

MICHAEL POLANYI

AND THE FOUNDATIONS OF RELIGIOUS KNOWLEDGE

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By
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ABSTRACT

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This essay explores the implications of Michael Polanyi's theory of tacit knowing for foundational theology. Foundational theology, which begins with a recognition of the problematic status of religious knowledge, seeks to resolve that problem by providing theology with a method and criteria of meaning and truth firmly grounded in cognitional theory. Central to the task of articulating a method for theology is the necessity of accounting for the relationship of faith and reason. Polanyi's cognitional theory recognizes coherence of faith and reason to be an indispensable condition of knowledge, and, therefore, his thought is deemed especially relevant to the foundational task of Christian theology. This work, then, attempts to bring Polanyi's theory of knowledge to bear on the problem of method in theology.

The dissertation is divided into two major sections. The first section focuses on the theological problem of accounting for the discovery and justification of religious knowledge, that is, the problem of method in theology. The faith-reason

relationship in theology is examined in terms of the historical development of theology's self-understanding. This investigation leads to a consideration of the contemporary concern for the foundational questions of meaning and truth in theology. The task of foundational theology is discussed as the attempt to transform the hermeneutic circle of faith and reason, and to establish the significance and validity of the theological enterprise.

The second section of the dissertation focuses on a resolution of the theological problematic. Polanyi's post-critical conception of personal knowledge is examined in order to provide a background for a detailed analysis of his theory of tacit knowing. It is argued that Polanyi's cognitive theory--his account of the structure and act of tacit integration--provides a foundation for an objectification of method in theology and for a differentiation of theological specializations.

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ABBREVIATIONS

The following abbreviations will be used for references to the books and lectures of Michael Polanyi:

- SFS for Science, Faith and Society* (Chicago: University of Chicago Press, 1946; Phoenix edition, 1964).
- LL for The Logic of Liberty (Chicago: University of Chicago Press, 1951).
- PK for Personal Knowledge: Towards a Post-Critical Philosophy* (Chicago: University of Chicago Press, 1958; London: Routledge and Kegan Paul, 1958; New York: Harper Torchbooks, 1964).
- SM for The Study of Man* (Chicago: University of Chicago Press, 1959; London: Routledge and Kegan Paul, 1959; Phoenix edition, 1964).
- TD for The Tacit Dimension* (Garden City, New York: Doubleday and Co., Inc., 1966; Anchor Books, 1966).
- KB for Knowing and Being* Essays by Michael Polanyi edited by Marjorie Grene (Chicago: University of Chicago Press, 1969; Phoenix edition, 1971).
- MIT I for "The Metaphysical Reach of Science" Man In Thought Unpublished Duke Lectures (Duke University), February 10, 1964.
- MIT II for "The Structure of Tacit Knowing" Man In Thought Unpublished Duke Lectures (Duke University), February 17, 1964.
- MIT III for "Commitment to Science" Man in Thought Unpublished Duke Lectures (Duke University), February 24, 1964.
- MIT IV for "The Emergence of Man" Man In Thought Unpublished Duke Lectures (Duke University), March 2, 1964.

- MIT V for "Thought and Society" Man In Thought Unpublished Duke Lectures (Duke University), March 9, 1964.
- RM I for "Science and Reality" The Recovery of Man Unpublished Wesleyan Lectures (Wesleyan University), September 29, 1965.
- RM II for "The Structure of Tacit Knowing" The Recovery of Man Unpublished Wesleyan Lectures (Wesleyan University), October 14, 1965.
- RM III for "The Creative Imagination" The Recovery of Man Unpublished Wesleyan Lectures (Wesleyan University), October 21, 1965.
- RM IV for "The Growth of Science In Society" The Recovery of Man Unpublished Wesleyan Lectures (Wesleyan University), October 28, 1965.
- RM V for "Levels of Reality" The Recovery of Man Unpublished Wesleyan Lectures (Wesleyan University), November 11, 1965.

Intellect and Home: Essays in the thought of Michael Polanyi, edited by Thomas A. Langford and William H. Poteat (Durham, N. C.: Duke University Press, 1968) will be cited as IH.

*Note: The pagination of the American hardbound and paperbound editions of Michael Polanyi's books corresponds. One exception, however, is the preface to Personal Knowledge. An additional preface was written for the Harper Torchbook edition, and references to the preface are to that edition.

PREFACE

Reflecting on the well known story of Archimedes' famous discovery in the baths of Syracuse and his exuberant cry of delight, Michael Polanyi makes the observation in Personal Knowledge that "nothing is a problem or discovery in itself; it can be a problem only if it puzzles and worries somebody, and a discovery only if it relieves somebody from the burden of a problem."¹ The present study of the bearing of Polanyi's thought on certain foundational questions in theology has its origins in that sometimes-perplexed-sometimes-resolute state of mind which results from living with a problem for a long time, watching it grow and become entangled in what appears to be an ever-widening web of complex issues, all the while harboring at a level of vague and tacit awareness both a hint and a hope of its resolution. From a personal point of view, then, this dissertation offers not only a challenge but also an opportunity to identify that problem, sort out and circumscribe the relevant issues and generally bring to a level of explicit awareness what such a resolution might look like. More specifically, this study reflects a long standing concern with a theological problem that began, as much as

¹PK, p. 122.

I can recall, more than twelve years ago with a senior seminar paper in philosophy on "The Development of the Medieval Doctrine of 'Double-Truth'". The problem that began to emerge for me at that time was the theological problem of resolving the apparent conflict between faith and reason that led to the development of a doctrine which declared that there were two different kinds of truth--a truth of faith and a truth of reason. My interest in this particular episode of medieval thought was aroused by the suspicion that the same kind of disjunctive view of faith and reason which brought about the thirteenth century polarization of "fideists" and "rationalists" was a fairly prevalent assumption in contemporary theological thought as well. The so called "two-truth" doctrine seemed to imply a kind of intellectual schizophrenia. Was this one of those ideas, of which Whitehead wrote, "that the world had got hold of" but "which the world could neither live with nor live without"?² I wasn't really prepared to answer that question.

In reading Michael Polanyi's Personal Knowledge a few years later, however, I became convinced that his "post-critical philosophy" offered a framework of thought within which a resolution of the theological problematic might be

²Alfred N. Whitehead, Science and the Modern World (New York: The Free Press Paperback Edition, 1967), p.

found. Here was a radical conceptual reform. In seeking to account for the nature and justification of scientific knowledge, Polanyi was led to develop a cognitional theory which recognized coherence of faith and reason to be an indispensable condition of all knowledge. The conception of scientific knowledge as "personal knowledge" challenges the epistemological view that there is an unavoidable conflict between faith and reason by establishing the inevitably fiduciary character of reason and the essentially rational character of faith. Moreover, "personal knowledge" transcends a number of distinctions which form the conceptual basis of modern thought: objectivity--subjectivity, judgments of fact--judgments of value, scientific truth--existential truth. Polanyi's thought, thus, provided a host of clues pointing to a possible solution.

The third phase in the development of my own thinking on the problematic foundations of religious knowledge began just six years ago when I was introduced to the thought of Bernard Lonergan and to the movement of "foundational theology". Foundational theology begins with a recognition of theology's problematic status and seeks to resolve that problem by grounding theology in cognitional theory. The concerns and methods of foundational theology, thus, converged with my own interest in Polanyi's thought and also provided a contemporary context for seeking a resolution of the faith-reason

problem. The present work is, in short, the attempt to bring Polanyi's thought to bear on the faith-reason problematic in the context of foundational theology.

The dissertation is divided into two major sections. The first section, "The Problem of Religious Knowledge", identifies and circumscribes the faith-reason problem and places the discussion in the context of the foundational quest for method in theology. Chapter I sets forth the general lines of the thesis. The faith-reason relationship is shown to be at the core of the foundational issues of meaning and truth in religious knowledge and to give rise to the problem of method in theology. Foundational theology and post-critical philosophy converge in seeking in cognitional theory a resolution of the problem of method and this suggests the significance Polanyi's theory of tacit knowing holds for the foundational task. A discussion of Polanyi's conception of the nature of a problem anticipates his account of the logic of discovery and justification, and illuminates as well the method of the present work.

Chapter II examines the notions of faith and reason, the two-fold source and ground of religious knowledge. Historically, the relationship of fides and ratio has always been problematic for Christian theology. More recently, however, the problem has taken on a new dimension, due in large measure to the emergence of philosophic and scientific ideals which have substantially modified the conception of

rationality (the element of ratio) in human cognition, and discredited the conception of faith (the element of fides). The confrontation of twentieth century theology with critical philosophy and a positivist account of science results in a challenge to the conjunction of fides and ratio and raises serious doubts about the cognitive significance and validity of religious knowledge.

Chapter III brings the discussion of religious knowledge more explicitly within the context of contemporary Christian theology, and explores two alternative approaches to the problem of theological method. Finally the focus is sharpened upon the two foundational issues raised earlier: the possibility of meaning and the justification of truth in theology. Foundational theology is described as the attempt to transform the hermeneutic circle of faith and reason in a way which establishes theology as a significant and valid science of religion.

The second major section, "The Foundations of Religious Knowledge", examines Polanyi's post-critical philosophy in general and his theory of tacit knowing in particular, and brings this thought to bear on the foundational problem of method in theology. Chapter IV begins by noting the significance of "scientific ideals" to the foundational enterprise in theology. In seeking to establish the found-

ations of freedom in science, Michael Polanyi was led to reject the modern critical ideal of scientific knowledge and to develop an alternative ideal of science as "personal knowledge". After tracing this development, two aspects of this ideal are discussed, the emphases on passionate commitment and on a-critical belief.

Chapter V turns from a consideration of the "ideals" of scientific knowledge to a consideration of its "methods" and "grounds". Polanyi is one of the few contemporary philosophers of science to suggest that there is a logic of discovery and justification in science. His cognitional theory seeks to account for that logic in terms of the structure and act of tacit integration. Polanyi's theory of tacit knowing, therefore, is examined in some detail.

Finally, Chapter VI relates the analysis of Polanyi's theory of scientific knowledge to the question of the foundations of theology. The discovery and the justification of religious knowledge are explained from a Polanyian perspective. Polanyi's thought is seen to provide a basis for resolving the faith-reason problematic and for establishing the methodological and moral foundations of religious knowledge.

SECTION ONE

THE PROBLEM OF RELIGIOUS KNOWLEDGE

"The most important part of education--to teach the meaning of to know (in the scientific sense)."

Simone Weil

"Theology is the happy result of a daring trust in the coherence of faith and reason."

M.D. Chenu

CHAPTER I

INTRODUCTION TO THE PROBLEM

Christian theology includes among its many tasks the reflective understanding of the nature of theology itself. A consideration of the conditions for the possibility of theology as a cognitive enterprise, in other words, is itself a legitimate, indeed fundamental, theological concern. As Schubert Ogden has remarked, theology shares this self-reflective character with philosophy.¹ While this has always been more or less acknowledged, what characterizes the present theological situation is an increasingly heightened sensitivity and carefully reasoned response to some new and critical questions regarding both the significance and the validity of theological discourse. The issue the critics raise is whether or not such discourse can be considered either cognitively meaningful or true. The implication and/or the argument is that at least in any

¹"What is Theology?" The Journal of Religion LII No. 1 (January, 1972), p. 22.

scientific sense it cannot.² This critical line of inquiry exposes the very nerve center of theology as a "science" of religion--its right to claim for the results of its investigations and explorations the status of "knowledge".³

Yves M.J. Congar, in a recent symposium on the task of contemporary theology, begins his address by defining theology as "reflection on the faith intent upon

²"There is thus a radical difference between the scientific and the theological systems of belief. It is that difference which constitutes the first a system of knowledge, but the second a system only of faith, that is ...a system of beliefs 'which rests on no evidence whatever'. And it is that difference which justifies the characterization of theology--by Michelet, I believe--as 'the art of befuddling oneself methodically'". C. J. Ducasse, "Are Religious Dogmas Cognitive and Meaningful?" in Ronald E. Santoni ed., Religious Language and the Problem of Religious Knowledge (Bloomington: Indiana University Press, 1968), p. 289. See also, for example, A. J. Ayer, Language, Truth and Logic (New York: Dover Publication, 1956), pp. 102-115; R. B. Braithwaite, An Empiricist's View of the Nature of Religious Belief (Cambridge: Cambridge University Press, 1955), pp. 11-35; and Paul F. Schmidt, Religious Knowledge (Glencoe: The Free Press, 1961), pp.45-60.

³The shifting relationship between "knowledge" and "science" forms part of the historical context for understanding "theology" and is a basic concern of this study. Michael Polanyi's thought provides a framework for understanding that relationship which I hope to make clear as the thesis develops. To give initial coherence to the dissertation, however, and (for reasons to be explained shortly) to emphasize, following Polanyi, those elements which science has in common with all knowledge, the term "theology" is used, unless otherwise specified, as equivalent to both "religious knowledge" and "religious science". This leaves the further question of whether or not (or in what sense) all religious knowledge is to be considered scientific--or how the knowledge of the so called ordinary believer is related to the discipline of the professional theologian--to be resolved within the broader framework of the relationship of "knowledge" and "science" generally, which Polanyi's thought provides.

reaching the status of a science."⁴ The notion of science is frequently evoked by contemporary theologians and philosophers of religion to aver the fully rational character of religious knowledge. Thus, Congar clarifies what he means by theology's intent to reach scientific status when he continues: "Theology, therefore, puts a rational method to work in order to construct intellectually a datum received in the church on the basis of faith."⁵ The theological relevance of addressing the critical challenge to theology's cognitive status "in the scientific sense", then, becomes decisive once the pervasiveness of the cognitive standards set by modern science is recognized. The criteria of meaning and truth governing cognitive claims have come to extend far beyond the domain of the physical sciences to the human, social and religious sciences as well, so that, in effect, in our contemporary Western culture at least, "science" and "reliable knowledge" have generally become synonymous. In a remarkably comprehensive study of the relation of science and religion Ian Barbour points out that: "For many people today the challenge to religious belief arises not from any conflict between science and religion but from the assumption that the scientific

⁴"Theology's Tasks After Vatican II" Theology of Renewal I ed. by L.K. Shook, C.S.B. (New York: Herder and Herder, 1968), p. 47.

⁵Ibid.

method is the only road to knowledge."⁶ To the extent this is true, and in as much as "scientific" and "rational" have become pleonasms, the attack upon the meaning and validity of theological assertions undermines any theological claim to be "scientific" not simply in the specific or limited sense of a claim for status vis à vis some other responsible approach to human knowledge but in the more general and fundamental sense of a claim for respectability as a cognitive enterprise of any sort.

Strangely enough, the challenge to theology comes from within the religious community as well as from without. One of the distinguishing features of the recent ferment in theology, Langdon Gilkey notes, is the fact that "this radical questioning of the foundations of religious affirmation and so of the theological language reflective of it, is now taking place within and not outside of the Church."⁷ This widespread "shaking of the foundations" of religious

⁶Ian G. Barbour, Issues in Science and Religion (New York: Harper & Row, Publishers, 1966), p. 137.

⁷Langdon Gilkey, Naming the Whirlwind: The Renewal of God Language (Indianapolis: The Bobbs-Merrill Company, 1969), p. 9. Among the leading representatives of the theological critics are: Thomas J. J. Altizer and William Hamilton, Radical Theology and the Death of God (Indianapolis: The Bobbs-Merrill Company, Inc., 1966); Paul M. Van-Buren, The Secular Meaning of the Gospel (New York: The MacMillan Company, 1963); and Antony Flew and Alasdair MacIntyre eds. New Essays in Philosophical Theology (London: S.C.M. Press Ltd., 1955).

knowledge has made many theologians unusually self-conscious about the grounds of their science and created a deep concern for methodological issues. In short, contemporary theology finds itself confronted with the important and difficult task of uncovering or "discovering" its presuppositions, methods and categories and attempting to ground them critically.

The present investigation of the foundations of religious knowledge takes its starting point in the recognition of theology's problematic status, of which current philosophical speculation about the logical and ontological status of religious discourse and a corresponding ferment in theological circles are symptomatic. At the same time, it is aware of--and sympathetic to--those efforts in what can be called "foundational theology" to resolve that problematic at the level of cognitional theory, submitting the theologian's own performance to sustained and rigorous epistemological scrutiny. Moreover, I believe there are important implications for such a resolution in some yet unexplored relationships between contemporary foundational critiques offered or inspired by the "transcendental method" of Bernard F. Lonergan and certain developments of thought in what has come to be called "post-critical philosophy", specifically those stemming from the work of Michael Polanyi.

The task of foundations in theology, although shaped in part by the exigencies of contemporary science, is not entirely unrelated to procedures for establishing and

justifying the nature of religious knowledge carried out sometimes under the rubrics of "philosophical" or "fundamental" theology.⁸ Rather, a perennial problem in theology and one which has surfaced anew in the recent debates over the scientific (i.e. cognitive) status of religious knowledge is the problematic nature of the relationship between religious belief and rational judgment. This issue, which traditionally has been called the "faith-reason problem" seems, in fact, to form the "knot" so to speak of the foundational questions in theology. Those foundational questions are two: the possibility of establishing religious knowledge as meaningful, and the possibility of holding religious knowledge as true. It is the faith-reason problem, I believe, which any serious attempt to provide a justification for theology must unravel, for theological method inevitably involves some account of fides (a component of belief, a gift or grace of understanding and knowing) and ratio (a component of reason, a reflective capacity for understanding and knowing).

A resolution of the problematic faith-reason relationship involves, among other things, the task of

⁸On this point, see, for example, David Tracy "The Task of Fundamental Theology" The Journal of Religion LIV No. 1 (January, 1974), pp. 13-34. For a discussion of the relationship of "foundational" theology to "philosophical" theology and "fundamental" theology cf. Chapter Three, pp. 128-135.

understanding and assessing the function and significance of both fiduciary and critical contributions to human knowledge. This, in turn, requires a cognitional theory which is able to account for both the sources and grounds of ordinary human thinking and judging as well as what has become paradigmatic of its success, namely scientific knowledge. Since Michael Polanyi's theory of knowledge claims to fulfill this requirement,⁹ the general aim of the present study is to investigate the thought of Polanyi--in particular his explication of the ideal of personal knowledge and the concrete structure of tacit knowing--and to bring this thought to bear on specific foundational questions in theology.

The argument of this dissertation pivots between the insights of Polanyian epistemology and the concerns of foundational theology and is developed along the following lines. Modern epistemology has fostered a conception of positive scientific knowledge which upholds an ideal of formal, exact, clearly specifiable meaning, and objective, impersonal and explicit truth. As a corollary it extols a

⁹"I hope thus to comprise within a single continuously variable conception of knowing, both the process of acquiring such knowledge as is comprised by natural sciences and the knowledge of man himself as the seat of all knowledge; and I hope that this conception will readily expand even further to a comprehension of man as the source of moral judgment and of all other cultural judgments by which man participates in the life of society." SM, p.28.

view of reason as critical, analytic and detached.¹⁰ This idea of knowledge with its constrictive notion of rationality is embodied in and exemplified by the hypothetico-deductive model of scientific method. Much of the discussion of the nature of religious knowledge and the conditions for its possibility is dominated by criteria for meaning and truth which are derived from this understanding of method in science. Yet implied in this view of the discovery and justification of scientific knowledge is a notion of rationality essentially incompatible with belief and consequently problematic for theology which acknowledges the component of belief as well as reason in discovering and holding religious knowledge.

Foundational theology is an attempt to re-establish the conditions for religious knowledge and resolve theology's problematic status vis à vis Christian faith's confrontation with both critical philosophy and contemporary science. It

¹⁰"Such a programme implies" in Polanyi's words, "that science itself is 'positive', in the sense that it involves no affirmation of personal beliefs." LL, p. 9. Polanyi regards modern positivism as the outcome of the critical movement in philosophy which began with Descartes' principle of universal doubt. Thus, the terms "positive" and "critical" are taken to imply an ideal of knowledge divested of personal belief, which assumes that "intelligence. . . can operate outside such a fiduciary framework." PK, pp. 264-272. "Positive" or "critical" knowledge, in other words, is knowledge assumed to be discovered and justified objectively and impersonally.

does so, moreover, as David Tracy remarks, in a context of basic continuity with the task of classical philosophy and with traditional scholastic theology's concern with the faith-reason problematic.¹¹ Foundational Theology can be seen then--and is taken here--to provide a context for responding to the critical challenge confronting contemporary theology.

Michael Polanyi's theory of knowledge forms the basis for a fundamental critique of "critical philosophy" and initiates a radical reform in the conception of scientific methodology. It begins by examining some "essential features of the process of knowing which are disregarded by the modern conception of positive, scientific knowledge."¹² Polanyi's thought, therefore, has important implications for any contemporary effort to establish the cognitive status of theology when "cognitive" has come to be regarded as equivalent to "scientific". In a recent critique

¹¹Tracy makes this point in the first two theses of a paper presented at the American Academy of Religion Annual Meeting in New York (October 22-27, 1970) entitled "Foundational Theology as Contemporary Possibility". "Thesis One: The Task of 'contemporary' (i.e. post-critical) philosophy can continue to be described as a phenomenological-transcendental one. That task is both intrinsically problematic and intrinsically in continuity with the task of classical philosophy." and "Thesis Two: The traditional task of Christian theology as 'fides quaerens intellectum; intellectus quaerens fidem' can be properly reinterpreted as identical with the task of a contemporary phenomenological-transcendental philosophy in its basic subject matter, its method and its problematic status. As thus interpreted, the meaning of a 'foundational' theology is clarified." The paper is mimeographed and part of a collection of Papers from the Section on the Theology and Philosophy of Religion, 1970, pp. 140-174. Hereafter cited as "Foundational Theology".

¹²Michael Polanyi, "Faith and Reason", The Journal of Religion, XLI, No. 4 (October, 1961), p. 239.

of the impact of science upon contemporary culture and its modes of thought, Theodore Roszak characterized the modern critical ideal of scientific knowledge as "the myth of objective consciousness."

There is but one way of gaining access to reality--so the myth holds--and this is to cultivate a state of consciousness cleansed of all subjective distortion, all personal involvement. What flows from this state of consciousness qualifies as knowledge, and nothing else does.¹³

Polanyi seeks to "demythologize" this scientific ideal of objective consciousness and propose an alternative account of scientific knowledge to positivist explanations of science exclusively in terms of strict empirical method and formal deductive logic.¹⁴ His own conception of scientific knowledge is based on an understanding of the structure of the act of discovery which Polanyi describes as an achievement of tacit integration.¹⁵ The criteria for meaning and truth derived

¹³The Making of a Counter Culture (Garden City, New York: Doubleday & Company, Inc., 1969), p. 208. Italics added.

¹⁴In other words, Polanyi is not proposing "another" way to gain knowledge "along side" an objective scientific approach (for example a subjective existential approach), but rather seeks, as I will attempt to show, a more radical and fundamental reappraisal of objective scientific ideals and methods themselves.

¹⁵The structure of tacit knowing is Polanyi's major epistemological insight. The analysis of that structure as an integration of subsidiary clues to achieve a coherence which becomes a focal object of knowledge is a subject to which Polanyi returns repeatedly. Perhaps his clearest description can be found in Chapter One of The Tacit Dimension. Polanyi's case for tacit integration as the essential structure of scientific discovery is one of the major theses to be examined in this dissertation.

from Polanyi's understanding of the logic of scientific discovery and the notion of rationality implied in his conception of personal knowledge may provide new grounds for resolving the faith-reason problem in theology and establishing the conditions for the possibility of religious knowledge. The present work rests upon this expectation.

Affinities of "post-critical and "foundational" thought: There are a number of important reasons, as well as several precedents, for investigating the theological implications of Polanyian epistemology.¹⁶ Michael Polanyi's thought represents a major achievement in post-critical philosophy--a movement which shares with foundation theology 1) a common problematic, 2) several important assumptions, and 3) a basic methodological

¹⁶Polanyi himself initiates the link between his conception of scientific knowledge and theology with a brief excursus on the task of theology in Personal Knowledge pp. 181-186. More importantly, as Thomas A. Langford points out, he "never lets his readers forget that his philosophical investigations have religious implications." "Michael Polanyi and The Task of Theology" The Journal of Religion XLVI (January, 1966), p. 45.

The bibliography lists fifteen Ph.D. dissertations written on Polanyi and his thought since 1965. Over half of them deal directly with religious dimensions in his epistemology and ontology and relate these to numerous theological concerns. Included also in the bibliography are over one hundred articles, reviews and criticisms, many of which testify to the theological relevance of Polanyi's ideas. Of particular significance in this regard are the essays by Thomas A. Langford, Richard Gelwick, William T. Scott, and Bruno Manno.

orientation.¹⁷

1) Common Problematic: In a general sense, each movement represents a deliberate attempt to take seriously the full impact of the critical "turn toward the subject" in philosophy and the influence of empirical science upon contemporary culture and its modes of thought. More specifically, both post-critical philosophy and foundational theology are self-conscious responses to what is recognized as a "crisis of faith" within contemporary Western culture-- a crisis which leads to antithetical extremes of dogmatism and scepticism and threatens the existence of theology as a religious science.

The ramifications of this cultural crisis, as Polanyi sees it, are far reaching in their debilitating effect upon man's intellectual, moral and spiritual life. They are manifest in a nihilism which subverts rationality, a "moral inversion"¹⁸ which sanctions undisciplined passion,

¹⁷Langdon Gilkey, for instance, ranks Michael Polanyi and Bernard Lonergan "at the summit of modern interpreters of contemporary modes of knowing." "Empirical Science and Theological Knowing" in Philip McShane, S. J. ed., Foundations of Theology (Dublin: Gill and MacMillan Ltd., 1971), p. 240. Edward MacKinnon, S. J., observes that Polanyi's cognitional theory "has a surprising number of points in common with the Thomistic doctrine of knowledge and intellectual habits" which, of course, is the primary locus of Lonergan thought. "Review of Personal Knowledge", Modern Schoolman, XXXVI (May, 1959), p. 296.

¹⁸This term sums up Polanyi's assessment of the dis-ease of the modern mind. "Moral Inversion" is the result of a convergence of positivist scepticism and moral perfectionism. It is the dynamo-objective coupling of cynicism (a complete denial of moral motives) and fanaticism (a passionate quest for moral perfection). Cf "On the Modern Mind" Encounter XXIV (May, 1965), passim; LL, pp. 106-110; PK, pp. 227-237; KB, pp. 16-18, 21-2.

and a reductionism which leaves man without responsibility or recourse. Polanyi traced the roots of the contemporary crisis of faith to the modern critical movement in philosophy which sought to eliminate from human knowledge any trace of uncritically held beliefs. Critical philosophy accepted methodical doubt as its guiding epistemological principle and arrived at a conception of knowledge as wholly objective and explicit. The new scientific revolution embraced the doctrine of scepticism, giving it unprecedented power, while the logic of history carried it to sometimes fanatical extremes.¹⁹ Scientific rationalism, then, which began by rejecting the authority of traditionally guiding ideas, in Polanyi's view, unleashed forces of rebellious scepticism which culminated in a denial of meaning and validity to all transcendent ideals and values. Our age, according to Polanyi, is reaping the fruits of this rebellion against reasonable faith, for "when man's faith in human ideals decays, he inevitably turns to the worship of power and material welfare."²⁰ Polanyi recognized in radical scepticism, then, a destruction of meaning and truth in

¹⁹Michael Polanyi, "Science and Conscience," Religion in Life, XXIII, No. 1 (Winter, 1952-1953), p. 49. Cf. also Michael Polanyi, "History and Hope: An Analysis of Our Age," The Virginia Quarterly Review, XXXVIII, No. 2 (Spring, 1962), pp. 177-195.

²⁰Michael Polanyi, "Science - Its Reality and Freedom," The Nineteenth Century, CXXXV (February, 1944), p. 83.

contemporary culture, which could only be overcome by a thorough restoration of the foundations of human consciousness itself. And unlike many phenomenologists and existentialists who recognized the problem and then denounced modern science (accepting the definition of science Cartesians and positivists offer), Polanyi set out to challenge this fashionable description of scientific method attacking critical rationalism on its own grounds and reasserting the fiduciary foundations of science and of all knowledge.

The destruction of faith in our age was originally started by people dazzled and misguided by the successes of science. Today this destruction, having reached its logical completion, has become a threat to science itself. Respect for the ideals of science cannot be restored except by recovering the common ground on which all human ideals are jointly founded.... The foundations of science must be laid down afresh as part of a new comprehensive reassertion of faith.²¹

Lonergan also speaks to the broader issues of the modern crisis, which he depicts in terms of the transition from classical culture to modern culture. This transition, brought about by the breakdown of the classical mediation of meaning, leaves modern man "bewildered, disoriented, confused, preyed upon by anxiety, dreading lest we fall victims to the up-to-date myth of ideology and the hypnotic,

²¹ Polanyi, "Science - Its Reality and Freedom", p. 83.

highly effective magic of thought control."²² Moreover, the "clearest illustration" of the collapse of classical culture, according to Lonergan, can be seen in the emergence of a new conception of science.

Aristotle. . . envisaged science as true, certain knowledge of casual necessity. But modern science is not true; it is only on the way towards truth. It is not certain; for its positive affirmations it claims no more than probability. It is not knowledge but hypothesis, theory, system, the best available scientific opinion of the day.²³

This shift in the very meaning of the word science affects the basic fabric of Western culture. Unfortunately, the theological response to the shift from classical culture to modern culture was less than adequate. Theology became dogmatic. "It demoted the quest of faith for understanding" to a much less desirable goal. "When modern science began, when the Enlightenment began, then the theologians began to reassure one another about their certainties."²⁴ This conception of theology, according to Lonergan, has survived right into the twentieth century, although its defects are

²²Bernard Lonergan, "Dimensions of Meaning," Collection, Papers by Bernard Lonergan, S. J. ed. by F.E. Crowe, S. J. (Montreal: Palm Publishers, 1967), p.259 Hereafter cited as Collection.

²³Ibid.

²⁴Bernard Lonergan, "Theology In Its New Context" Theology of Renewal I ed. by L. K. Shook, p. 36.

becoming more and more apparent.

While theology moved in the direction of dogmatism, modern science moved in the direction of positivism and scepticism. A confrontation could not be avoided indefinitely, however, and thus theology finds itself today "locked in an encounter with its age."²⁵ Rejecting what Polanyi calls the credentials of both dogmatism and scepticism, post-critical philosophy and foundational theology seek to restore both intellect and hope by re-equipping man with powers of thought and responsibility he has been taught to deny.²⁶ When men limit knowledge to clear and distinct ideas, to discrete sensa, to scientific method narrowly conceived-- then reason is confined only to a very narrow patch of the Lebenswelt. What happens to vaguer issues--that the tradition and perhaps ordinary experience take to be real in some

²⁵Lonergan, "Theology In Its New Context", p. 37.

²⁶"This reappraisal demands that we credit ourselves with much wider cognitive powers than an objectivist conception of knowledge would allow...we must accredit our own judgment as the paramount arbiter of all our intellectual performances....I shall yet try to elaborate the structure of this ultimate self-reliance." PK, pp. 249 and 265. "The point to the labor of objectifying the subject and his conscious operations is that thereby one begins to learn what these are and that they are...transcendental method... adds no new resource to theology but simply draws attention to a resource that has always been used. For transcendental method is the concrete and dynamic unfolding of human attentiveness, intelligence, reasonableness, and responsibility." Bernard Lonergan, S. J., Method In Theology (London: Darton, Longman and Todd Ltd., 1971), pp. 20 and 24. Hereafter cited as Method.

sense--in ethics, aesthetics, politics, religion? They hardly go away (to think that what we do not think about goes away is a fallacy of crude subjective idealism). They remain but are without reason's (disciplined, philosophical reason) help.

The problem, then, is that man's capacity for belief and self-transcendence has been widely discredited (in the natural and social sciences), and where acknowledged (in religious science) has been reduced to the status of subjectivity.²⁷ While post-critical philosophy addresses itself immediately to the problem of belief and transcendence as it arises in the natural and social sciences, foundational theology addresses itself immediately to the same problem as it arises in theology. Yet most importantly, both seek to transcend the principles, methods or conclusions of any particular science in order to examine the actual activity of scientific inquiry itself. Thus, in Method in Theology, Lonergan states that

we shall go behind the procedures of natural sciences to something both more general and more fundamental, namely, the procedures of the human mind. . . in those procedures we shall discern a transcendental method, that is, a basic pattern of operations employed in every cognitional enterprise.²⁸

²⁷PK, p.266.

²⁸Method, p. 4.

Likewise, in Personal Knowledge Polanyi criticizes those philosophers whose efforts "have been almost wholly concentrated on the process of empirical discovery which underlies the natural sciences" and insists that "any serious attempt to analyse the process of discovery should be sufficiently general to apply to all three fields of systematic knowledge."²⁹ It is clear from the context that the "three fields" Polanyi has in mind at this time are natural science, technology and mathematics. His concern, however, as he explicitly states, is to elucidate the structure of all thought, and in The Tacit Dimension he claims to discern in the operations of tacit integration procedures "by which all knowledge is discovered and, once discovered, is held to be true."³⁰ At this level of reflection, then, it is evident that the "crisis" to which both post-critical and foundational thought respond can be considered one of "faith" not in some narrowly religious or sectarian sense, but rather in a fully human and rational sense--and certainly one with profound religious implications. If reason or intelligence, committed to standards of scientific excellence, requires, as positivist epistemology implies, a repudiation of one's ability to hold unverifiable beliefs or to affirm

²⁹PK, p. 125.

³⁰TD, p. 6.

reality beyond the immediately observable or demonstrable, then what is undermined is not only man's capacity for religious faith but the very conditions of human understanding itself. If, on the contrary, the structure of knowing cannot be reduced to positivist dimensions, both faith and transcendence become, at least, open questions.

Foundational theology and post-critical philosophy are directed towards a common goal inasmuch as they aim--by means of theoretical reform--to re-establish the validity of cognitive powers which a naturalistic and positivistic view of science has obscured or rendered problematic. The point of such efforts, then, is not to rescue any particular faith affirmation from rational criticism, but instead to discover whether there can be found in the very operation of critical intelligence itself a structure or pattern which necessitates, or at least allows, a capacity for belief and accounts for the possibility of transcendence. To attempt to accomplish this task without abandoning the exigencies of scientific method or relinquishing the gains of critical philosophy is to envision the possibility of grounding religious knowledge--knowledge of ultimate transcendent reality--upon an authentic basis.

2) Important Assumptions: In addition to the basic thrust in the direction of resolving the problematic status of transcendent knowledge within a context which does justice to the achievements and

implications of modern science, foundational and post-critical thought share several important assumptions regarding the nature of scientific knowledge and attempts to articulate its ideals and methods. While this point will be developed throughout the dissertation, a few remarks at this time can anticipate that discussion. First of all, it is assumed that an intelligent act of "discovery" (to use Polanyi's language) or "insight" (to use Lonergan's) grounds the achievement of innovation and the advancement of knowledge which characterizes modern science. Behind every formal step of scientific procedure lies the unformalized and unformalizable operations of the scientist's own mind and of intelligence per se. Originality and creativity are essential attributes of these operations of scientific inquiry, operations which are "personal" in the fullest sense of the term. A fundamental prerequisite for any scientific knowledge, then, is the active participation of the knowing subject in its discovery. According to Polanyi, "into every act of knowing there enters a passionate contribution of the person knowing what is being known, and . . . this coefficient is no mere imperfection but a vital component of his knowledge."³¹ The process of discovery or insight cannot be converted into an impersonal method or a

³¹PK, p. viii.

set of rules, nor even made fully explicit. On the contrary, the operations of intelligence are unrestricted, indeterminate, and not reducible to strict logical prescription--in Lonergan's words, "not a set of rules to be followed meticulously by a dolt."³² They can only be described by procedures which Lonergan calls "transcendental" and Polanyi "tacit". It is essential to recognize this point if the notion of "method" as understood in Lonergan's transcendental and Polanyi's post-critical philosophies is to be correctly understood.³³

Cognitional theories which thematize scientific ideals and procedures only reflect (accurately or inaccurately) the actual performance of the scientist himself as a knower. Consequently, from the point of view of foundational theology and post-critical philosophy, the celebrated ideal of scientific detachment and objectivity is seriously misleading and the popular characterization of science as an impersonal method governed entirely by explicit procedures and justified completely by precisely observable criteria is regarded as superficial and reductionist.³⁴ It is the human act of creative

³²Method, p. xi.

³³I have argued this point, discussing the relationship of Polanyi's and Lonergan's notion of method in further detail, in an article "Polanyi and Lonergan on Scientific Method" to be published in the Fall issue of Philosophy Today XX, No. 2 (1976).

³⁴Commenting on this perspective, Langdon Gilkey notes that the naturalistic account of science as an "impersonal

intelligence involved in the actual process of discovery and at the basis of all scientific advance which needs to be elucidated. Foundational and post-critical thought agree that only a method which is "transcendental" (in Lonergan's sense) or "tacit" (in Polanyi's sense) can adequately illuminate the personal foundations of scientific knowledge.

The activity of the scientist, however, is not limited to heuristic acts which lead to new discoveries. It consists also of routine performances operating within an existing framework. Modern science is characterized not only by individual creative acts of insight, but also by a body of commonly accepted premises which are the result of the coordinated research and experimentation of the past. These premises form an indispensable tradition, to which the scientist gives allegiance. In this regard, science can be described "as a vast system of beliefs, deeply rooted in our history and cultivated today by a specially organized part of our society."³⁵ And, just as the creative act of intelligent inquiry cannot be adequately represented by an impersonal method, so too the scientist's reliance upon the premises of science is a commitment

activity based on a cool, tentative, logical intellect alone, drawing inductions by rules from given data, to form theories or hypotheses which can then be objectively tested by experience" is challenged today precisely because it obscures the contribution of the knowing subject. Religion and the Scientific Future (New York: Harper and Row, Publishers, 1970), p. 41.

³⁵PK, p. 171.

which "cannot be represented in non-committal terms."³⁶
 Thus, scientific knowledge is at once an activity requiring creativity and a tradition requiring commitment. As an activity, science is more personal, passionate and tacit than positivistic accounts assume, and as a tradition science is more convivial, authoritative and fiduciary than is ordinarily acknowledged.

Foundational theology and post-critical philosophy--each in its own context--have set for themselves the difficult objective of understanding the nature of cognitional activity taking into account both creativity and commitment. They do so in the hope of discovering in the structure and operations of knowing a common foundation upon which all knowledge rests, in the natural, social and religious sciences. They believe that foundation to be neither an impersonal method nor an objectively specifiable or explicitly verifiable set of conditions, but rather a personally authenticating act of rational judgment. It is the nature and full implications of that act which modern epistemology has neglected to make clear, and to which foundational theology and post-critical philosophy turn their attention.

3) Methodological Orientation: The methodological "tools" which are consonant with these assumptions and apposite to this task can be described as

³⁶PK, p. 171.

phenomenological and transcendental. In explicating the meaning and justifying the validity of knowing in the scientific sense post-critical philosophy recognizes that science includes much more than is commonly supposed. Its creative vision and powers of discernment transcend the explicit content and formal procedures of science and can only be accounted for by regarding science in broader and more concrete terms as a personal and social enterprise, a living tradition of thought. In this regard the comments of John Compton are pertinent and help explain the phenomenological and transcendental character of Polanyi's cognitional theory.

There must be an understanding of science as a human activity; and to this end, there must be comprehension of the total, historic phenomenon of 'doing' science. Prevailing intellectualist philosophies of science, however analyze the sciences outside this human context of development and meaning. Science is treated as a body of propositions, terms, operations. . . . or as a process of experimental manipulation, of theory construction. . . . A phenomenological philosophy of science, on the other hand, should be expected to take seriously the incarnation of scientific work in the historic-personal-perceptive life of its practitioners.³⁷

Polanyi's post-critical philosophy is constructed in terms of the validity of an appeal to the intentional structure of historic-personal consciousness. It is phenomenological

³⁷John Compton, "Natural Science and The Experience of Nature," Journal of Existentialism (Winter, 1965-66), pp. 203-204.

and transcendental inasmuch as it seeks a descriptive interpretation of the structures of consciousness and accounts for the meaning and validity of the scientific tradition in terms of his own beliefs. For the structure of consciousness Polanyi finds to be identical to the structure of commitment, and his own commitment is to the scientific tradition.

Personal Knowledge can be read, then, as a clear and persuasive description of Polanyi's own intellectual commitments as a practicing scientist, operating within a concrete historical tradition. Polanyi's methodology, moreover, which in the Kantian sense of transcendental knowledge is concerned not so much with objects as with our manner of knowing objects, goes beyond Kant in affirming that the nature of objective reality is disclosed in the very operations whereby it is known. In his post-critical philosophy Polanyi finds the ultimate justification of his beliefs rooted in the very structure of commitment whereby he affirms them. He acknowledges, in other words, that in exploring and justifying the fundamental operations of knowing, he must rely on those very operations. His own method, then, Polanyi admits, "must be intentionally circular. . . . Logically, the whole of my argument is but an elaboration of this circle; it is a systematic course in teaching myself to hold my own beliefs."³⁸

I have mentioned that David Tracy builds his case

³⁸PK, p.299.

for interpreting the foundational task of theology in terms essentially identical to those of post-critical philosophy on the basis of their common appropriation of phenomenological and transcendental methods.³⁹ Establishing the discipline of Christian theology as a legitimate cognitive enterprise--which is the burden of foundational theology--requires both an accurate "interpretation" and a thorough "justification" of the grounds of religious knowledge. The task can be considered a properly phenomenological one, for the interpretation consists in describing the intentional structure of religious consciousness and providing a reflective exposition of the meaning of its assumptions and beliefs. It can be considered a distinctively transcendental task, for the justification consists in adjudicating the truth claims of theology by disclosing the ultimate interior sources and grounds upon which they rest. In other words, the phenomenological moment provides an interpretation of the meaning of religious faith, while the transcendental moment provides an authentication of the truth of religious faith.⁴⁰

Contrast Between Polanyi and Lonergan: The fundamental affinities of the methodological conception of theology in foundational thought to the presuppositions of post-critical philosophy suggest the merit of undertaking an examination of

³⁹"Foundational Theology", pp. 140-174.

⁴⁰This task of foundational theology is discussed in more detail in Chapter Three, pp. 128-135.

Michael Polanyi's post-critical thought and applying a Polanyian framework to the foundational quest in Christian theology. Yet, there is a further and perhaps more compelling reason to hope that such an investigation might yield some interesting and fruitful results--a reason based not on similarities in foundational and post-critical thought, but on a point of contrast between Lonergan's and Polanyi's appraisals of the function of critical reason in establishing objective scientific knowledge, and the way the appraisals in each instance have influenced their respective cognitional theories. Foundational theology has been described as an attempt to ground theology critically by appropriating a phenomenological and transcendental method and submitting the theologian's own performance to the demands of this method. Lonergan has objectified a method which he sees as relevant to theology by appealing first to the successful procedures of the natural sciences. From these sciences he has "derived a preliminary notion of method" and certain presuppositions regarding "the recurrent and related operations" of intelligence which lead to discovery.⁴¹ Among these presuppositions can be discerned a conception of the nature and function of critical reason in scientific method, which Lonergan thematizes in terms of the "critical and dialectical functions" of transcendental method.⁴² A foundational theology

⁴¹Method, pp. 4-5.

⁴²Method, pp. 20-21.

which appropriates a transcendental method so conceived must reconcile religious faith with the requirements of this critical ideal derived from the natural sciences. This has provoked some criticism of Lonergan's conception of theological method based on his cognitional theory.

In a critique of Lonergan's epistemology, Gilkey refers to Santayana's characterization of transcendental criticism as a "sceptical instrument used by persons who were not sceptics," and then proceeds to criticize Lonergan's "proposal for a 'scientific' theological methodology" along similar lines.⁴³ His thesis, he says, is that Lonergan is "less sceptical in theology than his understanding of scientific method prescribes that he be if theology is to be understood on the analogy of scientific knowing, and therefore that the analogy is a mistake."⁴⁴ Lonergan seems to suggest such an analogy when he argues that although theology was a deductive science, "it has become largely an empirical science" and "has to be interpreted in the light of contemporary techniques and procedures."⁴⁵ In indicating what must be the "new foundation" for theology in its contemporary context, Lonergan's approach is to consider as

⁴³"Empirical Science and Theological Knowing", pp. 77, 85.

⁴⁴Ibid.

⁴⁵"Theology in its New Context", p. 37. Gilkey refers to this article several times in his critique of Lonergan's approach to theology.

a first approximation the foundation of modern science-- which is its method.⁴⁶ Yet on the basis of Lonergan's own remarks he does not intend simply to make an "analogy" between the natural sciences and theology, but rather to get behind the procedures of both to the more fundamental procedures of the human mind.⁴⁷ Nevertheless, it is significant, I think, that Gilkey finds in Lonergan's account of scientific method an element of scepticism, which is incompatible with religious faith and, thus, presents "a tension, if not a contradiction, between his epistemological and his theological thought."⁴⁸ If there is a "mistake" in Lonergan's approach, however, it is not in drawing an analogy between scientific knowing and theology but in the implication derived from the natural sciences that being scientific requires such a conception of critical reason at all and the scepticism it entails. To the extent, then, to which foundational theology is led to adopt an ideal of critical reason in its appropriation of Lonergan's transcendental method, (i.e. to the extent theologians such as Gilkey who are concerned with the problem of foundations in theology discern in Lonergan's account of science a notion of method "which can only subvert

⁴⁶ "Theology in its New Context", p. 42.

