sphere is the geosphere, the physical material that makes up the earth. The next sphere is the biosphere, life emerging in a new ontological level from the geosphere. The next sphere, emerging from the biosphere and forming an ultrabiological level of existence, is the noosphere: the articulate framework that constitutes our cultural heritage and that sustains and is sustained by the vast interdependent web of individual human intellectual achievement. In Polanyi, see especially PK, 382-90, 393-404; Study, 45-63.

**objectivist epistemology:** In Polanyi's work, objectivism is perhaps the central term in an array of terms that are closely related to one another. Other terms in this cluster include positivism, skepticism, behaviorism, empiricism, mechanism, and reductionism. According to Polanyi's analysis, a profound epistemological shift gradually occurred during the sixteenth, seventeenth, eighteenth, and nineteenth centuries. New scientific views of the cosmos supplanted many of the older views, which were deeply interwoven with the Christian faith and were, to a significant degree, sustained by appeals to religious faith. By and large, the new views came eventually to be accepted because of appeals to empirical evidence. Successful confirmations of mechanical interpretations of the universe--Newton's laws are a prime example--appeared to demonstrate that all reality could ultimately be explained by a process of breaking down complex phenomena, reducing them to their most basic parts, and analyzing those parts

empirically. Phenomena that could not be so reduced--abstract, intangible things like values or beliefs, for example--came to be viewed with increasing skepticism. According to the objectivist ideal, knowledge, in order to be reliable, must be totally determinate, totally accounted for by empirical data. In this epistemological system, the knower's function is simply that of seeing clearly the meaning that inheres in the empirical, external data; it is emphatically not that of interpreting the data, since interpretation entails a personal participation that contaminates the pure data with an unreliable element. Hence, the Royal Society took as its motto Nullius in verba (There is nothing in words--we accept no authority), and Newton proclaimed, "Hypotheses non fingo!" (I do not engage in speculations.) Two twentieth century manifestations of objectivism are positivism in the philosophy of science and related fields and behaviorism in psychology and its related fields. In Polanyi, see, inter alia, PK, 139-142, 266, 286; Meaning, 22-30.

**objectivity:** In the first chapter of Personal Knowledge, titled "Objectivity," Polanyi redefines objectivity, stripping away the objectivist meanings that he has found distorting the proper meaning of the term. Objectivity, he insists, does not mean an utter dependence upon empirical data. The objectivity of Copernicus, which objectivism holds up as a model of reliance on empirical data, was not this kind of objectivity at all. In fact, the preponderance of empirical data supported the proposition that the sun orbited around the earth, not Copernicus' heliocentric theory. The objectivity that Copernicus modeled--true objectivity--is a knowledge "which relies to a greater extent on theory rather than on more immediate sensory experience" (PK, 4). Objectivity is the capacity to make the creative imaginative leap that synthesizes the data into a comprehensive, rational theoretical structure that can be shown to be true from numerous perspectives beyond simply the local perspective that one has on the empirical data. "Objectivity," Polanyi insists, "does not demand that we estimate man's significance in the universe by the minute size of his body, by the brevity of his past history or his probable future career. It does not require that we see ourselves as a mere grain of sand in a million Saharas. It inspires us, on the contrary, with the hope of overcoming the appalling disabilities of our bodily existence, even to the point of conceiving a rational idea of the universe which can authoritatively speak for itself. It is not a counsel of self-effacement, but the very reverse--a call to the Pygmalion in the mind of man" (PK, 5). In Polanyi, see especially PK, 3-17.

**ontology:** The same complementarity that exists between Polanyi's **metaphysics** and his **heuristic** epistemology also exists between his ontology and his epistemological theory of **tacit knowing**. Polanyi's ontology is hierarchical: he postulates ontological levels of reality that emerge from lower levels just as higher levels of understanding emerge from our **subsidiary** awareness. Each level of reality leaves open possibilities, or boundary conditions, that are constrained by higher levels. For example, at the most basic level of reality there exist matter and energy, behaving according to the laws of physics. At the next level, matter and energy are further constrained by the laws of chemistry, but, at the same time, more complex physical structures--i.e., chemical compounds--are possible. With the emergence of the biosphere--biotic existence--much more complex levels of reality emerge: centers capable of locomotion, reproduction, the various