⁴⁷ Lonergan, in fact, forthrightly rejects the former approach to the problem of method in theology: "Nor will recourse to the analogy of science be of any use." Method, p. 4.

⁴⁸ "Empirical Science and Theological Knowing", p. 76.

rather than establish what he clearly expects theology to talk intelligently about"⁴⁹), Polanyi's "post-critical" philosophy offers a corrective. On Polanyi's account it is clear that neither the theologian nor any other scientist need be sceptical in order to be rational or methodical, and Polanyi offers an alternative to the ideal of critical reason in science.

Polanyi has indicated that in setting out to examine the grounds on which science is pursued and its knowledge justified, he has discovered that "its progress is determined at every stage by indefinable powers of thought."⁵⁰ The many indeterminacies which he found undergirding scientific achievement at each step--from the first sighting of a good problem to the discovery of its solution and finally the acceptance of that solution into the tradition--forced Polanyi to look beyond the articulated ideals of scepticism and objectivism in the natural sciences, and the strict criteria for meaning and truth which they implied (and which he found to be "nonsensical") to discover in the structure of tacit integration truer grounds for scientific knowledge.⁵¹ The insight which Polanyi has

⁴⁹"Empirical Science and Theological Knowing", p. 76.

⁵⁰Michael Polanyi, "Logic and Psychology", The American Psychologist, XXIII (January, 1968), p. 27.

⁵¹TD, pp. 3-4.

continued to pursue has been to show how the activity of tacit knowing forms an invariant pattern for all cognitive endeavours, theoretical as well as practical. Moreover, he discovered not critical doubt but belief to be an indispensable element in all knowing, and found this fiduciary element to be "intrinsic to the tacit component of knowledge."⁵²

Finally, Polanyi's writings contain numerous indications of the relationship which he sees between the beliefs which underlie all scientific activity and the beliefs which form the basis of Christian life and thought. He has clearly stated, in fact, that "the conflict between faith and reason evoked by natural science today is but a modern variant" of the faith-reason problem which is the peculiar legacy of Western religious thought and culture.⁵³ If this is true, and if, as Alfred N. Whitehead has observed, the clash between science and religion is "a sign that there are wider truths and finer perspectives within which a reconciliation of a deeper religion and a more subtle science will be found,"⁵⁴ then Polanyi's conception of knowing may well

⁵²"Logic and Psychology", p. 27. Cf. also Polanyi's acceptance speech, "The Lecomte du Nouy Foundation Award", The Christian Scholar, XLIII (March, 1960), p. 58.

⁵³"Faith and Reason", p. 237. Polanyi points out that he received this insight from reading Josef Pieper's Scholasticism. The next chapter, which surveys the history of the faith-reason problem, will have occasion to unpack this statement by drawing more explicitly upon Pieper's account.

⁵⁴Alfred N. Whitehead, Science and the Modern World, p. 185.

provide a framework for achieving a new synthesis, restoring a coherence of faith and reason in all cognitive pursuits, and providing a foundation for reconciling scientific and religious knowledge.

Scope and Method--Problem Solving: Further clarification can be given here regarding the overall structure of this study, its scope and method. Since the objective is to examine the implications of Michael Polanyi's cognitional theory for understanding the nature of religious knowledge, and more specifically the faith-reason relationship in theological method, two possible foci and points of departure suggest themselves--one being Polanyi's epistemology, the other being the theological problematic. In other words, one might first undertake a detailed analysis of Polanyi's thought--having in mind certain theological interests--and attend to the salient features of his philosophical position. Then, having explicated Polanyi's epistemology, it would remain to draw out whatever implications his theory holds for theological self-understanding. An alternative approach, however, would be to begin in the theological context with the foundational problem itself--relying on those clues in Polanyi's own thought which help to shape one's conception of the problem, and concentrate on exploring that problem in its complexities and ramifications. Having gained an understanding of the theological problem and the foundational quest, one would then seek in a more detailed Polanyian analysis of scientific method a possible resolution of the problematic.

In the first instance, one is guided primarily by theological intimations to focus on understanding Polanyi's thought. In the second instance, one is guided primarily by clues in Polanyi's thought to focus on understanding and resolving the problem of method in theology. Both approaches can be described as "problem-centered" and need not be considered as necessarily exclusive. My concern here, however, is a problem in theology--namely the relationship of faith and reason in theological method--rather than a problem in Polanyi's thought, and, therefore, the second description provides a more accurate account of the method to be adopted.

Since all research begins with a problem, some Polanyian reflections on the nature of a problem are pertinent to this initial discussion of methodology. According to Polanyi, the same structure of discovery is operative in surmising a problem as is operative in solving it and in affirming the solution to be true.⁵⁵ There will be occasion in later chapters to develop at some length Polanyi's ideas regarding the entire process of discovery and the structure of tacit knowing which characterizes that process. But these insights not only form the content of the present investigation, they also inform its methodology--which is the operation of surmising and resolving what is taken to be an important theological problem. In other words, if the act of discovery

⁵⁵Michael Polanyi, "Genius In Science", Encounter, XXXVIII (January, 1972), p. 46.

is not only the intentional object of this dissertation but also (hopefully) operative in its intentional subject, and, if the structure of that act is tacit knowing, then this structure will be reflected not only in its conclusions but in its performance.

The conception of a problem is apparently self-contradictory. The classical formulation of the paradoxical nature of a problem, and one to which Polanyi often refers, can be found in Plato's Meno. There Meno argues that to search for the solution to a problem is absurd, for either one knows what he seeks, in which case there is no problem, or one does not know what he seeks, in which case he would not recognize a solution were he to find it.⁵⁶ Socrates' reply that all knowledge is recollection has not found widespread philosophical acceptance, and the paradox of Meno remains inscrutable in terms of modern epistemology's ideal of wholly explicit and formalizable knowledge.⁵⁷ The seeming conflict between truth and the search for truth on these grounds led Polanyi to return to the paradox, for to see a problem in the modern scientific sense is to see something hidden yet accessible. Polanyi describes having a problem as having "an intimation of the coherence of hitherto not comprehended particulars. The problem is good if this

⁵⁶TD, p. 22.

⁵⁷TD, p. 22.

intimation is true; it is original if no one else can see the possibilities of the comprehension that we are anticipating."⁵⁸ To begin with a problem, in other words, is not to begin with nothing, but to begin with something. A problem is a known-unknown, a potential-actuality, the presence-of-something absent.⁵⁹

If recognizing a worthwhile problem or forming a fruitful question is itself the first stage in the process of discovery, then understanding a problem is at least as important, and perhaps as difficult, as understanding its solution. To have a problem--in contrast to simply being confused--is to have direction, to know where to look and what to look for. A good problem anticipates its solution, just as a good question anticipates its answer. Yet, like a good question, a good problem is also without its solution. We commonly distinguish in ordinary language between rhetorical questions and real questions on the grounds that

⁵⁸TD, p. 21.

⁵⁹It is worth noting that Polanyi's idea of a problem transcends the distinction sometimes drawn between problem and mystery by existentialists. Gabriel Marcel, for example writes that: "A problem is something which I meet, which I find complete before me, but which I can therefore lay siege to and reduce. But a mystery is something in which I am myself involved, and it can therefore only be thought of as a sphere where the distinction between what is in me and what is before me loses its meaning and its initial validity." Being and Having (New York: Harper Torchbooks, 1965), p. 117. On Polanyi's account, this distinction appears at best exaggerated and one of many indications of a false dichotomy between objective scientific knowledge (the realm of problems) and subjective existential or religious knowledge (the realm of mysteries).

the former not only anticipate but already contain an answer, whereas the latter do not. This is also what distinguishes a pedagogical or pseudo-problem (the kind teachers often--and for good reasons--set for students) from a scientific or real problem (the solution of which is unknown).

Polanyi's explanation of the nature of a problem as an anticipation of something hidden rests upon a distinction which forms the basis of his theory of tacit knowing--the distinction between two kinds of knowledge: focal awareness and subsidiary awareness. Focal awareness describes the way we know something by "attending to" it, while subsidiary awareness describes the way we know something by "relying on" it. These two kinds of knowledge are combined in the act of tacit knowing, and the basic structure of that act is a function of the logical relation of the two components, the subsidiary and the focal. Put briefly, tacit knowing has a from-to structure. In an act of tacit knowing we attend from something in order to attend to something else.⁶⁰ That from which we attend functions as a subsidiary clue bearing on the focal object to which we attend. Tacit knowing achieves comprehension or understanding by a process of indwelling and integration. Dwelling in the particulars of a whole allows them to function as subsidiary clues which can then be integrated into a coherent pattern with a bearing on a focal object which

⁶⁰TD, p. 10.

becomes their meaning.

The from-to structure of tacit knowing is not only a logical relation of subsidiary clues to focal objects. It is also a temporal relation. Tacit knowing dwells in the past and tends towards the future. Logically and temporally the process is irreversible. Tacit knowing may be almost instantaneous--as it is in most cases of ordinary perception when raw data are integrated to form sensory objects--or it may require a sustained effort drawn out over a longer period of time--as skillful performance and intelligent inquiry often testify. In any case, when the logical and temporal gap widens, the subsidiary aspects loom large, and tacit knowing becomes problematic.⁶¹

A problem, then, is an awareness pointing to a gap, an anticipated discovery, a partial comprehension of a coherence, striving for its consummation. According to Polanyi:

To understand a problem is to commit oneself to the belief that you can fill in this gap and make thereby a new contact with reality. Such a commitment must be passionate. A problem which does not worry us and the prospects of which do not excite us is not a problem; it does not exist. A problem is discerned by integrating bits of experience to a fragmentary pattern which, if completed, will touch upon reality. Completion, which solves the problem, is achieved by a sustained quest for deeper coherence.⁶²

⁶¹Marjorie Grene, "Introduction" KB, p. ix.

⁶²Michael Polanyi, MIT I, pp. 19-20.

The problem I am undertaking in this dissertation is the problem of theological method--the relationship of faith and reason--in discovering and justifying religious knowledge.⁶³ Two questions in particular will have to be addressed, the question of meaning and the question of truth. The prevailing philosophic and scientific outlooks have thus far set the terms and conditions for discussing such questions. Contemporary foundational theology, which attempts to establish a truly scientific method in theology, and Michael Polanyi's post-critical philosophy, which presents a critique of scientific method in the natural sciences, provide a host of subsidiary clues pointing to a possibility. That possibility can be described as a new philosophic and scientific model (i.e. terms and conditions) for the discussion of the problem of religious knowledge. By dwelling in an awareness of these particulars in foundational theology and Polanyian epistemology and integrating these clues bearing on the problem of religious knowledge, it is hoped that a new and deeper coherence will emerge which constitutes the joint meaning of the clues and a resolution of the problem. This describes both the aim and the method of this study.

⁶³ If the historical analysis of the faith-reason relationship and of the foundational problem of method in theology (the focus of the next two chapters of Section One) seems a lengthy anticipation of the more explicit analysis of Polanyi's cognitional theory and its implications for resolving the problem of religious knowledge (the focus of Section Two) I ask the reader's indulgence, and remind him of what I take to be a cardinal principle of Polanyian methodology--namely that understanding a problem is at least as important as understanding its solution.

CHAPTER II

FAITH AND REASON IN THEOLOGY

The faith-reason problem in philosophy of religion and theology has been conceived in a variety of different ways. Obviously how one understands the problem depends in large measure on how one understands the meaning of "faith" and "reason". Wittgenstein's caveat about the "bewitchment of language" is significant in this regard,¹ for not every philosopher of religion nor theologian necessarily uses the terms "faith" and "reason" in ways which would suggest they mean the same thing. Moreover, since it is finally only within a particular historical and philosophical-theological context that the notions of faith and reason take on concrete meaning, an adequate understanding of what renders their relationship problematic emerges only as a context becomes clarified. The context in which the present study locates the faith-reason problem has been described as contemporary, Christian, foundational theology.

The purpose of this chapter and the next is to provide a background for understanding the faith-reason problem in

¹Ludwig Wittgenstein, Philosophical Investigations. Trans. by G. E. M. Anscombe. (Oxford: Basil Blackwell and Mott Ltd., 1958), p. 47^e.

foundational theology. This will be done, first, by considering briefly some of the various ways in which "faith" and "reason" have been conceived and the faith-reason relationship understood. The significance of the cognitive component of "faith" will be taken as one clue to their problematic status. The shift in horizons from a classical (Greek) to a modern (Enlightenment) ideal of "reason" will be taken as another clue. The second step will be to trace the theological conception of the faith-reason relationship through the three historical periods of rationalism Polanyi outlines: the Greek, the medieval, and the modern.² The task of Chapter Three will be to focus on some contemporary aspects of the problem of religious knowledge and to describe the response of foundational theology to the present "crisis". Two formulations of the faith-reason problem which have a bearing on the foundational issues in Christian theology today will be suggested and discussed. The first formulation construes the relationship of faith and reason in terms of a "paradox of understanding", and focuses on the activity of knowing in theology. The paradox consists in the fact that the theologian must believe in order to understand, yet must understand in order to believe.

²"Faith and Reason", p. 237. The present chapter is an historical survey, in other words, which prepares for a consideration of the faith-reason problem in the context of what Polanyi calls yet a fourth (contemporary) period of rationalism. For a further discussion of how the two horizons (the classical ideal of reason and the modern ideal of reason) are related to the four periods of rationalism, cf. the appendix "Theology and Notions of Reason and Science".

The faith-reason problem thus formulated becomes the "methodological" problem of clarifying the procedures operative in the discovery of religious knowledge. This circular form of the problem of understanding in theology--fides quaerens intellectum, intellectus quaerens fidem--relates to the question of meaning in theology, since understanding has to do with meanings. The second formulation construes the relationship of faith and reason in terms of a "dilemma of affirmation", and focuses on the justification of knowledge in theology. The dilemma stems from the contemporary conception of the theologian's dual commitment as a "believer" (bound by the authority of faith) and a "scientist" (bound by the obligations of a rigorous critical methodology) and consists in the apparent conflict between two kinds of knowing sometimes contrasted as judgments of faith and judgments of reason. The faith-reason problem thus formulated becomes the "moral" problem of justifying the grounds on which religious knowledge rests. This polar form of the problem of affirmation in theology relates to the question of truth in theology, since affirmation has to do with truths. The faith-reason problematic, then, will be shown to be at the heart of the two foundational issues involved in the justification of the discipline of Christian theology. Those issues are the possibility of religious knowledge being meaningful (i.e. the question of its intelligibility) and the possibility of religious knowledge being true (i.e. the question of its validity).

THE NOTIONS OF "FAITH" AND "REASON"

A well known philosopher of religion has described faith as "the religious habit of mind. . . a habit of mind which accepts without criticizing, pronounces without proving, and acts without arguing."³ As a cognitive habit, faith so described knows nothing of hypothesis and induction, analysis and classification. It is the intuitive attitude taken up toward things as a whole. Reason, in contrast, is described as "the scientific habit of mind. . . a habit of mind which aims at criticizing before it accepts, proving before it pronounces, and arguing before it acts."⁴ As a cognitive habit, reason so described is sceptical, methodical and logical. It is the analytic attitude taken up toward things as parts of a whole. I begin with this description of faith and reason because it emphasizes both the cognitive component of faith and the Enlightenment ideal of reason, and because it suggests the kind of conflict between faith and reason which would be problematic for theology as a religious science. It is Polanyi's contention (as it is Collingwood's) that in spite of their opposite characteristics faith and reason are not really at bottom opposed. Yet they certainly seem to be opposed, and in this chapter I want to examine this apparent opposition as it develops in the history of Western

³R.G. Collingwood, Faith and Reason: Essays In the Philosophy of Religion, ed. by Lionel Rubinoff (Chicago: Quadrangle Books, 1968), pp. 122, 140. Italics added. (Although known chiefly for his philosophy of history, Collingwood's contribution to philosophy of religion is no less profound.)

⁴Ibid., pp. 122, 142. Italics added.

religious thought.

Anyone familiar with the language of religious literature in Western thought is aware of the ambiguity which surrounds the notion of "faith" especially as it is related to the notion of "reason". What is not so often nor clearly recognized, however, is that the notion of "reason" itself has undergone some rather fundamental changes in the course of our intellectual history.⁵ Certainly, the variety of interpretations given the notions of faith and reason--and the fact that in the tradition of Western thought, as Henry Dumery has observed, faith and reason have "exchanged categories" so often⁶--is itself a source of much confusion in attempting to explicate the nature of the theological problematic.

How, then, are we to understand the meaning of "faith" in Christian theology? The epistle to the Hebrews describes faith as "the substance (or reality) of things hoped for, the evidence (or proof) of things not seen." (11;1)

⁵The comment by Ed L. Miller that the "word 'reason' poses no real problem for most of us: it signifies the logical, discursive, or inferential faculty of knowing. It is, however, more difficult to define 'faith.'" seems to reflect a rather common and, I believe mistaken, assumption that the notion of faith and not the notion of reason is what is ambiguous--and hence problematic--about the faith-reason relationship. Classical Statements On Faith and Reason. (New York: Random House, 1970), p. ix.

⁶Henry Dumery, The Problem of God. (Northwestern University Press, 1964), pp. 3-4.

Augustine speaks of faith as a precondition for knowledge and advises Christians: "Do not seek to understand in order to believe, but believe that you may understand."⁷ Thomas Aquinas says that faith is giving assent to truth which "surpasses the capacity of the reason" and is, therefore, inaccessible to human understanding.⁸ Pascal calls faith the "reason of the heart"⁹ and Kierkegaard describes it as an "infinite passion of inwardness."¹⁰ More recently, Paul Tillich defines faith as "the state of being ultimately concerned,"¹¹ F. R. Tennant as the element of "willing venture" in all discovery,¹² and H. R. Niebuhr as that "attitude

⁷ Augustine, Homilies on the Gospel of St. John. XXIX, 6. Trans. by John Gibb and James Innes, Nicene and Post Nicene Fathers, VII. (Edinburgh: T. & T. Clark, 1888).

⁸ Thomas Aquinas, Summa Contra Gentiles, tr. Anton C. Pegis (Garden City, N. Y.: Image Books, 1955), Chapter 7 No. 1.

⁹ "The heart has its reasons, which reason does not know. . . This, then is faith: God felt by the heart, not by the reason." Blaise Pascal, Pensées. No. 626-627. Trans. by H. F. Stewart. (New York: The Modern Library, 1967), pp. 343-5.

¹⁰ Soren Kierkegaard, Concluding Unscientific Postscript. Trans. by David F. Swenson and Walter Lowrie, (Princeton: Princeton University Press, 1941), p. 182.

¹¹ Paul Tillich, Dynamics of Faith. (New York: Harper and Row, 1957), p. 1.

¹² F. R. Tennant, Philosophical Theology. (Cambridge: Cambridge University Press, 1928), I, 297. John Hick points out that Tennant distinguishes "faith" so defined from "belief" which is limited by the world of fact, i.e. what is, rather than what could be. Cf. Philosophy of Religion. (Englewood Cliffs, N. J.: Prentice-Hall Inc., 1963), p. 66.

and action of confidence in, and fidelity to, certain realities as the sources of value and the object of loyalty."¹³ Out of context and so juxtaposed, of course, such references to faith on the part of theologians and philosophers of religion suggest a wide range of meanings and describe a number of different, though related, ways in which men consciously become aware of and respond to the religious objective. Describing "faith" as a certain kind of knowledge (revealed truths), a specific set of propositions (doctrines or creeds), a personal attitude or disposition (trust or confidence), an act of commitment (loyalty or devotion), a mode of existence (a "leap" into the dark or a "state" of concern), or a quality of acceptance given an assertion--whether expressed positively (credence or "on authority") or negatively (credulity or "without evidence")-- does not begin to exhaust the semantic richness of the term. Moreover, the close association of the term "faith" with its semantic cognate "belief" further contributes to the general ambiguity of this rather fundamental theological concept.

Like the notion of faith, the notion of reason is descriptive of many different ways in which man apprehends and appropriates reality. Some of the more common meanings conveyed by the term "reason" include: the process of

¹³H. Richard Niebuhr, Radical Monotheism and Western Culture. (New York: Harper & Row, 1943), p. 16.

inferential thinking; the faculty of imaginative generalization; the power of abstraction; the function of analysis; the procedure of discovery; the pursuit of wisdom; the technique of control and manipulation; or simply the idea of causal explanation. Moreover the use of descriptive adjectives such as "ontological," "logical," "deductive," "inductive," "speculative," "critical," "theoretical," "practical," "synthetic," "analytic," "technical," et cetera, have modified the notion of reason in innumerable ways to suggest an almost unlimited range of meanings. As Whitehead has pointed out, many of the special controversies involving a contrast between reason and faith, reason and authority, reason and intuition, or reason and imagination stem from various determinations of the true function of reason.¹⁴

We could add to these controversies the polemics surrounding the relationship of religion and science, philosophy and theology, belief and knowledge, and reason and revelation. In each instance the interpretations of "faith" and of "reason" provide the conceptual matrix within which the discussion takes place.

The conceptual matrix of the contemporary faith-reason problematic in theology needs to be clarified. Despite the ambiguity of the terms "faith" and "reason",

¹⁴ Alfred N. Whitehead, The Function of Reason. (Boston: Beacon Press, 1929), p. 3.

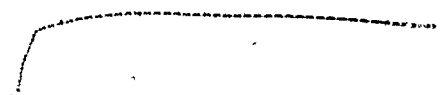
there are certain patterns discernable in the historical development and interaction of these notions. First, there is a polarity in the notion of faith as it has been understood traditionally--an emphasis, on the one hand, upon faith as a theoretical activity (i.e. a "cognitive" function) and, on the other hand, upon faith as a practical activity (i.e. a "valuative" function). Second, there is the shift from the classical notion of reason as logos, the necessary and eternal structure of the mind and of reality, to the modern notion of reason as method, the empirical and critical operations of intelligence. Finally, in the convergence of these patterns the contemporary faith-reason problematic emerges.

It is evident that the relationship of faith and reason would not be problematic for theology were there no common ground for conflict. If the Christian theological tradition understood "faith" exclusively in terms of volitional, affective or practical aspects of human activity, and "reason" exclusively in terms of intellectual, rational or theoretical aspects of human activity, then there would be no faith-reason problem at all. For not only could there be no conflict between these two activities of man (willing or feeling and knowing), they would seem rather to presuppose and complement one another.¹⁵

¹⁵ Ed L. Miller, p. ix.

Consequently, to view faith and reason as two distinct activities in which man engages (i.e. the one volitional, the other cognitional) or two different ways of being-in-the-world (i.e. the one existential or passionate, the other theoretical or intellectual) is not to resolve the faith-reason problem, but to refuse to recognize it. Were this in fact the only way of conceiving faith and reason, there would, indeed, be a clear separation between the two domains--the practical and the theoretical, willing or feeling and knowing, aesthetics and epistemology. The claims of faith and reason would have no basis for conflict, nor would religion have anything to do with knowledge.

That there is, however, and always has been a problem of faith and reason in Western religious thought is undeniable. Obviously, then, the notions of faith and reason have not been conceptually dichotomized in the way just suggested above, and the roots of the problem lie in some common ground both faith and reason share. That common ground is the claim to cognitive significance and validity. Because both faith and reason are understood in the Christian tradition as offering man the possibility of religious meaning and truth, they have been regarded as somehow jointly operative in the theological discovery and justification of knowledge. Thus, the question, how are these two sources and grounds of cognition related? This is the question of method in theology.



Faith and reason have always had a rather precarious relationship in Christianity from apostolic times to the present day. In one sense, at least, the entire history of Christian theological thought can be interpreted as a record of Western man's attempt to deal with this epistemological dualism and somehow reconcile two apparently conflicting approaches to meaning and truth. It is a problem without parallel in the tradition of Eastern religious thought where such a conflict between faith and reason never arose and where, consequently, the kind of distinction made between theology and philosophy in the West is without conceptual basis.¹⁶

The Christian response to the faith-reason problem tends to polarize theologians in the defense of faith on the one hand or the defense of reason on the other. A tendency to maximize the role of faith and minimize the role of reason in religious knowledge leads to "theological fideism". Methodologically, an emphasis upon the cognitive component of religious faith makes an appeal to reason a secondary or even (in some extreme views) an unnecessary step. Since faith already gives one immediate knowledge of God, the fideist sees little need (and some danger) in the effort to intellectualize or "rationalize" belief. In its

¹⁶Heinrich Zimmer, Philosophies of India (Princeton: Princeton University Press, 1951), pp. 27-34; 42-47.

extreme form, the fideist position "suggests that in the presence of revelation and supernatural knowledge, all natural reasoning and knowledge should be abandoned."¹⁷ On the other hand, a tendency to maximize the role of reason and minimize the role of faith leads to "theological rationalism". Here faith is regarded as a practical activity, that is, its valiative component is emphasized, for the rationalist attempts to make all religious knowledge depend on rational proof. In the theological rationalist's notion that natural reason is sufficient to attain religious knowledge is the implication that the cognitive function of faith is superfluous or even (in some extreme views) spurious.

The fideist tendency in theology begins by asserting the primacy of faith and admitting the need for reasoning in faith, but ends by asserting the supremacy of faith and rejecting the intrusion of natural reason altogether. The rationalist tendency in theology begins by asserting the primacy of reason and the possibility of transcending rational knowledge by faith, but ends by appropriating to autonomous reason and its operations the entire domain of knowledge. The logical outcome of these tendencies carried to their extremes is a disjunction of faith and reason. Thus, rationalism leads to various forms of natural theology, i.e. theologies without faith, while fideism leads to various forms of supernatural or revelational theology,

¹⁷Ed L. Miller, p. xi.

i.e. theologies without ("above" or "beyond") reason.

Fideism and rationalism, however, remain useful categories for describing not only the extreme disjunctive solutions to the faith-reason problem but also for understanding the inherent tension involved in attempts to relate faith and reason in a theological synthesis or conjunction. Theologians generally avoid explicitly positing a radical antithesis between faith and reason believing that to abandon openly or explicitly either faith or reason is to step outside the circle which defines the theologian's proper task. Lonergan expresses this conviction in formulating the theological problematic this way:

If one is not to affirm reason at the expense of faith or faith at the expense of reason, one is called upon both to produce a synthesis that unites two orders of truth and to give evidence of a successful symbiosis of two principles of knowledge.¹⁸

Yet theological syntheses of faith and reason seem to be inherently problematic, and often, although attempting to achieve a harmonious balance, unwittingly move in the direction of fideism or rationalism, i.e. either underestimating the role of critical reflection or over-rationalizing faith. Both Augustine and Anselm, for example, express in almost identical form the principle of joining faith and reason. Their theological formulas become, in fact, mottos for those

¹⁸Insight: A Study of Human Understanding. (London and New York: Longmans, Green & Co., and Philosophical Library, 1957), p. 732. Hereafter cited as Insight.

who seek to reconcile the demands of faith and reason: fides quaerens intellectum and credo ut intelligam. Yet, Augustine's thought with its emphasis on faith as a prerequisite for understanding is often interpreted as being fideistic, while Anselm's rational arguments for God, while admittedly based on faith (e.g. "I should never be able to attain insight if I did not believe." Proslogion, Chapter One.) nevertheless are sometimes considered an overvaluation of the powers of natural reason which conjure up the "peril of deductive rationalism".¹⁹

The difficulty of achieving an adequate theological synthesis of faith and reason is, in part, the difficulty of balancing what H. Richard Niebuhr calls the two-fold task of theology. If reason and faith are not exclusive of each other, one task of theology is to develop reasoning in faith, while the second task for which theology is responsible is the criticism of faith.²⁰ This account of theology as mediating between the extremes of unreasonable belief or blind faith on the one hand, and over-critical reason or scepticism on the other, assumes a view of faith and reason as somehow compatible. Ultimately, it is on the validity of this assumption that the

¹⁹Josef Pieper, Scholasticism. (New York: McGraw-Hill Book Co., 1960), p. 61. According to Pieper, Anselm thought rational argument in itself "sufficient proof of the truths of Christian faith" and attempted to demonstrate, for example, "that salvation through God incarnate was necessary on compelling rational grounds" apart from any knowledge of even the existence of Jesus Christ.

²⁰Niebuhr, p. 15.

possibility of a theological synthesis of faith and reason rests. But since the problematic relationship of faith and reason in theology cannot really be understood apart from the concrete-historical encounter of the Christian community's understanding of faith and the broader secular culture's view of rationality (i.e. the prevailing scientific ideal) we will be able to evaluate this assumption and its bearing on the contemporary faith-reason problem only after tracing the historical development of the scientific ideal and the notion of reason and faith in relation to it.

THREE PERIODS OF RATIONALISM

A full-scale historical investigation of the relationship of faith and reason vis à vis the developing ideal of scientific knowledge is in itself a task of enormous range and complexity, and certainly one far beyond the limited scope of this chapter. Before entering upon this brief excursion into the difficult realm of history, then, I need to make clear the fundamental principle of limitation and organization which is operative here. It has been suggested that Polanyi's thought provides certain clues for understanding and resolving the contemporary faith-reason problematic. Dwelling in the framework of Polanyi's vision of the current crisis we can discern a perspective on the historical episodes which precede it that provides some "guidelines within which these developments can be discussed. In other words, the faith-reason problem is admittedly

complex and can be interpreted in a number of different ways. In seeking a solution to the problem in Polanyi's epistemology I also recognize the guidance his thought lends to the conceptualization of the problem itself.

Polanyi distinguishes three periods²¹ of rationalism in the history of Western thought--the Greek, the medieval, and the modern.²¹ He envisions the onset of yet a fourth great period of rationalism--the emergence of a post-modern or contemporary scientific ideal--and sees his own philosophical efforts as contributing to this new post-critical conception of reason.²² In each of these historical periods there reigns a dominant ideal of knowledge and a corresponding view of the nature and function of reason in terms of this ideal. The honorific adjective in this regard is always "scientific", for the cognitive discipline attracting the brightest minds and making the greatest achievements in the realm of knowledge during each period of thought is regarded as the supreme science of the age. For the Greeks, the paradigm of science was mathematics, for the medievals it was theology (the "regina scientiarum"), and for the moderns it is physics. The scientific ideal

²¹Polanyi, "Faith and Reason", p. 237.

²²"We have. . . begun to live in a new intellectual period, which I would call the post-critical age of Western civilization. . . . It is a period of rationalism conscious of its own fiduciary foundations." LL, p. 109.

and method thus provide the basic framework or horizon within which the faith-reason problematic can be evaluated.

Greek Rationalism: According to Polanyi, the achievement of Greek rationalism lies in its liberation of man's mind from subjective, mythical thought and the establishment of a realm of objective and certain scientific knowledge. It is within the context of a classical ideal of reason antithetical to personal belief and subjectivity that the initially hostile encounter of faith and reason in the early centuries of the Christian era can be understood. Scientific knowledge represented the triumph of reason over inferior forms of mythic thought and superstitious beliefs.²³ The difference between science and myth was equivalent to a difference between knowledge and opinion, and the fact that there was such a difference was itself unquestionable according to Plato:

that there is a difference between right opinion and knowledge is not at all a conjecture with me but something I would particularly assert that I knew; there are not many things of which I would say that, but this one, at any rate, I will include among the things that I know.²⁴

²³John Baillie states that for the Greeks science (episteme) and philosophy (philosophia) were synonymous terms referring to the whole body of new knowledge. The Interpretation of Religion. (New York: Abingdon Press, 1928), p. 26.

²⁴Plato puts these words in Socrates' mouth, in the dialogue with Meno. Cf. Marjorie Grene's account of this discussion in The Knower and the Known. (London: Faber & Faber, 1966), p. 29.

Two distinctive characteristics of rational knowledge are particularly significant, as Polanyi sees it, for the eventual encounter between Greek reason and Christian faith. Accepting a view later articulated in great detail by Marjorie Grene, Polanyi felt that, in the first place, Greek rationalism considered knowledge, as distinct from mere opinion or belief, to be objective and impersonal. Platonic knowledge, Grene argues, is wholly explicit, impersonal, finished and final. "It is theoria, something the mind confronts and to which it must submit as more than itself, but which is at the same time separable from it."²⁵ On this account, knowledge is not a personal possession of the knower but exists apart from and independent of the individual mind. It was this idea of objective and explicit knowledge that led Plato to consider learning (i.e. the personal appropriation of knowledge) to be paradoxical. In the second place, the Greek philosophers considered knowledge to be certain and unchangeable. Plato sought the source of certainty in the world of ideal forms. Aristotle believed the source to be in the real world, i.e. that rational certainty was grounded in an isomorphism of mind and nature. Both philosophers agreed, however, that what reason apprehends is eternal and immutable (i.e. "universals", whether in the divine mind or in the world of

²⁵Grene. The Knower and the Known p. 31.

nature). In Greek rationalism the triumph of logos over mythos was complete. Truths of reason alone deserved the name of "knowledge", and such truths could be clearly distinguished from belief or opinion which were also forms of apprehension, but forms whose objects were the temporal and shifting appearances of the world. On these grounds religious belief was distinct from and inferior to rational knowledge and the Greeks sought to "liberate the mind from this pervasively personal network" of relationships (mythos) and to replace it with objectivity and certainty (logos).²⁶

Into this world of Greek rationalism Christianity "came as a destructive and revolutionary force".²⁷ The initial response of Christianity was to invert completely the Greek view of faith and reason. While reason could give knowledge of the sensible world, such knowledge, according to St. Paul was mere foolishness compared to the eternal and unchanging truths of Christian faith.²⁸ Moreover, Christian faith was personal knowledge, a matter of passionate commitment and thus in stark contrast to that precision


²⁶ Polanyi, "Faith and Reason", p. 238.

²⁷ Collingwood, Faith and Reason, pp. 130-32. Cf. also Polanyi "Faith and Reason"; p. 238.

²⁸ "Thus the Platonic relation between faith and reason was reversed. Plato had considered faith an inferior kind of knowledge because it could not, when challenged, argue in its own defense. Christianity saw in the same fact a ground of superiority" Ibid., p. 131.

instrument of Greek thought, the Aristotelian syllogism, a matter of objective demonstration. The Christian message, so interpreted, was an outrage to reason. St. Paul's vehement attack, in the name of faith, upon the "wisdom of the wise and the understanding of the prudent" (I Cor. 19) hardly portends a compatibility of Christian faith and Greek reason.

Nevertheless, Christianity eventually moved beyond preaching and polemics to teaching and apologetics (i.e. from "glossalology" to "theology"). Consequently, in order to present its message to the world, and also for the purpose of self-understanding, the Christian community experienced the need to seek some accommodation of faith and reason. If the Christian message is addressed to the whole man, not only the heart but the mind as well, faith must seek rational understanding. The scriptures themselves, of course, are, in a sense, theological, i.e. products of the early community's rational understanding of its faith. But, although a conjunction of faith and reason is implicit even in the earliest--and largely symbolic--attempts to articulate the meaning and truth of Christianity, it becomes problematic to the extent that Greek--theoretic--rationalism makes its influence felt in the life of the Church. Thus, as early as the second century, Tertullian forcefully expressed what he held to be an irreconcilable antagonism between Christian faith and Greek philosophy. His contrast of Athens and Jerusalem as two antithetical modes of knowledge reveals the disjunctive



view of faith and reason which dominates the period of classical rationalism. His rejection of philosophical reflection as a source of heresy places him firmly in a tradition of fideism. Tertullian's contemporary, Clement of Alexandria, is influenced by the same disjunctive view of faith and reason, although his belief in man's capability to apprehend divine truth by means of his unaided natural intellect anticipates to some extent a rationalist tradition.²⁹

The Alexandrian theologians, however, schooled in Platonism and familiar with the scientific ideal of knowledge in which rational apprehension of truth is opposed to imperfectly grounded opinion or belief were the first to deal seriously with the problem of relating Christian faith to the classical ideal. Basically, the cognitive distinction they made between faith and reason was one of degree. Both Clement and Origen, for example, considered faith to be knowledge, but knowledge in an undeveloped

²⁹ "Then those cannot condemn the Greeks, who have only a mere hearsay knowledge of their opinions, and have not entered into a minute investigation in each department, to have an acquaintance with them. For the refutation which is based on experience, is entirely trustworthy. For the knowledge of what is condemned is found the most complete demonstration." Clement of Alexandria, Stromata, in The Writings of Clement of Alexandria, trans. by William Wilsen, I and II, Ante-Nicene Christian Library, IV and XII (Edinburgh: T. & T. Clark, 1882, 1884). Selection taken from Ed. L. Miller, p. 12.

form. It is reason which brings this knowledge to perfection. Augustine was also under the influence of Platonism, yet his insistence that faith was a necessary component of knowledge, which is neither surpassed nor made superfluous by reason but itself seeks understanding, foreshadowed what was to become the explicit program during most of the next ten centuries of theological thought--the attempt to arrive at a unified view of knowledge in which faith and reason are brought together.

But, as Pieper points out, although Augustine in many ways already formulated the principles of medieval rationalism, nevertheless, "in his historical existence he remained a pre-medieval man, a thinker who belonged to antiquity."³⁰ The theological efforts of the first few centuries of the Christian era, then, are primarily symbolic rather than theoretic. For the most part, during the scriptural, conciliar and patristic periods of Christian theology, what reconciliation of faith and reason there is remains implicit and systematically undeveloped.³¹ It is

³⁰Pieper, p. 21. The importance of Pieper's account of the development of Christian thought for Polanyi's understanding of the faith-reason problem has already been mentioned. Cf. Chapter I, p. 31.

³¹David Tracy, The Achievement of Bernard Lonergan. (New York: Herder and Herder, 1970), p. 46.

only with the medieval program that the exigencies of the classical scientific ideal are responded to explicitly.

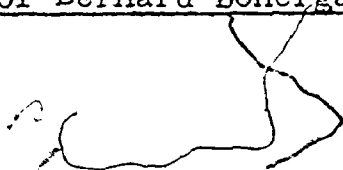
Medieval Rationalism: The period of "medieval rationalism" extends from Boethius in the sixth century to Duns Scotus and William of Ockham in the fourteenth. The entire movement of scholastic thought is characterized by repeated efforts to achieve a harmonious balance between the claims of faith and the demands of reason. The assumption that sustained this historical endeavor was a conception of knowledge in which both faith and reason are essential components, a belief that scientific thinking neither threatens nor impoverishes religious faith, but enriches it. Probably the most influential exponent of the notion of knowledge which dominates the period of the "middle ages" was the philosopher whose works provided the principle source of Aristotelian thought for the Christian world until the end of the twelfth century, the first "scholastic", Boethius. It was Boethius who explicitly urged that faith and reason be joined--"fidem, si poteris, rationemque conjunge."³² His challenge moved Christian theology into the world of Greek theoria and issued in the "demand of the medievals that one's religious experience also be made cognitively accessible."³³

³² Pieper, p. 37.

³³ Tracy, The Achievement of Bernard Lonergan, p. 46.

There is a dual implication in the scholastic principle--the conjunction of fides and ratio--as it was affirmed by the great thinkers of the medieval period. The principle asserts, first of all, that believers must seek a fully rational understanding of the content of Christian faith. Reason is indispensable, if one is to believe authentically, since no one can give credence to a message which is incomprehensible. That "rationalist" implication of the faith-reason conjunction is concisely expressed in Anselm's phrase "fides quaerens intellectum" and explains the intent of the Proslogion. The meaning and importance of the conjunction from the side of ratio is clear. Faith is not only compatible with, but demands a thoroughly rational account of itself. The adoption of a theoretic stance as a basic attitude reflects the medieval acceptance of the full force of this injunction. From this point on, the progressive development of medieval theology is towards the realization of the classical scientific ideal, even though this achievement remains generally lost in the perpetuation of the myth characterizing the medieval period as the "dark ages".³⁴

³⁴Tracy makes this point forcefully when he remarks: "That the theoretic attitude was first fully revealed by the original Greek expulsion of mythos by logos is common enough knowledge. That its second manifestation came into the West with the scientific theology of the medievals is, to a world still attuned to Enlightenment propaganda, largely unrecognized." The Achievement of Bernard Lonergan, p. 48.



Medieval theology did indeed confront the exigencies of the classical scientific ideal in leaving unrestricted the range of man's intellectual passion to know and in bringing theoria to bear even upon the region of religious faith. However, medieval rationalism, despite its acceptance of the exigencies of the classical scientific ideal, did not lead to a repudiation of the cognitive power of belief nor to the kind of critical detachment from primitive--symbolic--expressions of faith characteristic of modern (i.e. critical) rationalism. To imply that it did is also to misrepresent the dominant spirit of medieval rationalism.³⁵ For there is a second implication in the conjunctive principle of faith and reason present as a corrective to excessive rationalism. It asserts that unaided reason, of and by itself, will not lead to positive knowledge of the divine. This "fideist" implication--summed up in another Anselmian formula, "credo ut intelligam"--means that reason itself rests upon belief which is an indispensable condition of knowledge. The failure to realize just how

³⁵Tracy's account of scholasticism sometimes seems to do this. For example, he contrasts the theological achievements of the age previous to the Scholastic with the achievement of the medievals. The spirit of the previous age, he says, was that of "the attached, the committed, the artistic." It "did not claim to be dominated by the detachment and disinterestedness native to the scientific mind." The suggestion is, apparently, that the scholastics in appropriating the classical scientific ideal can be so characterized. But this description of the scientific ideal which emphasizes the critical spirit of detachment, it seems to me, is precisely the kind of "Enlightenment propaganda" Tracy himself claims to expose. The Achievement of Bernard Lonergan, pp. 45-48.

seriously scholasticism took this second implication--in rejecting "disjunctive" rationalism--leads to a confusion of the medieval notion of rational demonstration with the modern empiricist notion of critical verification. What the medieval theologians were seeking was not the sort of "knock-down proof" modern rationalists desire, that is, logical demonstrations unrelated to faith and critically grounded in the autonomous operations of reason. As Pieper remarks, "Thomas Aquinas, for example, often speaks of 'proof' demonstratio where in reality he is trying to develop only a 'reason of convenience,' an entirely different affair from proof in the modern sense of the word."³⁶ To develop a "reason of convenience" is to show the compatibility of the positive understanding faith attains with what reason can demonstrate on its own. Such rational understanding is in itself always negative, "a refutation of objections or grasp of the absence of inner contradiction."³⁷ Lonergan's explanation of Aquinas' theological method confirms this account of the medieval conception of the limits of rational understanding.³⁸

³⁶Pieper, p: 45.

³⁷"Theology and Understanding", Collection. p. 126

³⁸. . . though we do not understand God in any positive fashion this does not imply that we do not understand revealed truth in any positive fashion. . . . the articles of faith are the theologian's causae cognoscendi, . . . they provide the priora quoad nos and . . . are first in the ordo inventionis." Aquinas' theological intention was to manifest the truth of faith and refute contrary errors. His work is composed "not in the ordo inventionis which moves from revelation to conclusions that have not been revealed, but in the ordo disciplinae which moves from the conclusions of the ordo inventionis to a systematic presentation of the truths that have been revealed." Ibid., pp. 126-129.

The corrective to an excessive rationalism which would make both revelation and faith cognitively superfluous can be traced, according to Pieper, to the impact of Dionysius Areopagitus' negative theology and philosophy upon medieval scholasticism as a whole and on Aquinas in particular (who quotes Dionysius no less than seventeen hundred times). Aquinas he says "vigorously incorporated into his own thinking the 'unscholastic' element of negative theology and philosophy as a counterpoise to ratio's tendency to overemphasize the positive."³⁹

The principle of "conjunctive" rationalism seeks to maintain the creative tension between faith and reason which is dissolved by the tendency of theological rationalists to make religious judgments depend entirely on proof and the tendency of theological fideists to dispense with reason altogether. The medieval synthesis which Boethius began achieved perhaps its finest expression and most delicate balance in the theologies of Aquinas and Bonaventure, who, "carried out that coordination between acceptance of revealed and traditional truth on the one hand and rational argumentation on the other with unfailing resoluteness."⁴⁰ It is beyond the scope of this chapter to describe in detail the rise and fall of medieval

³⁹Pieper, p. 53.

⁴⁰Ibid., p. 38.

scholasticism. What is important to note, however, is that the eventual dissolution of the medieval synthesis and the subsequent development of the doctrine of "two truths" was as much the result of the emergence of a new conception of rational knowledge as it was a decline of greatness in the ranks of scholastic theologians. Duns Scotus and William of Ockham were largely responsible for shifting the ground and making the distinction between faith and reason (which neither Aquinas nor Bonaventure had denied but had tried to clarify) into a dichotomy. The conflict between faith and reason became a conflict between philosophy and theology, and what had been separate in the minds of men, now separated men themselves. Gilson describes the polarization which resulted when faith and reason were so set against one another. At one extreme were the Latin Averroists who were convinced that philosophical reason alone could attain absolute truth and who saw no merit in believing what could not be rationally demonstrated. The list of 219 propositions condemned in 1277 by Etienne Tempier, the Bishop of Paris, gives ample evidence of the extreme to which theological rationalism had gone, e.g. "that nothing should be believed, save only that which either is self-evident, or can be deduced from self-evident propositions" (Prop. 37).⁴¹ At the other extreme

⁴¹Etienne Gilson, Reason and Revelation in the Middle Ages (New York: Charles Scribner's Sons, 1938), pp. 60-64.

were those theologians who clung to the tradition of theological fideism which regarded revelation as a substitute for all other knowledge. In their view the knowledge faith could attain was better off without the help of philosophical reflection. "Reduced to its essentials their position is very simple; since God has spoken to us it is no longer necessary for us to think."⁴² Caught in the middle were those theologians who appropriated the conception of reason and philosophy from the Avorroist tradition but who refused to give up their beliefs, and being unable to reconcile their reason with their faith attempted to keep both "with a watertight separation between them."⁴³

The end of scholasticism is marked by the repudiation of the fundamental assumption which sustained medieval rationalism, the conjunction of faith and reason in a unified conception of knowledge. In Polanyi's words: "Ockham brought scholasticism to a close by declaring that faith and reason were incompatible and should be kept strictly separate."⁴⁴ In its place a new hypothesis is proposed which becomes the principal assumption of modern rationalism, namely: "that belief is one thing and knowledge an altogether different matter; and that a marriage of the two is neither meaningfully possible nor even desirable."⁴⁵

⁴² Ibid., p. 6.

⁴³ Ibid., p. 58.

⁴⁴ Polanyi, "Faith and Reason", p. 238.

⁴⁵ Pieper, p. 39.

H. A. Hodges makes the observation that one difference between the period of medieval rationalism and the period of modern rationalism is that in the medieval world there was generally a consensus regarding what constitutes knowledge or truth and how to go about seeking it, whereas today this unified conception of knowledge has been lost and we live with a plurality of conflicting views as to what should be counted as true knowledge.⁴⁶ While there may be some truth in this remark, as a generalization it should not be pushed too far, for it can be misleading both as an account of the medieval world and as a description of the modern age. In the first place, there is always the danger of oversimplifying the intellectual milieu of a past epoch and seeing one's own times as exceedingly complex and diversified. Certainly generalizations about the medieval period are commonplace, some, doubtless, more accurate than others. It has just been argued, in fact, that a principle of conjunction of faith and reason was the pervasive epistemological assumption throughout most of the medieval period, a principle which characterized the tradition known as "scholasticism". A disjunctive approach to faith and reason was accepted by some, however, and forms the basis of both the mystical tradition from Plotinus

⁴⁶H.A. Hodges, Language, Standpoints and Attitudes, (London: Oxford University Press, 1953), p. 47.

to Meister Eckhart and the rationalist tradition of the Latin Averroists. In each of these traditions the knowledge which faith attains is not regarded as cognitive in the same sense as rational or scientific knowledge. Moreover, what Pieper's work on Scholasticism manages to dispel is the notion that--even within the limits of scholastic thought--the entire movement of thought consisted simply of mindless repetitions of the principle of joining faith and reason with no conflict or development. In short, the medieval period is more divided in its view of what constitutes true knowledge than is often assumed.

If we turn to the modern period, the assumption of widespread epistemological pluralism is equally misleading. Certainly there is diversity of world views. Yet, on the whole, the modern world is less pluralistic than we are sometimes led to believe, for modern Western thought is dominated to a large extent by a single and pervasive ideal of what is to be regarded as knowledge and how to go about discovering it. This is the widespread assumption that modern positive science is the paradigm of reliable knowledge and that the scientific method based on an ideal of critical reason is the tried-and-true means for achieving it. It is with this ideal of modern rationalism that contemporary faith must contend.

Modern Rationalism: If the modern conception of rational knowledge was anticipated in Ockham's clear

separation of faith and reason, the disjunction which characterizes modern thought receives its decisive foundation in Cartesian scepticism and Lockian empiricism, and its most thorough and systematic expression in the critiques of Immanuel Kant. Polanyi traces the historical roots of the modern scientific ideal to the emergence of a new conception of rationality in the 16th and 17th centuries brought about as a result of attempts to establish cognitive certainty and objectivity by a methodical acceptance of the principle of critical doubt. Accordingly to Polanyi, the philosophies of Descartes, Locke, and those of their disciples "had the purpose of demonstrating that truth could be established and a rich and satisfying doctrine of man and the universe built upon the foundations of critical reason alone."⁴⁷ All knowledge could be justified, in other words, on the basis of self-evident propositions, the testimony of experience or some combination of the two. Both Descartes and Locke were able to affirm this conception of rational knowledge while maintaining their belief in the revealed truths of Christianity. And, as Polanyi points out,

though the later rationalists succeeding them tended towards deism or atheism they remained firm in their conviction that the critical faculties of man unaided by any powers of belief could establish the truth of science

⁴⁷SFS, p. 75.

and the canons of fairness, decency, and freedom.⁴⁸

Scepticism was assumed to be the necessary methodological basis for rational knowledge. Hume formulated the hope of scientific rationalism in suggesting that sceptical doubt would "prove useful by exciting curiosity and destroying that implicit faith and security which is the bane of all reasoning and free inquiry."⁴⁹ Kant carried forward the critical ideal seeking to replace the role of belief in theoretical knowledge with operations of an autonomous reason. The rejection of religious authority and traditional belief became the condition of intellectual freedom and integrity during the Enlightenment as the ideal of rational autonomy first acknowledged in the empirical sciences began to permeate all human activity. The spirit of enlightenment in Kant is opposed to the spirit of faith, for enlightenment means freedom to doubt whereas faith means uncritical acceptance. Indeed enlightenment and criticism are practically synonymous terms for Kant: "We do live in an age of enlightenment. . . our age is, in especial degree, the age of criticism and to criticism everything

⁴⁸SFS, p. 75.

⁴⁹David Hume, An Inquiry Concerning Human Understanding, ed. by Charles W. Hendel. (Indianapolis, New York: The Bobbs-Merrill Company, Inc. 1955), p. 41. Originally published in 1748.

must submit."⁵⁰

The profound transformation of intellectual ideals that took place in the shift from a classical (pre-critical) to a modern (critical) conception of reason stems from the fact that not only particular beliefs but the principle of belief itself is rejected as incompatible with a critically rational, "scientific" pursuit of knowledge.⁵¹ The emergence of the modern critical ideal of reason provides the groundwork for the development of a positive conception of scientific method, one which creates a radically new problematic for theology that cannot be resolved simply within the context of the medieval synthesis. What characterized medieval rationalism was its appropriation of the Aristotelian notion of science and the attempt to achieve a synthesis of faith and reason which met the exigencies of the classical ideal. The shift of scientific ideals from the classical (Greek) to the modern (Enlightenment) framework of thought represents a fundamental reinterpretation and explication of the goals of science in terms of critical thought. Theology becomes problematic when it seeks to express faith in the language of the Enlightenment, that is,

⁵⁰Immanuel Kant, "What is Enlightenment" in Foundations Of The Metaphysics Of Morals. Trans. by Lewis White Beck (Indianapolis: The Bobbs-Merrill Company, Inc., 1959), p. 85.

⁵¹PK, pp. 269-71.

when it seeks to be fully "rational" according to the model of critical reason. Novak points out that:

From the time of Descartes onwards . . . a special class of interpretations has surrounded the word 'reason' such that anyone who begins to use the language of intelligence according to that class of interpretations must end by placing 'reason' and 'faith' on opposite sides of the divide.⁵²

This dichotomizing of faith and reason is at the heart of the contemporary problem of method in theology. A closer examination of the ideal of critical reason and its impact upon the theological conception of the faith-reason relationship I think will bear out the truth of Novak's remark.

Kant set about to define the nature and limits of reason and thereby establish the conditions for the possibility of knowledge in order, he says, to make room for faith.⁵³ What characterizes modern Western thought after Kant is not the separation of faith and reason, but the separation of faith and knowledge, that is, the separation of faith and critical or cognitive reason. According to Kant, not all that is rational and can be thought is to be taken as knowledge.⁵⁴ What characterizes

⁵²Michael Novak, Belief and Unbelief (New York and Toronto: The New American Library, Inc., 1967), p. 27.

⁵³Immanuel Kant, Critique of Pure Reason. Trans. by Norman Kemp Smith. (New York: St. Martins Press, 1965), p. 29 (B XXX).

⁵⁴Ibid., The Transcendental Dialectic Book I passim.

knowledge, as science demonstrates, is advance, the discovery of new knowledge rather than the exposition of knowledge already acquired. The Kantian critique of the nature and limits of human knowledge was provoked, at least in part, by what seemed to be an anomaly of human thought--the perplexing contrast between reason's success in mathematics and the physical sciences, on the one hand, and reason's utter failure, on the other hand, to make similar progress in solving the problem of metaphysics.⁵⁵ Reason was capable of achieving certitude and of acquiring knowledge which was objectively valid. Such knowledge was necessary and universal, while at the same time, in the case of science of nature, applicable to experience. Reason was also capable, however, of venturing beyond the boundaries of experience and thinking ideas which could be grounded only subjectively. Kant sought to distinguish such a pure speculative employment of reason from "knowing". His solution was to establish the possibility of synthetic a priori judgments. He agreed with the empiricists that knowledge was limited to experience, but insisted that experience itself was not a passive reception but an active construction. He agreed with the rationalists that reason could give necessary and universal knowledge, but insisted on limiting reason's cognitive function to the realm of experience. Knowledge, according to Kant, in other words,

⁵⁵Immanuel Kant, Prolegomena to Any Future Metaphysics (Indianapolis: The Bobbs Merrill Company, Inc., 1950), p. 4.

is the result of an active synthesis of two elements: 1) sensuous intuition, i.e. intuition according to the forms of sensibility (space and time) which provide representations, and 2) conceptual construction, i.e. understanding according to the forms of pure concepts (the categories) which unite representations in consciousness. These are the two essential conditions for human cognition. "Thoughts without content are empty, intuition without concepts are blind. . . . The understanding can intuit nothing, the senses can think nothing. Only through their union can knowledge arise."⁵⁶

The most far reaching implication of Kant's account of the knowing process is the restriction of all knowledge ~~to~~ to the appearance of things or to phenomena. Knowledge can never be of reality as it exists in itself but only as it appears; it is applicable, therefore, to experience but not to objects as they are apart from experience. Reason can "think" objects independently of their appearance in experience but cannot "know" them. Kant devotes the whole of the transcendental dialectic of the first Critique to the task of demonstrating the impossibility of such a transcendental use of ideas contributing in any

⁵⁶Kant, Critique of Pure Reason, p. 93 (A 51; B 75).

"constitutive" way to knowledge. Considered in themselves, that is, taken as knowledge, these guiding ideas of pure reason are dialectical and illusory. According to Kant, the ideas of pure reason "never allow of any constitutive employment" and, therefore, add nothing to human knowledge.⁵⁷ These ideas merely perform a "regulative function" giving unity and completeness to thought. In other words, they provide a rational fulfillment to the architectonic of pure reason, but are not cognitively significant.⁵⁸

Kant draws a clear line between knowledge and faith when he distinguishes three different degrees of validity a judgment can have in asserting a truth--namely knowledge, faith or belief, and opinion. Knowledge is assent on grounds which are both objectively and subjectively sufficient. Faith is assent on grounds which are subjectively sufficient but objectively insufficient. Finally, opinion is assent on grounds neither objectively nor subjectively sufficient.⁵⁹ Only knowledge can claim universal certainty because it is objectively valid, whereas faith can demand only personal

⁵⁷ Ibid., p. 533 (A 644; B 672).

⁵⁸ Polanyi sees this distinction as a device of intellectual prevarication which has become typical of modern critical rationalism. "Knowledge that we hold to be true and also vital to us, is made light of, because we cannot account for its acceptance in terms of a critical philosophy. We then feel entitled to continue using that knowledge, even while flattering our sense of intellectual superiority by disparaging it." PK, p. 354.

⁵⁹ Kant, Critique of Pure Reason, p. 646 (A 822; B 850).

conviction, since it rests upon subjective conditions alone. Kant suggests in this distinction that knowledge, because it is objective, is somehow impersonal, that the criteria for true judgments are established independently of the subjective needs of the knower. Furthermore, he assumes that belief is only appropriate in a practical context not in a theoretical context, that is, not in making judgments. Thus, in discussing the status of regulative ideas, Kant states that "opining" is too weak a term to describe them while 'knowing' is too strong a term. "Belief" he says, would seem to be an accurate description of this regulative use of ideas, "but it is only from a practical point of view that the theoretically insufficient holding of a thing to be true can be termed believing."⁶⁰ From a theoretical point of view, i.e. cognitively, the activity of pure reason is simply called illusion or dialectics. According to Polanyi, this radical separation of the theoretical and the practical, of "knowing" and "believing" is at the basis of the modern conception of scientific reason. Scientific knowledge is limited to "facts", what critical reason can objectively verify on the basis of empirical observation. In contrast, scientific "theory", what pure reason can think is not to be regarded as knowledge since it is not true but only probable, tentative, the best opinion of the day. In Polanyi's words: "Modern descriptions of scientific truths as mere working hypotheses or interpretative

⁶⁰Kant, Critique of Pure Reason, p. 647 (A 823; B 851).

policies are generalizations of the Kantian regulative principles to the whole of science."⁶¹ Such accounts manage to deny or disguise the component of belief at the basis of rational knowledge. "For we would never use a hypothesis which we believe to be false, nor a policy which we believe to be wrong."⁶²

On the grounds marked off by Kant, knowledge and faith occupy entirely different spheres. Rational knowledge pertains to the phenomenal world (experience), is objectively valid, and can be held with certainty. Faith pertains to the noumenal world (reality), but is only subjectively valid and can be neither certain nor true. The realm of knowledge (objectivity) belongs to science and is established in accordance with the ideal of critical reason. Belief functions in a different realm altogether (subjectivity) to sustain the practical moral life but provides no basis whatsoever for cognitive assertions.

The implications for theology are significant. Methodologically, unless it is to acquiesce either to the demands of a rationalism which makes all religious knowledge depend on reason (proof), or a fideism which dispenses with rational demonstration altogether and grounds religious

⁶¹PK, p. 307.

⁶²PK, p. 307. In Polanyi's view, Kant's recommendation to entertain ideas as if they were true is in fact based on the "tacit assumption that they are in fact true. By conveying this assumption without asserting it, he avoids any formulation which would require to be upheld as his own personal judgment."

knowledge on faith alone, theology must somehow reconcile the dual components of reason and faith. Theological reactions to critical philosophy and the modern scientific ideal of objective knowledge vary widely but again generally seem to move in these two directions. But, with the transformation of the ideal of reason from the classical (pre-critical) conception to the modern (critical) conception, theological rationalism and theological fideism assume new forms, and become radically polarized. In attempting to establish the limits of rational knowledge, Kant so dichotomized knowledge and faith as to deny altogether the possibility of theology as religious "knowledge".⁶³

Theological rationalism begins with the Kantian dichotomy of rational knowledge and religious faith and seeks to overcome it on the side of reason, establishing theology on rational (scientific) grounds. Theological fideism takes as its starting point the same dichotomy and affirms that it is overcome by God through revelation and faith. In the end, however, neither rationalism nor fideism are able to reconcile reason and faith or transcend the dualistic tension implicit

⁶³"Now I maintain that all attempts to employ reason in theology in any merely speculative manner are altogether fruitless and by their very nature null and void, and that the principles of its employment in the study of nature do not lead to any theology whatsoever. Consequently, the only theology of reason which is possible is that which is based upon moral laws or seeks guidance from them. All synthetic principles of reason allow only of an immanent employment; and in order to have knowledge of a supreme being we should have to put them to a transcendent use for which our understanding is in no way fitted." *Critique of Pure Reason*, p. 528 (A 630; B 664). Italics added.

in the theological appropriation of the modern conception of knowledge. It appears--and this is the implication of Polanyi's critique of modern critical thought--an adequate theological synthesis of faith and reason cannot be achieved within the context of critical rationalism. Hence the problem of method in theology remains unresolved.

The development and ultimate breakdown of these two theological accommodations to modern rationalism has been recounted by Langdon Gilkey in a way which bears out Polanyi's assessment of the impact of critical philosophy on contemporary thought. According to Gilkey, the failure of theological liberalism and neo-orthodoxy form the background of the present crisis in theology.⁶⁴ Moving in the direction of rationalism, liberal theology generally accepted the imperative of the scientific ideal of critical reason and its radical critique of faith and adopted as normative for theology the criteria of what Polanyi calls a positive scientific method.⁶⁵ It sought, therefore, to establish religious knowledge on grounds other than traditional Biblical or ecclesiastical authority which had broken down under the scrutiny of epistemological scepticism. Hegel tried to establish religious knowledge on the basis of philosophical

⁶⁴Gilkey, Naming the Whirlwind: The Renewal of God Language, pp. 73-106.

⁶⁵That is a method which "involves no affirmation of personal beliefs" LL, p. 9. Cf. Chapter One, p.8.

reflection, developing the rationalist elements in Kant's thought while eschewing its antimetaphysical assumptions. Schleiermacher sought to derive theology from experiential grounds, and Ritschl followed Kant in rejecting the claims of pure speculative reason and establishing religion on the basis of moral experience. After Kant, liberal theology generally followed one or more of these paths, appealing directly to rational (scientific) inquiry or some aspect of human experience as the foundation of theological reflection.⁶⁶

Although, as Gilkey points out, this approach to theology led liberalism eventually to dispense with many traditional beliefs, the full implications of this theological commitment to the Enlightenment ideal of critical reason and a positive scientific method were not immediately discernable throughout the nineteenth century. Liberal theology continued to reflect the scientific, optimistic and progressive spirit of the age and to believe it could make Christian truth claims intelligible to the secular mind.⁶⁷ Liberalism accepted, in other words, the cognitive capacity of critical reason to discover and justify an ultimate order of meaning and truth. But as the logic of critical rationalism worked itself out historically in the contemporary philosophical development of positivism and empirical naturalism, the very "rational" foundations of liberal theology

⁶⁶Gilkey, Naming the Whirlwind: The Renewal of God Language. p. 75.

⁶⁷Ibid.

itself began to dissolve. "What seemed eminently reasonable to the confident thinkers at the end of the nineteenth century", Gilkey remarks, "became sheer myth, the meaningless confusion or bewitchment of language, or an exercise in futile speculation undertaken only by pious minds to most of the radically empirical or linguistic philosophers of the twentieth century."⁶⁸ Theological liberalism had hoped to seek an accomodation to the secular world by upholding the ideals of scientific rationalism, assuming a broadly empirical attitude towards experience and adopting a method which was rigorously critical. According to Gilkey, this proved in the end to be its undoing, for the more scrupulously liberalism acceded to the Enlightenment model of scientific knowing the more questionable became the cognitive capacity of theology to speak at all meaningfully about God.⁶⁹ The real theological inheritors of modern scientific rationalism were the radical and empirical theologies which emerged in the twentieth century, acknowledged the disjunction of faith and reason, and accepted the implications of a theological commitment to the principle of criticism and the scientific method even to the point of trying to develop a theology without faith and without God. This contemporary development will be considered briefly in the next chapter

⁶⁸Gilkey, Naming the Whirlwind: The Renewal of God Language, p. 78.

⁶⁹Ibid., pp. 79-80.

as it leads directly to the contemporary problem of method to which foundational theology responds.

The alternative theological reaction to critical philosophy and scientific rationalism can be characterized as moving in the direction of fideism. There was considerable reluctance among the more conservative and fundamentalist theological traditions to acknowledge the critical imperatives of the new philosophic outlook and scientific method in the realm of theology. Some simply retreated to defensive positions and rejected philosophical criticism and modern scientific and historical scholarship outright as perversions of faith, insisting instead on the pure and literal truth of Biblical revelation which faith alone assured.⁷⁰ For these theologians, there could be no compromise between religious faith and secular reason. If there was a conflict between what scientific reason could know and what religious faith revealed there was no question what was to be accepted as true. Other theologians, however, took the position that religious knowledge was on an entirely different level than secular (philosophic and scientific) knowledge and that there could be no real conflict between them.

Probably the most significant and influential religious thinker to reject the rationalist implications

⁷⁰Gilkey, Naming the Whirlwind: The Renewal of God Language, pp. 85-90.

of Kantian epistemology and draw out its fideist implications was Soren Kierkegaard. His doing so forbode the development of both neoorthodox and existential responses to the modern scientific ideal of knowledge. Louis Dupré argues quite convincingly I think that Kierkegaard's notion of faith and conception of theology must be understood as a reaction against theological rationalism in general and Hegel in particular.⁷¹ Although Hegel rejected the limitations Kant placed upon human reason, he agreed with Kant in considering faith an imperfect form of knowledge which could not establish cognitive certitude but had to be sublated by reason. In other words, theology, if it was to understand and make intelligible the truth of Christianity, had to be objectively grounded. Kierkegaard rejects absolutely all attempts objectively to establish the truth of faith.⁷² Any rational or so called "scientific proof" of faith misunderstands the nature of faith which is an act of pure interiority. Faith alone

⁷¹Louis Dupré, Kierkegaard As Theologian (New York: Sheed and Ward, 1963), p. 122.

⁷²Kierkegaard, Concluding Unscientific Postscript, pp. 169-224.

can establish the truth of Christianity, in Kierkegaard's view. There "is only one proof, one alone: that of faith . . . there is only one argument for the truth of Christianity: the interior proof, the argumentum Spiritus Sancti." ⁷³

It is important to note in terms of the significance I am trying to establish for Polanyi's philosophical thought, that Kierkegaard did not dispute the ideal of objective, critically grounded scientific knowledge, only that such knowledge had anything to do with the truth of Christianity. While the scientific method was deemed appropriate for the sphere of objective knowledge, "such a scientific method becomes especially dangerous and pernicious when it would encroach also upon the sphere of spirit. Let it deal with plants and animals and stars in that way; but to deal with the human spirit in that way is blasphemy." ⁷⁴ Kierkegaard thus echoes the Kantian contention that religion belongs to a sphere entirely distinct from science.

There is in Kierkegaard's thought, then, a radical disjunction between objective scientific knowledge (which

⁷³Soren Kierkegaard, Journals Vol. X (1849), A, 481. Translation in Dupré, Kierkegaard as Theologian, p. 122.

⁷⁴Ibid., Vol. VII (1846), A, 186. Translation in Jerry H. Gill, The Possibility of Religious Knowledge (Grand Rapids: William B. Eerdmans Publishing Co., 1971), p. 27.

reason can establish on the basis of the scientific method) and subjective existential knowledge (which faith can establish in an act of interiority). The truth of Christianity can be "known" according to Kierkegaard but not rationally. Only by means of a "leap" of faith can what is objectively paradoxical and, therefore, rationally incomprehensible be appropriated subjectively as truth. Faith is the capacity to grasp that truth which transcends the limits of rational understanding. To be concerned with establishing the objective truth of Christianity on scientific grounds manifests not the rationality of faith as theological rationalism claimed, but rather the absence of faith.⁷⁵

Theology, according to Kierkegaard, begins and ends with faith and demonstrates not the rationality of religious truth but rather its non-rationality. In contrast to the Augustinian conception of the task of theology as faith seeking understanding (a view which assumed a conjunction of faith and reason) Kierkegaard maintains that the real theological task "is not to understand Christianity but to understand that one cannot understand it", (a view which

⁷⁵"For whose sake is it that the proof is sought? Faith does not need it; aye, it must even regard the proof as its enemy. . . when faith begins to cease to be faith, then a proof becomes necessary so as to command respect from the side of unbelief." Kierkegaard, Concluding Unscientific Postscript, p. 31.

assumes a disjunction of faith and reason).⁷⁶ As Dupré points out, Kierkegaard calls this approach to theology the "opposite of apologetic" because it demonstrates the impossibility of providing a rational justification for religious truth.⁷⁷ Kierkegaard, thus, upholds the radical separation of faith and reason which is at the basis of modern scientific rationalism but rejects the proviso accepted by liberal theology that critical reason and the scientific method are the means for establishing true religious knowledge. He draws, in fact, the opposite conclusion, that in the sphere of religious knowledge the inherent limitations of reason make understanding impossible, and that faith alone can grasp the truth with which theology is concerned.

Neoorthodox and existentialist theology were born in the wake of liberalism's demise, and drew heavily upon Kierkegaard's thought, maintaining a clear distinction between the realms of faith and reason, religious and scien-

⁷⁶Kierkegaard, Journals Vol. IX (1848), A, 248. Translation in Dupré, op. cit., p. 144. In this regard, Kierkegaard's comment on Augustine is not surprising. "Augustine has done incalculable harm. The whole of Christian doctrine through the centuries really rests upon him--and he has confused the concept of faith." Journals Vol. XI, A 237. Translation in The Last Years: Journals 1853-1855 Ed. and Trans. by Ronald Gregor Smith (London: Lowe & Brydone Ltd., 1965), p. 99.

⁷⁷Dupré, Kierkegaard As Theologian, p. 144.

tific knowledge.⁷⁸ While these theologies accepted for the purpose of rational understanding the principle of criticism and the strict procedures of the scientific method, they considered religious truth to be mediated existentially by Christian faith. There is a tension, however, within neoorthodoxy's acceptance of scientific reason to account for ordinary experience, and biblical faith to explain the unique intervention of God in the world which is never finally resolved. As Gilkey points out, neoorthodoxy accepted for the purpose of its own inquiries the modern scientific understanding of the spatiotemporal world process and attempted to graft onto it a traditional biblical understanding of God who acts in this world and reveals himself to men of faith.

This synthesis was at best only an uneasy dualism, The union of these two world views, one modern and one ancient, proved more difficult than at first it promised to be; the secular elements warred against the Biblical ones, and the result was the ultimate break up of the intellectual level of neoorthodox theology.⁷⁹

In seeking to justify cognitively the theological significance and validity of divine activity in the world, neoorthodoxy had no scientifically acceptable evidence or arguments to appeal to. The acts of God were unique events that could only be apprehended by faith. And yet, within the framework of mod-

⁷⁸ Gilkey, op. cit., p. 80.

⁷⁹ Ibid., pp. 91-92.

ern rationalism, observable evidence subject to critical verification or falsification remained the sole criterion of meaning and truth. What neoorthodoxy failed to recognize was the pervasiveness and exclusiveness of the cognitive framework of modern scientific rationalism, and the essential incompatibility, given this framework, of the kind of cognitive claims neoorthodoxy wanted to establish on the basis of faith (fides) with knowledge acquired by means of the scientific method (ratio).

Contemporary neoorthodox and existentialist theologies are driven to emphasize not only the distinction but the radical discontinuity between the realms of faith and reason and to conceptualize the task of theology as essentially different from the rational pursuit of knowledge in the empirical sciences. They have in common with the radical and empirical theologies of recent times the acceptance of the dichotomy between scientific and religious knowledge, objectivity and subjectivity, judgments of fact and judgments of value. But whereas the radical and empirical theologians affirm that theology--if it can be cognitively justified at all--must be established on grounds which are critically rational and objectively verifiable or falsifiable, that is, which meet the criteria of scientific method (the modern ratio), neoorthodox and existential theologians affirm that theology can only be justified on sub-

jective, existential grounds of faith (fides). Thus, in contemporary theology there appears a polarization, rationalism at one extreme and fideism at the other, both rooted in the common assumption of modern rationalism: the incompatibility of faith and reason.

Summary: Taking cues from Polanyi, I have sketched briefly three periods of rationalism in the history of Christian thought: Greek, medieval, and modern, focusing on the prevailing scientific ideal and the development of the faith-reason problematic. The early centuries of the Christian era were characterized by conflict between Christian faith and Greek reason and dominated by a disjunction of faith and reason, captured in Tertullian's cryptic question: "What has Athens to do with Jerusalem?" The period of medieval rationalism was characterized by efforts to reconcile faith and reason in a harmonious synthesis which Augustine foreshadowed and scholasticism completed. The assumption which sustained this endeavor was a conjunction of faith and reason. With the emergence of the modern ideal of critical reason attempts to reconcile faith and reason collapsed. Since Kant, a radical separation and conflict between faith--conceived as a cognitive enterprise--and reason again appeared to be the pervasive assumption of intellectual life. As a consequence, theology once more has become polarized in the apparent conflicts expressed by the tensions between revealed theology and natural theology,

neoorthodox theology and liberal theology, apologetic theology and philosophical theology, existential theology and empirical theology. An investigation of these polarities in contemporary theology will help establish the exigence of foundational theology and is the task of the next chapter. For if one implication of modern rationalism can be discerned in theology's heightened awareness of its own problematic status and leads to the contemporary search for method, another can be found in the failure of these contemporary theological alternatives to provide an adequate resolution of that problematic and suggests the need for a more foundational enterprise.

CHAPTER III

METHOD AND THE FOUNDATIONS OF THEOLOGY

Since our concern is with the problem of method in theology, this chapter will consider how the dichotomy of faith and reason in modern thought pervades contemporary conceptions of theological method and leads to a foundational crisis for theology. The dualistic tension which characterizes Christian theology today has been traced to the exclusion of faith from the Enlightenment ideal of knowledge and to the acceptance of a positive scientific method as the model of rationality. Theological fideism, in accounting for the discovery and justification of religious knowledge, tends to emphasize the cognitive capacity of faith (fides) and to question the competency of reason (ratio). Theological rationalism, in accounting for the discovery and justification of religious knowledge, tends to uphold the ideal and method of scientific reason (ratio) and to discredit the cognitive powers of faith (fides). Both rationalism and fideism, however, eventually arrive at the same conclusion regarding the relationship between theological and scientific methodology--a conclusion which is shared today by a great many philosophers and scientists as well--namely, that method in theology and method in science are fundamentally different and should

not be confused.

The contrast between theological understanding and scientific understanding and the methods appropriate for each is expressed in a positive way on the fideist side by those neoorthodox and existentialist theologians who describe theology as a cognitive response of faith totally dissimilar to the kind of knowing process involved in following the "scientific method. The same point of view is expressed in a negative way on the rationalist side by radical and empirical theologians and philosophers of religion who find that theology after all cannot be cognitive according to the standards of scientific reason and conclude, therefore, that theology be regarded as non-cognitive since the meaning of its assertions cannot be verified by positivist criteria. Both these approaches to theology contrast what it means "to know" in theology with what it means "to know" in science, and reflect the disjunction of faith and reason implicit in the framework of modern critical thought. This radical separation of faith and reason discernable in the distinction between theological and scientific methods of knowing needs further elucidation.

In a study referred to earlier of the relation of science and religion, Ian Barbour argues that disparity between method in theology and method in science is supported by three kinds of arguments.¹ First, there is

¹Issues In Science and Religion, pp. 115-125.
Cf. Chapter I, pp. 3-4.

said to be a fundamental difference between the objects of knowledge (a transcendent and mysterious divine being vs. a spatiotemporal world process) and correlatively a methodological difference between the starting points and sources of knowledge (God's self-revelation vs. natural reason). This is the basic position put forward in various ways by neoorthodox theologians. Secondly, a similar sort of argument is advanced by existentialist theologians. Here the divergence between theological method and scientific method arises from the contrast between the spheres of personal subjectivity and impersonal objectivity. Theology is concerned with the sphere of selfhood and requires personal commitment and involvement (fides), whereas science is concerned with the sphere of objects and requires impersonal detachment and analytic objectivity (ratio). Thirdly, there are reasons for a sharp differentiation of theology and science evident in developments within radical and empirical theology under the influence of logical positivism and linguistic analysis. The emphasis here is upon the difference in the logical structure of religious and scientific language. The function of language in science is the assertion of fact, and such statements are empirically verifiable or falsifiable. The function of language in theology is the assertion of value, and such statements express feelings or emotions but are without cognitive content. Implicit in all three of

these positions is the assumption of a disjunction between faith and reason. I will note first some representatives of neoorthodoxy and existentialism (whose positions support the first two arguments Barbour cites and extend the kind of thinking I have called "fideistic" into a contemporary theological context), and then some representatives of radical and empirical theology (whose positions support the third argument Barbour cites and extend the kind of thinking I have called "rationalistic" into a contemporary theological context).

Neoorthodox and Existentialist Theologies: Certainly one of the most profound influences upon contemporary theological thought is Karl Barth. Although a constructive and systematic theologian himself, Barth avoids overly rationalistic descriptions of the theological task and rejects unequivocally the idea of "natural theology" or the "formulation of a system. . . whose method differs from the exposition of Holy Scripture."² As he conceives theology, revelation has nothing to do with the natural capabilities of human reason, but only with that capacity for divine truth which can be called "faith" or "obedience". Barth

²Karl Barth, "No!" A Reply to Emil Bruner's "Nature and Grace", Natural Theology (London: Geoffrey Bles: The Centenary Press, 1946), p. 74. Barth is loath even to discuss theology and natural knowledge of God in the same context since this might suggest they are somehow related if even negatively. For, in Barth's view: "If one occupies oneself with real theology one can pass by so called natural theology only as one would pass by an abyss into which it is inadvisable to step if one does not want to fall."

insists upon the absolute autonomy and uniqueness of religious knowledge and contrasts such knowledge with ordinary rational or scientific understanding.

The cognitive powers of natural reason, appropriate for philosophical and scientific pursuits, are totally impotent when it comes to theology. Thus, not only does Barth affirm that apart from revelation and faith religious knowledge would be impossible, he denies any "point of contact" between revealed truth and human reason.³ He firmly rejects even the most cautious moves in the direction of natural theology, labeling attempts to establish a point of contact between faith and reason, grace and nature a "theology of compromise."⁴ For Barth, faith is the medium of man's knowledge of God and there is no other medium for it. Absolute truth is not to be regarded as some kind of "matter" to which man is related because as man, that is, as rational and responsible, he has or is the "form". In Barth's view, "surely all his rationality, responsibility and ability to make decisions might go hand in hand with

³What the advocates of natural theology fail to realize in Barth's view is that "there can be as little question of a co-operation of reason in the knowledge of God as of the co-operation of the human will in the fulfillment of the divine commandments." Barth, "No." A reply to Emil Brunner's "Nature and Grace". p. 79.

⁴Ibid., p. 69. The relationship of "faith" and "reason" represents the noetic side of the theological problematic, and relationship of "grace" and "nature" represents the ontic side.

complete impotency as regards this 'matter': "⁵ God is the wholly other, absolutely transcendent reality who can only be known because he chooses to reveal himself. The condition for understanding divine truth is established in the act of divine self-revelation. Faith becomes in Barthian terms the a priori to any knowledge of authentic reality, and, as von Balthasar points out, "it is not an a priori which belongs to reason, nor an innate constituent of the human spirit; it is something established by the concrete, authentic word of God."⁶ Faith, in other words, is not reasoned argument but a divine gift and man's obedient response.

A radical disjunction of faith and reason it seems leads Barth to emphasize the discontinuity and dissimilarity between the method and task of theology and that of modern science, and to argue that, "There is no fundamental necessity, there are no inner grounds, to cause it [theology] to claim membership in this genus [science]. Rather it has abundant reason to renounce it in every form".⁷ Whether or not theology wants to call itself a "science" is a rather insignificant question, as far as Barth is concerned. What

⁵Barth. "No!" A Reply to Emil Brunner's "Nature and Grace", Natural Theology. p. 88.

⁶Hans Urs von Balthasar, The Theology of Karl Barth, trans. by John Drury (New York: Holt, Rinehart and Winston, 1971; original German edition, 1962). p. 128.

⁷Karl Barth, Church Dogmatics (Edinburgh: T. and T. Clark, 1936), Vol. I, Part I, p. 6.

his conception of method in theology makes clear, however, is that theology is in no way obliged to distort its own unique task by heeding the ordinary meaning of science. On the contrary, in performing its special task of expositing faith, theology must subordinate and if necessary "sacrifice every consideration of what 'science' means elsewhere."⁸ While theology, like the sciences, must be faithful to its axioms and methods, "it cannot allow itself to be taught by them the concrete meaning which that involves in its own case. As regards method it has nothing to learn in their school."⁹ After considering what it would mean for theology to accommodate itself to the critical ideal of reason and the current conception of scientific method Barth concludes that whether or not theology calls itself or allows itself to be called a science, "it cannot at the same time take over the obligation to submit to measurement by the canons valid for other sciences."¹⁰

Barthian theology led to the recovery of the Reformation emphasis upon faith which liberal theology had lost, and following Barth, neoorthodoxy continues to sharply differentiate method in theology and method in science

⁸Barth, Church Dogmatics p. 7.

⁹Ibid. (Emphasis added)

¹⁰Ibid., p. 9.

in a way which is assumed to resolve any conflict between them. Theology or religious knowledge, accordingly, derives from the self revelation of God in Christ, whereas scientific knowledge derives from the pursuit of rational discovery in nature. As the methods of theology and science differ so do their levels of competency. There are, then, according to neoorthodoxy, "no points of contact between the ideas of science and those of theology. . . . Science can thus neither contribute to nor conflict with theology."¹¹

Starting from different premises, Rudolf Bultmann's existentialist interpretation of Christian theology reflects the same tendency to dichotomize faith and reason and reaches a conclusion similar to the neoorthodox position in contrasting method in theology with method in science. Bultmann distinguishes the committed, existential perspective of the theologian from the detached, objective standpoint of the historian or scientist. He contrasts the "mythical" and subjective understanding which faith attains in theology with the "factual" and objective understanding which reason attains in science. "The real purpose of myth is not to present an objective picture of the world as it is, but to express

¹¹Barbour, Issues in Science and Religion, p. 118.

man's understanding of himself in the world in which he lives."¹² Theology, then, is existential self-knowledge and something quite different from rational or scientific knowledge of objective reality.

Faith operates in an entirely different sphere from rational scientific inquiry. Bultmann wants to distinguish clearly the boundaries which separate scientific understanding from theological understanding. The knowledge and control of nature which results from scientific enlightenment and technical progress is limited and unable to solve the existential questions to which theology speaks. According to Bultmann, Greek science was aware of its limits, that is, "aware that it could not give a rational account of human existence."¹³ Modern science, however, comes into conflict with faith when it oversteps its bounds and imagines that it is able to solve the riddle of human existence. On the other hand, the "knowledge" of the meaning of existence which comes with

¹²Rudolf Bultmann et al., Kerygma and Myth, ed. by Hans Werner Bartsch, trans. by Reginald H. Fuller (New York: Harper Torchbooks, 1961), p. 10.

¹³Rudolf Bultmann, Existence and Faith, trans. by Schubert M. Ogden (Cleveland and New York: The World Publishing Company, 1960), p. 210.

faith is "not at all knowledge that has been acquired by the understanding or that proceeds from rational bases."¹⁴

Thus, in speaking of Christian Theology's account of creation, Bultmann contrasts faith or existential knowledge with reason or theoretical knowledge which is depicted in either philosophical or scientific terms. Faith in creation, as distinct from knowledge about the world, is a recognition of man's present determination by God. It is not a conviction about the world "which I can rationally investigate and with reference to which I can understand all individual phenomena. Rather it is an 'existentiell' knowledge. . . that must constantly be laid hold of anew."¹⁵ Theology or religious knowledge can be neither discovered nor justified on scientifically rational grounds. Bultmann, accordingly, defends Barth's refusal to assume rationalist "positions" in theology. Theology speaks out of faith alone. Thus, Bultmann states that "because theology can be nothing other than the exposition of faith, no concepts of knowledge which have meaning can be gained

¹⁴Rudolf Bultmann, Existence and Faith. p. 215.

¹⁵Ibid., p. 221.

from it apart from the miraculous actualization of faith."¹⁶

Theology expresses meaning and truth, then, but it is an existential meaning and a subjective truth which can only be apprehended in faith and is radically distinct from empirical meaning and objective truth which is rational and with which science deals. Bultmann is concerned to differentiate the language of theology (i.e. the language of selfhood and transcendence) from the language of science (i.e. the language of space and time). The meaning and truth of the Christian message has to do with a new existential self-knowledge given in faith, not with the discovery of objective knowledge about occurrences in the world. Theology requires commitment and the self-involvement of the knower, whereas science proceeds by means of detached observation and analysis. There are no points of contact between them.

A similar disjunctive view of faith and reason seems to be present in the theological thought of Paul Tillich. Tillich defines faith as "ultimate concern" and contrasts the kind of existential knowledge implied in faith with the kind of objective knowledge involved in scientific

¹⁶Rudolf Bultmann, Faith and Understanding I, ed. by Robert W. Funk, trans. by Louise Pettibone Smith (New York: Harper and Row, Publishers, 1969), p. 52.

work.¹⁷ He incorporates into his conception of the rational character of theology the dualistic tension of which we have been speaking by locating theology "on the boundary" between two conflicting ideals of knowledge, faith in the existential sense of ultimate concern and reason in the technical sense of scientific method.

There is a kind of cognition implied in faith which is qualitatively different from the cognition involved in the technical, scholarly work of the theologian. . . . who is supposed not only to participate in the New Being but also to express its truth in a methodical way.¹⁸

The tension in theology results from the contrast Tillich sees between the religious ideal of faith which requires a method of existential involvement and self-surrender, and the scientific ideal of reason which involves a method of objective detachment and technical criticism, and from the theological necessity to mediate between these two conflicting and incompatible ideals of knowing. The inherent risk of the theological enterprise stems, Tillich says, from the fact that, "the detachment required in honest theological work can destroy the necessary involvement of faith. This tension is the burden and the greatness of every theological work."¹⁹

While Tillich describes theology as existing in

¹⁷Paul Tillich, Systematic Theology (Chicago: The University of Chicago Press, 1951), I, p. 53.

¹⁸Ibid. Italics added.

¹⁹Ibid., p. 26.

tension between existential faith and critical reason, he distinguishes two concepts of reason and experience in such a way as to set theology methodologically apart from science in the modern sense of the term. Tillich reaffirms the classical notion of reason as logos over against the modern notion of reason as technique to account for the rationality of Christian faith, and he appeals to the classical notion of experience over against the modern notion of experience to explain the medium through which the content of theology is existentially received. Behind Tillich's contrast between method in theology and method in science lies an acceptance of the critical ideal of technical reason and the positivist conception of empirical method as an accurate account of what modern science is all about, and the inability to harmonize this ideal and method with existential faith.²⁰

Tillich distinguishes between classical or "ontological" reason as the structure of the mind whereby it grasps and transforms reality and modern or "technical" reason as the logical and methodological function of reasoning which leads to the discovery of means for ends.²¹ Although theology does not reject the methods of technical reason, nevertheless, the faith-reason relationship according to

²⁰ According to Polanyi: "The traditional division between faith and reason, or faith and science (which Tillich, too, erroneously reaffirms), reflects the assumption that reason and science proceed by explicit rules of logical deduction or inductive generalization." Polanyi seeks to show that such explicit operations are impotent by themselves and represent only a caricature of reason and science. "Faith and Reason", p. 244.

²¹ Systematic Theology / I, pp. 71-75.

Tillich, cannot be discussed on the level of technical reason for there is no point of contact between faith and reason on that level. Thus, Tillich explains, "theology cannot accept the support of technical reason in 'reasoning' the existence of a God. . . . On the other hand, theology is not perturbed by the attack on the Christian message made by technical reason. . . ." ²² Religion stands on an entirely different level. The critical function of technical reason does not even touch faith. The rational character of theology derives from its appropriation of ontological reason and its refusal to reduce reason to its technical or critical function. Whereas technical reason is instrumental, ontological reason is essentially identical with the content of revelation and existentially related to faith, that is, "its actualization is not a matter of technique but of 'fall' and 'salvation'." ²³

Tillich also distinguishes between the ontological and the scientific concept of experience, or experience by participation and experience by separation. The scientific method of experience is not applicable to theology, according to Tillich, for two reasons. First of all, scientific discovery proceeds "by detached observation or by conclusions derived from such observations," whereas theology in contrast discovers its object "only in acts of surrender and

²²Systematic Theology I, p. 74.

²³Ibid.

participation."²⁴ In the second place, the object of scientific investigation can be experimentally verified by an impersonal and objective method. The object of theology, on the other hand, "cannot be tested by scientific methods of verification. . . in which the testing subject keeps himself outside the testing situation."²⁵ It can only be verified existentially by an act of participation in which the theologian risks himself ultimately.

Distinguishing as he does the dual ideals of modern (technical) ~~reason~~ and experience, on the one hand, and classical (ontological) reason and experience on the other, Tillich is led to contrast two essentially incompatible methods of knowledge, one appropriate for science, the other for religion. Scientific knowledge is that type of knowledge predominantly governed by the ideal of critical reason, objective detachment and a strict experimental method of verification. Tillich calls such knowledge "controlling knowledge". Religious knowledge is that type of knowledge predominantly governed by the ideal of existential faith, personal involvement and a less exact experiential method of verification. Tillich calls such knowledge "receiving knowledge."²⁶ The contrast between these two types of knowledge, according to Tillich, mirrors a basic conflict in cognitive reason and creates a theological dilemma: "controlling knowledge is safe but not ultimately significant,

²⁴Systematic Theology I, p. 44.