vital functions. The laws of physics and chemistry still operate at the biotic level, but they are not sufficient to explain biotic operations, except when there are biotic failures that have chemical or physical causes. Within the biosphere, sentience eventually emerges, and with it still more new possibilities and constraints. Eventually existence breaks through into an articulate, noetic level that Polanyi, following Teilhard De Chardin, calls the **noosphere**. "This is the point," says Polanyi, "at which the theory of evolution finally bursts through the bounds of natural science and becomes entirely an affirmation of man's ultimate aims. For the emergent noosphere is wholly determined as that which we believe to be true and right; it is the external pole of our commitments, the service of which is our freedom. It defines a free society as a fellowship fostering truth and respecting the right. It comprises everything in which we may be totally mistaken" (PK, 404). For further discussion, see, inter alia, Study, 47-60 and PK, 139-42, as well as PK Chapter 11 ("The Logic of Achievement," pp. 327-46) and PK Chapter 13 ("The Rise of Man," pp. 381-405).

**personal knowledge:** The importance of the term personal knowledge in Polanyi's thought can be seen in the fact that he gave his magnum opus the title Personal Knowledge. Polanyi says, "according to the theory of Personal Knowledge, all meaning lies in the comprehension of a set of particulars in terms of a coherent entity--a comprehension which is a personal act that can never be replaced by a formal operation" (Meaning, 49). The **triadic structure** of personal knowledge distinguishes Polanyi's epistemology from both **objectivist epistemologies** and **subjectivist epistemologies**. An objectivist epistemology rejects the vital role of the knower in interpreting or **comprehending** the empirical data. A subjectivist epistemology rejects the empirical data as contributing to any ultimate meaning. Personal knowledge is characterized by a bipolar **commitment**. This commitment has both a personal and a universal component. Polanyi says, "We have seen that the thought of truth implies a desire for it, and is to that extent personal. But since such a desire is for something impersonal, this personal motive has an impersonal intention. We avoid these seeming contraditions by accepting the framework of commitment, in which the personal and the universal mutually require each other. Here the personal comes into existence by asserting universal intent, and the universal is constituted by being accepted as the impersonal term of this personal commitment" (PK, 308). Polanyi finds enormous liberating power in this dialectic between the personal and the universal, expressed in his maxim, "The freedom of the subjective person to do as he pleases is overruled by the freedom of the responsible person to act as he must" (PK, 309).

**reality:** Polanyi's metaphysics may be briefly described as follows. "Reality is something that attracts our attention by clues which harass and beguile our minds into getting ever closer to it, and which, since it owes this attractive power to its independent existence, can always manifest itself in still unexpected ways. If you have grasped a true and deep-seated aspect of reality, then its future manifestations will be unexpected confirmations of our present knowledge of it" (K&B, 119-20). Each discovery that discloses a new aspect of reality (whether we are considering the tangible reality of physics or a purely conceptual reality such as a mental strategy) suggests still other aspects of reality, just as the palm of my hand suggests the presence of the back of my hand. Polanyi's metaphysics,

then, complements his **heuristic** epistemology of **personal knowledge**: just as each healthy sentient organism has an inexhaustible yearning to discover richer and truer aspects of reality, so reality has what Polanyi calls an inexhaustible profundity, an endless capacity for providing, with each new insight, further clues and hints to yet further new insights. For further discussion in Polanyi, see especially "Duke 1" and ID 32-33.

**subjectivist epistemology**: Like the term **objectivist epistemology**, subjectivist epistemology carries with it, in Polanyian usage, an array of terms that are closely related. These terms include solipsism, relativism, existentialism, radical individualism, and nihilism. All are characterized by their rejection of an ultimate truth and universal meaning to which we as knowers must submit. All share Polanyi's rejection of objectivist epistemology, but all depart radically from Polanyi's epistemology of **personal knowledge**, which posits a "knowledge which submits to requirements acknowledged by itself as independent of itself" (PK, 300). Subjectivism indicates that any idiosyncratic assertion is as valid as any other assertion, because the individual judgment is the only measure of truth. Paradoxically, Polanyi finds, subjectivism and its related concepts have in modern times been fed by the intellectual rubble left by objectivism. The destruction of traditional belief in any ultimate cosmic purpose by the skepticism and reductionism of objectivist epistemologies has left a nihilism that has, in turn, paved the way for radical individualism and other subjectivist world views. Polanyi's discussions of these concepts and their distinctions are extensive. See, for example, LL, 93-110; COF, 1-26; Meaning, 3-21; "Why?"; ID, 74-81; and PK, 300-303 & 308-312; for discussions of the distinctions among them.