²⁵Ibid.

while receiving knowledge can be ultimately significant, but it cannot give certainty."²⁷ It is the threatening character of this dilemma which leads to the quest for revelation. And, although Tillich claims that final revelation overcomes the conflict between detachment and commitment, formalism and emotionalism, controlling knowledge and receiving knowledge (distinguishing theology methodologically from science), in the end, theology, on his account, is left not simply "on the boundary" of faith and reason, but "straddling the fence" separating them which modern scientific rationalism has constructed.

Radical and Empirical Theologies: The contrast between method in theology and method in science is reinforced by another line of reasoning, one rooted in the rationalist tradition as it has been influenced by developments in logical positivism and linguistic analysis. Modern rationalism takes scientific method positivistically conceived as the paradigm of rationality. While neoorthodoxy and existentialism characterized theology as a non-scientific form of knowledge, empirically oriented philosophers of religion and so called "radical theologians" found the notion of non-scientific knowledge a contradiction in terms and began to examine theological alternatives to the fideist tendency. They accepted the presupposition of scientific rationalism which Bertrand Russell summarized accurately and succinctly: "Whatever knowledge is attainable, must

²⁷Systematic Theology I, p. 105.

be attained by scientific methods; and what science cannot discover mankind cannot know."²⁸ Logical positivism revived the empiricist emphasis upon the role of observation and experiment in science and established the "verification principle" as the basis for assessing the meaningfulness of any and all propositions. Accordingly, only statements which could be verified by empirical observation were to be regarded as genuinely cognitive.²⁹ Those who accepted this account of scientific method as the norm for all cognitive assertions sought to apply the strict criteria of meaning and truth in science to the subject matter of theology. The results were essentially negative. Theology could either continue to speak the language of faith and transcendence but give up its claim to cognitive significance and validity (the argument of certain empiricist philosophers) or adopt the rigorous methodology of the sciences but employ the kind of language which proclaims the end of faith and the death of God (the argument of

²⁸ Bertrand Russell, Religion and Science (Home University Library, 1935; London, Oxford, New York: Oxford University Press, 1961), p. 243.

²⁹ "The criterion which we use to test the genuineness of apparent statements of fact is the criterion of verifiability. We say that a sentence is factually significant to any given person, if, and only if, he knows how to verify the proposition which it purports to express--that is, if he knows what observations would lead him, under certain conditions, to accept the proposition as being true, or reject it as being false." Ayer, Language, Truth and Logic, p. 35. Italics added.

certain radical theologians).

British philosopher of science and religion, Julian Huxley expresses the rationalist hope that theology might become a true science "if the scientific method were applied to its subject matter."³⁰ The scientific method, which he describes as beginning with dispassionate observation and analysis leading to hypotheses which can be empirically tested and followed by the construction of a broad interpretive framework, Huxley believes to be the only road to certain knowledge. It is, in his words, "the only method which in the long run will give satisfactory foundations for beliefs."³¹ Traditional theological method based on faith in divine revelation and affirming belief in supernatural beings is, according to Huxley, intellectually intolerable today. He argues that the time has come for a purely naturalistic approach to theology. "In the light of this approach, gods appear as interpretative concepts or hypotheses. They are hypotheses aiming at fuller comprehension of the facts of human destiny, in the same way that scientific hypotheses aim at fuller comprehension of the facts of nature."³²

³⁰ Julian Huxley, Religion Without Revelation (New York: The New American Library, Inc., A Mentor Book, 1957), p. 49.

³¹ Ibid., p. 15.

³² Ibid., p. 51.

What at first appears in Huxley's analysis to be an analogy between theology and natural science, however, develops into a sharp and critical contrast between what he considers to be the dogmatic and a priori foundation of theological hypotheses and the critical and empirically grounded hypotheses of modern science. Whereas scientific hypotheses are upheld only on the basis of constant checking and rechecking against fact, the god-hypothesis derives primarily from authority or feeling or intuition. In short, it is a contrast between fides or what Huxley calls "primitive and prescientific methods of thinking" and ratio, or what it means to "operate according to the laws of logic or by utilising scientific method."³³ Religion, then, should give up its pretensions to knowledge, for apart from what can be established on the basis of the scientific method of empirical testing there is nothing man can know about nature or human destiny, and traditional theological method is not scientific in this sense.

Similarly, on the assumption that explicit (propositional) knowledge alone is knowledge, A. J. Ayer brought the tools of logical analysis and the criteria and principles of scientific investigation to bear on the question of meaning and truth in theology and concluded that religious discourse must be relegated to the realm of

³³Ibid., p. 53.

nonsense or the cognitively meaningless.³⁴ In contrast to scientific statements, theological statements have no factual content; they assert nothing which can be experientially verified or falsified, but merely express religious feelings or emotions. According to Ayer, this means that there can be no logical grounds for conflict between religion and science. "For since the religious utterances of the theist are not genuine propositions at all, they cannot stand in any logical relation to the propositions of science."³⁵ Ayer regards this conclusion, moreover, as compatible with the view of fideism that theology differs fundamentally from science in that its object is not accessible to natural reason but must be taken on trust. This implies, however, Ayer goes on to say, that nothing significant can be said about that object.

Again, we are told that God is not an object of reason but an object of faith. . . . But if one allows that it is impossible to define God in intelligible terms, then one is allowing that it is impossible for a sentence both to be significant and to be about God.³⁶

On Ayer's assumption that the knowable and the expressible are synonymous, the fact that religious discovery cannot be expressed in propositional form subject to strict empirical testing indicates that such "knowledge" is not genuinely

³⁴ Language, Truth and Logic, p. 115.

³⁵ Ibid., p. 117.

³⁶ Ibid., p. 118.

cognitive. Thus a disjunction of faith and reason is again discernable in this radical division set between language concerning the observable (reflective of the scientific method) and language concerning the unobservable (reflective of method in theology).

The function of theological language, according to linguistic analysts, is radically different from the function of scientific language. Scientific propositions report empirical facts, theological propositions report subjective (emotional or mental) states of mind or moral intentions. The impossibility of assimilating religious assertions to scientific assertions (or verifiable propositions about states of affairs in the world) led R. B. Braithwaite to assimilate them to moral assertions (or expressions of allegiance to a set of moral principles).³⁷ There are, according to Braithwaite, three classes of statements whose method of verification is quite clear. The first are statements of matters of fact which are testable by direct observation. Braithwaite agrees with Ayer that theological propositions do not fit into this class.³⁸ The second are statements of scientific hypotheses or other empirical generalizations supported by factual evidence. Like Huxley, Braithwaite sees no reason to prefer theological hypotheses to scientific ones and indeed contrasts them on

³⁷ An Empiricist's View of The Nature of Religious Belief, pp. 4-5.
³⁸

the grounds that unlike theological hypotheses, scientific hypotheses are refutable by experience and revised or abandoned if the facts prove them wrong.³⁹ Finally, there are mathematical statements which are non-cognitive, and make no assertions of existence. Obviously theological propositions do not resemble these.

Yet, the fact that method in theology differs from method in science does not, Braithwaite maintains, mean that theological discourse is meaningless.⁴⁰ Substituting the linguistic principle of use for the positivist principle of verification, Braithwaite explains the meaning of religious language in terms of moral purpose. Religious propositions are declarations of commitment to a way of life or ways of subscribing to a moral policy. The function of theological language, then, is to inspire action not to make assertions about reality. Consequently, it is not necessary that religious statements be believed to be true, for their meaning lies not in an empirical relation to facts but in a psychological relation to the pursuit of certain values. While Braithwaite agrees with the positivists, then, that theological language is non-cognitive, it does not necessarily follow, he argues, that it is, therefore, meaningless. What linguistic analysis establishes is that language can function meaningfully in

³⁹ Ibid., p. 6.

⁴⁰ Ibid.

a variety of ways. For this reason, science and theology ought to be regarded as methodologically very different.

The theological adoption of the positivists' and linguistic analysts' conception of scientific method, with its negative implications for the cognitive character of religious language, tended to diminish reliance on the cognitive powers of faith and led certain radical theologians to proclaim that theology is unable to speak at all meaningfully of God. Paul van Buren, for example, accepts the positivist critique of theological truth claims and regards "the choice of a non-cognitive, 'blik' conception of faith rather than a cognitive conception" as fundamental to his scientific investigation of the gospel.⁴¹ He is interested only in what we can "know" about the gospel, that is, in discovering its "secular meaning." Van Buren rejects the cognitive approach to theological faith because, he believes, it leads to the kind of inner contradiction evident in earlier forms of natural theology, that is, irreconcilable conflict between the god of reason and the god of faith. Assuming a cognitive stance towards religious language, in van Buren's estimate, "tends to mark off a certain area of experience as 'religious' and it argues for a religious way of knowing, in contrast to other (secular?) ways of knowing."⁴²

⁴¹The Secular Meaning of the Gospel, p. 97.

⁴²Ibid., p. 99.

Van Buren insists, on the contrary, that there is only one valid approach to knowledge and that is reason (i.e. the scientific method). Faith, on the other hand, he regards much the same as Braithwaite, as meaningful only when it refers to the Christian way of life. not when it makes truth-claims about the world or God.

The outcome of van Buren's application of scientific criteria and principles of investigation to the gospel is a theology which can claim to be cognitive but can not speak of God. Scientific theology is theology without faith. What this means, finally, is that when the question of God is raised, the Christian, on van Buren's account, "will be wise to remain silent."⁴³ Although van Buren has been widely criticized for a naive appropriation of the verification principle, nevertheless the positivistic attitude and sceptical outlook which informs his approach to theology remains a dominant force in much contemporary thinking on method. It is not only among a few radical theologians that the pursuit of a rigorously scientific method in theology is taken to entail radical scepticism and a weakening or even complete negation of the cognitive character of faith

Radical theology is regarded by its adherents and its critics alike as a rejection of traditional faith and

⁴³ Ibid., p. 144.

a critical reappraisal of theological method in the name of intellectual honesty and scientific objectivity. The standards and methods that modern science recognizes as normative for intelligent inquiry are embraced wholeheartedly as valid for theology. The result is that theology can no longer begin with faith as a cognitively certain starting point. In Gilkey's assessment, for the radical theologians "doubt had so permeated faith as to take away all the latter's certainty and so its power to give us knowledge of God."⁴⁴ Thus, self-styled radical, William Hamilton, describes the contemporary theologian as a man without faith and without God. He holds that the theologian who accepts the critical imperative of the scientific method is no longer able to accept belief in a transcendent deity or follow the traditional theological method. The theologian should rather "reduce the area of what is believed and lay hold on those few things of which he can be certain."⁴⁵ Hamilton would restrict theology to the realm of the empirically verifiable, refusing to accept authoritative or traditional grounds of faith on the assumption that such grounds are uncritical and unscientific.

⁴⁴ Naming the Whirlwind: The Renewal of God Language, p. 116.

⁴⁵ William Hamilton, The New Essence of Christianity (New York: Association Press, 1961), p. 30.

Thomas J. J. Altizer expresses as unequivocally as any radical theologian the view that theology is impelled to adopt the critical methodology of modern science, even though this means the destruction of faith and the death of God. The assumption which underlies this view of theology's dilemma is again the fundamental incompatibility of Christian faith and scientific reason. For it is understood that to be rational in the modern scientific sense is to be rigorously critical, detached and objective. Thus, Altizer speaks as a modern man when he says, "to 'know' scientifically means to dissolve the ground of faith, and thus to will the death of God."⁴⁶

It is not surprising that the radical movement in theology was so short-lived. A theology which tends to reject the traditional sources of religious insight, negate faith, and find the Christian community's language of God largely meaningless, soon relinquishes its raison d'être. Yet the problem of method which it illustrates remains, for that problem concerns the relationship of faith and reason and neither neoorthodox-existential nor radical-empirical accounts of theology adequately reconcile these apparent incompatibles. This methodological problem can be summarized briefly as follows. Given the pervasiveness of the critical ideal of knowledge and a strict scientific

⁴⁶Radical Theology and the Death of God, p. 16.

method as the paradigm of all rational procedure theology can be pursued "unscientifically" (as neoorthodox-existentialists suggest) only at the expense of weakening theology's claim to rationality (ratio) and ultimately its claim to cognitive significance and validity. But, to pursue theology "scientifically" on the grounds staked out by critical rationalism and positivism (as radical-empiricists suggest) leads to the weakening of theological faith (fides) and ultimately of theology's claim to religious significance and validity. Yet, somehow theology must meet, it seems, what Ogden has called the dual criteria of adequacy: understandability and appropriateness.⁴⁷ It must be understandable according to criteria of meaning and truth universally established and discerned through intensive discussion with the best secular knowledge of the age, i.e. the prevailing scientific ideal (as radical and empirical theologies recognized). And it must be appropriate in the sense that it represents the same understanding of faith given in the Christian witness. It seeks to articulate. In other words, "the development of its conceptuality should never lose touch with the symbolism it is supposed to interpret"⁴⁸ (as neoorthodox and existential theologies recognized). This is the dilemma, then, which theology must somehow resolve--how to be at once understandably rational (scientific) and appropriately faithful (religious). It is,

⁴⁷"What is Theology?" p. 25. ⁴⁸Ibid.

I believe, in response to the exigency of this contemporary mode of the faith-reason problem that foundational theology can best be understood. I want to conclude this chapter, therefore, by discussing briefly the effort of foundational theology to resolve this problem, and thereby establish, hopefully, the final link in what I realize has been a lengthy attempt to circumscribe the contemporary theological context in which Polanyi's account of scientific knowledge has a significant bearing.

Two Foundational Questions: Meaning and Truth:

There are two formulations of the problematic faith-reason relationship which summarize and clarify, I think, the critical juncture to which neoorthodox-existential and radical-empirical developments in theology have led, and which illustrate the foundational issues of meaning and truth with which foundational theology is concerned. For while the contemporary question of the foundations of religious knowledge focuses upon the apparent incompatibility of the modern scientific ideal of critical reason and the religious ideal of faith commitment to unproven beliefs (where proof is understood as positive demonstration), there seem to be, upon closer inspection, two aspects to this faith-reason problematic--one methodological, the other moral. The methodological aspect of the problem becomes apparent when faith and reason are considered in

terms of their contribution to the discovery of religious knowledge. When one asks such questions as "By what process, procedures, or methods does the theologian attain insight?" or "How does understanding come about in theology?" he is concerned with the activity of knowing. To question the relationship of faith and reason in terms of this activity is to raise the problem of method in theology. The moral aspect of the problem is brought out when faith and reason are considered in terms of their role in the justification of religious knowledge. When one asks such questions as "By what warrants, sanctions, criteria does the theologian make truth/claims?" or "On what grounds are judgments made in theology?" he is concerned with the authenticity of theological knowledge. To question the relationship of faith and reason in terms of justifying religious knowledge is to raise what some have called the problem of the "morality of knowledge".⁴⁹ The question "How does the theologian know?" can, in other words, be interpreted in two slightly different ways. If one takes the question as asking for an account of the operations leading to the discovery of knowledge,

⁴⁹ Van A Harvey, The Historian and the Believer (Toronto: The Macmillan Company, 1966). See also the articles by Robert A. Evans "The Future of Philosophical Theology and a Transformation of Consciousness" and Van A. Harvey "The Alienated Theologian" in Robert A. Evans (ed.) The Future of Philosophical Theology (Philadelphia: The Westminster Press, 1971), pp. 21-54; 113-1143.

then the issue seems to be methodological or procedural. If one takes the question as asking for a determination of the grounds on which knowledge rests, then the issue seems to be moral or ethical. Although these two questions are intrinsically related, different formulations of the theological problem shift the emphasis upon one or the other aspect.

Thus the faith-reason problem confronts the contemporary theologian in one form whenever claims are made for the significance (meaning) of religious assertions. In accounting methodically for the activity of interpretation the theologian encounters what can be described as a "paradox of understanding" apparently underlying the discovery of religious knowledge. The paradox consists in the fact that theological understanding seems to depend on a prior act of faith ("unless you believe you will not understand") while theological faith seems to require some achievement of understanding (in Braithwaite's words, "a religious statement cannot be believed without being understood, and it can only be understood by an understanding of the circumstances which would verify or falsify it").⁵⁰ If faith (fides) confers meaning on religious language, then a theological statement would make sense only to one who already believes it. Yet obviously one cannot believe

⁵⁰ An Empiricist View of Religious Belief, p. 3.

what he does not understand. On the other hand, if the critical process of verification (ratio) establishes the meaning of religious assertions then there is no need of faith. Yet obviously religious statements are meaningful precisely for those who believe them. Theological method, then, is said to be circular. Interpretation or the discovery of meaning takes place within a hermeneutic circle of faith seeking understanding and understanding seeking faith. If the circle is not to be a vicious one, however, a satisfactory account of this faith-reason relationship must be given which resolves this "paradox of understanding". Polanyi's account of tacit knowing, I want to show, seeks to do precisely this.

The faith-reason problem confronts the contemporary theologian in a second form whenever claims are made for the validity (truth) of religious assertions. Truth-claims in theology require the adjudication of the grounds on which such judgments rest. The theologian encounters what can be described as a "dilemma of affirmation" when he seeks to justify his cognitive claims. J. M. Crombie describes the dilemma this way. If one professes certain beliefs to be true, it seems that one ought to offer some rational grounds for them. There is an obligation, in other words, to provide reasons for what one believes lest he believe indiscriminately and irresponsibly. Yet it is difficult, and some would say, impious, to offer adequate

grounds for faith. Such an attempt is itself, one might argue, a manifestation of unbelief, a sure sign that one lacks faith.⁵¹ In justifying the grounds of judgment in theology one must avoid, on the one hand, turning theology into a kind of gnosticism where "truths of faith" remain inaccessible to ordinary rational criticism and ultimately inexplicable, and yet avoid, on the other hand, reducing theology to a kind of sceptical rationalism where "truths of reason" are established by repudiating their fiduciary roots in the Christian tradition. The contemporary theological dilemma results from the convergence of two apparently incompatible demands, that is, from what Harvey calls a "collison of two moralities of knowledge, the one characteristic of the scholarly world since the Enlightenment, the other characteristic of traditional Christian belief."⁵² The ethic of scientific knowledge demands impartiality and objectivity, and is infused with the spirit of scepticism and detachment. Its judgments rest upon a thoroughly critical reason (ratio). The ethic of traditional belief demands devotion, loyalty and involvement, and is motivated by the spirit of trust and obedience to authority. Its

⁵¹ J. M. Crombie, Faith and Logic (London: George Allen and Unwin Ltd., 1958), p. 31.

⁵² Van A. Harvey, The Historian and the Believer, p. 127.

judgments rest upon a deeply committed faith (fides). "The old morality celebrated faith and belief as virtues and regarded doubt as sin. The new morality celebrates methodological skepticism and is distrustful of passion in matters of inquiry."⁵³

There are two ways of dealing with this dilemma. As Harvey points out some Christian theologians have perceived the issue precisely as a matter of choice. "The real question is whether one wants to be accepted by the scholarly establishment or whether he wills to remain loyal to the Word of God."⁵⁴ That is, the dilemma is accepted and a decision must be made. The alternative is to perceive the dilemma as ill-conceived, or as depicting what in reality is only an apparent conflict. This is the approach Harvey himself pursues in seeking to discover how it is possible to be both an historian (which seems to imply a rigorous adherence to the rational methods of scientific inquiry) and a believer (which seems to imply the acceptance of and commitment to certain a-critical beliefs.) For behind the question of the possibility of being both an historian and a believer lies the more general and fundamental question with which we are concerned of the possibility of being both scientific (a man of reason) and a believer (a man of faith). This, it would seem, is what the theologian

⁵³Ibid., p. 103.

⁵⁴Ibid., p. 107.

must be. Thus, for theological claims to cognitive significance and validity to be upheld, a satisfactory account of the faith-reason relationship must be given which dissolves this "dilemma of affirmation". Again, Polanyi's account of personal knowledge, I want to show, attempts to do precisely this.

The methodological question (the paradox of understanding) and the moral question (the dilemma of affirmation) in theology, many contemporary theologians are recognizing, requires nothing less than a transformation of consciousness.⁵⁵ Given the presuppositions of modern rationalism, "rational consciousness" is bound by a conception of methodology and a morality of knowledge in which technical or positive reason (adjudged by criteria of objectivity and logical precision) is the final arbitrator. And, as John E. Smith has pointed out: "When reason is too narrowly conceived those who perceive this narrowness often conclude that if reason is nothing more than formal logic it is better to abandon all attempts at rationality in art, religion, and morality and seek elsewhere for guidance."⁵⁶ Thus, in spelling out what new methodological directions philosophical theology needs to take if it is to transform these narrow limits, Robert Evans invokes Polanyi's work in cognitional theory as a foundation for a

⁵⁵ Evans (ed.), p. 29.

⁵⁶ John E. Smith, Experience and God. (New York: Oxford University Press, 1968), pp. 117-118.

transformation of rational consciousness and makes three suggestions. Theology, he argues, needs first of all to move away from theological explanations and justifications which insist on the priority of reason as the final court of appeal. Second, theology needs to formulate a method which employs intuitive-imaginative reflection to illuminate religious symbols rather than simply critically justifying commitment to such symbols. Finally, theology needs to develop a broader concept of reason and thought than is presently accepted in technocracy.⁵⁷ If a transformation of method along these lines could lead to a resolution of the paradox of understanding in theology, a philosophical theology which brought it about would be truly "foundational".

In discussing the moral dimension of the faith-reason problem, Ogden clarifies, I think, the assumptions behind the dilemma of affirmation in theology and suggests new directions for fundamental theology in its traditionally apologetic function. Two false suppositions, Ogden explains, lie behind modern doubts about theology's right to exist as a legitimate cognitive discipline:

- (1) that theology by its very nature involves an appeal to special criteria of meaning and truth to establish some or all of its statements; and
- (2) that the theologian himself must be a believer already committed to the Christian understanding

⁵⁷ Evans (ed.), pp. 34-35.

of reality, and thus to the truth of the statements that theological reflection ostensibly seeks to establish.⁵⁸

But, Ogden argues, in the first place, theology can be subject to no other criteria of meaning and truth than apply to its cognate fields generally. And it belongs to fundamental theology to establish this. In the second place, while theological understanding is in a way necessary to authentic faith and love (i.e. to its full self-understanding and adequate witness) conversely, "the realization of authenticity by a personal existence of 'faith working through love' is in no way necessary to theological understanding."⁵⁹ It is wrong, in other words, to assume that one of the conditions for the possibility of theology is that the theologian himself already have accepted the Christian witness by an existential decision of faith. The reason is obvious. Since one cannot presume this condition of faith even in oneself, much less establish it in others, theology becomes an impossibility. In Ogden's words: "If in order to understand the Christian witness, one must first believe it, under what conditions could one possibly disbelieve it?"⁶⁰ This idea of belief as a condition of understanding is self-contradictory and renders the distinction between belief and unbelief meaningless. If theologians continue to insist on the condition of faith

⁵⁸ Ogden, p. 38.

⁶⁰ Ibid., p. 36.

⁵⁹ Ibid., p. 37.

for theology, it is because they confuse faith with what is in fact a necessary condition of theological understanding, namely, being grasped by the question to which the answer of the witness of faith is addressed. Once the question common to witness and theology is distinguished from the answer then perhaps one can say as Ogden does that "even though faith without theology is not really faith at all, theology without faith is still theology."⁶¹ But to establish this involves a transformation of the faith-reason relationship and the morality of knowledge it implies. A fundamental theology which brought this about and dissolved the dilemma of affirmation in theology would be truly "foundational".

The Task of Foundational Theology: If the questions of meaning and truth are the two foundational issues confronting contemporary theology, the task of foundational theology can be regarded as nothing less than establishing the very intelligibility and validity of the discipline itself. Foundational theology, then, carries forward the traditional function of "philosophical theology" and "fundamental theology" in providing a rational explanation and justification of Christian faith, but moves away from both classical and modern conceptions of philosophical reason and breaks out of the narrow and defensive posture of fundamental apologetics, thus radically transforming the foundational task to meet the formidable challenge of modern rationalism.⁶² Foundational the-

⁶¹Ogden, p.38.

ology sets out to examine critically the nature and method of theology as a science. In short, it seeks to provide theology with a method and criteria of meaning and truth firmly grounded in cognitional theory. For while the challenge of modern rationalism makes it incumbent upon theology to adopt a method which meets accepted standards of secular knowledge, nevertheless, the scientific character of theology cannot be adequately determined simply by taking some other science as its prototype. It is necessary, rather, to take a step backwards--behind the objectifications of ideals, methods and criteria in particular sciences--to their source (foundation), the dynamic structure and operations of human cognition itself, (even, it should be added, if this involves a radical revision of modern science's own self-understanding).

In speaking of foundational theology as a contemporary possibility (if not necessity) Tracy describes it as "traditional Christian theology conscious of its now prob-

⁶²I do not mean to imply that this relationship of "foundational theology" to "philosophical theology" and to "fundamental theology" is a simple or clearly established matter among contemporary theologians. Indeed, all three conceptions (and a fortiori any relationship between them) are both complex and highly debatable. It is obviously beyond the scope of this thesis, therefore, to justify fully the relationship suggested here. All I can do, in addition to acknowledging that line of thought leading from Lonergan to Tracy, Novak, Crowe and others to which I am largely indebted for this view, is to refer here to other recent studies which support this position. Regarding the transformation of "philosophical theology" see Robert Evans (ed.) op. cit. Regarding the transformation of "fundamental theology" see Johannes B. Metz (ed.) The Development of Fundamental Theology. Concilium No. 46. (New York: Paulist Press 1969).

lematic status and attempting to ground, validate or falsify the discipline itself."⁶³ In other words, to say that contemporary theology has become self-consciously problematic is not to argue against its essential continuity with the traditional task of Christian theology classically defined. Hopefully, the last chapter on the history of Christian theology has helped to make that clear. For theological understanding precisely as theological is determined or in some recognizable manner circumscribed by the hermeneutic circle of faith and reason, and theological judgment precisely as theological has as a condition of its possibility a synthesis or some kind of resolution of the tension between the polar elements of faith and reason. Foundational theology recognizes, however, that the differences between a classical understanding and formulation of the problem and a contemporary one are considerable. Thus, in Tracy's words, "the 'fides' in question for a contemporary theologian need not be restricted to a particular doctrinal tradition nor is the 'reason' involved usually that of an explicitly classical philosophy."⁶⁴ I would go even further. Indeed, if Polanyi's account of the history of Christian thought is correct, the rise of modern rationalism in the development of critical philosophy, the scientific outlook and historical conscious-

⁶³ Tracy, "Foundational Theology" p. 140.

⁶⁴ Ibid., p. 150.

ness has been decisive in shaping the contemporary understanding and formulation of the faith-reason problem. For with the emergence of modern science and the critical ideal of reason, two things become evident. One, the classical approach to justifying the theological circle from within--by an appeal to the authority of the Christian tradition itself (whether in terms of sacred scripture or the magisterium)--is no longer a possibility. Two, the theologian can no longer step outside the circle of faith and reason to justify his discipline on "rational grounds alone" as that phrase has come to be understood within the framework of modern critical thought. Foundational theology, then, as at least some of its contemporary practitioners envision it, "must involve some kind of transformation of the traditional hermeneutic circle of Christian theology (fides quaerens intellectum; intellectus quaerens fidem) into an explicitly contemporary formulation."⁶⁵

Foundational theology which conceives theology in terms of method can be considered just such a reformulation. Discussing the development of methodical exigence in Lonergan's foundational thought, Tracy refers to Lonergan's own formulation of the problem of theology today in terms of the need to move fully and coherently from a notion of theology as "reason illuminated by faith" to a notion of theology as

⁶⁵ Ibid., p. 151.

"method illuminated by faith".⁶⁶ This shift to a methodological conception of theology, it is important to note, is not a move simply from one conception of reason to another, for example, from the classical "ratio" to the modern "ratio", but to something far more fundamental than any conception. It is a shift from conceptions to their grounds. In other words, foundational theology seeks a phenomenological and transcendental account of the invariant structure and operations of the human mind. The relevance of the foundational task to Christian theology as a whole is rather obvious, I think. Lonergan puts it this way in his study of theological method: However peculiar theological operations may be, theology "nonetheless is the work of human minds performing the same basic operations in the same basic relations as are found in other special methods."⁶⁷ Tracy makes the same point even more forcefully (and more accurately, I believe) when he writes: "In short, there is no peculiarly theological method. But there is a peculiarly theological subject matter, viz. the symbolic, linguistic and doctrinal expression of the Christian tradition as themselves expressions of common human experience, and as open to critical investigation by the ordinary methods of human

⁶⁶ Tracy, The Achievement of Bernard Lonergan, pp. 204, 236.

⁶⁷ Method, p. 23. While the operations and relations are many, according to Lonergan they follow a basic pattern, namely: experiencing, understanding, judging and deciding. In other words, one uses his mind when he is attentive, intelligent, reasonable and responsible.

inquiry, especially the philosophical."⁶⁸ This basic position Tracy develops and clarifies in his article on "The Task of Fundamental Theology".⁶⁹ Drawing on insights in Lonergan, Ogden, Bultmann and Tillich he describes in five interrelated theses a view of theology as reflection (ratio) upon common human experience and the Christian fact (fides). These two sources of theology, common human experience ("consciousness", "existence", "scientific world view", "situation") and the Christian fact ("tradition", "witness of faith", "kerygma", "message") need to be methodically investigated and critically correlated, and Tracy's basic argument is that a phenomenological, historical and hermeneutic, and transcendental method is adequate to the task. A phenomenological investigation of the religious dimension of experience would allow the meaning of common human experience to be adequately analyzed and explicated theologically. A historical and hermeneutic investigation of the classical Christian texts would articulate adequately the theological meaning of the phenomena referred to as the Christian fact. Finally, a transcendental method would

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Tracy, "Foundational Theology", p. 140.

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Tracy, op. cit. For some reason Tracy has chosen to return to the more traditional terminology of "fundamental theology" for the title of this article, although he makes it clear in the first paragraph that he is using the terms "fundamental" and "foundational" interchangeably here.

correlate the results of these investigations and determine their truth-status by grounding the prior investigations and their criteria in a cognitional theory, in other words, by establishing that such operations and criteria are in fact those adequate for any cognitive claim.⁷⁰

This methodological conception of the task of foundational theology, then, means that the correlation and subsequent grounding of the results of theological investigations (phenomenologically) of common human experience and (historically and hermeneutically) of the Christian fact is not simply a matter of giving a rational explanation of how the "questions" of common human experience are met by the "answers" of the Christian fact.⁷¹

In the first place, a correlation which merely juxtaposes questions from one source and answers from another would hardly be said to take human experience seriously or its own tradition critically. In the second place, a grounding of theology which merely consists in giving rational explanations would be neither transcendental nor self-authenticating.

Christian foundational theology, then, attempts to be both serious and critical as well as self-authenticating. The self-authentication in question, however,

⁷⁰ Ibid., passim.

⁷¹ Ibid., pp. 16-18.

lies only in an adequate resolution of the faith-reason problematic. Foundational theology, in other words, "does not admit that theology as theology may be self-authenticated solely through either the religious experience or 'faith' of the theologian or a proof of 'reason'." ⁷²

Rather, it seeks to transform the problematic faith-reason relationship into an explicitly contemporary formulation by a self-conscious search for method. The major effort of the first section of this dissertation has been to circumscribe this contemporary form of the problem, to show its continuity with the traditional task of theology and thus to recognize methodical exigence as a basic theological concern today. The major effort of the second section will be to show what contribution Polanyi's cognitional theory can make to such a reformulation of the foundational task in theology. The question is germane in as much as Polanyi's epistemology, although it begins with a critique of knowing in the natural sciences, moves beyond this concern to provide grounds for a radical reappraisal of man's capacity to acquire and hold any knowledge, and involves a fundamental reconceptualization of the relationship of faith and reason in all human knowing.

⁷²Tracy, "Foundational Theology", p. 142.

SECTION TWO

THE FOUNDATIONS OF RELIGIOUS KNOWLEDGE

What's emerging from the pattern of my own life is the belief that the crisis is being caused by the inadequacy of existing forms of thought to cope with the situation. It can't be solved by rational means because the rationality itself is the source of the problem.....solving it...by abandoning rationality altogether and going by feelings alone.....seems like a wrong direction too. So I guess what I'm trying to say is that the solution to the problem isn't that you abandon rationality but that you expand the nature of rationality so that it's capable of coming up with a solution.

Robert M. Pirsig

Zen and the Art of Motor-
cycle Maintenance

CHAPTER IV

POST-CRITICAL THOUGHT

Section One began with a foundational problem in theology and found it to be a properly methodological one. Foundational theology developed from self-conscious reflection upon the grounds of religious knowledge to recognition of methodical exigence as the central theological problematic. "Dwelling in" certain philosophical and theological clues, the discussion "focused" on the need to objectify the structures and operations of intelligence involved in the theological enterprise and noted the relevance of Lonergan's transcendental method to the foundational task.

The development of a transcendental method which thematizes the performance of the knower reflects, as Tracy points out, Lonergan's own "methodological interest in the question of how all knowledge is the realization of a scientific ideal."¹ Lonergan's account of method begins by assuming an ideal of scientific knowledge and appealing to the formal operations of the successful empirical sciences to form a preliminary notion of method. Then, moving behind the formal procedures of scientific method to grasp the basic pattern of intelligence

¹Tracy, The Achievement of Bernard Lonergan, p. 36.

whence such procedures are derived, transcendental method seeks to explicate the invariant operations and relations which are present whenever human minds inquire, discoveries take place and judgments are made.² From that horizon of thematized transcendental operations of intelligence, it is possible, then, to move forward to determine the function of transcendental method as it relates to the particular methods of the various sciences. The relevance of a cognitional theory so conceived to the foundational task of theology can be seen in this forward movement, for theology, we have seen³, whatever else it may be, is still the work of human minds performing the same basic operations in the same basic pattern of relations and subject to the same basic criteria as any cognitive enterprise. Thus, theology will approach the scientific ideal to the extent that it is grounded in a transcendental method, in other words, to the extent the transcendental conditions of any knowledge are fulfilled.

In the introductory chapter I suggested that the post-critical philosophy of Michael Polanyi and particularly his epistemological theory of the structure of tacit knowing is relevant to the enterprise of foundational theology. Foundational theology begins with the problematic status of religious knowledge and moves towards resolving that problem on the level

²Method, p. 4.

³Cf. Chapter Three, pp. 131-2.

of cognitional theory. My concern in this chapter will be to explain how Polanyi's post-critical philosophy developed in response to a similar exigency--resolving the problematic status of scientific knowledge. A consideration of the problem which led Polanyi to philosophy and eventually to the development of a cognitional theory to account methodically for the operations of intelligence leading to the discovery and justification of scientific knowledge will achieve two purposes. It will serve, first, to introduce the general framework of Polanyi's philosophical thought. Secondly, it may provide an insight into the direction in which his thought develops and the significance of that development for reconceptualizing the relationship of faith and reason in the pursuit of any knowledge.

THE PROBLEMATIC FOUNDATIONS OF SCIENTIFIC KNOWLEDGE:

Michael Polanyi was not an academic philosopher by profession when he began to question the nature and justification of scientific knowledge.⁴ His credentials were not those of

⁴Polanyi began his professional career as a physician. He received his M.D. from the University of Budapest in 1913, and served as a medical officer during W.W.I. In 1917 he was granted a Ph.D. in Physical Chemistry from the same University, where subsequently he taught until his appointment to the Kaiser Wilhelm Institute for Physical Chemistry in Berlin. Polanyi soon established himself as a distinguished scientist in that field and in 1929 he was awarded a lifetime membership at the Institute. When he resigned that position four years later in protest against the Nazi regime, Polanyi was elected to the Chair of Physical Chemistry at Victoria University of Manchester, England. He later exchanged this position in 1948 for the Chair in Social Studies at Manchester, as his interests turned from the physical sciences to economics, social and political thought and eventually to more strictly philosophical concerns. For a complete bibliography of Polanyi's published

one professionally groomed in a tradition of philosophical reflection or associated with a particular school of thought. Nor were his philosophical concerns immediately generated or shaped by some controversy in philosophy of science.⁵ Rather, as a practicing scientist Polanyi was driven to such questions by what he experienced to be a serious crisis in scientific thought and a critical challenge to the foundations of freedom in science and in society as a whole. In pursuing a solution to the problem of freedom Polanyi came to recognize as an indispensable component of science non-explicit knowledge. Such knowledge could be held only by conviction and, thus, constituted the fiduciary foundation of scientific thought and, as Polanyi was later to argue, of all knowledge. This realization led Polanyi to develop a cognitional theory to account for the role of responsible belief which he saw to be at the very basis of human thought and culture.

Polanyi recognized a pernicious threat to the freedom of

research in Physical Chemistry, including a book on Atomic Reactions and some two hundred and eighteen articles and papers, cf. The Logic of Personal Knowledge, edited by Paul Ignatus, et. al. (Glencoe, III.: The Free Press, 1961; London: Routledge and Kegan Paul, 1961.).

⁵As has been observed this explains, in part, Polanyi's originality and accounts both for the difficulty of characterizing his thought along the lines of traditional philosophical categories (e.g. realist-idealist, rationalist-empiricist, etc.) as well as the reason why his thought has been unduly neglected by some academic philosophers. Cf. Helmut Kuhn "Personal Knowledge and the Crisis of the Philosophical Tradition" *IH*, pp. 111-12; Richard Gelwick, "Michael Polanyi--Modern Reformer" *Religion in Life* XXXIV (Spring, 1965), pp. 225-6; and Samuel D. Watson Michael Polanyi and the Recovery of Rhetoric. Unpublished Doctoral Dissertation The University of Iowa, 1973, Chapter Four.

scientific inquiry in the movement--at first on the Continent and later in England--for the social planning of science. He saw that the effort to organize and direct scientific research towards socially useful ends calls into question the ideal of objective truth and undermines the rational foundations of scientific knowledge. The movement to control science launches its attack upon the traditional foundations of scientific thought from two directions. On the one hand, modern materialistic analysis "denies that the human intellect can operate independently on its own grounds and holds that the purpose of thought is, at bottom, always practical."⁵ This pragmatic or utilitarian view of knowledge is the logical outcome of a destructive scepticism which denies absolute validity to any knowledge and reduces science to ideology, the contents of which are wholly determined by social need. It was Polanyi's conviction that when truth becomes identified with what best serves the interests of the State, then ideological control replaces rational freedom as the foundation of science. This argument, moreover, is curiously linked to a second line of attack which takes the guise of a moral demand. Scientists, the social planners argue, should direct their concerns to alleviating the ills of society and, therefore, ought to subordinate their personal concerns to the welfare of the State.⁷ The argument in support of State control of science, then,

⁶LL, p. 4.

⁷LL, p. 4.

according to Polanyi, runs basically along these lines: All scientific knowledge is relative since it rests upon assumptions the acceptance of which represents an arbitrary act of faith. In choosing a problem for research the scientist introduces further arbitrariness into the scientific enterprise. Since the progress of science is of vital concern to the whole community, however, it should not be left to the capriciousness of individual scientists but should be directed and regulated by those responsible for the common good, in other words, by the State.⁸

The movement to organize centrally the pursuit of scientific knowledge for social ends received its ideological formulation in the Soviet interpretation of Marxist doctrine. In the Soviet Union, according to the logic of Marxism, there could be no distinction between pure and applied science. The notion that science could pursue truth for its own sake was dismissed as a bourgeois illusion, the morbid symptom of a class society. This was the view Polanyi first encountered in a conversation with N.I. Bucharin, a leading theoretician of the Communist Party, in Moscow in 1935. As Polanyi later recalls:

I was struck by the fact that this denial of the very existence of independent scientific thought came from a socialist theory which derived its tremendous persuasive power from its claim to scientific certainty. . . . This conception denied altogether any intrinsic

⁸LL, p. 49.

power to thought and thus denied also any grounds for claiming freedom of thought.⁹

A number of very influential works carried forward into England the campaign for the planning of science advancing the argument that the primary function of science is to promote social welfare, and emphatically opposing the idea that scientific knowledge seeks truth for its own sake regardless of its immediate practical applicability. It was to counter such views and defend the freedom of science as an independent self-governing force that Polanyi began to investigate the rational foundations of scientific knowledge.¹⁰

Polanyi realized from reflection upon his own work as a scientist as well as from his understanding of the history of modern science that the pursuit and discovery of knowledge in science was not the result of explicit procedures in the service of pre-defined goals but was largely attributable to unspecifiable powers of thought in search of an as yet unknown reality. In the first place, "there exists no strict set of suppositions on which scientists are agreed. . . . Whatever premises may be held in common among scientists", Polanyi observed, "they are

⁹TD, pp. 3-4, Cf. also SFS, p. 8.

¹⁰Polanyi's essay on "Rights and Duties of Science", The Manchester School of Economic and Social Studies, X (October, 1939) pp. 175-93 contains a detailed critique of J.D. Bernal's Social Functions of Science (New York: Macmillan, 1939). Other popular accounts Polanyi cites are L.T. Hogben's Science for the Citizen (New York: Alfred A. Knopf, 1938) and J.G. Crowther's Social Relations of Science (1941). Over the next ten years Polanyi published more than twenty articles challenging the movement for the Central Planning of Science and developing a view of scientific knowledge which anticipates his theory of tacit knowing as the basis for all thought.

not to be found formulated in definite precepts."¹¹ Moreover, the methods which scientists accept do not seem to be reducible to a set of formally prescribed rules. In other words, both the assumptions and the operations of scientific knowledge can only be said to exist in the sense that they are implied in the very activity of scientific inquiry itself.

Freedom As Self-Governing Thought: The activity of scientific inquiry, according to Polanyi, testifies to the coherence of science as a system of truth sustained by a self-regulating tradition and capable of indefinite extension. The pursuit of discovery in science begins with many independent and original surmises, intuitive apprehensions of further progress in diverse directions. These anticipations which guide scientists in their search for new knowledge are not personal whims but rather aspects of those general suppositions regarding the nature of reality and the correct procedures of inquiry which the scientific community implicitly accepts and which each scientist hopes to realize and modify in some novel way.¹² Moreover, the claim to have made a discovery in science expresses the scientist's belief in the fulfillment of this hope, that is, the conviction of having grasped some aspect of the truth which other scientists must surely recognize in as much as it con-

¹¹Michael Polanyi, "Foundations of Freedom in Science", The Nineteenth Century, CXLI (April, 1947), p. 165.

¹²EL, p. 40.

firms and extends the suppositions they already communally uphold. In this informal way, then, the unspecifiable assumptions and methods of the scientific tradition not only provoke the intuitive surmises leading to discovery but also ensure its own standards of validity.¹³

It is not explicit scientific knowledge, then, which accounts for the creative advance of science but rather anticipatory powers of thought, which--though accepted and operative--remain essentially informal and tacit. And since what cannot be explicitly known cannot be subject to external control, Polanyi was convinced that attempts to manage science on the basis of clearly defined social goals was not only fallacious, but if carried out would eventually destroy science as he knew and practiced it. The scientific pursuit of truth demands the freedom of the scientist to follow his own insights wherever they might lead, responsibly guided only by a framework of acceptances and vague expectations of an unknown reality. In Polanyi's words, "The freedom of science consists in the right to pursue the exploration of these beliefs and to uphold under their guidance the standards of the scientific community."¹⁴ Thus Polanyi began to explore the nature of science as a self-governing tradition of non-explicit thought.

¹³Polanyi, "The Foundations of Freedom in Science", p. 165. Cf. also Polanyi, "Rights and Duties of Science", p. 177.

¹⁴LL, p. 26.

What Polanyi found in searching for the philosophical grounds upon which the edifice of autonomous scientific inquiry might be constructed was that the prevailing philosophical conception of scientific knowledge--the positivism of Ernst Mach and the Vienna Circle--offered no clear defense against the logic of social control. Positivist philosophy denied to scientific knowledge "any claim to inherent rationality, a claim which it condemned as metaphysical and mystical."¹⁵ Mach regarded the theoretical suppositions of science only in terms of their explicit content, and that as merely a convenient summary of the functional relations between empirical data.¹⁶ Such a conception of scientific knowledge involves no notion of truth in the purposive aim of theoretical knowledge, but rather represents scientific theory simply as a useful device for classifying observations. Accordingly, in Polanyi's words,

Scientific theory is denied all persuasive power that is intrinsic to itself as theory. It must not go beyond experience by affirming anything that cannot be tested by experience; and above all, scientists must be prepared immediately to drop a theory the moment an observation turns up which conflicts with it.¹⁷

Identifying knowledge in science with its explicit and verifiable content, and method in science with strictly formalizable rules of procedure, Polanyi thought, undermines any

¹⁵PK, p. 9.

¹⁶MIT I, p. 1.

¹⁷PK, p. 9.

claim of science to pursue truth irrespective of its immediate practical value. He concluded, therefore, that freedom in science could not be finally upheld on positivistic grounds. In fact, in his view, the positivist program "disintegrates all rational grounds on which man can hold convictions and act on these convictions,"¹⁸ pursue truth and uphold it. For, unless human thought is in the service of transcendent truth and governed by self-set standards, then rational judgments, it can be claimed, are valid only to the extent that they conform to and serve the practical interests of a certain power.¹⁹

Against those who would control scientific inquiry Polanyi argues that science must be regarded first as a body of valid theoretical ideas.²⁰ Practical application alone can never justify the existence of science, for it is the rational coherence of the whole theoretical framework of scientific knowledge which attracts the intellect. It is in these structures, then,--the structures of sound and consistent ideas tacitly apprehended--that all scientific interest resides. Isolated facts unrelated scientifically to other data within a conceptual scheme which bears on reality can have no significance to the scientific mind. "No unconnected single fact, however momentous it might be, possesses any scientific in-

¹⁸LL, p. 28.

¹⁹LL, p. 29.

²⁰Polanyi, "Rights and Duties of Science", p. 177.

terest."²¹ The conceptual framework of scientific knowledge provides the criteria for assessing both the meaning and validity of scientific "facts".

This ordered framework of ideas, according to Polanyi, forms a vague network of expectations within which the scientific mind dwells. And it is this theoretical framework of thought--the full range of which is unspecifiable--which forms the anticipatory powers of scientific knowledge. No explicit handling of knowledge, then, can make it into a science, for it is the very indeterminacy of science which makes possible the kind of creative thought which leads to discovery. Reluctance to accept the fact that knowledge in science transcends its explicit content and includes a framework of anticipations which guides the scientist in the pursuit and discovery of further truths leads to attempts to direct and control research from without, towards results of possible applicability.²²

Non-explicit knowledge in Science. In Polanyi's view, the underlying inadequacy of the conception of scientific knowledge as wholly explicit and verifiable lies in its failure to explain the powers of science to foresee the discovery of new knowledge.

The explicit content of a theory fails to account for the guidance it affords to future discoveries. To hold a natural law to be true is to believe that its presence will manifest

²¹Ibid., p. 178.

²²SFS, p. 10.

itself in an indeterminate range of yet unknown and perhaps yet unthinkable consequences. It is to regard the law as a real feature of nature which, as such, exists beyond our control.²³

Polanyi finds it imperative, then, to acknowledge the presence of anticipatory powers in science by distinguishing between the precise predictive content of a scientific theory and its vague surplus of meaning which goes beyond this.²⁴ The former constitutes the explicit or formal component of scientific knowledge, consisting in the functional relation of measured variables, while the latter constitutes the non-explicit or informal component of science, consisting in its heuristic powers. While the predictive content of science is specifiable in terms of explicit propositions and laws, and forms a system of exact rules, procedures and inferences, its heuristic powers are not. In other words, "it is not clear how anticipatory powers can be known at all. It is clear that they cannot be explicitly known."²⁵ What is also clear to Polanyi is that the role of anticipatory powers is essential to the process of discovery in science and has to be taken into account by any theory of scientific knowledge that claims to be accurate and comprehensive. He, therefore, does not hesitate to affirm the cognitive significance of this mental capacity and speak of it as a non-explicit form of knowledge.

²³SFS, p. 10.

²⁴MIT I, p. 7.

²⁵MIT I, p. 9.

It is this fundamental insight, the discovery of non-explicit thought as an indispensable component of science which leads Polanyi to search for the grounds upon which such unspecifiable knowledge can be accepted and justified. "The view that the pursuit of science is determined at every stage by unspecifiable powers of thought. . . forms my starting point for developing a theory of non-explicit thought."²⁶ Before I proceed further, then, I want to examine more closely the significance of this initial distinction between two kinds of scientific knowledge, and more specifically ask in what sense vague unspecifiable powers of thought--what Polanyi later calls tacit knowledge--can indeed be called "knowledge".

On Polanyi's account, discovery in science proceeds from a theoretical framework of general suppositions which are not themselves directly subject to experimental verification or falsification since they are not explicitly asserted but rather implied in the practice of science, i.e. provide the interpretive framework within which assertions of fact are made. The scientist is said to dwell in this framework of suppositions and work out of it. In Polanyi's words: "It is by his assimilation of the framework of science that the scientist makes sense of experience."²⁷ These theoretical suppositions form the premisses of science operative at every stage of investigation as a kind of "foreknowledge" which suggests the

²⁶KB, p. 155.

²⁷PK, p. 60.

kind of problems which are reasonable and interesting to pursue, guides the scientist in collecting data and weighing evidence and finally sets the standards for making valid judgments. In this way the non-explicit premisses of science, its suppositions and procedures are mutually determined and self-authenticating without being explicitly formalized, for Polanyi says, "we proceed according to what we expect to be the case and we shape our anticipations in accordance with the success which our methods of procedure have met with."²⁸

At the same time, every discovery of new knowledge in science represents an original contribution to the fund of scientific knowledge and modifies to some degree this framework of expectations extending the vision of science into previously uncharted domains and opening up new areas of research. The non-explicit knowledge of science, then, is embodied communally in the traditional premisses of science and personally in the innovative intellectual passions of the scientist which drive him to seek the truth of these suppositions in novel directions.

Polanyi speaks of the anticipatory powers of science as an active foreknowledge, an intuitive vision of reality which is at once both more and less than explicitly formalizable knowledge.

Scientific discovery reveals new knowledge, but the new vision which accompanies it is not knowledge. It is less than knowledge for it is a guess; but it is more than knowledge

²⁸PK, p. 161.

for it is a foreknowledge of things yet unknown and at present perhaps inconceivable.²⁹

Non-explicit knowledge is more than knowledge inasmuch as it takes us beyond the already known to the as-yet-to-be-known. It is the (tacitly) "known-unknown". Such knowledge is "actual" knowledge in the sense that it is "operative" in guiding conjectures with reasonable probability of success in the discovery of new knowledge. At the same time, non-explicit knowledge, as understood by Polanyi, is less than knowledge inasmuch as it only anticipates--and has not yet attained--the explicitly known. It is the (explicitly) "unknown-known". Such knowledge is "potential" knowledge in the sense that it is a cognitive "power" or "capacity" to intimate the presence of a hidden yet accessible reality.

It is clear, then, that the initial insight at the basis of Polanyi's account of science is the distinction between two kinds of knowledge in science, tacit knowledge and explicit knowledge. There is an ambiguity, however, in Polanyi's initial use of the terms "non-explicit knowledge" and "tacit knowledge". These terms are applied often without clarification to the unspecifiable content of scientific knowledge in its bearing on reality (consisting in the "heuristic powers" of scientific theories), the unspecifiable grounds of scientific knowledge (consisting

²⁹PK, p. 135.

in the "implicit premises" of the scientific community), and the unspecifiable process of scientific knowing (consisting in the "skillful performance" of the individual scientist). In other words, Polanyi's recognition of non-explicit knowledge is itself at first only a vague anticipation of what he later comes to understand as three closely linked kinds of indeterminacy in scientific knowledge. For what Polanyi intimates but only later clearly comprehends is that science is based on clues which have a bearing on reality, and neither the clues, the bearing, nor the reality can be adequately accounted for in terms of explicit knowledge.³⁰ The three kinds of indeterminacy Polanyi finds in science will be discussed in more detail shortly, after a consideration of the role of belief in scientific knowledge. The point here is simply that in pursuing the problem of the foundations of science Polanyi first came to recognize that science could not be adequately explained in terms of its explicit content, procedures and grounds alone.

Against objectivist accounts of science, then, which either ignore or attempt to eliminate the tacit dimension and restrict scientific knowledge to its formal and demonstrable

³⁰ Polanyi makes this clarification most succinctly in an article on scientific imagination when he states: "Science is based on clues that have a bearing on reality. These clues are not fully specifiable. Nor is the process of integration which connects them fully definable. And the future manifestations of the reality indicated by this coherence are inexhaustible." "The Creative Imagination" Tri-Quarterly (Winter, 1967), p. 116.

content, procedures and grounds, Polanyi contends that non-explicit knowledge is an essential component of science. Apart from an interpretive framework of anticipations which is never fully specifiable but which guides the process of discovery, scientific inquiry "would inevitably spread out into a desert of trivialities."³¹ Scientific discovery does not proceed by making observations or collecting facts in a vacuum. Without a personal assessment of interest and plausibility rooted in a vision of reality, nothing could be discovered that is of scientific value.³² Moreover, what governs the acceptance of a discovery as part of science is also an informal judgment of value whose grounds are never fully specifiable. This point needs to be clarified since it indicates a basis in Polanyi's thought for distinguishing between various sciences without implying any hierarchical ordering which would give preferential "status" to one science

³¹PK, p. 135.

³²William T. Scott has pointed out that: "The recognition of value and the recognition of fact occur in quite similar ways in Polanyi's theory of knowledge, countering the old view that facts are purely objective and values purely subjective, a view which has helped in the past to maintain a sharp distinction between science and religion." "A Bridge From Science to Religion Based on Polanyi's Theory of Knowledge" Zygon: Journal of Religion and Science V No. 1 (March 1970), p. 49. Polanyi himself provides the reason for this deliberate blurring of the fact-value distinction. "The moment the ideal of detached knowledge was abandoned, it was inevitable that the ideal of dispassionateness should eventually follow, and that with it the supposed cleavage between dispassionate knowledge of fact and impassioned valuation of beauty should vanish." SM, p. 38.

over another.

According to Polanyi, scientific value is a function of three factors: 1) certainty (accuracy), 2) systematic relevance (profundity) and 3) intrinsic interest.³³ These three criteria apply jointly so that deficiency in one can be compensated for by excellence in the others but can never be completely replaced. Thus while some discoveries are valued primarily for their accuracy of observation, this is always a matter of degree and must be balanced in terms of systematic relevance and interest of subject matter. Scientists will often ignore "evidence" which seems to contradict an accepted system of knowledge hoping it will turn up eventually to be irrelevant. And no scientist seriously pursues a discovery which is altogether lacking in intrinsic interest.³⁴ Judgments of plausibility can never be reduced to explicit or impersonal rules of procedure, and always involve a personal decision and consequently an element of risk. The notion that science consists of strictly objective knowledge, Polanyi believes, tends to disguise the personal component of science and mistakenly to enhance observational accuracy and systematic precision elevating

³³PK, p. 136; "Genius In Science", p. 50.

³⁴Polanyi points out, for example, that: "When the distinguished German physicist Friedrich Kohlrausch (1840-1910) declared, in a discussion about the aims of natural science, that he would be pleased to determine accurately the speed of water running through the gutter, he was talking nonsense. . . . But in doing so he demonstrated involuntarily that such absurd conclusions can be avoided--without inconsistency--only by abandoning altogether the ideal of a strictly objective science". PK, pp. 136-7.

exactitude to an all-surpassing scientific ideal.³⁵ Once the tacit component of scientific knowledge is recognized as indispensable, however, science can be appraised by a more equitable three-fold criteria. According to Polanyi: "This triad of values distributes our appreciation evenly over the whole range of sciences."³⁶ While one science (e.g. physics) may be more exact and systematic than others, its subject matter (e.g. inanimate matter) may be comparatively dull. Another science (e.g. psychology) may be very interesting in its subject matter (e.g. human behavior) but less capable of being represented in terms of exact observation and strict correlation of data. But even the most exact science must rely on the guidance of vague anticipatory knowledge, just as the most interesting science must seek clarity and precision. In contrast to the ideal of strict objectivity, the recognition of non-explicit knowledge and the appraisal of the "scientific" character of knowledge in terms of a three-fold criterion (accuracy, relevance and interest) elevates all scholarship to the same "scientific" status. In Polanyi's words: "The foolish hierarchy of Auguste Comte is smashed and flattened out."³⁷

Scientific Beliefs: If the first step Polanyi takes in establishing the philosophical foundations of freedom in

³⁵ PK, p. 141.

³⁶ "Genius In Science", p. 49.

³⁷ Ibid., p. 50. Polanyi's cryptic reference here is to Comte's well known "law of the three states" according to which every branch of knowledge has necessarily to pass through three successive theoretical states: theological or fictitious, metaphysical or abstract, and scientific or positive.

science is to acknowledge its non-explicit or tacit component, the second step is to recognize that such scientific knowledge, since it transcends what is formalizable and strictly controllable, can be upheld only by conviction, and that such conviction is a matter of belief. Science could not exist apart from a framework of acceptances which scientists freely and communally share and take on faith. For this reason, in Polanyi's view: "Any account of science which does not explicitly describe it as something we believe in, is essentially incomplete and a false pretention."³⁸

The assertion that science rests upon a foundation of belief seems to run contrary to the whole thrust of modern rationalism. The assumption underlying the movement of modern thought and leading to the development of positivism is that science represents a cognitive enterprise which can be critically grounded and which does not require the acceptance of any doubtful belief. The modern scientific revolution, it seems, supplied the supreme axiom of eighteenth-century rationalism, the rejection of all authority.

Descartes led the way by his programme of universal doubt: de omnibus dubitandum. The Royal Society was founded with the motto: Nullius in verba, We accept no authority. Bacon had claimed that science was to be based on purely empirical methods, and Hypotheses non fingo, No speculations! echoed Newton. Science has been through the centuries the scourge of all creeds which embodied an act of faith and was

³⁸LL, p. 10. . . .

supposed--and is commonly still supposed--
to be built, in contrast to these creeds,
on a foundation of hard facts, and on facts
alone.³⁹

Scientific knowledge came to be regarded then as knowledge positively established and explicitly demonstrable. The absence of personal conviction as a necessary component of science was taken to be a token of science's exactitude and objectivity. In this respect science was seen to differ not only from religious belief but from any conviction or belief which could be subjected to doubt. As early as Locke, the distinction was drawn--with respect to religious truth and scientific truth--between faith and knowledge. We have seen how Kant systematically elaborated this distinction in his Critique of Pure Reason.⁴⁰ Moreover, Polanyi points out: "The two and a half centuries of scientific triumphs that have passed since Locke drew this distinction between faith and demonstrable knowledge have greatly added to the prestige of science as the embodiment of knowledge that is unambiguous and objective."⁴¹

There can be little question as to the invaluable and, indeed, unprecedented contribution the modern scientific revolution has made to human thought and culture. "The

³⁹LL, p. 15.

⁴⁰Cf. Chapter Two, pp. 71-78.

⁴¹Michael Polanyi, "Scientific Beliefs" Ethics XLI (October, 1950), p. 27.

critical movement" which modern science represents has been "perhaps the most fruitful effort ever sustained by the human mind . . . [and has] . . . enriched us mentally and morally to an extent unrivalled by any period of similar duration."⁴² But this movement of thought is nearing the end of its course today, for the spirit of scepticism which has sustained it--while not unhealthy in itself--has turned pathological, so that the foundations of science itself have eroded.⁴³ The denial of value and the attempt to misrepresent scientific knowledge as something based on "hard facts alone" or as something "objective" in the sense of impersonally discovered and established, threatens the existence of science because it undermines the capacity to pursue truth freely by weakening the foundations of belief.

The freedom of science rests upon certain fundamental beliefs which are not recognized by a positivist conception of scientific knowledge. These include belief in a reality that transcends but can be approximated by scientific inquiry, belief in the premises of science which bear on that reality, and belief in the capacity of science to discover it. Such beliefs are at the basis of any cognitive endeavor. In Polanyi's words: "Any effort made to understand something must be sustained by the belief that

⁴²PK, p. 266.

⁴³TD, p. 58. Cf. also Michael Polanyi, "Why Did We Destroy Europe?" Studium Generale XXIII (1970), p. 110.

there is something there that can be understood."⁴⁴ Without such "faith" there would be no "reason" to learn the methods of scientific investigation, to accept the premises of the scientific community, or to acknowledge the standards of scientific value. These beliefs, moreover are at the basis of the very existence of a free society in which science can be pursued. Belief in transcendent reality, that there is something beyond man's control to which he owes allegiance, and belief in rationality, that man "is amenable to reason and susceptible to the claims of his conscience"⁴⁵ is the only alternative to the exercise of brute force in deciding what is to be accepted as true. Such beliefs are commitments which cannot be objectively demonstrated but must be personally endorsed. Yet the pervasiveness of the critical ideal of knowledge has eroded man's very capacity to believe. According to Polanyi, then, we must "learn once more to hold belief, our own beliefs." Moreover:

The task is formidable, for we have been taught for centuries to hold as a belief only the residue which no doubt can conceivably assail. There is no such residue left today, and that is why the ability to believe with open eyes ⁴⁶ must once more be systematically re-acquired.

This "formidable task" is what Polanyi sets out to accomplish--to re-establish the fiduciary foundations of

⁴⁴SFS, p. 42.

⁴⁵LL, p. 29.

⁴⁶LL, p. 31.

knowledge and to re-equip man with the capacity to believe that centuries of critical thought have discredited. It is Polanyi's conviction that no knowledge can be built up on the foundations of critical reason alone but rather is achieved within a fiduciary order of acceptances which are logically primitive to critical reflection. Knowing, in other words, rests upon a prior act of faith. In Polanyi's words: "According to the logic of commitment, truth is something that can be thought of only by believing it."⁴⁷

Polanyi challenges the disjunction of faith and reason in modern thought which precipitates the effort to represent science as knowledge grounded in reason alone. He regards this disjunction as "the break by which the critical mind repudiated one of its two cognitive faculties and tried completely to rely on the remainder," and argues that we must go back to Augustine to restore the balance and "now recognize belief once more as the source of all knowledge."⁴⁸ Polanyi's thought reflects the Augustinian view of the faith-reason relationship in recognizing the priority of belief over understanding. The order of knowing in science is not that we understand and then believe but rather that we believe in order that we may understand. All explicit acts of reasoning, according to Polanyi, are grounded in a tacit and fiduciary framework. In his view: "This is the way of

⁴⁷PK, p. 305.

⁴⁸PK, p. 266.

acquiring knowledge. . . fides quaerens intellectum, to believe in order to know."⁴⁹ Moreover, if all scientific knowledge is what someone believes to be true, then, "to believe" and "to know" are simply two ways of describing the same cognitional activity, the former emphasizing the personal character of scientific knowledge, the latter its universal intent.

Belief was discredited when it was reduced to the status of subjectivity, when it came to be regarded as an "imperfection" by which knowledge fell short of universality. "Positivism," Polanyi explains, "made us regard human beliefs as arbitrary personal manifestations, which must be discarded if we are to achieve a proper scientific detachment."⁵⁰ Central to the task of rehabilitating scientific belief, then, is the conviction that belief is neither "subjective" nor "arbitrary" in the sense in which it has come to be regarded. If it appears to be subjective and arbitrary it is only because the process, content and grounds of belief are not explicit. Polanyi seeks to develop a tacit logic of discovery and justification, to account for belief as both normative and responsible.⁵¹

⁴⁹SPS, p. 15.

⁵⁰LL, p. 22.

⁵¹Cf. Chapter Five "The Logic of Discovery and Justification".

The Indeterminacy of Scientific Knowledge: I have mentioned that Polanyi's initial recognition of the tacit component of scientific knowledge vaguely anticipates his more developed account of the indeterminacies which characterize scientific knowledge. A brief look at what Polanyi calls the "three indeterminacies of science"⁵² will help to explain the basis for his rejection of the critical ideal of reason and his proposal of a post-critical ideal rooted in responsible belief. The first indeterminacy of science according to Polanyi consists in the unspecifiable content of scientific knowledge in its bearing on reality. This indeterminacy resides in the informal heuristic powers of scientific theory. Positivist critiques deny the claim of science to know reality. Polanyi, however, believes it is essential to acknowledge such claims if we are to understand how science develops. If, to pursue a discovery in science is to believe in the reality of that which one seeks to discover, to affirm the truth of a discovery is to believe that the reality discovered will continue to manifest itself in yet unknown ways. According to Polanyi, what it means to attribute reality to scientific discovery can be seen in the example of Copernicus. "It was Copernicus who claimed for the first time that science can discover new knowledge about fundamental reality, and this claim triumphed in the Copernican revolution."⁵³

⁵²"Logic and Psychology", p. 27.

⁵³Ibid. Cf. also, MIT I, pp. 2-3.

When he affirmed the reality of the heliocentric system Copernicus also affirmed by implication the future discoveries that would be made by those who relied on the reality of his system. The "truth" of Copernicus' theory, in other words, was not limited to its explicit content but included as well its power to anticipate future discoveries. Kepler's three laws and Newton's theory of general gravitation were discoveries based on belief in the reality of the heliocentric system, and as such bore out the truth of Copernicus' theory. And while Copernicus certainly did not know explicitly that his system represented an aspect of these discoveries, he did anticipate them tacitly, as Polanyi points out, for he affirmed that his system was real, and "based this claim on the very features of the system which were to serve as clues to the problems of Kepler and Newton and lead to their discoveries."⁵⁴ Belief in the reality of a theory, then, entails the expectation that some aspect of that theory may become a clue to new problems and discoveries. In this sense Copernicus can be said to have vaguely anticipated the problems and discoveries he evoked in Kepler and Newton, even though those discoveries were very different from anything Copernicus himself might have expected.⁵⁵ This is what Polanyi means

⁵⁴ MIT I, pp. 9-10.

⁵⁵ "The vast indeterminacy of Copernican vision showed itself in the fact that discoveries made later in the light of this vision would have horrified its author. Copernicus would have rejected the elliptic planetary paths of Kepler and, likewise the extension of terrestrial mechanics to the planets by Galileo and Newton. Kepler noted this by saying that Copernicus had never realized the riches which his theory contained." "Creative Imagination", p. 113.

when he argues that the affirmation of truth always has a widely indeterminate content, and that, consequently, knowledge of reality deserves to be called a vision. The claim to know, "commits us, passionately and far beyond our comprehension, to a vision of reality. Of this responsibility we cannot divest ourselves by setting up objective criteria of verifiability--or falsifiability or testability, or what you will."⁵⁶ A fundamental concern of Polanyi's cognitional theory, as Richard Langford explains, is to establish what can be called "the indigenous and normative place of heuristic vision in all gaining of knowledge."⁵⁷ "Normative" is an important word here in terms of Polanyi's account of the logic of discovery and justification in science due to the persistent effort of certain accounts of scientific knowledge to admit the fact of belief or speak of heuristic vision but to relegate it to the epistemological limbo of the inexplicable and exclude it from the inner sanctum of method.⁵⁸

From this understanding of the way a true discovery in science bears on reality, Polanyi arrives at the following definition of reality and truth.

If anything is believed to be capable of a largely indeterminate range of future manifestations it is thus believed to be real. A statement about nature is believed to be true if it is believed to disclose an aspect of something real in nature.⁵⁹

⁵⁶PK, p. 64.

⁵⁷"Michael Polanyi and the Task of Theology", p. 45.

⁵⁸Ibid.

⁵⁹MIT I, p. 12.

To affirm something as "real", then, is to believe that it exists independently of our knowing it and that it has the power to manifest its existence, inexhaustibly. And since the "truth" of a statement lies in its bearing on reality, the establishment of truth entails an unlimited commitment. Such an act of commitment, in its full structure, Polanyi holds, is the true meaning of objectivity in science. It is what keeps knowledge from being merely subjective.⁶⁰ For intellectual commitment is a responsible decision to submit to the compelling claims of what one takes to be true and a self imposed task accepted by one who acknowledges a vision of reality to make clear the nature and implications of that vision. It is an act of hope and an obligation "expressed in the universal intent of personal knowledge."⁶¹

There is a further implication in this understanding of reality and truth, which can be introduced here. Polanyi recognizes what might be thought of as "degrees" or "dimensions of depth" to reality. He distinguishes different levels of reality on the basis of the range of possible manifestations a real entity leaves open. Any comprehensive entity which is known and has the power to manifest itself in yet unknown ways in the future is to be regarded as "real". Yet the more intangible and indeterminate an entity, the more reality it has, for the more it remains rich in

⁶⁰PK, p. 65.

⁶¹PK, p. 65.

unexpected possibilities for the future. A person or a problem has greater depth and consequently more reality than a stone although a stone is certainly more tangible.

Persons and problems are felt to be more profound, because we expect them yet to reveal themselves in unexpected ways in the future, while cobblestones evoke no such expectation. This capacity of a thing to reveal itself in unexpected ways in the future I attribute to the fact that the thing observed is an aspect of a reality, possessing a significance that is not exhausted by our conception of any single aspect of it. . . . I shall say, accordingly, that minds and problems possess a deeper reality than cobblestones.⁶²

Furthermore, in Polanyi's view, various "levels of reality" can be seen to be structured hierarchically, so that higher levels of reality rest upon and "emerge" from lower levels. He explains the relation of higher levels to lower levels in terms of "boundary conditions". Higher levels of reality operate on the boundaries left open by the principles which account for the existence of an entity at lower levels.

"This opens a perspective to a whole sequence of levels. . . . [and forms] a hierarchy of operations, each higher level controlling the margin left indeterminate by the one below it."⁶³ A comprehensive entity, then, can exist on many different levels of reality. This vision of stratified and emergent levels of reality contrasts sharply with a reductionist view of reality which seeks to account for a comprehensive entity in terms of its particular elements.

⁶²TD, pp. 32-33.

⁶³KB, p. 154.

(This, for example, was the Laplacean basis for constructing a universal atomic knowledge of the world). On Polanyi's account, the operations of a higher level of reality rely on the principles governing a lower level, but can never be explained simply on the basis of those principles since any principle must leave indeterminate the conditions of its application. The operational principles governing a machine, for example, cannot be explained in terms of physics and chemistry "any more than the physical chemical testing of a printed page can tell the content of its text."⁶⁴ For the same reason, Polanyi rejects the claim of biologists who affirm that they are explaining life in terms of physics and chemistry. "The purpose which biology actually pursues. . . consists predominately in explaining the function of living beings in terms of a mechanism founded on the laws of physics and chemistry, yet not explicable by these laws."⁶⁵

The distinction between an account of a comprehensive entity in terms of the boundary conditions whereby it is determined at a lower level and an account of a comprehensive entity in terms of the indeterminate range of its future manifestations at a higher level which those boundary conditions leave open is the basis for Polanyi's distinction between "causes" and "reasons".⁶⁶ A causal explanation is determinate

⁶⁴RM V, p. 4.

⁶⁵RM V, p. 3.

⁶⁶PK, p. 332.

but can never be comprehensive, a rational explanation is comprehensive but always remains indeterminate. For Polanyi, scientific knowledge is rational knowledge; its content is never fully specifiable.

This brings us to the second indeterminacy Polanyi recognizes in scientific knowledge, the unspecifiable process by which such knowledge is acquired. In the pursuit and discovery of knowledge, a scientist must exercise personal powers of knowing which, Polanyi says, "cannot be replaced by the operation of explicit reasoning".⁶⁷ Formal procedures, in other words, cannot account for the radical intending that moves the scientist from ignorance to knowledge. Polanyi cites innumerable examples from all fields of science to show that scientists must rely on tacitly acquired skills of knowing which they cannot specify. Such skills are learned not by precept but by practice and are operative in the application of rules and maxims without an explicit knowledge of these rules or how they work. The scientist, in other words, possesses a knowledge which is ineffable, i.e. which cannot be formulated in explicit terms. In short, he knows more than he can tell.⁶⁸

It is a well known fact, Polanyi points out, "that the aim of a skillful performance is achieved by the observation of a set of rules which are not known as such to

⁶⁷KB, p. 105.

⁶⁸TD, p. 4..

the person following them."⁶⁹ That is, they are not known formally. Thus, just as one learns to ride a bicycle without an explicit knowledge of the principles of motion and balance, so the scientist learns through practice indispensable skills which enable him to recognize the kind of coherence in nature which constitutes a discovery. There are rules, of course, which give valuable guidance to scientific discovery and some can be formulated very precisely. But they remain rules of art which must ultimately be integrated into a practical knowledge.⁷⁰ Thus, again, just as an explicit knowledge of the rule that for a given angle of imbalance on a bicycle the curvature of each turn of the wheel is inversely proportional to the square of the speed at which one is travelling does not tell one how to ride a bicycle, so an explicit knowledge of scientific rules of procedure cannot account for their application and so cannot tell one how to go about making a scientific discovery. Discovery in science Polanyi explains, "is an extremely delicate and personal art which can be but little assisted by any formulated precepts."⁷¹

Scientific skills are transmitted by example from master to apprentice. While the explicit content of a science can be formulated into rules of procedure and

⁶⁹PK, p. 49.

⁷⁰SFS, p. 14; PK, p. 50.

⁷¹SFS, p. 34.

diffused by means of the printed word throughout the world, the unspecifiable skills required of a scientist are communicated tacitly through personal contact. Polanyi speaks of this as "connoisseurship".⁷² The scientist submits to a living tradition when he apprentices to a scientific community. By participating in the practice of science under the guidance of authorities he comes to assimilate the necessary skills for scientific work. Polanyi describes his own experiences during three years of research with x-rays and crystals at the Institute of Fibre Chemistry in Berlin in essentially these terms.⁷³ The training required in medical science provides another clear illustration of what Polanyi means by connoisseurship.

Unless a doctor can recognize certain symptoms, e.g. the accentuation of the second sound of the pulmonary artery, there is no use in his reading the description of syndromes of which this symptom forms part. He must personally know that symptom and he can learn this only by repeatedly being given cases for auscultation in which the symptom is authoritatively known to be present, side by side with other cases in which it is authoritatively known to be absent, until he has fully realized the difference between them and can demonstrate his knowledge practically to the satisfaction of an expert.⁷⁴

The art of "diagnosis" so described is, for Polanyi, paradigmatic of the skillful performance demanded in all scientific work. The diagnostician is one who has acquired

⁷²PK, p. 54.

⁷³KB, pp. 97-104.

⁷⁴PK, pp. 54-55.

through practice the skill of recognizing clues or symptoms where the untrained observer finds only meaningless data or facts. Similarly, all scientists must learn to recognize in the data of experience what should be regarded as significant (that is, "evidence") and what should be ignored as insignificant. Such an act of recognition is a personal performance and involves the integrating of particulars into a coherence which becomes their true meaning. It is a skillful knowing which remains essentially informal and can only be "vaguely defined".⁷⁵ It is, in fact, a tacit process, for the operations of knowing which lead to discovery are the fruit not of observation but "indwelling". In Polanyi's words, "it is not by looking at things but by dwelling in them that we understand their joint meaning".⁷⁶

This second indeterminacy in scientific knowledge, the unspecifiable process of indwelling which Polanyi regards as a necessary condition for the possibility of discovery in science requires the personal participation of the knower. For indwelling is an act of "intelligent interiorization" whereby that which is to be known as well as the directives

⁷⁵"Logic and Psychology", p. 27.

⁷⁶TD, p. 18.. Polanyi believes this confirms the idea developed by Dilthey and Lipps that we can know human beings and works of art only by indwelling. "But," he continues, "we see now also that these authors were mistaken in distinguishing indwelling from observation as practiced in the natural sciences. The difference is only a matter of degree: indwelling is less deep when observing a star than when understanding men or works of art." KB, p. 161.

and procedures for knowing are not explicitly observed but tacitly assimilated and made to function as clues and guides to a skillful performance.⁷⁷ The personal participation Polanyi recognizes clearly differs from the participation of the knower Kant postulated as a necessary condition of experience. The strict conceptual categories Kant describes are fixed and automatically imposed on experience, leaving no room for personal judgment. "The Kantian legislation for experience" in Polanyi's words, "is both infallible and impersonal, the knowing self is the recipient of knowledge over which he has no control."⁷⁸ In contrast, the personal participation Polanyi regards as essential to scientific knowing requires "hazardous operations developed by training," for skillful knowing involves an active shaping of experience. It requires, in other words, intelligent effort and personal judgment, and is neither automatic nor infallible.⁷⁹ Polanyi calls this "the unaccountable element in science."⁸⁰ He notes that even Kant, so intent on strictly determining the categorial rules of pure reason, "occasionally admitted that into all acts of judgment there enters and must enter a personal decision which cannot be

⁷⁷MIT, III, p. 5.

⁷⁸Ibid., p. 6.

⁷⁹Ibid.

⁸⁰KB, p. 105.

accounted for by any rules."⁸¹ But, as Polanyi points out, in his Critique of Pure Reason Kant says little of this indeterminate mode of intentionality, only that it is "what constitutes our so called mother-wit" (A p. 133) and that it is "a skill so deeply hidden in the human soul that we shall hardly guess the secret trick that Nature here employs" (A, p. 141). These personal and unformalizable powers of the mind, which receive but a few scattered references in Kant's critique are precisely what Polanyi's cognitional theory seeks to acknowledge and account for in terms of the structure and act of tacit knowing. For, as we will see in detail in the next chapter, the recognition of this indeterminacy in science leads Polanyi to characterize method in science as tacit knowing and to undertake an account of the fundamental structure and operations of consciousness itself.

Thus, we come, finally, to the third indeterminacy Polanyi finds characteristic of science, the unspecifiable grounds on which scientific knowledge is accepted. This indeterminacy Polanyi says, "will be seen when we find that the data on which a discovery ultimately rests are not fully identifiable".⁸² As I mentioned earlier, Polanyi regards the unspecifiability of the grounds on which a discovery in science

⁸¹KB, p. 105. Polanyi's reference here is to Kant's Critique of Pure Reason. Actually, Kant does discuss this at some length in his Critique of Judgment, but the context of that discussion is aesthetic not theoretical reason.

⁸²"Logic and Psychology", p. 27.

is accepted as true to be closely linked to the indeterminacy of the content of scientific knowledge and the process of scientific knowing. Thus, having relied throughout his inquiry on the presence of a hidden reality only vaguely known (i.e. on unspecifiable foreknowledge) and having relied on mental powers for discerning that reality which can be only vaguely defined (i.e. on unspecifiable skills of knowing) the scientist will necessarily rely on that same presence and those same powers for claiming the validity of the results which satisfy his quest. "On the grounds of the self-command which bound him to the quest of reality, he must claim that his results are universally valid: such is the universal intent of a scientific discovery."⁸³ The scientist cannot know apart from his own fiduciary acceptance of the premises of science and his own tacit exercise of scientific skills that his claim to discovery will be accepted. Nor can he regard acceptance of his claim by others as itself the guarantee of its truth.

On Polanyi's account:

To claim universal validity for a statement indicates merely that it ought to be accepted by all. The affirmation of scientific truth has an obligatory character which it shares with other valuations. . . it is futile to seek for explicit impersonal criteria of their validity.⁸⁴

⁸³"The Creative Imagination", p. 122.

⁸⁴Ibid., pp. 122-23.

The grounds of scientific knowledge, then, are essentially unspecifiable yet implicit in the very practice of science itself. Science, finally, rests on acts of personal judgment.

Strictly speaking a scientific discovery can neither be proved nor disproved. Polanyi does not find very persuasive, in other words, the argument that "though not strictly verifiable, scientific generalizations can be strictly refuted."⁸⁵ It may be true that a single piece of contradictory "evidence" can refute a generalization, but experience presents us not with evidence but with data, apparent confirmations or apparent contradictions, and there are no strict rules for deciding when an apparent contradiction is a real contradiction any more than for deciding when an apparent confirmation is a real confirmation. "The falsification of a scientific statement can, therefore, no more be strictly established than can its verification. Verification and falsification are both formally indeterminate procedures."^{86a} Ultimately, then, the grounds on which knowledge is accepted as true are as indeterminate as its content and the process whereby it is discovered. To accept the truth of a scientific discovery requires the kind of leap across a logical gap that constitutes a "conversion".^{86b} There is simply no specifiable point at which truth must be accepted out of logical necessity. It was on such indeterminate

⁸⁵"The Creative Imagination", p. 111. Basically, this is the position which Karl Popper develops in The Logic of Discovery (New York: Basic Books, 1959).

^{86a}Ibid.

^{86b}PK, p. 151.

grounds Polanyi explains that Copernicus' discovery was accepted.

Copernicus ('De Revolutionibus', Preface and Book 1, Chapter 10) claimed that his system had unique harmonies which proved to be real even though he could describe these harmonies only in a few vague emotional passages.⁸⁷

Polanyi's point in noting the "absence of strict criteria" governing the acceptance of truth claims in science is not to argue that, therefore, scientific knowledge is only probable, tentative or hypothetical. It is, on the contrary, to recognize that scientific knowledge does claim to be true, but that such a claim "is based on nonstrict criteria"⁸⁸

Science is grounded, and is firmly grounded, on the kind of indefinable insights which the current view of science regards as mere psychological phenomena, incapable of producing rational inferences. ⁸⁹

The fact that we may not know "explicitly" or be able to demonstrate "objectively" the grounds on which scientific knowledge is held to be true, does not mean that there are no rational grounds for truth. It means, rather, that rational grounds are tacit and personal. Only if we have been misled by the critical conception of knowledge to regard as rational that alone which can be explicitly formulated and objectively established does the former conclusion

⁸⁷"Creative Imagination", p. 112.

⁸⁸"Logic and Psychology", p. 27.

⁸⁹Ibid.

necessarily follow. In the same way, to recognize, as Polanyi does, that scientific knowledge is grounded in belief is not to introduce into science an element of subjectivism or irrationalism. Again, only if we have been misled by the same critical conception of knowledge to regard belief as subjective and arbitrary does this necessarily follow. A critical conception of knowledge, however, cannot, in fact, account for the way science is practiced nor for the grounds on which science rests. On the contrary, the ideals of scepticism and detachment which such a conception assumes have become a threat to the free pursuit of science by rendering problematic the foundations of scientific knowledge. In setting out to establish the philosophical grounds on which freedom in science could be upheld, Polanyi found, first, that science must be accepted as a tradition of self-governing thought; second, that such a tradition consists fundamentally of non-explicit knowledge upheld by conviction; third, that the unavoidably fiduciary character of scientific knowledge contradicts the assumption that science is something other than a matter of belief; and fourth, that scientific belief involves at least three closely linked kinds of indeterminacy inasmuch as its content, process and grounds cannot be explicitly identified. For these reasons, then, Polanyi found it imperative to reject the critical ideal of knowledge and to seek an alternative ideal, one which "restores to us once more the power for the deliberate holding of unproven

beliefs",⁹⁰ and, thus, one which reflects more truly the way discovery in science actually occurs and the way scientific knowledge once discovered is held to be true.

THE IDEAL OF PERSONAL KNOWLEDGE:

In the preface to Personal Knowledge, which, according to the author, is primarily an inquiry into the nature and justification of scientific knowledge, Polanyi introduces the ideal of "personal knowledge". He calls personal knowledge "an intellectual commitment".⁹¹ Two aspects of the ideal of personal knowledge have an important bearing on Polanyi's account of the methodological and moral foundations of scientific knowledge, and can be considered here. The ideal of personal knowledge as intellectual commitment emphasizes, first of all, the passionate contribution of the knower as a vital component of all knowledge. An account of the logic of discovery based on this ideal must, therefore, explain the personal participation of the knower in all acts of understanding. The ideal of personal knowledge as intellectual commitment emphasizes, second of all, the a-critical and fiduciary grounds of scientific knowledge. An account of the logic of justification based on this ideal, therefore, must explain the nature of responsible belief at the basis of all acts of judgment.

⁹⁰PK, p. 268.

⁹¹PK, p. xiv.

Intellectual Passions: Polanyi begins by rejecting the ideal of detachment as a characterization of the scientific attitude. The image of the scientist as a detached, disinterested observer of facts is a false ideal which, although harmless for the most part in the exact sciences where it is largely ignored, "exercises a destructive influence in biology, psychology and sociology, and falsifies our whole outlook far beyond the domain of science."⁹² It implies that science is somehow more accurate and reliable than other forms of human knowledge and that scientific knowledge is "objective" to the extent that it is established dispassionately and impersonally. The data of science are said to be "given" in the objects of experience independent of the subject's volition.

Polanyi sees the paradigm of this conception of scientific knowledge pursuing an ideal of absolute detachment in the Laplacean formulation of strictly objective knowledge, a view which leads to a mechanistic conception of man and a reductionist understanding of human affairs. Reduced to its essentials, the Laplacean ideal of universal knowledge would substitute for the subjects scientists are personally interested in, a set of data which tells them nothing they want to know. Polanyi points out the absurdity of this ideal. For example,

if we decided to examine the universe objectively
in the sense of paying equal attention to portions

of equal mass, this would result in a lifelong preoccupation with interstellar dust, relieved only at brief intervals by a survey of incandescent masses of hydrogen--not in a thousand million lifetimes would the turn come to give man even a second's notice.⁹³

Obviously, no scientist seeks this kind of objectivity. It is simply mistaken to assume that one can achieve a point of view grounded in dispassionate, detached observation of data. Whatever lip-service is given to objectivity in science, there is no way of eliminating the human perspective and value judgments from one's knowledge. As human beings, "we must inevitably see the universe from a centre lying within ourselves".⁹⁴

In place of the ideal of scientific detachment, Polanyi proposes an ideal of scientific commitment. While the former implies we "revere scientists for their absolute respect for the observed facts, and for the judiciously detached and purely provisional manner in which they hold scientific theories (always ready to abandon a theory at the sight of any contradictory evidence)",⁹⁵ the latter suggests we recognize passionate commitment as the hallmark of scientific inquiry. Indeed, detachment "in the rigorous sense of the word, can only be achieved", Polanyi points out, "in a state of complete imbecility well below the normal animal's

⁹³PK, p. 3.

⁹⁴ PK, p. 3.

⁹⁵ PK, p. 12.

level. In all states of mind above that we are inevitably committed".⁹⁶ Objectivity in science, then, is not the absence of passion, but a particular kind of passion, for relevance emerges only as the passion for inquiry is released and supported. The discovery and acceptance of scientific knowledge, according to Polanyi, is the outcome of a passionate commitment to certain beliefs and appreciations which shape expectations, guide investigation and establish validity.

Intellectual passion, Polanyi argues, is an essential component of scientific knowledge. "Scientific passions are", in his view, "no mere psychological by-product, but have a logical function which contributes an indispensable element to science".⁹⁷ Passionate commitment involves the scientist personally in the "objects" he seeks to know, and can be seen to function in three different ways: selectively, heuristically, and persuasively.

The selective function of scientific passion is to distinguish between observable facts which are of scientific interest and those which are not. Problems for research are not chosen arbitrarily, nor are they planned according to a logic extrinsic to the practice of science itself. Scientists decide to investigate certain problems because of the interest they arouse. This kind of personal discernment of value is an act of appreciation, which, according to Polanyi, "depends

⁹⁶LL, p. 25.

⁹⁷PK, p. 134.

ultimately on a sense of intellectual beauty; . . . it is an emotional response which can never be dispassionately defined".⁹⁸ The ideal of personal knowledge emphasizes the total involvement of the knower in his knowledge. The scientist does not operate on a level of intellectual detachment in some way removed from physical or emotional patterns of knowing. Rather his whole person participates in his commitment.

The passionate involvement of the scientist, then, is an indispensable guide in assessing what is of greater or lesser value to science. Value depends, we have seen, not simply on the qualities of accuracy and systematic relevance, but also on the intrinsic interest of the subject matter. An impersonal ideal of knowledge would reduce science to a matter of formal observation and calculation. But, being unable to recognize the relative importance of objects it would inevitably reduce all data to quantifiable significance alone and "present us with a picture of the universe in which we ourselves are absent. In such a universe there is no one capable of creating and upholding scientific values; hence there is no science".⁹⁹

The heuristic function of scientific passion is continuous with its selective function inasmuch as the desire to know does not merely sense the kind of possible harmony or

⁹⁸PK, p. 135.

⁹⁹PK, p. 142.

coherence which constitutes an interesting problem, but also evokes and sustains the quest which leads to its solution. It is the passionate commitment of the scientist to a vision of the truth which often overcomes what would otherwise be insurmountable obstacles. Indeed, the more original and creative the insight the more likely it will meet with opposition. Polanyi points to the example of Einstein's discovery of relativity.

Brushing aside the protest of common sense as the complaint of mere habit, he adopted a vision in which the electro-dynamics of moving bodies were set beautifully free from all the anomalies imposed on them by the traditional framework of absolute space and time. Accepting this intellectual beauty as a token of reality, Einstein went on to generalize his vision further and to derive from it a series of new and surprising consequences. This was an unfamiliar beauty in science, for it accepted a new conception of reality.¹⁰⁰

The history of science is filled with examples of persistent research and years of labor against great odds. If the ideal of detachment counsels the scientist to remain disinterested and personally uninvolved in his research in order to maintain an outlook of objectivity, the ideal of personal knowledge recommends passionate dedication and faithful perseverance in one's vision of a reality not yet revealed but expected to be disclosed.

Scientific passion, moreover, is far from infallible. One's vision may be misguided. Yet, there is a difference

¹⁰⁰PK, p. 144.

between an intellectual passion which is personal and fallible, and an emotional bias which is subjective and misleading. As Polanyi says, "scientific guesses" may turn out to be mistaken, "unscientific guesses" are not only false but incompetent.¹⁰¹ Scientific passion is in the service of a reality it seeks to discover, and as such subordinates private desire to a sense of personal responsibility. The ideal of personal knowledge, thus, seeks to establish man's responsibility for scientific knowledge on the grounds that one's passionate participation in the act of knowing is intrinsic to it. If there is no way to avoid the risk of passionately upholding one's vision while seeking its confirmation, then one must take full responsibility for his knowledge.

The persuasive function of scientific passion takes over when one believes himself to have established that confirmation and made contact with reality. Just as there is no impersonal way of acquiring scientific knowledge, so there is no impersonal way of communicating such knowledge and convincing others of its validity. The scientist who finds himself converted to a new way of looking at some aspect of reality must then set out to convert others to that vision. Persuasive passion, is according to Polanyi, the "mainspring of all fundamental controversy" in science.¹⁰² The indispensable

¹⁰¹PK, p. 144.