**tacit knowing**: A central proposition in Polanyi's philosophy of **personal knowledge** is the assertion that we know more than we can tell. Knowing, he asserts, is a skillful act entailing the use of a multitude of experiences, beliefs, memories, and sensory operations. In any act of knowing, we use this reservoir tacitly: we are **indwelling** this tacit knowledge. In any situation that puzzles us, we direct our **heuristic** energy in search of a fuller understanding, dwelling in what we know. Polanyi also refers to this tacit knowledge as an interpretative framework, and the frame of a window is a useful metaphor for understanding what he means by these concepts. When we are using our tacit knowledge as an instrument for understanding something else, that tacit knowledge is virtually invisible--clear like a window. Without it we could not see. But when we concentrate our attention directly on what we have been using tacitly, it becomes opaque and we see it, as we might concentrate on a scratch on a window and thereby lose focus on what we had been seeing beyond the window. Among the many places where Polanyi discusses tacit knowing, see especially "Tacit Knowing," Chapter 1 of The Tacit Dimension, pp. 3-25. See also Meaning, 30-38, 52-53, and 57; K&B, 156, 160, 171-73, 181-83, 195, 199-200, 212, 218; and Study, 12-27.

**triadic structure of knowledge**: Polanyi asserts that all knowledge--indeed, all perception, all discovery, all understanding--has a triadic structure comprising the knower, a subsidiary or proximate term which the knower indwells, and a focal or distal term toward which the knower strives. Knowledge is an affirmative act performed skillfully by the knower. Everything we know is known in terms of something else. Each thing



known, to which we attend focally as the center of our attention, we know in terms of our other knowledge, which we use subsidiarily (or tacitly) in our effort to understand that which is now the focus of our attention. Because this tacit knowledge, or subsidiary term (which may be highly complex and multitudinous despite the singular usage: see also **tacit knowing**) is often used as a mental probe to explore that which is the focus of our attention, Polanyi sometimes refers to it as the proximate term. It is proximate because it is closer to us--mentally, if not in a literal, physical sense--than is that on which we focus. We use the proximate term intelligently in understanding the distal term by **indwelling** the proximate term, by making it a part of our tacit apparatus of knowing. For references to Polanyi's discussion of the triadic structure of knowledge, see the references under **tacit knowing**.

**truth**: Polanyi's discussion of truth is intimately intertwined with his discussions of **commitment**, **comprehension**, the **fiduciary component** in all knowledge, **objectivity**, **reality**, and **personal knowledge**. For example, he says, "According to the logic of commitment, truth is something that can be thought of only by believing it" (PK, 305). He rejects as inadequate "pseudo-substitutions" the objectivist definitions of truth such as the correspondence theory or the utility or fruitfulness theory. All these definitions describe aspects of truth but fail to account for the inescapable personal element entailed in any assertion of the truth: "To affirm anything implies, then, to this extent an appraisal of our own art of knowing, and the establishment of truth becomes decisively dependent on a set of personal criteria of our own which cannot be formally defined. ... The ideal of an impersonally detached truth would have to be reinterpreted, to allow for the inherently personal character of the act by which truth is declared" (PK, 71. Polanyi's own definition of truth is expressed as follows: "[T]ruth lies in the achievement of a contact with reality--a contact destined to reveal itself further by an indefinite range of yet unforeseen consequences" (PK, 147). This definition resembles the correspondence theory in that both reject a strictly subjective, solipsistic view of truth. But Polanyi's definition departs from the correspondence theory of truth in acknowledging the inescapable role of the person and in rejecting the objectivist reliance on skepticism as the sure route to truth: "For all truth is but the external pole of belief, and to destroy all belief would be to deny all truth" (PK, 286). This bipolar, dialectical character of truth is perhaps best described in the following comments: "The only sense in which I can speak of the facts of the matter is by making up my own mind about them. In doing so I may rely on an existing consensus, as a clue to the truth, or else may dissent from it, for my own reasons. In either case my answer will be made with universal intent, saying what I believe to be the truth, and what the consensus ought therefore to be. This is the only sense in which I can speak of the truth, and though I am the only person who can speak of it in this sense, this is what I mean by the truth. ... This position is not solipsistic, since it is based on a belief in an external reality and implies the existence of other persons who can likewise approach the same reality. Nor is it relativistic. ... There remains therefore only one truth to speak about" (PK, 316). In Polanyi, see especially PK, 110-116, 144-149, 160-173, 264-270, 303-307, 320; K&B, 138-141; Meaning, 14, 24, 211; SFS, 10, 19; LL, 8; ID, 76-82.