¹⁰²PK, p. 159.

function of persuasive passion can be seen most clearly in a scientific controversy involving a major discovery. In such cases¹⁰³ two conceptual frameworks, separated by the same kind of logical gap which separates a problem from its solution, come into conflict. And, as Polanyi points out, it is impossible to bridge the gap separating two conflicting systems of thought by logical demonstration alone. "Formal operations relying on one framework of interpretation cannot demonstrate a proposition to persons who rely on another framework."¹⁰⁴ Demonstration must always be supplemented by some form of rational persuasion which can induce a conversion. Essentially the same informal logic of persuasion operates in any rational argument. Since scientific passion seeks contact with a reality that is universal, it only finds satisfaction in communicating its vision to others. In such a way persuasive passion binds the scientist to a community of explorers who share a common vision.

¹⁰³Polanyi discusses in some detail four examples of such scientific controversies: 1) the conflict between the Ptolemaic and Copernican theories; 2) the conflict between Hegel and Bode over the rational foundation of Bode's Law; 3) the conflict between van't Hoff and Kolbe concerning the foundations of chemistry; and 4) the controversy over the nature of alcoholic fermentation. (PK, pp. 152-58). The reason such controversies could drag on indefinitely, Polanyi points out, is revealed by a remark of Pasteur who entered the last conflict mentioned above in 1857. "If anyone should say that my conclusions go beyond the established facts (he wrote) I would agree, in the sense that I have taken my stand unreservedly in an order of ideas which, strictly speaking, cannot be irrefutably demonstrated" (quoted in PK, p. 157.)

¹⁰⁴PK, p. 151.

In challenging the view of science as essentially dispassionate and impersonal inquiry, and arguing that all knowing involves an indispensable personal component, Polanyi proposes an ideal of knowledge which dissolves the dichotomy of subjectivity and objectivity. To the extent subjectivism consists in the view that truth is a creation of the knowing mind, Polanyi's account of personal knowledge is not subjectivist. For Polanyi insists that genuine knowledge is not made but discovered.¹⁰⁵ To the extent objectivism consists in the view that the path to truth lies in minimizing the personal involvement of the knower in his knowledge and in achieving a standpoint of detachment, Polanyi's account of personal knowledge is not objectivist. In short, scientific knowledge is neither subjective nor objective, according to Polanyi, but personal.

In so far as the personal submits to requirements acknowledged by itself as independent of itself, it is not subjective; but in so far as it is an action guided by individual passions, it is not objective either. It transcends the disjunction between subjective and objective.¹⁰⁶

The scientist transcends the objectivity of his discovery inasmuch as it is shaped by his own personal participation in that which he knows. He transcends his own subjectivity by striving passionately to fulfill an obligation to universal standards. This brings us to the second aspect of the ideal

¹⁰⁵PK, p. 122.

¹⁰⁶PK, p. 300.

of personal knowledge, its a-critical, fiduciary character.

Post-critical exigence: The critical ideal of knowledge assumes that reason can comprehensively specify the grounds of knowledge, and that all indeterminate, unformalizable elements can be eliminated from one's conceptual framework. Accordingly, knowledge is not authenticated until it becomes explicitly formulated, critically established and objectively verified.¹⁰⁷ Criticism implies explicit formulation. In Polanyi's words: "Where there is criticism, what is being criticized is, every time, the assertion of an articulate form".¹⁰⁷ This conception of knowledge, we have seen, has given rise to the widespread critical imperative of rejecting beliefs which cannot be reflectively grounded. Thus, there is a certain morality of knowledge implied in the critical ideal. As Polanyi points out: "To assert any belief uncritically as a matter of our faith has come to be regarded as an offense against reason".¹⁰⁸ The ideal of personal knowledge transforms this morality of knowledge by overcoming the false dichotomy of objective reason and subjective faith.

The critical ideal has generally been thought to be represented by modern science. Yet, if only the acceptance of explicit knowledge can be judged as either critical or uncritical and the mind granting this acceptance can be said to be acting critically or uncritically, in the sense just

¹⁰⁷PK, p. 264.

¹⁰⁸"Science and Conscience", p. 55.

specified scientific knowledge cannot be said to be comprehensively critical, for scientific knowledge is largely indeterminate. Polanyi's recognition of the tacit dimension of scientific knowledge, then, leads to a post-critical exigence. To accept the indeterminacy of knowledge is to recognise an ideal of knowledge which credits a person with much broader cognitive powers (and responsibility) than a critical conception of knowledge would allow, namely "to shape his knowing according to his own judgment, unspecifiably."¹⁰⁹

The critical ideal of knowledge tends to misrepresent the nature of scientific method by exaggerating the precision and exactitude of its operations. The effect is to reduce scientific procedure to a set of clearly specifiable and impersonal observations and calculations which can be objectively criticized step by step. This would relieve man of responsibility for holding his knowledge. But it also eliminates from science the element of originality "which conflicts sharply with the ideal of a completely formalized intelligence".¹¹⁰ A post-critical ideal of knowledge, on the contrary, recognizes that vagueness and indeterminacy is a vital and necessary part of science and that far from representing a system of exact rules, procedures

¹⁰⁹PK, p. 264.

¹¹⁰PK, p. 301.

and inferences, science more closely resembles a "loose system of intuitions" based on a tradition which is tacitly and responsibly accepted and "transmitted from one generation to the other only through the medium of personal collaboration."¹¹¹

It is Polanyi's contention that no knowledge is or can be fully explicit, that we always "know" more than we can "tell" and therefore that reason can never be comprehensively critical.

Tacit assent and intellectual passions, the sharing of an idiom and of a cultural heritage, affiliation to a like-minded community; such are the impulses which shape our vision of the nature of things on which we rely for our mastery of things. No intelligence, however critical or original, can operate outside such a fiduciary framework.¹¹²

Here we can see the far reaching implications of Polanyi's original distinction between explicit knowledge and tacit knowledge. Explicit, articulate knowledge is subject to the reflective scrutiny of critical reason. Tacit, inarticulate knowledge is not. The essential difference lies in the fact that we can critically reflect on something explicitly stated in a way in which we cannot reflect on our tacit comprehension of something.¹¹³ Explicitly formulated knowledge is knowledge derived from specifiable premises according to strict rules of inference. It is the critical function of reason to test

¹¹¹LL, pp. 52 and 57. Cf. also "The Value of the Inexact", Philosophy of Science, III, (April, 1936), pp. 233-34. Letter to the editor.)

¹¹²PK, p. 266.

¹¹³SM, p. 14.

such explicit processes, rehearsing their chain of reasoning in search of some weak link. But in contrast to the critical ideal which assumes the possibility of absolute reflection, that is, which assumes the possibility of formalizing knowledge to the exclusion of the tacit component, the ideal of personal knowledge recognizes tacit knowledge as an indispensable part of all knowledge. What Polanyi is saying, then, is that while being rational implies the explication and criticism of knowledge, reason or rational consciousness itself is not fully accessible to criticism. In other words, reason can explicate and criticize knowledge to some extent, but the cognitive act of explication and criticism itself is a tacit performance which evades explication and criticism. The critical ideal of knowledge leads to an infinite regress, for if one could criticize one's criticism then that act would also need to be criticized, and so on. The ideal of personal knowledge simply reflects the fact that at some point one must accept a-critically personal responsibility for that which he asserts to be true. It is on such personal grounds that scientific knowledge rests. Thus, if all knowledge is, as Polanyi says, either tacit knowledge or rooted in tacit knowledge, "then the ideal of eliminating all personal elements of knowledge would, in effect, aim at the destruction of all knowledge".¹¹⁴

Polanyi shows the futility of trying to eliminate the personal coefficient of knowledge. All knowledge, he

explains, is what someone believes to be true, and there is no impersonal way in which true knowledge can be apprehended or grounded. An assertion of fact means we believe the case to be true. "Every conceivable assertion of fact", Polanyi points out, "can be made in good faith or as a lie. The statement remains the same in both cases, but its tacit components are different".¹¹⁵ One can, in other words, either commit oneself to a belief in what he has asserted to be the case (and to all its future implications) or one can withhold this belief (and perhaps deceive others in the process). In either case, however, the personal coefficient must be taken into account, for an unasserted statement can be neither true nor false. The personal component of knowledge is the act of judgment. It can be distinguished from the explicit or formal content of knowledge but never separated from it, for until a judgment is made and a statement is endorsed as someone's personal belief there is no knowledge.

The personal ideal of knowledge, then, means that an explicit assertion is composed of two parts: the statement conveying the content that is asserted as a fact, and the tacit act by which the statement is asserted. While it is possible to assess critically the content of a statement, temporarily withholding one's assertion, until the statement is reasserted it cannot be said to be true. And, the cognitive

¹¹⁵PK, p. 253.

act of assertion itself cannot be critically assessed or said to be true in the same way that the content of the statement can be tested or said to be true.

Therefore, if 'p is true' expresses my assertion or reassertion of the sentence p, then 'p is true' cannot be said to be true or false in the sense in which a factual sentence can. . . . To say that 'p is true' is to underwrite a commitment or to sign an acceptance. . . . Hence we cannot assert the expression 'p is true', any more than we can endorse our own signature; only a sentence can be asserted, not an action.¹¹⁶

Post-critical exigence, then, means that the word "true" must be re-defined as expressing an act of personal asseveration. To affirm a sentence as true is equivalent to expressing one's personal belief in what the sentence asserts. Truth and belief are thus the universal and personal poles of an a-critical act of commitment. To say that "p is true" is to emphasize the universal intent of one's knowledge, while to say that "I believe p" is to emphasize its personal endorsement.¹¹⁷

Once the distinction between the fiduciary mode of knowledge and the explicit content of knowledge is recognized, Polanyi believes, then the meaning of verification is clarified. Within the framework of commitment an assertion of truth is necessarily personal, that is, it is made by a particular person at a particular time and place. Modern

¹¹⁶PK, p. 254.

¹¹⁷PK, p. 255.

science is just such a concrete, historically conditional pursuit of truth. To accept this framework as the only way in which something can be asserted as true, "is to abandon all efforts to find strict criteria of truth and strict procedures for arriving at truth".¹¹⁸ According to the ideal of personal knowledge then truth is an act of personal authorization. In Polanyi's words: "Truth becomes the rightness of an action; and the verification of a statement is transposed into giving reasons for deciding to accept it".¹¹⁹ Thus, while commitment offers to those who accept it legitimate grounds for the affirmation of personal beliefs, it also imposes upon them the responsibility to seek universal acceptance of those beliefs.

In Polanyi's own case, the conviction that the ideal of personal knowledge leads to a true understanding of the way science actually works, that is, the way discoveries are made and accepted, was a commitment of the very kind it authorized. In giving reasons for accepting this ideal Polanyi was led to work out the structure of tacit integration to account for the logic of discovery (the method) and the logic of justification (the grounds) of all knowledge.

¹¹⁸PK, p. 311.

¹¹⁹PK, p. 320.

CHAPTER V

THE DISCOVERY AND JUSTIFICATION OF KNOWLEDGE

In the last chapter I tried to show how Polanyi's post-critical philosophy emerged in response to a foundational problem in science and developed in reaction to the ideals of critical philosophy as represented by positivism. The positivist conception of knowledge Polanyi encountered was critical, impersonal, and grounded in the principle of doubt. Its ideals were scepticism and detachment. Scepticism liberated science from its dependence on authority, detachment prevented science from sinking into subjective bias or personal opinion. Reason became autonomous and critical. Polanyi proposes an alternative ideal which he calls personal knowledge, and which he characterizes as post-critical, inherently hazardous, and grounded in the principle of faith.¹ In the present chapter I want to approach the two foundational questions raised earlier by examining the notion of method and the notion of grounds which follow from this ideal of personal knowledge. The methodological issue will be discussed in terms of the "logic of discovery", the moral issue in terms of the "logic of justification".

¹PK, p. xiv.

THE LOGIC OF DISCOVERY: METHODICAL EXIGENCE:

Polanyi's critique of the modern positivist conception of scientific knowledge centers on the fact that its methodology disregards certain real and indispensable cognitive powers "for the sake of maintaining an 'objectivist' framework which in fact cannot account for them."² Scientific methodology, aspiring to an ideal of critical reason, limits knowledge to its articulate forms. This restrictive view of knowledge which confines the rational to what is explicit reduces scientific method to a description of the formal operations linking explicit terms. But, Polanyi argues, explicit logical procedures cannot explain that which is paradigmatic of scientific knowledge--the act of discovery. His own positive program, then, is to pursue knowledge "towards its most primitive forms which lie behind the operations of a scientific formalism,"³ in order to elicit those cognitive powers which make discovery possible. He seeks, in other words, to discern in the structure and operations of the human mind itself the source of all formalisms--personal powers of understanding and judgment. In his words: "Tearing away the paper screen of graphs, equations and computations, I have tried to lay bare the inarticulate manifestations of intelligence by which we know things in a purely

²PK, pp. 16-17.

³PK, p. 64.

personal manner."⁴

It is Polanyi's contention that the inarticulate roots of knowledge, its "tacit dimension", far from being an imperfection of human cognition provide an indispensable condition of all knowing and account for the capacity of discovery in science and for the highest achievements of rational thought. For the cognitive power which Polanyi's cognitional theory recognizes as the basis of scientific discovery is the act of integration. "This act of integration. . ." he says, "is the tacit power we have been looking for. I shall call it tacit knowing."⁵ Scientific discovery, in other words, is a tacit achievement, a spontaneous coalescence of elements, or process of emergence deeply personal and largely uncontrolled by conscious effort. Yet the fact that discovery represents an intelligent act which cannot be codified does not reduce science to mere guesswork. Indeed, Polanyi's stated aim is "to see what method, if any, can be discovered in its operations."⁶ He recognizes methodical exigence as a central epistemological problem and sets out to discover the logic of discovery which is operative in scientific knowing and in every cognitive endeavor, and to thematize that personal performance of the

⁴PK, p. 64.

⁵KB, p. 140.

⁶SFS, p. 32 (*italics added*).

knower which transcends formal and explicit methodologies. An account of scientific method thus transformed becomes a phenomenological and transcendental account of the informal operations of intelligence. Polanyi's cognitional theory extends the conception of rationality to include a broad range of powers previously excluded from the realm of reason. This conception of reason is "post-critical" in that it recognizes the foundational significance of tacit, a-critical acts and acknowledges reason's fiduciary character without forsaking the real gains of modern critical thought.⁷

Scientific Method and the Logic of Discovery: Tacit knowing, according to Polanyi, can be considered an "informal logic" of discovery.⁸ As such, it offers an alternative to the emphases found in both the critical rationalist's and the empiricist's accounts of scientific method. The deductive ideal of critical rationalism⁹ sharply divides scientific knowledge into two distinct stages, its discovery and its verification, or more specifically, the forming and testing

⁷In the words of one reviewer, it complements the critical approach, rescuing "what is best in critical philosophy by providing a Critique of Critical Reason". Carl J. Friedrich, "A Review of Personal Knowledge", Natural Law Forum, VII (1962), , p. 148.

⁸"You may call such a theory--using a term coined by Gilbert Ryle--an informal logic of science and of knowledge in general." KB, p. 155.

⁹Cf. Karl R. Popper, The Logic of Discovery; and R. B. Braithwaite, Scientific Explanations (Cambridge: Cambridge University Press, 1953).

of hypotheses. Polanyi notes that:

The first part (the choice of hypothesis) is deemed to be inexplicable by any rational procedure, while the second (the testing of the chosen hypothesis) is recognized as a strict procedure forming the scientist's essential task.¹⁰

Such a model of scientific method Polanyi finds unsatisfactory on two counts. 1.) By considering the structure of the first stage of scientific knowing (choosing an hypothesis) essentially indeterminate and inexplicable, this account of the hypothetico-deductive method fails to illuminate in any way the element of originality and creativity in science. It fails, in other words, to deal with the problem of discovery at all. It assumes that scientific knowledge begins with hypotheses, but leaves unexplained the rational capacity to form such hypotheses. The inadequacy of this approach, Polanyi believes, hinges upon its concept of rationality. Critical rationalism assumes a truncated view of human reason which excludes the powers of creative imagination and intuition. In assessing this view Polanyi finds that "neither imagination nor intuition is deemed a rational way of making discoveries. They are excluded from the logic of scientific discovery, which can deal then only with the verification or refutation of ideas after

¹⁰Polanyi, "Genius In Science", p. 46 (*italics added*).

they have turned up as possible contributions to science."¹¹ Polanyi, however, agrees with Hanson who points out that: "Physicists do not start from hypotheses; they start from data. By the time a law has been fixed into a hypothetical deductive system, really original physical thinking is over."¹² The first inadequacy then lies in the failure to deal at all with the pivotal act of discovery which moves from data to theory. 2.) By considering the structure of the second stage of scientific knowing (proving/disproving an hypothesis) as fully determinate and explicable, this view of method tends to eliminate from an already narrowly restrictive notion of rationality any trace of a personal coefficient thereby reducing scientific method to strictly formalizable procedures. Polanyi argues, however, that in fact "the distinction between the production and testing of scientific ideas is not really so sharp. No scientific discovery can be strictly verified, nor even proved to be probable."¹³ Yet this does not prevent us from believing they are true and betting our lives every day on the correctness of such scientific general-

¹¹Michael Polanyi, "The Creative Imagination" p. 111.

¹²Norward R. Hanson, Patterns of Discovery (Cambridge: Cambridge University Press, 1958), p. 70. For Polanyi's expressed agreement with Hanson, cf. SFS, p. 12.

¹³Polanyi, "The Creative Imagination", p. 111.

izations. Critical rationalism, in effect, then, offers no logic for the first stage of scientific method (discovery) and an explicit logic for the second stage (verification). It would save the strictness of science by declaring all discoveries merely "working" or "tentative" hypotheses until objectively verified. "This however," Polanyi points out, "is either meaningless or untrue."¹⁴ If it means a scientific proposition is abandoned whenever a fact is accepted as evidence against it the statement is tautologous. If it means any fact which contradicts a scientific proposition leads to its abandonment it is patently false. In practice this usually means one had better recheck his facts.¹⁵ According to Polanyi, then, this two-stage logic fails to explain how discoveries in science actually take place. The hypothetico-deductive method so conceived, begs the question of discovery and concentrates entirely upon formulating explicit rules and principles of verification and/or falsification which then become the sole criteria of meaning and truth.

The inductive ideal of empiricism (for which Bacon, Hume and Mill were spokesmen), on the other hand, emphasizes

¹⁴SFS, p. 29.

¹⁵SFS, p. 29. Polanyi cites numerous examples here and in the appendix of this work of scientific theories which continued to be upheld even though formally contradicted by certain "facts", including the periodic system of elements and the quantum theory of light. Cf. also "Genius in Science" pp. 46-7.

the movement from experience to generalization and so at least attempts to deal with the problem of how scientific knowledge is acquired (i.e. the problem of discovery) and not simply how it is verified. This account of method, however, is also found to be unsatisfactory for two reasons: 1.) its impoverished notion of experience and 2.) its inability to explain adequately the transition from the experiential level of isolated instances of observation (simply amassing mere bits and pieces of data) to the theoretical level of comprehension or insight (integrating experience into a general scientific proposition or law). Polanyi's criticism here is that the empiricist account overestimates the role of observation and experiment in the process of discovery.¹⁶ In the first place, there are no uninterpreted facts or data and, therefore, observation is always more than just "taking a look". The simplest act of perception involves the active process of "making" sense of impressions. Polanyi's point, in other words, is that "apart from meaningless sense impressions there is no experience that abides as a 'fact' without an element of valid interpretation having been imparted to it."¹⁷ In the second place, scientific evidence is never simply "given" as empiricism assumes. It is rather the fruit of a personal assessment. "Things are

¹⁶SFS, p. 28.

¹⁷SFS, p. 89.

not labelled 'evidence' in nature, but are evidence only to the extent to which they are accepted by us as observers."¹⁸

It is, then, misleading to represent scientific discovery according to the inductivist model as a logical outcome of explicit operations, i.e. procedures of collecting, measuring and calculating data. This Baconian method "can yield no scientific results whatever".¹⁹ And, in Polanyi's estimation, despite the popular belief that Francis Bacon is responsible for revealing and establishing the procedure of empirical discovery, "actually his prescription of making discoveries by collecting all the facts and passing them through an automatic mill was a travesty of research."²⁰

The empirical method, then, offers a logic of discovery, but it is an explicit logic which fails to take into account the personal coefficient of the inquiring mind as well as the influence of the scientific community's assumptions and premises upon the selection of data to be observed.

Polanyi's theory of tacit knowing offers a logic of discovery, but a logic which transcends the alternatives of inductive and deductive methodology for thematizing the operations of human reason. In contrast to the critical rationalist's emphasis on the logic of deduction and verification in science, Polanyi recognizes (as does the inductive approach)

¹⁸PK, p. 30.

¹⁹SFS, p. 26.

²⁰SFS, p. 33.

that the process of discovery is the essential operation which scientific method must elucidate. For, as he explains, "the paradigmatic case of scientific knowledge. . . is the knowledge of an approaching discovery."²¹ But, in contrast to the empiricist's explicit logic of inductive reasoning, Polanyi also recognizes that discovery is characterized throughout by a kind of intellectual groping and guesswork which cannot be definitely (i.e. formally) prescribed or set out.²² Thus, the explicit logic of empiricism, being reductionist and impersonal in its conception of rationality, no more accounts for the intellectual questing which leads to discovery than does the non-logic of discovery implied in the two-stage model of critical rationalism. And as for the explicit logic of critical rationalism, while it does have some legitimacy when applied to verification of knowledge already attained rather than the actual process of discovery itself, it nonetheless remains inadequate, for the process of knowing is not so clearly dichotomized as the choosing-testing model suggests, and even the stage of verification/falsification if perhaps more subject to rules than the stage of discovery, still "rests ultimately on mental powers which go

²¹TD, p. 25.

²²In the words of one astronomer at a recent international symposium held at McMaster University, "We fumble towards the truth. To think it is a rigorous, unemotional, error-free path toward the truth is just simplistic." James Warwick, University of Colorado, as reported by Lydia Dotto The Globe and Mail, Saturday, July 27, 1974.

beyond the application of any definite rules."²³ In other words, science is not "simply based on experiments which anybody can repeat at will. . . . critical verification. . . requires the same powers for recognizing rationality in nature as does the process of scientific discovery. . . ."²⁴ These "mental powers", according to Polanyi, are powers of creative imagination and intuition, essential components of rationality which cannot be omitted from a cognitional theory that seeks to account methodically for discovery in science. It is precisely these powers of reason, then, which Polanyi's theory of knowledge attempts to elucidate in terms of an informal logic of tacit integration. And, this more constructive epistemic task takes him beyond the models and language of both empiricism and critical rationalism.

The logic of tacit integration seeks to thematize the actual practice of scientific inquiry, operations of human reason which transcend formal methodology. While such operations are numerous, the act of discovery itself is a heuristic process combining active and passive stages.²⁵ Descriptively the process can be analyzed in terms of any number of moments. Polanyi himself sometimes distinguishes

²³SFS, p. 29.

²⁴PK, p. 13.

²⁵PK, p. 126. Polanyi's use of the word "stages" here is somewhat confusing especially in the light of the discussion which follows. It is clear from later usage that "active" and "passive" refer to integrative "powers" (specifically of imagination and intuition) which are operative at every "stage".

"two steps",²⁶ at other times "three periods",²⁷ and still at other times "four phases",²⁸ in referring to stages in the process of scientific discovery. However, as the same powers of tacit integration are at work in each and every stage of scientific procedure,²⁹ the number of steps, periods or phases into which the process is divided is less significant than the realization that at no stage can the procedures be entirely reduced to a series of explicit or formal rules. The point to note, then, in any analysis of stages is that "the conditions in which discovery usually occurs. . . show it in fact to be a process of emergence rather than a feat of operative action."³⁰

Polanyi points out that Poincaré first described these conditions in Science et Methode when he observed that discovery usually occurs not at the culmination of mental effort but more often in a flash after a period of rest or distraction. All the efforts of the discoverer, in other words, seem to be but preparations for the act of insight itself which, in Polanyi's words, "eventually takes place--if at all--by a process of spontaneous mental reorganization uncontrolled by conscious effort."³¹ Poincaré actually ob-

²⁶"The Creative Imagination", p. 117; PK, pp. 120, 126.

²⁷"Genius In Science", p. 44. ²⁸SFS, p. 34; PK, p. 121

²⁹"Genius In Science", p. 46. ³⁰SFS, p. 33.

³¹SFS, p. 34.

served four stages in the process of mathematical discovery, stages which Wallas and others also found exhibited in the course of discovery in the natural sciences. Following Wallas' terminology, then, Polanyi identifies these stages of discovery as: Preparation, Incubation, Illumination, and Verification. As I mentioned earlier, his own analysis is more concerned with establishing the logical structure of tacit integration manifest in each of these stages than with clearly delineating the stages themselves. However, Preparation can be briefly described as the effort to identify the problem that is to be solved. It consists in discerning in the data of experience clues pointing to a possibility. Between possibility and actuality, however, looms a logical gap. And, as the obstacles can be many and the path from problem to discovery lengthy once a scientific inquiry has been launched, the stage of Incubation describes, in Polanyi's words, "that curious persistence of heuristic tension through long periods of time, during which the problem is not consciously entertained."³² The stage of Illumination describes the--often spontaneous and unexpected--moment of insight in which the problem is solved. "'Illumination' is then the leap by which the logical gap is crossed. It is the plunge by which we gain a foothold at

³²PK, p. 122.

another shore of reality."³³ Finally, the stage of Verification, which will be discussed at more length in the second part of this chapter in terms of "the logic of justification", involves the process of confirming a discovery, holding it to be true and persuading others of that truth. This fourth stage, Polanyi insists, is likewise a personal performance which can be but little assisted by formal rules or demonstrations.

The process of scientific discovery so described is to some extent paradigmatic of the general structure of problem solving which, Polanyi believes, tends to fall into two basic stages, a first stage of perplexity, followed by a second stage in which the perplexity is dispelled.³⁴ Furthermore, it illustrates the interplay of deliberate heuristic activity operating at a level of focal awareness, on the one hand, and spontaneous integrative passivity operating at a level of subsidiary awareness, on the other. Thus, although a discovery is the fruit of intense effort, it is no more the result of deliberate action than felt to be something that "happens". While extensive preoccupation with a problem gives rise to a tension and emotional strain, a discovery which releases from it is an unexpected joy.³⁵

³³PK, p. 123.

³⁴PK, p. 120

³⁵PK, p. 122.

Polanyi appeals to Archimedes' "Eureka" for a concrete illustration and to Plato's Meno for the theoretical formulation of this basic paradox at the heart of discovery. Archimedes' outburst is a dramatic instance of the presence of these two seemingly incompatible features of discovery: strenuous mental effort and gift of inspiration. Seldom does inspiration come without effort, yet no amount of effort, it seems, can predictably produce one. After all, Polanyi explains, "How can we possibly conjure up an inspiration without even knowing from what corner it may come?"³⁶ How, in other words, can the scientist pursue a discovery he does not yet know? Yet this is precisely what scientific discovery does. We make a discovery and yet it comes to us as a surprise. Plato gave this paradox of seeking the unknown its classical formulation when he asked how the inquirer recognized a discovery when he reached what, as an inquirer, he did not know. According to Polanyi, the "first task of a theory of creativity, and of scientific discovery in particular, must be to resolve this paradox."³⁷ That resolution, he believes, can be found by identifying inspiration with spontaneous integration and accounting for the effort that induces such integrations. This will explain our ability to bridge heuristically the logical gap between

³⁶"Genius In Science", p. 43.

³⁷Ibid.

a problem and its solution by relying upon anticipatory knowledge without ever being able to specify that upon which we rely. For integration is spontaneous and unexpected because we have no direct control over it. Yet we do cause it to happen and in some sense even anticipate it.³⁸

Polanyi believes the logic of perceptual integration provides a model for the logic of discovery and helps to explain how scientific discovery can be guided by anticipations of its achievements. He draws on insights of Gestalt psychology when he argues that "scientific discovery is in essence an extension of perception,"³⁹ and that "the structure of scientific intuition is the same as that of perception."⁴⁰ Polanyi's concern, however, it should be emphasized, is not simply to apply the principles of Gestalt to scientific knowing, much less to psychologize the act of discovery. For while he finds clues in Gestalt his own focus is strictly philosophical. Polanyi's task, in other words, is not psychological but foundational⁴¹ and the fact that his cognitional theory establishes the methodological grounds of science in the operations of the inquiring subject manifests not the psychological but the transcendental character of his enterprise. As he explains in

³⁸"Genius in Science", p. 44

³⁹Ibid.

⁴⁰KB, p. 118.

⁴¹TD, p. 82.

the preface of Personal Knowledge: "I have used the findings of Gestalt psychology as my first clue to conceptual reform. Scientists have run away from the philosophic implications of gestalt; I want to countenance them uncompromisingly."⁴² While these "philosophic implications" have to do broadly with recognizing science's indeterminacy and establishing its a-critical foundations--a concern throughout this chapter and the last--it might be appropriate here to note briefly the significant features of perception Polanyi finds paradigmatic of knowing in general and scientific discovery in particular.

The most remarkable thing about perception, in Polanyi's view, is the way it achieves coherence by integrating a multitude of clues without attending to them directly. For example:

When I move my hand before my eyes, it would keep changing its colour, its shape and its size, but for the fact that I take into account a host of rapidly changing clues, some in the field of vision, some in my eye muscles and some deeper still in my body,⁴³

Such integration, performed almost effortlessly by adult eyes, is a skill which proceeds informally without the inferences of formal logic. While a scientific discovery may require a more sustained effort to integrate clues and involve more exceptional skills, the difference is only one of range and degree. Discovery in science, then,

⁴²PK, p. xiii.

⁴³KB, p. 139; MIT II, p. 3.

according to Polanyi, consists in discerning gestalten which indicate a coherence in nature, and operates by selecting, shaping and assimilating clues without focally attending to them.⁴⁴ It is at once a spontaneously intuitive and skillfully imaginative integration which evokes the emergence of insight.

Another remarkable feature of perception, in Polanyi's view, is that unlike formal operations, it is irreversible. To perceive coherence is to acquire a power to see things in a new way. A good perceptual gestalt is characterized by stability, and once coherence has been achieved we do not relapse into a former state of ignorance. Perceptual integration is neither a deduction nor an explicit inference. Like formal deduction, "explicit inference is reversible: we can go back to its premises and go forward again to its conclusions, rehearse the whole process as often as we like."⁴⁵ In other words, we can critically examine formal or explicit operations step by step as they lead from premise to conclusion while still holding on to the conclusion. Perception, however, is acritical, and Polanyi speaks of its irreversibility in two senses: first, in the sense that one cannot specify its operations, i.e. "it is difficult to find our way back to the clues"⁴⁶ and second, in the sense that to reverse a

⁴⁴SFS, p. 11.

⁴⁵KB, p. 213.

⁴⁶KB, p. 213

perception is to destroy the coherence it achieved, i.e. "it is not to retrace our steps, but to efface them."⁴⁷ In the same way, scientific discovery is a heuristic act which is irreversible. According to Polanyi, we cross a logical gap.

Such acts of tacit integration that are vital both to the inception and conduct of scientific enquiry, are obliterated by achieving success. Once solved, a problem can never puzzle us again. Steps which required exceptional penetration and imaginative powers, may well appear obvious.⁴⁸

Furthermore, perceptual integration is a constructive process, for perceived coherence is never merely equivalent to the sense impressions received. Perception requires an interpretive effort in order to bridge the logical gap, and so in some sense is not simply "taking a look" but also "making a look". This constructivist emphasis on the active contribution of the subject, however, in no way detracts from the realist implications of the logic of tacit integration in Polanyi's view, for integrations which achieve coherence can only be sustained because the subject "believes that they are apposite: that he has not made them but discovered them."⁴⁹

Polanyi's account of the logic of discovery, then, draws on Gestalt but goes beyond it in at least two important respects. First, while Gestalt psychology describes percep-

⁴⁷KB, p. 213.

⁴⁸MIT II, p. 19.

⁴⁹PK, p. 63.

tion as an integration of parts to wholes, the coalescence of elements is not the result of an active shaping of experience, but rather a mere equilibration of particulars spontaneously forming a coherent shape. For Polanyi, however, it is a personal achievement, the outcome of a deliberate integrative act which reveals a hitherto hidden real entity. "This shaping or integrating I hold to be the great and indispensable tacit power by which all knowledge is discovered and once discovered, is held to be true."⁵⁰ What tacit knowing adds to Gestalt, in other words, Polanyi holds to be the foundational coefficient of science--the "act of personal judgment."⁵¹ Secondly, while the structure of Gestalt accounts phenomenologically for the act of recognizing apparent coherence, as such it involves no metaphysical claim. In recasting this structure into the logic of tacit thought, however, Polanyi seeks to account not only phenomenologically but also transcendently for the act of positing real coherence. In his words, "I go beyond Gestalt when speaking of true coherence in nature. A tendency to good closure is only a clue to coherence; it does not establish

⁵⁰ TD, p. 6; cf. also "Genius In Science", p. 48.

⁵¹ Thus, Polanyi remarks, ". . . as I came to realize that all such integration is largely based, like perception itself, on tacit elements of which we have only a vague knowledge, I concluded that science too was grounded on an act of personal judgment." "Genius In Science", p. 48

true coherence. . . the way a judgment /does/.⁵²

According to the logic of tacit integration, then, scientific advance consists in discerning gestalten that are aspects of reality, attending to their joint significance and positing their true meaning in claiming a discovery. The powers which surmise, pursue and establish true coherence are dynamic intuition and creative imagination. In discussing the dynamics of these two tacit powers, Polanyi clarifies his understanding of the structure of anticipation which underlies the formal procedures of discovery in science and which, he believes, resolves the paradox of the Meno. For the problem of pursuing the unknown is solved if we have a foreknowledge sufficient to guide our conjectures with a reasonable probability of success, and Polanyi accounts for anticipatory knowledge in science in terms of the rational capacity (intuitive and imaginative) to discern a good problem, to seek its solution and eventually to claim a discovery.⁵³ Since Polanyi usually discusses the dynamics of tacit integration in terms of these three stages of discovery (rather than the four stages of mathematical heuristics or the two stages of problem-solving mentioned earlier) I should advert to them more explicitly here. In Polanyi's words:

⁵²"Logic and Psychology", p. 28.

⁵³SFS, p. 14; "The Creative Imagination", p. 116.

The progress of discovery falls into three periods. The first is the sighting of a problem and the decision to pursue it; the second the quest for a solution and the drawing of a conclusion; the third, the holding of the conclusion to be an established fact.⁵⁴

Polanyi elsewhere refers to these three stages of scientific inquiry simply as finding a problem, pursuing its solution and finally (if successful) solving it.⁵⁵ Again, following Polanyi's terminology, the first stage can be called a "heuristic surmise", the second stage a "passionate quest" and the third stage a "claim to discovery". These stages, according to Polanyi, are not clearly distinguishable⁵⁶ and cannot be explicitly formalized in practice, yet descriptively they serve to emphasize different aspects of the concrete dynamic process of discovery. The structure of tacit knowing is present throughout each stage of discovery and the imagination and intuition "are at work jointly from the beginning to the end of an enquiry."⁵⁷

1.) Heuristic Surmise: According to Polanyi, the

⁵⁴"Genius In Science", p. 44.

⁵⁵"Work of Art", p. 17. This is the second of four lectures given at the University of Texas at Austin, 1969 under the general title Meaning: A Project. Mimeographed for private circulation.

⁵⁶Thus, for example, a "heuristic surmise" can itself claim to be a discovery in Polanyi's view since "to see a problem is a definite addition to knowledge," while a claim to discovery itself includes anticipations of even further fruitful problems and their solutions. MIT I, p. 16; PK, pp. 64 and 120.

⁵⁷"Logic and Psychology", p. 41.

way we know a true problem is a paradigm of all knowing, for a problem is something both puzzling and promising. Discovery begins with research, and research consists in assembling clues that intrigue the inquiring mind. A problem, then, is a heuristic surmise which is evoked in the imagination of the scientist by a set of circumstances he intuitively recognizes as clues to a hidden reality. To recognize something as a "clue" is not to observe it in itself but to attend from it to something else. This is the integrative act Polanyi calls intuition.⁵⁸ While intuition is spontaneous and effortless, imagination is a creative and often painstaking effort. At the inception of inquiry, Polanyi says, intuition predominates and the imagination enters only by keeping intuition sensitive to significant clues. He calls these "anticipatory judgments that guide the sighting of a problem and the decision to enquire into it, the work of a strategic intuition."⁵⁹

An important difference between the logic of tacit integration and the choosing-testing model of discovery discussed earlier can be made at this point. "It is a mistake,"

⁵⁸ Polanyi clarifies what he means by the kind of intuition that evokes, guides and confirms a scientific discovery when he explains: "The intuition I have recognized here is clearly quite different from the supreme immediate knowledge called intuition by Leibniz or Spinoza or Husserl. It is a skill for guessing with a reasonable chance of guessing right; a skill guided by an innate sensibility to coherence, improved by schooling." "The Creative Imagination", p. 117.

⁵⁹ "Works of Art", p. 18; RM III, p. 8.

Polanyi observes, "to think of heuristic surmises as well-defined hypothetical statements which the scientist proceeds to test in a neutral and indeed critical spirit."⁶⁰ For one thing, initial progress in discovery often consists in narrowing down originally wider and vaguer anticipations, so that surmises are generally far more indeterminate than the eventual discovery will be. Moreover, and more importantly, the relation of the scientist to his surmises is one of passionate personal commitment. For the genuine inquirer, in other words, "his surmises embody all his hopes."⁶¹ A scientist passionately committed to a discovery risks not only his time and effort but often his career and his future pursuing what he believes to be a real yet hidden and only vaguely anticipated coherence in nature. Polanyi readily admits that it may sound strange, especially to positivist's ears, to insist on belief in the reality of theoretical surmises as the driving force to discovery.⁶² The critical ideal of reason has led to the view that discoveries in science are based on a sceptical attitude rather than one of passionate commitment. Yet the hypothetico-deductive method which embodies that ideal and according to which hypotheses arise unaccountably or are tentatively entertained while we seek facts which might falsify them, he has argued, has no bearing

⁶⁰ "Logic and Psychology", p. 41

⁶¹ Ibid.

⁶² MIT I, p. 16.

on discovery. According to the logic of tacit integration, then:

The dynamics of discovery are brought into action by committing ourselves to certain anticipations; without such commitment no supporting evidence will turn up; no failure to find such evidence will be felt; no conclusion will be drawn and tested; no quest will take place.⁶³

In other words, "Evidence," Polanyi argues, "can only be mobilized by a surmise," which functions heuristically to anticipate a discovery by discerning clues pointing to a possibility and then seeking its own confirmation.⁶⁴

2.) Passionate Quest: If intellectual striving entails a conviction of anticipating reality, the intimations which guide such striving are expressions of this belief. Thus, in Polanyi's view, "only if we believe that a solution exists can we passionately search for it and evoke from ourselves heuristic steps towards its discovery."⁶⁵ Polanyi's account of this second stage or aspect of discovery--the pursuit--emphasizes the desire to know which sustains inquiry, overcomes obstacles and carries the quest for discovery forward. The drive towards deeper coherence is expressed, then, as a heuristic passion. When Polanyi describes the activity of inquiry in terms of its inception he says simply, "a problem is an intellectual desire."⁶⁶ When he describes the quest in terms of its conclusion he writes: "A potential

⁶³MIT III, pp. 20-21.

⁶⁵PK, p. 130.

⁶⁴MIT III, pp. 20-21.

⁶⁶PK, p. 127.

discovery may be thought to attract the mind which will reveal it--inflaming the scientist with creative desire and imparting to him intimations that guide him from clue to clue and from surmise to surmise."⁶⁷

The capacity to intimate belongs to the intuition. Knowing what to look for, however, does not lend us the power to find it, according to Polanyi. This power lies in the imagination. While spontaneous intuition occupied center stage at the inception of inquiry, once the search has begun the creative imagination predominates. The imagination reduces the vagueness of a problem and pushes towards a possible solution. Polanyi recalls George Polya's admonition to "Look at the unknown. Look at the conclusion!" which he interprets to mean look at the known data but not in themselves, rather as clues to the unknown.⁶⁸ This active integration is the work of the imagination, the deliberate thought of things not present. Polanyi summarizes the operation of the tacit powers of integration at this stage of discovery, thus: "The whole course of the quest is filled by laborious efforts of the imagination, broadly guided by a questing intuition."⁶⁹ The scientist's imagination, in other words, does not roam about at random casting up hypotheses to be critically verified or falsified. It thrusts forward in a direction deemed

⁶⁷SFS, p. 14.

⁶⁸PK, 127.

⁶⁹"Works of Art", p. 18.

to be plausible and with a reasonable hope of success.

It is not difficult to see at this point again how far removed Polanyi's account of the activity of scientific discovery is from the view of science as the routine gathering of data or the formal application of thoroughly defined and tested rules of procedure. All this does not deny, of course, that the formulations of science are essential, its measurements, computations, algebraic formulae.⁷⁰ The logic of tacit integration, however, is not an account of science as it exists in text books or lab manuals, where positivist formulations of method may seem to apply, but science in its prior and more fundamental (foundational) manifestation as intelligent inquiry which all formulations presuppose and without which they are impotent.

3.) Claim to Discovery: The concluding stage of discovery in Polanyi's account is the moment of insight itself when the logical gap is crossed and a discovery can claim to be made. Reference to Poincaré's description of the process showed that it is often brought to a close, after a quiet interval in which the imagination is at rest, by a sudden illumination. Lonergan's characterization of insight as coming "suddenly and unexpectedly. . . as a release to the tension of inquiry" or happening "in a flash, on a trivial occasion, in a moment of relaxation,"⁷¹ is a remarkably similar descrip-

⁷⁰"Logic and Psychology", p. 42. ⁷¹Insight, p. 4.

tion of this phenomenon. This testifies to the tacit powers of the mind which Polanyi describes as "self-accelerating" in the sense that each step which brings us nearer a solution (whether spontaneous or contrived) intensifies our premonition of deepening coherence so that the "final discovery may be upon us in a flash."⁷² Polanyi calls this event, which is sometimes referred to as "inspiration" in recognition of the fact that it transcends strict rational control, the work of concluding intuition. It is a spontaneous integration uncontrolled by conscious effort yet evoked by the creative efforts of the imagination.

On Polanyi's account the rational powers of discovery operate tacitly. Racking one's brain by successive sallies of the imagination produces clues to a potential discovery. The intuition then reveals in a spontaneous move the coherence which is the realization of the discovery sought. And when the discovery is finally made, intuition and imagination continue to be active:

Our intuition recognizes our final result to be valid and our imagination points to the inexhaustible future manifestations of it. We return to the quiescent state of mind from which the enquiry started, but return to it with a new vision of coherence and reality. Herein lies the final acceptance of this vision; any new standards of coherence implied in it have become our own standards, we are committed to them.⁷³

⁷²PK, p. 129.

⁷³"The Creative Imagination", p. 121.

Polanyi maintains that the exercise of intuition and imagination throughout each and every stage of discovery consists in acts of personal judgment. The discerning of clues, the pursuit of a solution, and the claim to discovery are all decisions which, according to the logic of tacit integration, are in some sense irreversible. The achievement of discovery, therefore, which throughout involves the active participation of the subject, culminates in his transformation. "The change is irrevocable", Polanyi argues: "Having made a discovery, I shall never see the world again as before. My eyes have become different. I have crossed a gap, the heuristic gap which lies between problem and discovery."⁷⁴ Discovery, then, changes not merely the content of our knowledge but is an inescapable commitment which modifies our conceptual framework and shapes our existence as well.

The second section of this chapter will examine the further implications of the self-authenticating character of a claim to discovery in discussing the "logic of justification". That discussion can be anticipated only briefly here by noting one further contrast between this account of scientific method as an informal logic of intelligence and what Polanyi calls objectivist accounts of scientific method in terms of formal rules and explicit procedures. Discovery

⁷⁴PK, p. 143.

in science, as Polanyi explains it, takes place when a person performs a tacit act of integration reducing a focal awareness of observations (data) into a subsidiary awareness of them (clues) by intuitively and imaginatively shifting attention from them to their theoretical coherence. Such an act, which Polanyi sometimes calls an act of tacit inference, like the act of perception, can be valid or mistaken. But to arrive at conclusions according to this tacit logic differs sharply from drawing logical conclusions by explicit deduction. While the logic of explicit inference is a critical and reversible operation, the logic of tacit inference which makes claim to discovery is a-critical and irreversible. Polanyi explains the contrast this way: "This difference between a deduction and an integration lies in the fact that deduction connects two focal items, the premises and consequents, while integration makes subsidiaries bear on a focus."⁷⁵ For Polanyi this means that while explicit operations can be impersonally performed and critically verified, a tacit integration is intentional throughout. To pursue the implications of this, I think it is necessary to inquire further into Polanyi's conception of the structure of tacit knowing. Then the question whether or not this tacit logic can justify the claim to discovery on the basis of self-set standards can be considered.

⁷⁵"Logic and Psychology", p. 32.

The Structure and Act of Tacit Knowing: Polanyi's account of the logic of discovery has been discussed as an alternative to the formal account of the hypothetico-deductive model of discovery. Yet it becomes clear, I think, that what Polanyi is seeking to do is not simply substitute one logic for another but something both more general and more radical. More general in the sense that the logic of tacit integration is comprehensive and takes into account formal conceptions of scientific method by seeking to disclose the conditions of their possibility. More radical in the sense that the logic of tacit integration goes behind formal conceptions of scientific method to their source (radix), the operations of the human mind, to reveal the structure of inquiry itself. In other words, Polanyi's criticism of explicit methodologies (critical rationalism and empiricism) is directed not so much at what they say--that science proceeds by formal operations--as it is directed at what they fail to say or by implication deny--that such formalisms are grounded in informal or tacit operations which are ultimately personal performances.

Polanyi himself is not interested, then, in simply giving an account of scientific method in any explicit sense. And while he attends to a whole range of data drawn from the natural sciences (physics, chemistry, astronomy, biology) and the social sciences (psychology, sociology, linguistics) his

primary concern is human consciousness itself. The various sciences serve as clues from which Polanyi attends in order to comprehend focally that which they manifest, the structure and operations of intelligence. In his own words, the "mind can be known only comprehensively, by dwelling within the unspecifiable particulars of its external manifestations."⁷⁶ The logic of scientific discovery, whereby informal operations of intelligence cannot be rendered fully explicit or reduced to formal rules of procedure, manifests an irreducible tacit dimension of knowing. Polanyi's cognitional theory, then, becomes an account of the structure and act of tacit knowing. According to Polanyi:

This structure shows that all thought contains components of which we are subsidiarily aware in the focal content of our thinking, and that all thought dwells in its subsidiaries, as if they were parts of our body. Hence thinking is not only necessarily intentional, as Brentano has taught: it is also necessarily fraught with the roots that it embodies. It has a from-to structure.⁷⁷

This intentional and from-to structure of consciousness-- which the informal logic of scientific discovery manifests-- Polanyi elucidates by distinguishing four aspects of tacit knowing: functional, phenomenal, semantic and ontological. These four structural aspects of tacit knowing bring to light the various relations of subsidiary and focal components

⁷⁶SM, p. 33.

⁷⁷TD, p. x.

of consciousness as they are established in the act of tacit knowing.

Functional: In tacit knowing, Polanyi explains, "we attend from something for attending to something else; namely from the first term to the second term of the tacit relation."⁷⁸ That from which we attend functions as a subsidiary clue bearing on the reality of the focal object to which we attend. Subordinating the subsidiary to the focal gives tacit knowing a vectorial quality. Polanyi speaks of the clues or parts which are subsidiarily known as the proximal term of tacit knowing and of that which is focally known as the distal term. In tacit knowing, "we always attend from the proximal to the distal term."⁷⁹

The functional aspect of tacit knowing shows that in every act of knowing there are subsidiary components which cannot be known directly but only in terms of their functional contribution to a focal component, for knowing proceeds not by an explicit specification of subsidiaries but by a tacit integration of them whereby we attend from them to that which they signify. Knowledge of subsidiaries remains, then, necessarily unspecifiable. Moreover, the functional aspect of tacit knowing reveals the irreducible role of the subject, for only a personal integrative act can make particulars function as subsidiaries. Thus, Polanyi

⁷⁸TD, p. 10.

⁷⁹KB, p. 141.

refers to the structure of tacit knowing as "triadic". A person (A) dwells in and integrates subsidiary clues (B) in order to attend to their focal coherence (C).⁸⁰ The relationship between the subsidiary and the focal, in other words, is not a given but something personally sought, established and confirmed.

Two points can be noted here regarding the nature of subsidiary clues (particulars) and their relation to a focal coherence (whole). First, Polanyi points out that something which is made to function as a clue cannot at the same time be held as an object of attention. That is, we cannot at once attend from and to a particular object.

Subsidiary awareness and focal awareness are mutually exclusive. . . . our attention can hold only one focus at a time and it would hence be self-contradictory to be both subsidiarily and focally aware of the same particulars at the same time.⁸¹

This means that a clue as clue is logically unspecifiable. The second point has to do with the nature of the unspecifiability, for, Polanyi holds, "while focal awareness is necessarily conscious, subsidiary awareness may vary over all degrees of consciousness".⁸² If to attend from a clue to that which it signifies is to render it functionally unspecifiable, clues may be of two kinds as the unspecifiability is either "subliminal" or "marginal". Subliminal clues are

⁸⁰KB, p. 181.

⁸¹PK, pp. 56-57.

⁸²PK, p. 92.

particulars which cannot be directly observed or experienced in themselves. Some clues, for instance, are deeply hidden inside the body. In the case of visual perception, Polanyi points out, it has been well established

that the way we see an object is determined by our awareness of certain efforts inside our body, efforts which we cannot feel in themselves. We are aware of these things going on inside our body in terms of the position, size, shape, and motion of an object, to which we are attending. In other words we are attending from these internal processes to the qualities of things outside. These qualities are what those internal processes mean to us.⁸³

We cannot be conscious of subliminal clues in themselves, then, but only in terms of their functional contribution to the object of our attention. Marginal clues, on the other hand, could be observed directly (although to do so would be to render them focal objects and no longer clues). Such clues provide the background or horizon for perception or intellection. We are sometimes aware of marginal clues "in the corner of our eye" or "at the back of our mind" but such awareness is deliberately not brought to focal attention. Both subliminal and marginal clues contribute to the reality of the object on which attention is focused, yet neither is attended to directly.

As the function of a personal integrative act, sub-

⁸³TD, pp. 13-14.

sidiary awareness is an indispensable component of consciousness, and should not be confused with a lack of consciousness. It is a mistake, Polanyi argues,

to identify subsidiary awareness with unconsciousness or preconsciousness, or the Jamesian fringe of awareness. What makes an awareness subsidiary is the function it fulfills; it can have any degree of consciousness so long as it functions as a clue to the object of our focal attention. To perceive something as a clue is sufficient by itself, therefore, to make its identification uncertain.⁸⁴

The functional structure of tacit knowing reveals, then, that consciousness always includes two terms, an identifiable object of awareness as its focal point and an unidentifiable set of subsidiary roots functioning as clues to its object or as parts of it. In subordinating the subsidiary to the focal, tacit knowing is directed from the first to the second. And, since this functional relation is personally set up between two kinds of awareness, "its directedness is necessarily conscious".⁸⁵ Acts of consciousness are, then, not only conscious of something but also conscious from something.

Phenomenal: The relation of the focal component of consciousness (that which we are aware of) and the subsidiary component of consciousness (that which we are aware from) is further disclosed in a second aspect of tacit knowing. The act of tacit integration which establishes the relation between the subsidiary and the focal "causes a transformation

⁸⁴"The Creative Imagination", p. 113.

⁸⁵KB, p. 141.

in the appearance of both: they acquire an integrated appearance".⁸⁶ Such is the case when we know a whole by integrating its parts into their joint-appearance, or when the discovery of a theory integrates observations into their theoretical appearance. Polanyi calls this the phenomenal aspect of tacit knowing. "We may say, in general, that we are aware of the proximal term of an act of tacit knowing in the appearance of its distal term; we are aware of that from which we are attending to another thing in the appearance of that thing."⁸⁷

There is a difference between the way an object appears when we observe it or attend to it as something in itself, and the way it appears when we dwell within it or attend from it to something else. Observed "data" are transformed phenomenally when reduced to "clues" at the level of subsidiary awareness, for when we comprehend particulars as clues to or aspects of a whole, the focus of our attention is shifted from hitherto uncomprehended particulars to an understanding of their joint significance.

This shift of attention does not make us lose sight of the particulars, since one can see a whole only by seeing its parts, but it changes altogether the manner in which we are aware of the particulars. We become aware of them now in terms of the whole on which we have fixed our attention.⁸⁸

⁸⁶KB, p. 141.

⁸⁷TD, p. 11.

⁸⁸SM, p. 30. Polanyi's account of the from-to

This phenomenal aspect of tacit knowing means that we become (subsidiarily) aware of particulars as the (focal) object of awareness appears. To observe particulars directly is to render them incapable of appearing as clues to or parts of something else. To dwell within particulars is to integrate them phenomenally and transform their appearance. Viewing a pair of stereoscopic pictures, we become subsidiarily aware of the particulars as we focus on the stereo-image, that is, we see the two pictures only in their joint appearance as a coherent image. Or, to use another frequent Polanyian illustration,

structure of consciousness bears some interesting resemblances to Whitehead's theory of perception. Rejecting the "sensationalist doctrine" which reduces all perception to the perception of clear and distinct sense data, Whitehead's analysis discloses two primitive modes of perception behind ordinary conscious perception: perception in the mode of "causal efficacy" and perception in the mode of "presentational immediacy". The former is the basic mode of inheritance of feelings from past data, and the feelings it transmits are vague, massive and inarticulate. The latter is a derived phase of experience and is articulate, sharply focused and objectified. On Polanyi's account we could say that perceptual responses to "causally efficacious" sense data function as subsidiary clues to a focal object of attention which then becomes "presentationally immediate". According to Whitehead, presentational immediacy is derived from causally efficacious experience. The logic of tacit knowing describes how that derivation takes place by a personal act of integration. The object of presentation, then, is the appearance of the subsidiaries in the focal content of consciousness. In Polanyi's words, "the object as I see it is the meaning I give to the responses the object evokes in my body. . . . The perception of an external thing is a from-to knowledge. It is a subsidiary awareness of bodily responses evoked by external stimuli, seen with a bearing on their meaning situated at the focus of our attention." "Logic and Psychology", pp. 38-39.

recognizing a physiognomy, we become aware of the particular features in terms of the whole appearance to which we are attending. And what is true of perception is also true of intellection, for subsidiary awareness is a dwelling of the mind within the subject we seek to comprehend while focal awareness is our grasp of the subject as it appears in the act of comprehension. In fact, for Polanyi, "all kinds of rational knowledge involve an existential participation of the knower in the subsidiary particulars known by him as their joint meaning or purpose."⁸⁹

Semantic: There is a significance in the relation of the subsidiary and focal components of tacit knowing which combines its functional and phenomenal aspects. When particulars are made to function as subsidiary clues bearing on a focus, the object of attention can be said to be the meaning of the particulars from which we attend, since, according to Polanyi, "it is in terms of their meaning that they enter into the appearance of that to which we are attending from them."⁹⁰ Thus, the stereo-image is the joint-meaning of the stereo pictures we subsidiarily see, just as a theoretical discovery is the joint-meaning of the many clues which lead to it. In Polanyi's view,

⁸⁹SM, p. 32.

⁹⁰TD, p. 12.

"whatever a thing bears on may be called its meaning."⁹¹
This is the semantic aspect of tacit knowing.

The relation of the subsidiary and the focal components of tacit knowing is a relation between things which have a meaning and things on which they bear or that which is their meaning. "By pointing to that which is their meaning, the things that have a meaning deflect our attention from themselves and cause us to focus our attention on that which is their meaning."⁹² Thus, words, signs, symbols or other particulars are meaningful not as objects of attention in themselves but as subsidiaries which point towards and participate in a focal object which is their meaning. Their mere givenness is without significance, in other words, for in themselves they mean nothing. A meaningful relation must be personally established. Tacit knowing establishes such a relation, for when we attend from particulars, we intend their joint-meaning. Attending from those things which have meaning to that which is their meaning is a sense-giving or interpretive act of understanding. We must look from (or through) the symbol to its meaning. To shift attention from the meaning of a symbol to the symbol itself renders it opaque and meaningless.

⁹¹"Logic and Psychology", p. 29.

⁹²"From Perception to Metaphor" (Lecture, University of Texas, Austin, 1969), p. 11.

We can see more clearly the separation of a meaning from that which has or conveys this meaning in some examples of practical knowing, where the separation of the two is wide, although the same semantic structure is manifest in theoretical knowing as well. The use of a probe to explore a cavern or the way a blind man feels his way with a stick illustrates the interpretive effort necessary for understanding, an effort which "transposes meaningless feelings into meaningful ones, and places these at some distance from the original feeling."⁹³

As Polanyi explains:

We become aware of the feelings in our hand in terms of their meaning located at the tip of the probe or stick to which we are attending. . . . We are attending to the meaning of its impact on our hands in terms of its effect on the things to which we are applying it.⁹⁴

The fact that all meaning tends in this way to be displaced away from ourselves as we dwell within and assimilate subsidiaries to ourselves is what leads Polanyi to refer to the two terms of tacit knowing as "proximal" and "distal".

The semantic aspect of tacit knowing reinforces Polanyi's fundamental contention that the subsidiary and focal components of awareness are neither impersonally nor automatically related but rather the outcome of a personal integrative effort. There is, according to Polanyi, a

⁹³TD, p. 13.

⁹⁴TD, p. 13.

logical gap which separates particulars from that which they mean that can only be crossed by a tacit act of understanding. To understand is to integrate particulars and make them function as subsidiaries bearing meaning. Thus, "all meaning is established by understanding."⁹⁵ Furthermore, once established, a meaningful relation between proximal and distal terms cannot be detached from the integrative act of understanding which brings it about.

It is our subsidiary awareness of a thing that endows it with meaning: with a meaning that bears on an object of which we are focally aware. A meaningful relation of a subsidiary to a focal is formed by the action of a person who integrates one to the other, and the relation persists by the fact that the person keeps up this integration.⁹⁶

The sense-giving act of tacit integration has its counterpart in the reverse process of sense-deprivation which occurs when the bond between subsidiary and focal components is broken (dis-integrates). This takes place when attention is shifted from the focal object to the subsidiary particulars in themselves. It is easy to demonstrate this destruction of meaning in the case of a skill. A pianist who shifts his attention from the comprehensive act of playing to the various particulars on which he normally relies and of which he is aware in a subsidiary way (e.g. how to read sheet music, how to finger the keyboard

⁹⁵MIT, III, p. 3.

⁹⁶KB, p. 182.

with proper timing and pressure, etc.) thereby ceases to integrate these particulars in a way that expresses their joint-meaning. Thus, skillful performance is paralyzed by attending focally to the clues or tools which make it possible. In the same way, a word loses its meaning if repeated over and over while we focally attend to the sound we make and the movement of our tongue and lips instead of attending to its meaning. And, as Polanyi points out, while it is not so easy to destroy the coherence of a sight, "still gestalt psychologists have observed that: 'perception of parts hinders perception of wholes, and vice versa'".⁹⁷

The mutual exclusiveness of subsidiary and focal awareness and the fact that attempts to render meaning focally explicit tends to destroy meaning, in Polanyi's view, confirms the sense-giving powers of indwelling. It also reveals how radically Polanyi's conception of tacit knowing differs from the view that meaningful knowledge is restricted to what can be explicitly expressed. If all knowledge were specifiable and meaning was established by a process of explicit inference linking two explicit terms --symbol (A) means object (B) to which it refers--then it would follow that the meaning of (B) could be specified in terms of (A). According to this view, if we make a statement

⁹⁷Harry Henson, Psychological Review 40, pp. 13-32 (1933), quoted in "From Perception to Metaphor", p. 12.

of fact we should be able to specify exactly what we mean (render it explicit). The semantic structure of tacit knowing reveals, on the contrary, that meaning is established by an act of tacit inference--symbol (A) has meaning only by subsidiarily bearing on focal object (B) which is its meaning--and such meaning dissolves when the relationship between subsidiary and focal components of consciousness is no longer personally sustained, that is, when the focus of attention is shifted from focal (A) to subsidiary (B). Consequently, Polanyi concludes that

not only can we not possibly know exactly what a statement of ours means, but that an attempt to make quite sure that we know it would deprive the statement from bearing on reality and hence from having any meaning at all. To be meaningful, a statement must be substantially indeterminate.⁹⁸

The semantic structure of consciousness, thus, leads to the recognition of the irreducible role of the knower in establishing meaningful knowledge and shows indeterminate meaning to be the foundation of all explicit meaning.

Ontological: The fourth aspect of tacit knowing which Polanyi discusses concerns the ontological implications of the act of comprehension. According to Polanyi: "The structure of tacit knowing is manifest most clearly in the act of understanding: It is a process of comprehending: a grasping of disjointed parts into a comprehensive whole."⁹⁹ The ontological implications are essentially these: first,

⁹⁸MIT, III, p. 1.

⁹⁹SM, p. 28.

that tacit knowing is the way we know comprehensive entities, that is, it is a knowledge of the real; second, that the way we know reality turns out to be the structure of reality, that is, the structure of tacit comprehension is isomorphic to the structure of the reality comprehended; and finally, that this ontological consequence is logically deduced from the structure of tacit knowing, that is, ontology is grounded in epistemology. Polanyi summarily states the ontological significance of tacit knowing this way:

Since tacit knowing establishes a meaningful relation between two terms, we may identify it with the understanding of the comprehensive entity which these two terms jointly constitute. Thus, the proximal term represents the particulars of this entity, and we can say, accordingly, that we comprehend the entity by relying on our awareness of its particulars for attending to their joint-meaning.¹⁰⁰

The functional and phenomenal aspects of tacit knowing reveal that particulars are known in terms of their contribution to a focal whole in which they appear as subsidiaries. The semantic aspect of tacit knowing extends this basic insight into the structural relationship of the proximal and distal terms of consciousness by showing the focal whole to be the meaning of the subsidiaries which are its particular constituents. Here Polanyi argues that because the comprehensive character of the particulars is determined by the whole to which they belong, this whole has an ontological status as a real entity, not just a descriptive or

¹⁰⁰TD, p. 13.

explanatory status. What is known in the act of tacit knowing, then, is a comprehensive entity which has two logically distinct levels: its particulars (which are subsidiarily known) and the whole or entity itself (which is focally known). In comprehending particulars as subsidiary components of a focal object, the knower dwells within and assimilates them to himself, but the comprehensive entity to which he attends is distanced from himself. While interiorized particulars are, thus, deprived of their character as external objects, the focally comprehended object is recognized as existing apart from and independent of the knower who comprehends it.¹⁰¹ A comprehensive entity is independent of the knower, in other words, because it exists on a different logical level from the particulars with which the knower identifies, separated from them by a logical gap.

This ontological consequence of tacit knowing stems from the fact that what is focally comprehended cannot be reduced to a specification of its subsidiary components. Since a comprehensive entity can only be known by tacitly integrating its particulars, it follows that explicit knowledge of the particulars in themselves is always a knowledge of something other than the comprehensive entity itself. In Polanyi's words, a "comprehensive entity is something else than its particulars known focally in themselves."¹⁰²

¹⁰¹KB, p. 184.

¹⁰²SM, p. 45.

The proximal and distal terms of tacit knowing, then, can be seen as two logically distinct levels of reality, a lower level comprising its particular components and a higher level comprising the comprehensive entity itself. The higher level relies for its operations on principles governing the lower level but its operations are not explicable in terms of these principles. Accordingly, Polanyi says, "between two such levels a logical relation holds which corresponds to the fact that the two levels are the two terms of an act of tacit knowing which jointly comprehends them."¹⁰³

The ontological aspect of tacit knowing, which shows the isomorphic structure of the act of comprehension and the object of comprehension is the basis for Polanyi's critique of reductionist attempts to explain comprehensive entities in terms of their particular elements.¹⁰⁴ According to the logic of tacit integration, a specification of particular components comprising a comprehensive entity (if, indeed, they can be specified at all) not only does not lead to a better understanding of it but tends to bring about a misunderstanding of it. In Polanyi's words: "Dismemberment of a comprehensive entity produces incomprehension of it and in this sense the entity is logically unspecifiable

¹⁰³TD, p. 35.

¹⁰⁴Cf. Chapter Four, pp. 165-69.

in terms of its particulars."¹⁰⁵

The fundamental contrast between this account of the logic of tacit knowing and explicit methodologies which reduce knowing to its specifiable content and formal operations is evident, I think, once the ontological aspect of consciousness is recognized. In both cases two terms are involved. Explicit reasoning moves from explicit premises to explicit conclusions by formal operations. Tacit reasoning moves from subsidiary to

¹⁰⁵SM, p. 45. This last point needs to be clarified, however, lest it overstate the case Polanyi makes for the irreducible role of tacit integration in the discovery of knowledge. I mentioned earlier that Polanyi's criticism of explicit methodologies is directed primarily to what they fail to say, rather than to what they assert. (Cf. p. 224) Polanyi's point is that knowledge cannot be reduced to its specifiable content, act or grounds. He is seeking to restore the balance between formal operations of intelligence (explication/analysis) and informal operations (integration/indwelling) involved in the discovery of knowledge. Polanyi does not deny the necessity of seeking an explicit knowledge of what is tacitly understood as the above quotation seems to suggest. Rather, he is concerned to recognize informal powers of tacit integration as the condition of all explicit knowing. Polanyi makes this clear, for instance, when he states that

discovery proceeds by a see-saw of analysis and integration similar to that by which our understanding of a comprehensive entity is progressively deepened. The two complementary movements are here a search for the joint meaning of a set of particulars, alternating with a search for the specification of their hitherto uncomprehended meaning in terms of yet unknown particulars. (KB, pp. 129-30.)

Since it is a token of the reality of an object of discovery (a comprehensive entity) that it will continue to reveal itself in yet unspecifiable ways, the attempt to render explicit the content of tacit knowing is essential according to the logic of discovery. However, according to the same logic, the reduction of tacit knowing to its explicit content is neither necessary nor possible.

focal terms by an informal process, relying on the first for attending to the second. In the case of explicit reasoning, the two terms and their relationship is fully specifiable. This is why Polanyi calls explicit inference "the ideal of critical reason".¹⁰⁶ The premises of an explicit inference can be repeatedly re-examined and scrutinized as can the formal operations by which results are derived. Tacit inference, on the contrary, is an ideal of post-critical reason. "A return to the antecedents of an act of comprehension is much more difficult and uncertain. It involves an analysis of tacitly known particulars, which--we have seen--may not be identifiable."¹⁰⁷ And, not only are the subsidiary components of a tacit inference logically unspecifiable but their relation to a focal component must be sustained by a personal act of integration. What follows from Polanyi's account of the ontological aspect of tacit knowing, then, is the ultimately unspecifiable and fiduciary foundation of knowledge, for an act of tacit integration "can sustain these relations only because the acting person believes that they are apposite: that he has not made them but discovered them."¹⁰⁸ Thus, Polanyi continues, "the effort of knowing is guided by a sense of obligation towards the truth: by an effort to sub-

¹⁰⁶ MIT, II, p. 22.

¹⁰⁷ MIT, II, p. 22.

¹⁰⁸ PK, p. 63.

mit to reality."¹⁰⁹ This obligatory or moral aspect of knowing will be considered further momentarily. Here I can sum up the discussion of Polanyi's account of the logic of discovery by simply observing that it is the rootedness of all rational knowledge in a tacit dimension which makes knowing an a-critical--but not irrational--act of reliance on unspecifiable beliefs. The structure and act of tacit knowing, thus, clarifies reason's fiduciary character and shows belief to be neither a matter of necessity nor of choice, but a matter of fact.

THE LOGIC OF JUSTIFICATION: MORAL EXIGENCE

The first section of this chapter began by noting that Polanyi's critique of positivist epistemology is based on the fact that it cannot explain adequately the discovery of scientific knowledge. Methodical exigence, thus, leads Polanyi to develop a theory of tacit knowing to account for the logic of discovery. Here I want to avert to a second reason for Polanyi's rejection of positivism and the ideal of critical reason, the fact that it attempts to relieve man of personal responsibility for upholding the knowledge he accepts as true by substituting for his sense of responsibility objective criteria of validity.

Objectivism seeks to relieve us of all responsibility for the holding of our beliefs. That is why it can be logically expanded to

¹⁰⁹PK, p. 63.

systems of thought in which the responsibility of the human person is eliminated from the life and society of man. ¹¹⁰

On the grounds that knowledge is wholly specifiable, its justification requires only strictly formal and, hence, impersonal procedures. Knowledge explicitly derived from identifiable premises can be critically tested by subjecting these premises and the process of inference which led to them to objective standards. However, to acknowledge, as Polanyi does, "tacit thought as an indispensable element of all knowing and as the ultimate mental power by which all explicit knowledge is endowed with meaning,"¹¹¹ is to deny the possibility of ever critically or impersonally testing all knowledge which we accept as true. How, then, Polanyi asks, can we justify such knowing? Certainly neither in terms of its unspecifiable content nor in terms of the unspecifiable process which moves from particulars to their focal meaning.¹¹² Rather, any justification of it must credit ourselves with unformalizable powers of judgment, with the competence to affirm an unspecifiable reality which will yet reveal itself indeterminately in the future. It is precisely such tacit powers of intelligence which objectivist theories of knowledge refuse to recognize. In Polanyi's view:

¹¹⁰PK, p. 323. Cf. also PK, p. 268.

¹¹¹TD, p. 60.

¹¹²KB, p. 132.

Objectivism requires a specifically functioning mindless knower. To accept the indeterminacy of knowledge requires, on the contrary, that we accredit a person entitled to shape his knowledge according to his own judgment, unspecifically.¹¹³

The intentional and from-to structure of tacit knowing, which "describes" the indispensable participation of the knower in the discovery of knowledge, also "prescribes" that such knowledge, as personal, can never be separated from the obligation for upholding its validity. It is the burden of Polanyi's rejection of objectivism, in other words, to show not only that man is involved in his knowing, but that he is also responsible for his knowledge. Moral exigence, thus, leads Polanyi to ask "whether intellectual powers, grounded in tacit knowing. . . can exercise the kind of responsible judgment which we must claim if we are to attribute a moral sense to man."¹¹⁴ To answer this question, Polanyi elucidates the logic of justification implied in the structure of tacit knowing.

¹¹³PK, p. 264. Polanyi does not believe, of course, that an objectivist method of justification was ever rigorously practiced, even during the so called "critical period of thought," for he regards such a method as impossible. Yet, "its practice has been avowed and emphatic while its relaxation was marginal and acknowledged only in passing." PK, p. 270. In other words, if, as Tracy argues, "basic intellectual inauthenticity be defined as using one's mind yet speaking of it as if it were something else," then it is this charge which Polanyi levels against the objectivist account of scientific knowing. The Achievement of Bernard Lonergan, p. 54.

¹¹⁴TD, p. 56.

It is Polanyi's contention that the same structure of tacit integration which accounts for the discovery of scientific knowledge can be shown to account for its justification. Tacit operations of intelligence play a decisive role not only in the discovery but also in the very holding of scientific knowledge, and such operations, Polanyi argues, are acts of personal judgment. Polanyi attempts to show, then, how "the structure of these acts . . . offers a justification for relying on such acts."¹¹⁵ It can be noted here that one of the impressive features of Polanyi's cognitional theory is its utter consistency. Repudiating the objectivist ideal of critically established knowledge and grounding all knowing in tacit powers of intelligence may appear a dangerous enterprise, even an invitation to dogmatism. Polanyi himself recognizes this danger and confronts this implication head on. He admits that "once you face up to the ubiquitous controlling position of unformalizable mental skills, you do meet difficulties for the justification of knowledge that cannot be disposed of within the framework of rationalism."¹¹⁶ What these difficulties are, and how they can be overcome without endorsing some form of irrationalism, is the concern of this second section of the present chapter.

¹¹⁵KB, p. 105.

¹¹⁶By "framework of rationalism" Polanyi means here the framework of critical rationalism.

Self-set Standards of Intelligence: The ultimate foundation of cognitional process, according to the theory of tacit knowing, is the fact that acts of consciousness are self-appraising. In every act of tacit knowing we shape our expectations of discovery (intend a focal object of comprehension) by relying on an unspecifiable framework of anticipations (indwelling subsidiary clues). And since the capacity of a comprehensive entity to manifest itself indeterminately in the future is what accounts for our affirmation of it as a real discovery, every new discovery also modifies to some extent our existing framework. Thus, Polanyi explains, "we find ourselves relying jointly on our anticipations and on our capacity ever to adopt these to novel and unprecedented situations."¹¹⁷ In this way, every exercise of skill, shaping of perception, or intellectual striving is guided by self-satisfaction, and can be said to achieve what it achieves only to the extent its performance is accredited according to standards set by itself for itself. The structure of tacit knowing, then, is the structure of an "ultimate self-reliance".¹¹⁸

¹¹⁷PK, p. 103.

¹¹⁸PK, p. 265. In Polanyi's words: "All personal knowing appraises what it knows by a standard set to itself." PK, p. 63. Thus, the "conception of personal knowledge departs in two closely related respects from the ideal of a strictly justifiable knowledge. It accredits man's capacity to acquire knowledge even though he cannot specify the grounds of his knowledge, and it accepts the fact that his knowing is exercised within an accidentally given framework that is largely unspecifiable." KB, p. 134.

Standards of intelligence are not extrinsic to the act of intelligence, but are subsidiarily appropriated and relied on in the very process of using them. We are never able to attend focally to the standards which tacitly govern the shaping of our present focus of attention. There is no alternative, then, but to accredit our own judgment as the final arbiter of all our intellectual performances, and it is this concomitant self-accreditation, implicit in every act of knowing, which manifests the intrinsically moral aspect of judgment. Judgment becomes a matter of conscience. Moreover, Polanyi acknowledges, "this self-accrediting is itself a fiduciary act of my own, which legitimates in its turn the transposition of all my ultimate assumptions into declarations of my own beliefs."¹¹⁹ The act of judgment, in other words, by which we lay claim to a true discovery, is finally a self-authenticating act. Rationality becomes a matter of self-recognition and self-acceptance of oneself as a knower.

By transposing truth claims into a fiduciary mode, the logic of tacit knowing reflects the fact that all assertions are inevitably personal performances. Once impersonal truth claims are seen to be a contradiction in terms, it is no longer possible to arrive at any justification of an assertion which would not itself in its turn consist of a personal assertion. Thus, while it is possible to justify

¹¹⁹ PK, p. 265.

any belief in terms of some logically antecedent belief, this justification must itself be acknowledged as a fiduciary act.. This leads to the seeming paradox of self-set standards of intelligence,

for if the criteria of reasonableness, to which I subject my own beliefs, are ultimately upheld by my confidence in them, the whole process of justifying such beliefs may appear but a futile authorization of my own authority.¹²⁰

We must ask, therefore, what keeps this self-accrediting from being merely subjective.

There are two significant implications in Polanyi's cognitional theory which underlie the justification of personal knowledge and protect self-set standards from arbitrariness and subjectivity. The first is the ontological aspect of tacit knowing, the fact that discovery bears on a reality existing independent of the knower. The second is the limitations imposed by an acceptance of tradition and authority, the fact that discovery indwells a tradition and implies membership in "a community which cultivates this lore, appreciates its values and strives to act by its standards."¹²¹

The object of tacit knowing is reality. According to the logic of personal knowledge: "Any effort to understand something must be sustained by the belief that there is some-

¹²⁰ PK, p. 256.

¹²¹ PK, p. 207.

thing there that can be understood."¹²² Thus, as the pursuit of discovery is guided by intimations of reality, so the claim to discovery is justified by making contact with reality. What characterizes objective reality is first, its coherence, and second, the indeterminate scope of its implications. These two characteristics of objectivity are evident in Polanyi's definition of reality, for it is the coherence of a comprehensive entity which attracts the mind and functions as a lure to discovery, while it is the indeterminate range of future manifestations which validates the claim to having made a true discovery.

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 power to its independent existence, can always manifest itself in still unexpected ways. If we have grasped a true and deep-seated aspect of reality, then its future manifestations will be unexpected confirmations of our present knowledge of it.¹²³

The claim to know the unexpected would not only be unjustified but self-contradictory if knowing included the capacity to specify completely what is known. But, if all knowledge is fundamentally tacit, as it is if it rests on subsidiary awareness of particulars in terms of a focal comprehensive entity, then knowledge will always include more than can be specified, and justification will always be a matter of

¹²² SFS, p. 44.

¹²³ KB, pp. 119-120.

confirmation on grounds independent of the knower. The logic of justification, then, like the logic of discovery, is disclosed in the structure of tacit comprehension. Just as subsidiarily comprehended particulars supply clues for the comprehension of reality and underlie the process of discovery, so the focally comprehended entity itself, in its turn, forms clues to future discoveries and underlies the process of justification. What understanding grasps is the intelligibility of that which it comprehends. It is the coherence of a comprehensive entity that evokes understanding. But it is the intimation of a hidden reality existing independently of the knower which endows the search for truth with a claim to universal validity. According to Polanyi, then, we can account for the capacity to know more than we can tell only if we believe in the presence of an external reality with which we can establish contact, and which, because of its independent existence, is accessible to others as well. It is this reference to reality which in the first place justifies acts of tacit knowing. In Polanyi's words:

My reference to reality legitimates my acts of unspecifiable knowing, even while it duly keeps the exercise of such acts within the bounds of a rational objectivity. For a claim to have made contact with reality necessarily legislates both for myself and others with universal intent.¹²⁴

In this way the claim to comprehend a reality existing independent of one's knowing it serves as the external anchor-

¹²⁴KB, p. 133.

ing of all personal knowledge.

The structure of tacit comprehension can be seen to be identical to the structure of commitment, in as much as commitment represents the knower's responsible acceptance of the bearing of his knowledge on reality. Within the framework of commitment there is an integration of the personal and the universal. The personal comes into existence by asserting a claim to truth with universal intent, and the universal is constituted by being accepted as the objective of this personal claim. Discovery in science, Polanyi explains, is a personal seeking and a responsible acceptance of a reality believed to be universally accessible and only in this sense can it be said to be "impersonally given".¹²⁵ The scientist is justified in ascribing impersonal status to his standards and his claims only because he believes in their independent existence. "But his submission to scientific standards for the appraisal and guidance of his efforts is the only sense in which these standards can be said to pre-exist, or even to exist at all, for him."¹²⁶ Universal standards can be known, in other words, only by acknowledging their jurisdiction over oneself. Thus, while the logic of discovery reveals how the knower creatively shapes his knowledge in the way he knows it, but seems to leave the task of discovery to the arbitrary choice of the subject, the logic

¹²⁵PK, p. 302.

¹²⁶PK, pp. 302-03.

of justification reveals how "even in the shaping of knowledge the knower is controlled by impersonal requirements"¹²⁷ and, thus, how discovery is finally determined by the object. The framework of commitment, then, circumscribes the hazards of belief and authorizes the choices made in the discovery of knowledge. Accordingly:

The paradox of self-set standards is eliminated, for in a competent mental act the agent does not do as he pleases, but compels himself forcibly to act as he must.¹²⁸

The personal participation of the knower in his knowledge is completely compensated for by the responsible submission of the knower to the universal status of the reality he comprehends. Though every choice in the process of comprehension is indeterminate in the sense of being an entirely personal judgment, in the exercise of such judgments competency is completely determined by the responsibility of the knower in respect to the object of comprehension. Thus, as Polanyi emphasizes: "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."¹²⁹

There is, according to the logic of justification,

¹²⁷TD, p. 77.. "A passionate search for the correct solution of a task leaves no arbitrary choice open to the seeker. He will have to guess, but he must make the utmost effort to guess right. The sense of a pre-existent task makes the shaping of knowledge a responsible act, free from subjective predilections." SM, p. 36.

¹²⁸PK, p. 315.

¹²⁹PK, p. 309.

what amounts to a "categorical imperative" implied in knowing as well as doing. Kant argued that when one acts he must intend his act as a law for all. Polanyi argues that when one believes he must intend his knowledge as a truth for all. The imperative to accept as true only what can be universally known is what makes belief a normative and responsible act, and one fulfills the ultimate requirement of self-criticism in so far as he expresses his understanding of his beliefs--makes a comprehensive claim to discovery--and takes full responsibility for them.

It is the universal intent of tacit knowing which gives knowledge its claim to objectivity, just as it is the freedom of tacit knowing which gives knowledge its characteristic subjectivity. The fact that within the framework of commitment objectivity is understood as universality which is not established but intentional means that personal knowledge can be justifiably rational without being dogmatic. The fact that within the framework of commitment subjectivity is understood as freedom which is not arbitrary but responsible means that personal knowledge can be justifiably rational without being solipsistic.

Polanyi contrasts his account of the logic of justification in terms of universal intent and responsible freedom to both an objectivism which would relieve man of all responsibility for his knowledge and a subjectivism which would demand an absolute and impossible responsibility.¹³⁰ He

conceive's personal knowledge as an alternative to positivism, on the one hand, according to which truth claims are justified by an appeal to strictly established criteria of validity, and existentialism, on the other hand, according to which truth claims are subjectively self-authenticated. In the first instance, truth is regarded as a matter of positive verification. In the second instance, truth is regarded as a matter of authentic existence. Thus, while Polanyi rejects the ideal of wholly determinate knowledge on the grounds that tacit knowing is an unspecifiable process bearing on an indeterminate reality, he also rejects the ideal of absolute self-determination on the grounds that the structure of tacit knowing implies commitment to an independent objective reality. Tacit knowing is a personal striving that responds to an obligation imposed from without, an apprehension in the form of intimations of a hidden reality that demands acceptance. The logic of tacit knowing shows, in Polanyi's words,

that any attempt to avoid the responsibility for shaping the beliefs which we accept as true is absurd; but the existentialist claim of choosing our beliefs from zero is now proved absurd too.

¹³⁰ Polanyi contrasts his conception of responsible freedom as service to certain existentialist notions of absolute self-determination. "There is here no existential choice comprising the whole world and claiming responsibility for it. Such a choice would leave neither a center to which it could be responsible, nor a criterion by which it could be judged. This impossible responsibility, which is the source of the existentialist's sense of universal absurdity, now appears as an obvious self-contradiction." TD, p. 81.

Thought can live only on grounds which we adopt in the service of a reality to which we submit.¹³¹

Community, Authority and Conscience: Besides the bearing of tacit knowing on reality and the appropriation of universal standards of validity implied in a claim to discovery, Polanyi recognizes a further limit and ground to personal knowledge in the way tradition exercises authority and shapes conscience convivially. A community of belief plays a significant role in setting standards for the justification of personal knowledge. According to Polanyi, one can never know explicitly more than a small fraction of all the knowledge he accepts as true, and, therefore, to acknowledge tacit integration as the ultimate mental power by which all explicit knowledge is comprehended is "to deny the possibility that each succeeding generation, let alone each member of it should critically test all the teachings in which he is brought up."¹³² The transmission of knowledge, in other words, always includes more than what can be formulated, and its verification must remain predominately tacit. Since knowledge is acquired by indwelling, comprehension is achieved in the main by relying on the authority of a community which embodies in its beliefs a traditional fund of knowledge. In this way, Polanyi explains: "Our believing is conditioned at its source by our belonging."¹³³ The limiting role of a com-

¹³¹TD, p. xi.

¹³²TD, pp. 60-61.

¹³³PK, p. 322.

munity as a living tradition provides at once a foundation for responsible belief and a limit to self-determination. Polanyi suggests this in summarizing the relationship of science, faith and society in these words:

I accept it moreover as inevitable that each of us must start his intellectual development by accepting uncritically a large number of traditional premisses of a particular kind; and that, however far we may advance thence by our own efforts, our progress will always remain restricted to a limited set of conclusions which is accessible from our original premisses. To this extent, I think, we are finally committed from the start; and I believe that this should make us feel responsible for cultivating to the best of our ability the particular strain of tradition to which we happen to be born.¹³⁴

Thus, how a community of belief exercises authority and shapes individual responsibility, sanctioning the discovery of knowledge, can be seen, according to Polanyi, in the way knowledge held jointly by a scientific community is built up, maintained and subjected to criticism.

In general, the individual scientist is responsible for the choice of subjects for research and the actual conduct of scientific inquiry, but "the recognition of claims to discoveries is under the jurisdiction of scientific opinion expressed by scientists as a body."¹³⁵ The scientific community exercises its authority for the most part informally but also through a framework of formal institutions, which consists of periodicals and books, research grants and salaries, and resources used for teaching and research. Within this

¹³⁴SFS, p. 83.

¹³⁵LL, p. 53.

framework, truth claims are communally assessed on the basis of their scientific merit, and such judgments depend on criteria of plausibility, scientific value and originality.¹³⁶

First, only discoveries deemed sufficiently plausible are accepted for publication in scientific journals and supported by the resources of the scientific community. What is rejected will be ignored by science. Decisions in such matters are based on convictions which remain uncoded but tacitly present in the pursuit of truth.¹³⁷ The second criterion by which the merit of a contribution is assessed is its scientific value, and, as we have seen, Polanyi argues that such value consists of three coefficients: accuracy, systematic relevance, and intrinsic interest of its subject matter.¹³⁸ The third criterion of merit is the originality of the discovery or its unexpectedness as evidenced by the degree of surprise which its communication evokes from other scientists.

According to Polanyi: "Both the criteria of plausibility and

¹³⁶ KB, pp. 53-54.

¹³⁷ Polanyi cites several examples of truth claims which were rejected for their lack of plausibility. One involves a letter published by Nature several years ago. "The author of this letter had observed that the average gestation period of different animals ranging from rabbits to cows was an integer multiple of the number π . The evidence he produced was ample, the agreement good. Yet the acceptance of this contribution by the journal was meant only as a joke. No amount of evidence would convince a modern biologist that gestation periods are equal to integer multiples of π . Our conception of the nature of things tells us that such a relationship is absurd, but cannot prescribe how one could prove this." TD, pp. 64-65.

¹³⁸ Cf. Chapter Four, pp. 154-55.

of scientific value tend to enforce conformity, while the value attached to originality encourages dissent. . . . Thus, the authority of scientific opinion enforces the teachings of science in general, for the very purpose of fostering their subversion in particular points."¹³⁹ A community of belief exercises its authority, then, for the purpose of providing those whose consciences are guided by it with independent grounds for its modification and extension. The continued existence of a scientific tradition is an expression of its capacity for self-renewal and testifies to the fact that its members trust each other to be informed by this tradition and accredit each other with independent powers of personal judgment.

Indirectly, through interlocking accreditation, there is achieved a group consensus as to who properly belongs to a scientific community. The resulting interdependence of scientists within a community sharing a common tradition becomes a source of normative judgments. Polanyi calls this the principle of mutual control. It consists

of the simple fact that scientists keep watch over each other. Each scientist is both subject to criticism by all the others and encouraged by their appreciation of him. This is how scientific opinion is formed, which enforces scientific standards and regulates the distribution of professional opportunities.¹⁴⁰

¹³⁹KB, p. 54.

¹⁴⁰TD, p. 72. The role of community in accrediting

While scientific authority is not distributed evenly throughout the community, and "shows some hierarchical features"¹⁴¹ nevertheless, such authority remains essentially mutual; it is established between scientists, not above them, and exists beyond the direct control of any one of them. Yet, a scientific community can be guided by an authoritative tradition only if it is believed that such a tradition transcends its temporary and imperfect embodiment in the premisses and formal institutions of the community itself. In other words, only by subscribing to a tradition and cultivating its ideals, rather than seeking success and recognition from one another, can individuals form a community which embodies that tradition and upholds its ideals. Thus, while authority is held in common and functions according to the principle of mutual control, each individual must acknowledge it by "an act of devotion".¹⁴² In this way, the premisses and institutions of a scientific community form not merely a guide to intuition but also a guide to conscience. They are not merely indicative but normative. A scientific tradition, according to Polanyi:

must be upheld as an unconditional demand if it is to be upheld at all. It can be made use of by scientists only if they place themselves at its

scientific truth claims has also been shown in some studies by Kuhn and Toulmin, who point out how community consensus influences the acceptance of both legitimate problems and their solutions in science. Thomas A. Kuhn, The Structure of Scientific Revolutions (Chicago: Phoenix Press), 1962, and Stephen Toulmin, Foresight and Understanding (New York: Harper and Row), 1961.

¹⁴¹TD, pp. 73-74.

¹⁴²SFS, p. 54.

service. It is a spiritual reality which stands over them and compels their allegiance.¹⁴³

The belief that the same obligations to scientific ideals are accepted by all confirms the faith of a community in the reality of these ideals. A community of consciences jointly rooted in the same ideals, thus, "becomes the embodiment of these ideals and a living demonstration of their reality."¹⁴⁴

To claim the truth of a scientific discovery is to accredit oneself with independent powers of judgment and to acknowledge one's allegiance to a living tradition. In making such a judgment, the scientist must rely on his own conscience while submitting to the authority of the scientific community. For it is the scientific community which shapes his own conscience as well as the consciences of all its members through the joint cultivating of scientific ideals. Thus, having made a discovery, the individual will appeal to the community as the ultimate judge while taking full responsibility for the validity of his claim. According to Polanyi:

This is the ultimate point to which we can trace the roots of our conviction expressed in affirming any particular scientific proposition as true. Such conviction implies in the last resort our adherence to a society dedicated to certain abiding grounds; among which are the reality of truth and our obligation and capacity to discover the truth.¹⁴⁵

The act of judgment, in other words, which sanctions a par-

¹⁴³SFS, p. 54.

¹⁴⁴SFS, p. 56.