## AN APPEAL TO HELP HUNGARIAN SCHOLARS

(The following letter from Professor Thomas F. Torrance was sent to the Polanyi Society General Co-ordinator. The need has not been met by an earlier appeal to members at the American Academy of Religion. We urge you to do what you can. In this time of dramatic changes in Eastern Europe, the thought of Michael Polanyi offers an important resource for hope and reconstruction.)

I have just returned from a visit to Hungary, to Debrecen, where a number of people asked me about the writings of Michael Polanyi. To my astonishment I learned that there were no copies of any of his works in the Lajos Kossuth University of Debrecen or in the Reformed College and Academy there! The Principal and Dean of the Reformed College is both a mathematical physicist and a theologian and is very keen to study Polanyi. Hence I am trying to find ways of supplying him and his colleagues with Polanyi's books. Do you know of any who have spare copies of Michael's works who might like to part with them in this way?

Do you think that readers of **Tradition and Discovery** might like to send copies of Polanyi's works to Debrecen? If so, they should send them to:

Professor Dr Botond Gaal,
Principal of the Reformed College and Academy,
Kalvin ter 16,
Debrecen,
Hungary 4044.

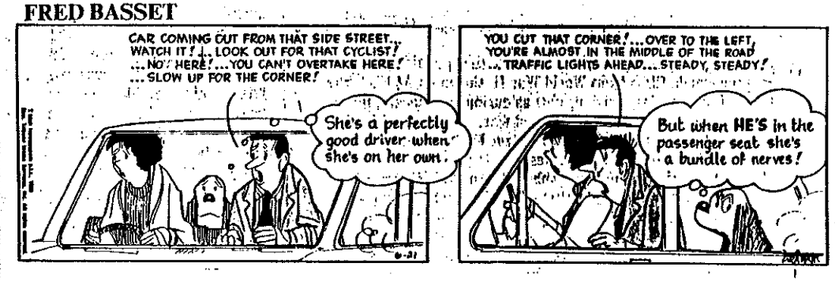
I know that this would be greatly appreciated. **Personal Knowledge** and **Knowing and Being**, would be especially useful in the dialogue between Christians and Marxists in which Reformed Theology has been making a definite impact. But they need all of Michael's works.

**Thomas F. Torrance,**
**37 Braid Farm Road,**
**Edinburgh EH10 6LE.**



## MORE MOORMAN HUMOR

FRED BASSET




The kind of clumsiness which is due to the fact that focal attention is directed to the subsidiary elements of an action is commonly known as self-consciousness. (PK, 56)

CROCK


...we cannot compare someone else's knowledge of the truth with the truth itself, but only with our own knowledge of it. (PK, 305)

## SUBMISSIONS FOR PUBLICATIONS

As indicated earlier, The Polanyi Society in North America and the Convivium in Great Britain are seeking to join their common interests and publish a common periodical. We are painfully aware of our shortcomings and need very much the support of our members. There are a number of ways that you can help:

1. Send news items regarding relevant publications, conferences, and events but be sure to send complete information such as author, source, date, page numbers.

2. Send articles "camera ready," i. e. ready to be copied just as they are. Presently we do not have secretarial staff to retype articles. We photocopy them as they are received. Send two copies and a self-addressed envelope to acknowledge receipt of your manuscript.

3. Articles within ten pages, single spaced, 3/4 inch side margins and 1 inch top and bottom margins are preferred.

4. Put author's name under the title and enclose the way you want to be identified in the "Contributors" listing.

5. Besides articles, critical reviews of relevant books and articles are sought. The CONVIVIUM contributors are very good examples of reviews that are useful. See back issues for examples.

6. We are eager to try production from computer disks. If you send a disk, we can print your text more easily (we think). We will be glad to return your disk once we have copied it. Be sure to specify the program you are using, file name, etc. Our computer system is in the IBM family, and the program is Word Perfect 5.0. If you have questions about publishing on disk, contact Phil Mullins: (816)271-4385.

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Mail to: Dr. Richard Gelwick
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