¹⁴⁵SFS, p. 73.

particular proposition as true, affirms, first, that one accepts a tradition or framework of beliefs within which truth can be discovered. It also affirms one's own competence to discover truth, and one's belief in the reality indicated by a proposition personally accredited within this framework of beliefs, a reality that will continue to manifest itself indeterminately. Finally, the act of judgment expresses one's belief in the universal intent of such a proposition and commits one to seek its universal acceptance. Thus, while the logic of tacit knowing recognizes that truth cannot be established by any explicit criteria, it does assert the universal validity of propositions which are personally accredited. Therein is expressed the belief that "truth is real and cannot fail to be recognized by all who sincerely seek it" and the belief "in a free society as an organization of its member's consciences for the fulfilment of their inherent obligation to the truth."¹⁴⁶ According to Polanyi, then, the verification of knowledge is the expression of a faith commitment which can be upheld only within a community. It is such a community, as a living tradition, that, in bearing on reality, justifies the claim to truth.

¹⁴⁶ SFS, p. 73.

CHAPTER VI

DISCOVERY AND JUSTIFICATION IN THEOLOGY

I have described how Polanyi's theory of knowledge developed initially from a recognition of the problematic foundations of the natural sciences, only to move beyond a consideration of the methods and procedures of particular sciences to an account of the structure and operations of consciousness itself. I have also suggested that Polanyi's cognitional theory is relevant to an understanding of the scientific character of the particular cognitive enterprise called Christian theology, and more specifically that it might point to a resolution of the faith-reason problem with which contemporary foundational theology is concerned.

Polanyi has indicated that the kind of knowledge he seeks to vindicate, what he calls personal knowledge, casts aside the absurd dichotomy between faith and reason,

and reconciles the process of knowing with the acts of addressing another person. In doing so, it establishes a continuous ascent from our less personal knowing of inanimate matter to our convivial knowing of living beings and beyond this to the knowing of our responsible fellow men.¹

More importantly, Polanyi makes it clear that he believes his account of the structure and act of tacit knowing

¹"Faith and Reason", p. 245.

provides a foundation (methodological and moral, I have tried to show) for "the true transition" not only from knowing in the natural sciences to knowing in the human sciences, but "also from our knowing the laws of nature to our knowing the person of God."²

But, although he has given an account of the foundations of intelligence which he believes underlie all knowing, Polanyi has not made an explicit attempt to relate his cognitional theory in any systematic way to the particular cognitive enterprise of Christian theology.³ In fact, although he speaks with familiarity and authority of both the natural sciences and the humanities, Polanyi carefully qualifies his remarks when it comes to the question of the possibility of religious knowledge, noting that this is a subject which lies outside his argument. At the same time, however, he admits that his "conception of knowing opens the way" for such a consideration.⁴ The purpose of this final chapter, then, is to bring Polanyi's

²"Faith and Reason", p. 245.

³as, for example, Bernard Lonergan has done in moving from an account of "method" in general to an account of "method in theology" in particular. Reference has already been made to Polanyi's brief discussion of theology in Personal Knowledge (cf. chapter I, p. 11), and this will be referred to again, although the major points to be developed in this chapter are not treated extensively there.

⁴"Faith and Reason", p. 246.

thought to bear more directly on the two foundational questions in theology which were raised in Section One, the question of meaning and the question of truth.

The relationship of faith and reason was seen to be at the basis of two contemporary formulations of the theological problematic. The first problem is how one accounts for the discovery of religious knowledge. Here the theologian meets the apparent "paradox of understanding" which can only be resolved in terms of a "methodical" account of the operations of intelligence which lead to the discovery of meaning in theology. The second problem is how one justifies the holding of religious knowledge. Here the theologian meets the seeming "dilemma of affirmation" which can only be resolved in terms of an account of the "moral" grounds on which truth in theology is upheld.⁵

We have also seen how Polanyi's cognitional theory attempts to establish the act of integration as "the great and indispensable tacit power by which all knowledge is discovered and, once discovered, is held to be true."⁶ In the last chapter I first discussed the methodological aspect of the question, "how does one know?" in terms of Polanyi's

⁵Cf. Chapter III, "Two Foundational Questions: Meaning and Truth", pp. 119-28.

⁶TD, p. 6.

account of integration as the rational process "by which all knowledge is discovered" and, I then discussed the moral aspect of the question "how does one know?" in terms of Polanyi's account of integration as the responsible grounds on which all knowledge "once discovered, is held to be true".

Before bringing this discussion to bear on the methodological aspect of the foundational task of theology (accounting for the operations leading to the "discovery of religious knowledge") and the moral aspect of the foundational task of theology (accounting for the grounds on which the "justification of religious knowledge" rests), two preliminary and related points should be made. The first can be made very briefly. The second is a bit more involved and will require a short digression.

The first point is simply this. It is not my intention to develop in this chapter a detailed or comprehensive account of method in theology, for that is both beyond the scope of this thesis and my own capabilities. Rather, I have tried to argue thus far that foundational theology, which takes this to be its task, will find Polanyi's cognitional theory relevant to that task. And, since I have suggested that contemporary theology's problematic status and consequent concern for method is related to the question of its "scientific" status, I now want to show

what that relevance is by attending to those components of theological method which Polanyi's thought claims to be at the basis of any cognitive enterprise and, thus, in continuity with other special scientific methods. In this way I hope to make clear in what sense theology can and ought to be considered "scientific".⁷

⁷This approach to the question of theology's scientific status can be given further clarification by contrast. R. J. Brownhill, "Michael Polanyi and the Problem of Personal Knowledge" *The Journal of Religion* XLVIII (April, 1968), pp. 115-123, has raised the question of how a "theologian" (by which I presume he means a religious scientist) and a "scientist" (by which he clearly means a natural scientist) can be said to be involved in the same task. He approaches the answer to this question in terms of a consideration of the object of science and theology, and argues for a convergence of science and theology on the basis of Polanyi's rejection of the Kantian dichotomy of nature and reality and Polanyi's conception of the object of science as reality in the Kantian sense of super-sensible. This leads Brownhill to conclude that "it would seem that Polanyi intends that his scientist should not be concerned merely with appearances but, like the theologian, should attempt to apprehend ultimate reality". (p. 119) In this way, Brownhill suggests that Polanyi bridges the gap between the sensible world and the super-sensible world. (p. 120) Apart from the fact that I think Brownhill misrepresents Polanyi's understanding of the object of the natural sciences by identifying it with Kant's ding an sich, and, consequently, misrepresents Polanyi's account of intuition by suggesting that it is an immediate knowledge of super-sensible reality, I think his approach totally overlooks the really fundamental basis Polanyi's thought provides for answering the question of how the theologian and the natural scientist are involved in the same task, that is, Polanyi's account not of the object but of the method of science. The common foundation Polanyi's cognitional theory intends to establish for every science, whether it be natural, humanistic or religious, lies in the structure and act of tacit knowing, which is operative whenever knowing takes place. It is on this basis that I have been pursuing the question of the "scientific" character of theology.

The second point requires a short digression. The task of relating Polanyi's cognitional theory to the problem of method in theology bears on the specific question of religious "knowledge" (its discovery and justification), and needs to be distinguished from attempts to relate Polanyi's thought to the more general question of the relationship of science and "religion". It seems to me that the failure to distinguish clearly between "theology" as a cognitive enterprise (i.e. reflection on religion, science of religion, or religious knowledge) and "religion" as a way of existing in the world (i.e. experiences, beliefs, rituals, or what Polanyi generally calls "worship"⁸) has led to an ambiguity in some of the literature exploring the religious implications of Polanyi's thought.⁹ Yet, the roots of the ambiguity can be traced to Polanyi himself.

⁸PK. p. 279.

⁹Two examples of this kind of ambiguity can be cited. Harry Prosh, Cooling the Modern Mind: Polanyi's Mission, Skidmore College Faculty Research Lecture, Skidmore College Bulletin LVI, No. 4, (August, 1971), pp. 17-26, and Brunno V. Manno, "Michael Polanyi On the Problem of Science and Religion" Zygon: Journal of Religion and Science, IX No. 1 (March, 1974), pp. 50-55. The ambiguity in Prosh's article stems from his use of the term "religion" to refer to both religion and reflection on religion. The ambiguity in Manno's article stems from the use of the terms "religion" and "theology" interchangeably.

In some of his more recent and unpublished writings,¹⁰ Polanyi discusses the difference between science and religion in terms of two different kinds of integration. All acts of integration are tacit and involve the active participation of the subject, who dwells in a subsidiary awareness of particulars (clues) to achieve a focal awareness of a whole (coherence) which is their meaning or joint-significance. Acts of integration, however, can be either "self-centered" or "self-giving".¹¹

"Self-centered" integrations, according to Polanyi, include any cognitive act in which the object which is known focally is of more intrinsic interest than the clues which are known subsidiarily. The act of discovery, which we have seen to be at the basis of all knowing that can be called "scientific" is an act of self-centered integration. In such acts, the subsidiary clues are meaningful only in terms of their bearing on a focal object. Thus, the integration of these clues whereby we discover their meaning does not constitute an act of self-surrender but rather self-appropriation. The integration, in other words, accounts for the comprehension of a reality which exists outside and

¹⁰"From Perception to Metaphor" *op. cit.*, pp. 10-28; "Acceptance of Religion" (lecture supplement No. 4, University of Chicago, May, 1969), pp. 1-11; "Meaning" (lecture, University of Texas, Austin, 1971), pp. 1-12.

¹¹"Meaning", pp. 3-8.

independent of the self which remains "centered". Polanyi diagrams self-centered integrations accordingly:

$$\text{our integration} = \begin{array}{ccc} -ii & \xrightarrow{\quad} & +ii \\ s & & f \end{array}$$

indicating that -ii stands for lack of intrinsic interest; +ii for presence of intrinsic interest; s for subsidiary; and f for focal.¹²

In contrast, "self-giving" integrations, according to Polanyi, are acts of achieving existential meaning through the surrender of oneself to an object of attention. Such integrations are characterized by "the inversion of intrinsic importance".¹³ In other words, the subsidiary clues are aspects of one's own existence and consequently of more intrinsic interest than the object on which attention is focused. A self-giving integration can be represented by the following diagram:

$$\begin{array}{ccc} \text{integration of} & = & +ii \xrightarrow{\quad} -ii \\ \text{our existence} & & s \quad \quad f \end{array}$$

In this case, the $\xrightarrow{\quad}$ indicates that our existence can become "caught up" and embodied in subsidiary clues and focused on an object which gives it meaning. The examples Polanyi gives of the objects of self-giving integrations are: symbols, rituals and metaphors.

¹²"Meaning", p. 4.

¹³Ibid., p. 5.

He describes the way a flag or the tomb of a departed friend, upon which attention may be focused, becomes "symbolic" to the extent one performs an act of self-surrender. A flag (or tomb) in itself is of little intrinsic interest. Only if it is allowed to become the focal embodiment of the meaning of our existence does it become a symbol. And this requires an act of "self-giving" integration whereby aspects of our existence of which we are only subsidiarily aware (a lifetime of memories, emotions, experiences in a particular country or with a particular companion) come together in a meaningful coherence, the object, (a flag, a tomb) of which we are focally aware.¹⁴

In a series of lectures and articles, Polanyi has extended this analysis of self-giving integrations not only to the area of religion but to a wide range of cultural activities, including poetry, drama and representational painting.¹⁵ In his account of the structure of the arts,

¹⁴"From Perception to Metaphor", p. 17.

¹⁵Meaning: A Project (four lectures given at the University of Chicago and the University of Texas at Austin), 1969; Kinds of Knowledge (four lectures given at the University of Chicago), 1970, and (five lectures given at the University of Texas at Austin), 1971. Much of this material, together with Polanyi's article "What Is A Painting?" which appeared in 1970 in The American Scholar (Autumn, pp. 655-669) and in the British Journal of Aesthetics (July, pp. 225-236) has recently been incorporated into a book, entitled Meaning (Chicago: University of Chicago Press, 1975). In addition to Polanyi's own work, several commentators have

morality and religion, Polanyi emphasizes another distinctive feature of all self-giving integrations, namely that the integrations involve incompatible elements. This can be seen most clearly in his analysis of the meaning of a work of art which lies in the imaginative integration we make of what are otherwise contradictory elements. In drama, for example, there is the simulated reality of the "acting", taking place within the artificial framework of the "stagecraft". The dramatic meaning of Hamlet's killing of Polonius and his own murder by Laertes would be lost on one who failed to indwell and integrate these incompatibles and instead either took the events as the perpetration of actual crimes or who focused simply on the subsidiary elements of the production rather than entering into the drama itself.¹⁶ The same kind of self-giving integrations are at work, according to Polanyi, in other areas of aesthetics as well as in morality and religion. The comprehensive "realities" to which the self surrenders in such acts of integration (a poem, a moral ideal, one's God) "have the power to carry us away by virtue of the integration of in-

extended this thinking to the areas of music and dance as well. Cf. Geoffrey Payzant, "Subsidiary Musical Awareness: Tonality" Unpublished report on Payzant's CBS radio programs; and Jerry Gill "On Knowing the Dancer from the Dance" soon to be published in the Journal of Aesthetics and Art Criticism.

¹⁶"What Is A Painting?", pp. 663-64.

compatibles that render their connections transnatural."¹⁷

The meaning achieved by any integration, we have seen, transcends the meaning of its parts, but in the case of self-centered integrations, the parts are compatible, subsidiaries bearing on a focus. The meaning achieved in self-giving integrations involve one's own existence as a part of a coherent reality which transcends the self. Thus, the self is carried outside itself.

"Religion", for Polanyi, as Manno observes, "is seen to exist at the end of a long line of evermore complex integrations. It concerns the meaning of the whole of existence The great power of religion lies in its capacity for integrating large, seemingly incoherent experiences in brief actions of ritual and symbols."¹⁸ As an act of self-giving integration, religion differs from science (self-centered integration) because the feelings it evokes, in Polanyi's words, are "existential rather than intellectual".¹⁹ Religion provides an existential and symbolic framework, a dwelling place within which the passionate search for the ultimate meaning of human existence occurs. The transformation of the self through surrender "corresponds to the degree to which the worshipper dwells within the fabric of

¹⁷"Meaning", p. 8.

¹⁸"Michael Polanyi on the Problem of Science and Religion", pp. 53-54.

¹⁹"What Is A Painting?", p. 666.

the religious ritual, which is potentially the highest degree of indwelling conceivable."²⁰

Religion, as Polanyi describes it, is fundamentally an "act of worship" and so conceived "is an indwelling rather than an affirmation."²¹ In this sense, religion is concerned not with "scientific" but "existential" meaning and truth. But, as Polanyi explains, religion implies affirmations, and as a heuristic vision evokes affirmations.²² Consequently, religion leads to theology. In other words, it is at the point where--to borrow a cryptic phrase from Paul Ricoeur--"the symbol gives rise to thought"²³ that one must begin to speak no longer simply of "religion" but of "theology". For theology is not religion but reflection on religion. Polanyi makes this distinction between religion and theology, even though it is not always clear throughout his writings. He defines theology as religious understanding raised to the level of "theory".²⁴ Theology, then, is an integration of an integration, that is, a self-centered integration (scientific and theoretical) of a self-giving integration (religious and existential). What theology comprehends is the meaning and truth of the Christian religion.

²⁰PK, p. 198.

²¹PK, p. 279.

²²PK, p. 281.

²³Paul Ricoeur, The Symbolism of Evil (New York, Evanston and London: Harper and Row Publishers, 1967), p. 347.

²⁴PK, p. 281.

As an understanding of understanding, theology is more closely related to the human sciences than the natural sciences, and subject to assessment by dual criteria of appropriateness and intelligibility. Theology must be appropriate in the sense that it must express scientifically the same integration of meaning and truth present existentially in the Christian religion itself. Theology, Polanyi explains,

is a theory of religious knowledge and a corresponding ontology of the things thus known. As such, theology reveals, or tries to reveal the implications of religious worship, and it can be said to be true or false, but only as regards its adequacy in formulating and purifying a pre-existing religious faith.²⁵

Like any scientific enterprise, theology is rooted in a prior framework of beliefs. And, for this reason, theological attempts to establish "critically" its presuppositions, e.g. to demonstrate rationally or "prove" the existence of God apart from the fiduciary framework of religion within which such an affirmation is evoked, are as absurd as attempts to establish "critically" or "prove" the premisses of mathematics or the principles of empirical inference.²⁶ However, Polanyi explains, "theology pursued as an axiomatization of the Christian faith has an important analytic task."²⁷ Theology, therefore, must not only

²⁵PK, p. 281.

²⁶PK, pp. 281-82.

²⁷PK, p. 282.

be appropriate but intelligible. For, although its results express a meaning and truth existentially understood and accepted only by those who dwell within the traditional framework of the Christian religion, theology's task as a "scientific" enterprise is precisely to seek a fully rational understanding of that faith in its universal intent and, thus, is governed by the relevant conditions of meaning and truth universally given with human existence.

In this concluding chapter, then, I want to consider the logic of discovery and justification in Christian theology in the light of Polanyi's cognitional theory. The discussion thus far has been for the purpose of clearly distinguishing "theology" as the kind of scientific activity Polanyi characterizes as "self-centered" integration from "religion" as the kind of existential activity Polanyi characterizes as "self-giving" integration. Only in this way, I believe, can the kind of ambiguity referred to earlier be avoided.²⁸

²⁸Cf. Harry Prosh and Bruno Manno op. cit. Prosh rightly contrasts science and religion in terms of the Polanyian distinction between two different kinds of integration, the cognitive act of integration Polanyi calls "self-centered" and the existential act of integration Polanyi calls "self-giving". (pp. 20-22) However, when he compares various sciences in terms of the Polanyian distinction between different degrees of indwelling necessary for any knowledge (p. 18) Prosh ought to speak of "theology" and not "religion" since here he is comparing cognitive disciplines (e.g. the others he mentions are psychology, biology, physics and mathematics). This would clarify the

THE FOUNDATIONS OF THEOLOGICAL METHOD

Polanyi's cognitional theory, which accounts for the discovery and justification of scientific knowledge in terms of the structure and operations of tacit knowing provides a foundation for method in theology. To conceive theology as a science, according to the logic of tacit integration, is to conceive it as a methodical process of discovery and justification subject to the same basic criteria of meaning and truth which govern any scientific enterprise. Science achieves comprehensive understanding, Polanyi has shown, by dwelling within subsidiary particulars and integrating them to their focal significance and validity. Christian theology, in so far as it manifests the same tacit logic of discovery and justification, can be understood as the comprehensive understanding of the meaning and truth of

apparent contradiction in Polanyi's thought between affirming, on the one hand, that the difference between knowing in science and religion is only a matter of degree not kind, and saying, on the other hand, that science and religion differ on the basis of two different kinds of integration.

Although Manno also fails to distinguish between theology and religion, he does speak of Polanyi's own "interpretation of religion" (p. 53) referring to Polanyi's theory of religion as self-giving integrations. Now, if, as Polanyi says, theology is the theory of religion, (PK, p. 281) then certainly there is a basis in Polanyi's own thought for distinguishing "theology" (which Polanyi himself engages in to some extent) from "religion". In this regard, I think Richard Gelwick's assessment is insightful when he characterizes Polanyi's own work as "a theological activity within his own field of intellectual and moral experience." Michael Polanyi: "Credere Aude" His Theory of Knowledge And Its Implications For Christian Theology. Pacific School of Religion, 1965. Unpublished Doctoral Dissertation, p. 269.

the Christian religion in its universal intent.²⁹ What theology as a special science--the science of religion--has in common with every other science is its method.

Theology, as a special science, can be distinguished from other special sciences, on Polanyian grounds, both in terms of its subsidiary and focal components and in terms of the degree and scope (but not kind) of comprehensive integration it achieves. First, theology is distinctive in its subsidiary component in as much as theology dwells within a particular tradition or framework of beliefs. The theologian is rooted in and limited by a fiduciary tradition whose authority he acknowledges and whose significance and validity he creatively seeks to extend. The Christian theologian dwells within the Christian religion in order to comprehend its meaning and truth. Christian theology, then, is a distinct scientific tradition. Second, theology is distinctive in its focal component in as much as it comprehends the meaning and truth of the Christian tradition as it bears decisively on human existence. Polanyi's cognitional theory, which "denies any discontinuity between the study of nature and the study of man"³⁰ does provide grounds for under-

²⁹ Such a scientific understanding of theology is applicable, of course, in principle not only to Christian theology but also to the comprehension of any other religion. Thus, Moslem theology can be understood, mutatis mutandis, as the comprehensive understanding of the meaning and truth of Islamic religion in its universal intent.

³⁰ SM, p. 72.

standing theology within a wide range of scientific pursuits. For, while there is no radical difference between the natural sciences and the human sciences, to which theology is cognate, there is, in Polanyi's words, a "progressive modification of methods used within science"³¹ as the object of focal comprehension encompasses increasingly higher levels of existence. The focal object of theology is distinctively reality as ultimately significant for authentic human existence as such. Finally, it follows from the distinctiveness of theology's subsidiary and focal components that the comprehensive mode of theological integration is also distinctive. According to Polanyi, "as the subject of our understanding ascends to higher levels of existence, it reveals ever new comprehensive features, the study of which requires ever new powers of understanding."³² Theology is distinctive in the degree and scope of its integration in as much as it is a comprehensive understanding not of some particular aspect of reality but of the whole, that is, reality at the level of its ultimate comprehensibility. Indeed, theology takes its name from that ultimate comprehensive entity which is the object of its distinctive integrating activity and which religious tradition calls "God".

If Polanyi's theory of knowledge provides a common ground for all scientific method in a pattern of cognitional

³¹SM, p. 73.

³²SM, p. 73.

operations and relations called the structure of tacit knowing, and also provides a basis for distinguishing and relating various scientific pursuits, then a foundational theology which accounts for the distinctive operations of the special science of theology in terms of the logic of tacit integration ought to resolve the apparent "paradox of understanding" and "dilemma of affirmation" which have become problematic for contemporary Christian theology. I want to show, then, the direction in which such a theological resolution of the faith-reason problem might proceed.

. The Discovery of Religious Knowledge: The "paradox of understanding" in theology has been discussed in terms of the apparent circularity involved in conceiving theological method as fides quaerens intellectum, intellectus quaerens fidem. Within the framework of critical rationalism (which regards all rational knowledge as fully explicit and clearly formalizable) such a paradox is opaque. It makes no sense to believe what one cannot understand, and what one can understand one need not believe. Faith seeking understanding, understanding seeking faith is a vicious circle leading nowhere. When the hypothetico-deductive model of discovery is brought to bear on method in theology, the discovery of religious meaning becomes either completely hypothetical, a matter of choosing to accept a revelation on faith without rational grounds, or completely understandable, a matter of

formal demonstration on strictly rational grounds. This is why accounts of theological method based on such a model of discovery tend to become polarized fideistically and rationalistically along the lines of revealed theology and natural theology, apologetic theology and philosophical theology, existential theology and empirical theology.

On the basis of the model of discovery which Polanyi's thought elucidates, however, the paradox of understanding can be seen to be, in one sense, a fundamental characteristic of any meaningful act of understanding, and, in another sense, logically resolvable. In a fundamental sense, the paradox that rationality implies a faith commitment and faith implies a rational quest for understanding--or that acceptance of a tradition and openness to discovery are mutually dependent--can be understood to be the very condition of human existence.³³ In all human understanding there is both something given and something gained. The logic of tacit integration reveals how intelligence functions creatively within a fiduciary tradition, and how the very possibility of scientific discovery depends upon the ability to assimilate an existing framework of knowledge and assumes that it is capable of fur-

³³According to Polanyi, it is the very rootedness of human existence--man's being-in-the-world--which makes the embodiment of a tradition a necessary condition for the exercise of human creativity and moral responsibility. "Such is the inescapable predicament of man which theology has called his fallen nature. Our vision of redemption is the converse of this predicament. It is the vision of a man set free from this bondage." "Faith and Reason", p. 246.

ther disclosures which are yet unknown. Theological inquiry manifests first, the givenness of a revelatory tradition, and second, the creativity of an intelligent quest for understanding. These two seemingly incompatible features of discovery, we have seen, gift of inspiration and strenuous mental effort, are present whenever scientific inquiry takes place.³⁴ If anything is distinctive of the special science of theology, it is the acknowledgement of these two aspects of knowing. For this reason, Polanyi considers the gift-effort paradox of discovery in science to be paradigmatic of the paradox of Christian theology "seeking to know what we know is impossible to attain."³⁵

If such a paradox is inevitable, however, it need not be incomprehensible, for the paradox becomes translucent when understood in terms of the logic of tacit integration. The structure of theological discovery is a from-to structure, involving subsidiary and focal components. Moreover, only a personal act of integration can make particulars function

³⁴Cf. pp. 208-9.

³⁵"Scientific Belief", p. 33. In a similar vein, Polanyi explains that "though no labor can make a discovery, no discovery can be made without intense, absorbing, devoted labor. Here we have a paradigm of the Pauline scheme of faith works, and grace. The discoverer works in the belief that his labors will prepare his mind for receiving a truth from sources over which he has no control. I regard the Pauline scheme, therefore, as the only adequate conception of scientific discovery." "Faith and Reason", p. 247.

as subsidiaries bearing meaning on a focal object. The discovery of meaning in theology, then, is dependent upon but not explicitly derivative from its subsidiary components. The Christian religion, its scriptures and tradition, which are accepted on faith as revelatory, provides clues to the meaning of a comprehensive reality which Christian faith seeks to understand. Such meaning, however, is not fully explicable in terms of what is given in the Christian revelation itself. Dwelling within the Christian tradition, the theologian achieves rational understanding by creatively integrating its particulars and making them function as subsidiaries bearing meaning. The focal object on which Christianity bears is Jesus Christ as the ultimate meaning of human existence.

The Christian theologian attends from a religious tradition or witness of faith in the past in order to attend to its significance for authentic human existence in the present. While the Christian tradition, therefore, can be said to have meaning (subsidiarily), authentic human existence is its meaning (focally). And, because this meaning is universal in its intent, the theologian is committed to making his discovery rationally understandable to all men. As a scientist, the theologian believes because he is committed to understanding the significance of the Christian religion for human existence. At the same time, the theologian ration-

ally understands because he manifests his commitment to this integration by signifying human existence in its terms. Only in this way can a scientist know the heuristic worth of his discovery, for the very reality he comprehends is measured by his expectation that future experience will bear it out tacitly.

According to the logic of tacit integration, then, the operations which lead to the discovery of meaning are not the result of intellectual detachment (or impersonal observation but of intellectual commitment and personal indwelling. Indeed, no knowledge lacks some measure of indwelling of the knower in that which he knows. And if, as Polanyi says, the measure of indwelling is proportionate to the level of reality or depth of the subject matter (i.e. its potential to reveal itself inexhaustibly in the future),³⁶ and if, again as Polanyi says, one can speak of a "continuous progression" of "the intimacy of this indwelling" as one moves from the sciences of nature to the sciences of man,³⁷ then it follows that the science of theology, which seeks a comprehensive understanding of reality in its dimension of ultimacy, requires the fullest measure of commitment and indwelling of which man is capable. Yet, the involvement of the theologian differs from the involvement of the physicist or the psychologist fundamentally in degree rather than kind.

³⁶ SM, p. 74-79.

³⁷ SM, p. 80.

for, on Polanyi's account, "the participation of the knower in the thing he knows increases steadily as the objects of knowledge ascend to ever higher levels of existence."³⁸ Thus, the transformation of the subject, which is the inevitable outcome of any scientific discovery, is an unavoidable consequence of the discovery of religious meaning and differs little in theology from the transformation which occurs in other special sciences.

Admittedly, religious conversion commits our whole person and changes our whole being in a way that an expansion of natural knowledge does not do. But once the dynamics of knowing are recognized as the dominant principle of knowledge, the difference appears only as one of degree.³⁹

The achievement of comprehensive understanding in any area of thought involves an expansion of oneself into a new dwelling place. By relying on a religious tradition as a framework of comprehensive thought, the theologian assimilates it to himself and thereby changes his very being. But it is by such acts of indwelling that the whole intellectual being of man has come into existence. Such, Polanyi believes, is "the calling of man" and represents "a supreme trust placed in us by the whole creation."⁴⁰

The science of theology, then, can be said to be both revealed and natural, apologetic and philosophical, existential and empirical. The unspecifiability of the pre-

³⁸ SM, p. 94.

³⁹ "Faith and Reason", p. 244.

⁴⁰ SM, p. 69.

sence of an ultimately comprehensive reality within the Christian tradition in the subsidiary form of an active foreknowledge constitutes the fiduciary component of theology. This hidden reality (heuristically attracting the intellect and functioning as a lure to discovery) without whose presence knowledge would not be possible, is itself an intimation of a focally comprehensive entity. In this sense, the hidden reality which makes religious knowledge possible is God himself, and the theological claim that such knowledge is revealed by God is fully commensurate with the fiduciary character of scientific discovery. Theology is revealed, apologetic and existential because it is "a passionate pursuit of a hidden meaning, guided by intensely personal intimations of this yet undisclosed reality."⁴¹

At the same time, theology is natural, philosophical and empirical because it depends on a rational act of understanding, an effort of creative intelligence bringing subsidiary particulars to bear on a comprehensive reality which is their focal meaning. While there can be no formal or explicit reasoning from clues to their comprehensive meaning, then, the discovery of religious knowledge depends upon an informal process of reasoning, a tacit integration of clues to their joint-significance.

Discovery in theology rests on faith, in the sense

⁴¹"Faith and Reason", p. 246.

that it requires a fiduciary act of indwelling. Discovery in theology is grounded in reason, in the sense that it requires an intelligent act of integration. There is nothing, finally, paradoxical, then, in describing method in theology as faith seeking understanding, understanding seeking faith.

The Justification of Religious Knowledge: The "dilemma of affirmation" in theology has been discussed in terms of a collision of two seemingly incompatible moralities of knowledge, the one characteristic of traditional religious thought, the other characteristic of what Polanyi calls the period of modern rationalism. The characterization of theology as a religious science appears self-contradictory in the context of these two conceptions of how knowledge is held to be true. Religious truth is said to rest on unspecified grounds of belief, whereas scientific truth is said to rest on specifiably rational grounds. The former is personal, a-critical and subjective; the latter is impersonal, critical and objective.

The theological dilemma is rooted in an objectivist theory of knowledge, for if all scientific knowledge is explicit and strictly verifiable, then either one knows something explicitly and is rationally justified in affirming it to be true, or one does not know something at all and is not justified in affirming it to be true on faith. Faith and reason, therefore, are assumed to be incompatible. And since

the theologian cannot satisfy objectivist criteria, he is forced either to deny the cognitive significance of his religious truth claims or give up his claim to intellectual integrity. To affirm both is to deny the possibility of a strict justification of scientific knowledge, and such a denial, it is warned, opens "the gateways to intellectual and moral irresponsibility."⁴²

Polanyi regards this conflict between faith and reason as ill-conceived, the result of modern rationalism's refusal to recognize the fiduciary grounds of all knowledge, and attempt to establish truth critically on "reason alone". More importantly, he sees the pervasive influence of this new morality of knowledge in all areas of thought. "Our whole culture," he writes, "is pervaded by the resolve to avoid unspecifiable commitments and to get down ruthlessly to the hard facts of this world and to keep our eyes firmly fixed on them."⁴³ This "spirit of ruthless inquiry" as Polanyi calls it, originates with the modern conception of science, and issues in a demand for "strict methods of

⁴²Sidney Hook, The Quest For Being (New York, Dell Publishing Co., Inc. 1961), p. 76.

⁴³RM, II, p. 8. According to Polanyi: "This dilemma has long haunted philosophy in the guise of the 'correspondence theory of truth'. Bertrand Russell, for example, defines truth as a coincidence between one's subjective belief and the actual facts; yet it is impossible, in terms Russell would allow, to say how the two could ever coincide." PK, 304.

research and, above all, strict criteria of meaning and truth".⁴⁴ Thus, it is in contrast to the search for strict criteria of theological verification that Polanyi's account of the logic of affirmation can be understood to offer a resolution of theology's dilemma.

The theological claim to know ultimate reality or God would not only be unjustified but meaningless if knowing includes the capacity to specify completely what is known. Within an objectivist framework it is possible to prove or disprove a theological assertion by empirical testing. Thus, certain theologians contend that religious knowledge can be verified or falsified by explicitly designating some event or state of affairs which would count decisively for or against belief.⁴⁵ They ignore the unspecifiable aspect of knowledge, and argue as if theological affirmations were the outcome of totally formalizable fact-gathering methods. Religious beliefs are treated as hypotheses which must be correlated to specific facts in experience in order to be verified or falsified. But it is precisely this hypothetico-deductive model of correlation which Polanyi's cognitional theory throws into question. Theological affirmations are neither provisional hypotheses to

⁴⁴RM, II, p. 8.

⁴⁵For example, Antony Flew, New Essays in Philosophical Theology, p. 99.

be discarded if experience tells against them, nor vacuous formulae to which experience makes no difference.⁴⁶ Such affirmations are, rather, the focal explication of subsidiary clues which make up the Christian religious tradition, the outcome of a personally integrative act of comprehension. Thus, theological affirmations and scientific affirmations which express non-religious beliefs differ very little.

Though religious beliefs are often formulated more dogmatically than other beliefs, this is not essential. The extensive dogmatic framework of Christianity arose from ingenious efforts, sustained through many centuries, to axiomatize the faith already practised by Christians. In view of the high imaginative and emotional powers by which Christian beliefs control the whole person and relate him to the universe, the specification of these beliefs is much more colourful than are the axioms of arithmetic or the premisses of natural science. But they belong to the same class of statements, performing kindred fiduciary functions.⁴⁷

To accept the logic of justification implied in the structure of tacit knowing is to recognize that the validity of any theological affirmation logically transcends the totality of relevant data that justifies its assertion and can be interpreted in terms of it. This does not make truth claims in theology irrational or non-empirical (for the rational and empirical cannot be reduced to the strictly

⁴⁶For a Polanyian reappraisal of the falsification challenge to religious assertions; see Larry R. Churchill, "Flew, Wisdom, and Polanyi: The Falsification Challenge Revisited" International Journal for Philosophy of Religion, III, No. 3 (Fall, 1972), pp. 185-194.

⁴⁷PK, p. 286.

demonstrable and observable). It does make such claims comprehensive acts of understanding expressed with universal intent. In other words, it is to recognize that theological integrations are true or false by virtue of the personal accreditation they are given by the theologian himself who dwells within a framework of beliefs which he cannot fully specify. Affirmation in theology, then, can be understood as the focal component of a comprehensive reality of which there are many subsidiary components which will necessarily remain unspecifiable and fiduciary. They can be comprehended, but only by the same kind of tacit act of integration. Indeed, to render such subsidiaries explicit, we have seen, destroys the integration which gives them their significance.

The criteria of theology, therefore, are not extrinsic to the process of theological comprehension itself. Consequently, any justification of truth claims in theology must accredit the theologian with unformalizable powers of judgment, with the competence to affirm an unspecifiable reality that will continue to reveal itself indeterminately in the future. In other words, just as rational discovery cannot be reduced to formal operations and procedures, so, according to the logic of tacit integration, rational justification cannot be reduced to formal arguments and warrants.⁴⁸ This

⁴⁸PK, p. 151.

does not mean that formal arguments are useless in theology any more than formal rules are useless. What it does mean is that such formalizations must be personally accredited, and at some point a logical gap must be crossed which cannot be bridged by explicit reasoning alone.

Because theology expresses an integration of faith with universal intent, to claim that an affirmation in theology is true is to claim that the reality of faith which theology comprehends will continue to manifest its presence in unspecifiable ways. The theologian, therefore, must submit to standards of validity over which he has no control. Thus, as in the case of any scientific affirmation, truth-claims in theology commit the theologian passionately and far beyond his immediate comprehension to a vision of reality. Of that responsibility, he cannot divest himself by appealing to objective criteria of validity.⁴⁹

Furthermore, because theology expresses an integration of faith within the Christian community, to claim that a theological affirmation is true is to claim that it represents the same integration of reality subsidiarily present in the Christian religious tradition. The theologian submits, in other words, to the abiding authority of the Christian community itself.

⁴⁹KB, p. 149.

A theological comprehension of the Christian religion affirms an ultimate reality according to the same principle of integration which is operative in religious existence. In saying this, however, it is important to recognize the difference between the kind of integration achieved in theology and the kind of integration which constitutes religion by recalling Polanyi's distinction between "self-centered" and "self-giving" integrations.⁵⁰ Theology, which comprehends the truth of the Christian faith, must be capable of integrating its subsidiary components, for therein lies its standards of validity. Yet, a theological integration is cognitive not existential, for its subsidiary components are meaningful only in terms of their bearing on the focal object the theologian seeks to comprehend. Thus, while theology can be said to dwell within and presuppose the Christian religion, the integration which it achieves is a scientific act of understanding not a religious act of worship. The theologian, then, according to the logic of tacit integration, must be both a believer and a scientist, and in the end, this presents not a dilemma to be avoided but a responsible challenge to be undertaken, in faith and with reason.

⁵⁰"Meaning", pp. 3-8.

THE FOUNDATIONS OF THEOLOGICAL SPECIALIZATION

To conceive theology as a science, according to the logic of tacit knowing, is to conceive it as a methodical process of discovery, a process subject to the same basic criteria of meaning and truth which govern every special science. Thus far, theology has been considered simply as such, i.e. without differentiation, to make clear that behind the complexity of the discipline as it has developed historically, there is but one fundamental structure of operations having one integral task. Another reason for this emphasis is that its recognition is essential for understanding what theology as a special science has in common with every other science, namely "method" in the sense of an invariant pattern of related and recurrent tacit operations leading ideally to an end, which Polanyi calls "personal knowledge". Contemporary theology, however, is itself specialized, and so a foundational theology grounded in cognitional theory ought not only to account for the basic structure of operations which constitute theological knowing generally, but also provide a basis for distinguishing specializations within the discipline and for interrelating such special forms of theological knowing. In this final section of the chapter, I want to suggest what further implications Polanyi's cognitional theory holds for foundational theology by distinguishing briefly three main functional specializations of contemporary theology and

showing the grounds in Polanyi's cognitional theory for this division as well as for the dynamic unity which underlies it and links the functional specialties to one another and to the science of theology as a whole. In other words, I want to show how the structure of tacit knowing, which accounts for the process of scientific discovery, provides grounds for a differentiation of specializations within a theology of discovery.

There are many different ways of distinguishing specializations in theology. Lonergan points out that specialties may be distinguished in three ways: by dividing and subdividing the field of data, by classifying the results of investigations, or by distinguishing stages in the methodical process which leads from data to results.⁵¹ It should be clear that the intention here is to ground such a distinction in an account of the methodical process of discovery, that is, to distinguish theological specializations on the basis of Polanyi's analysis of the stages of tacit knowing. I believe that such a functional approach demonstrates that, despite its complexity, theological differentiation is both fundamentally natural and sound. Functional specialties are intrinsically related to one another. In

⁵¹Method, pp. 125-26. Thus, Lonergan contrasts "field specialization," "subject specialization," and functional specialization.

Lonergan's words: "They are successive parts of one and the same process. The earlier parts are incomplete without the later. The later presuppose the earlier and complement them. In brief, functional specialties are functionally interdependent."⁵² A theological differentiation of functional specialties, thus, divides and clarifies the process of theological discovery, while preserving its fundamental unity as a science of religion.

In seeking grounds in Polanyi's cognitional theory for a functional differentiation of theological operations, two basic characteristics of tacit knowing should be recalled. The first is that the process of discovery involves a two-fold movement of strenuous mental effort (the work of creative imagination), on the one hand, and gift of inspiration (the work of spontaneous intuition), on the other. The logic of tacit integration, we have seen, reveals how active imagination and passive intuition are jointly at work from the beginning to the end of inquiry, making tacit knowing at once an innovative and creative as well as a traditional and fiduciary act.⁵³ According to the from-to structure of tacit knowing, the theologian (subsidiarily) dwells

⁵² Method, p. 126. While Lonergan's characterization of functional specialties applies to differentiations based on the structure of knowing, obviously, the functional specialties based on Polanyi's cognitional theory are not those of which Lonergan speaks, but are specialties peculiar to the theory from which they are derived.

⁵³ Cf. Chapter Five, pp. 208-14.

within the past and attends from a traditional framework of knowledge in order to attend to its significance and implications (focally) for the future.

In so far as theology meets the basic criteria of meaning and truth, and, thus, both faithfully engages its tradition and reflectively brings that tradition to bear on new problem-situations, it is at once dogmatic and apologetic as well as critical and constructive. In other words, as Ogden points out,

such familiar phrases as 'dogmatic theology,' 'apologetic theology,' 'critical theology,' and 'constructive theology,' are all pleonasms, which are significant only to the extent that 'theology' is always open to misunderstanding in one respect or another.⁵⁴

A theology of discovery that is not dogmatic and apologetic is no theology at all, for a theology of discovery must give appropriate expression to the traditional understanding of faith which it presupposes. Theology, thus, stands in the service of faith. Indeed, from the perspective of tacit knowing, commitment to a tradition is an indispensable prerequisite for any discovery. Similarly, a theology that is not critical and constructive fails in some respect creatively to bring tradition to bear significantly on new situations, and is, therefore, deficiently reflective.

The second fundamental characteristic of Polanyi's

⁵⁴"What is Theology", p. 27.

account of tacit knowing which provides grounds for a differentiation of specializations in theology. ⁵⁵ It is the fact that the process of discovery occurs in three distinct phases or moments. We have seen that Polanyi rejects the hypothetico-deductive model of science which dichotomizes the process of knowing into two formally distinct stages: choosing hypotheses and verifying or falsifying them. ⁵⁵ Only an informal logic of tacit integration, he argues, can account for the dynamism of scientific inquiry which leads from a problem to its solution, from data to results. As Polanyi explains it, the structure of inquiry is an integral process which falls into three periods: the heuristic surmise of a problem, wherein clues are discerned which anticipate a fruitful line of inquiry; the passionate quest for a solution, wherein clues are systematically assembled to their theoretical coherence; and finally, the persuasive claim to discovery, wherein the theoretical coherence is affirmed as true and brought to bear on ever new situations revealing further questions. ⁵⁶

The logic of tacit integration--the from-to structure of tacit operations--emphasizes the dynamic unity of the process, throughout which creative imagination and

⁵⁵ Cf. Chapter Five, pp. 197-204.

⁵⁶ "Genius In Science," p. 44.

spontaneous intuition are jointly at work. Yet, the inter-relation of these two "mental powers" of tacit intelligence --intuitive attending-from and imaginative attending-to-- was seen to be different during each of the three phases of discovery, leading Polanyi to distinguish the interaction of creative imagination with strategic intuition, then questing intuition, and finally concluding intuition.⁵⁷

Furthermore, correlative to this distinction between moments in the process of discovery is Polanyi's distinction between three functions of scientific passion. Thus, the selective function of scientific passion can be said to predominate "during the first phase--indwelling a tradition; the heuristic function during the second phase--integrating clues to a coherence; and the persuasive function during the third phase--demonstrating theoretical relevance by the application to future instances."⁵⁸

On the basis of this account of the structure of tacit knowing, it follows that in everyday performance, theological knowing moves through all three phases of discovery without differentiation, and this is the grounds for conceiving theology as a unified science of religion. But the unity of theology is a unity-in-diversity, and in formal scientific investigation the ends proper to a particular

⁵⁷Cf. Chapter Five, pp. 215-222.

⁵⁸Cf. Chapter Four, pp. 179-187.

stage--surmising clues, seeking coherence, claiming truth--can be distinguished, as one or another function of scientific passion predominates, and become the objective sought by operations in all three phases.⁵⁹ Thus, theology can be regarded as a process involving three distinct moments, historical, systematic and practical, each centering on a logically different kind of question. Conceived as functional specialties, historical theology, systematic theology and practical theology are successive parts of one and the same process, and their respective questions and answers, problems and solutions, all fall within the horizon of a single line of inquiry.⁶⁰ Just as a heuristic surmise is incomplete without a quest for coherence and a claim to discovery, a quest for coherence is itself a surmise and implies a claim to discovery, and a claim to discovery presupposes both a surmise and a quest for coherence, so it follows that theology is historical only if it is systematic-practical, is systematic only if it is

⁵⁹Lonergan makes this same point in Method, p. 133.

⁶⁰Cf. chart relating phases of discovery, scientific passions, and distinct theological moments. I must acknowledge that a similar differentiation of specializations can be derived from different cognitional grounds, and that, in fact, Ogden, for one, has done so on the basis of Heidegger's thought. "The Task of Theology", pp. 27-35. I am indebted to Ogden for the formulation of the three theological questions. The relation of Heideggerian and Polanyian cognitional theories has, to my knowledge, never been pursued, but I believe the compatibility of Ogden's division of theology's tasks and the present account of functional specialties enhances the argument for the foundational significance of Polanyi's theory of tacit knowing.

DIFFERENTIATION OF SPECIALIZATIONS IN A THEOLOGY OF DISCOVERY
BASED ON THE STRUCTURE OF TACIT KNOWING

Phases in the Process of Discovery*	Functions of Scientific Passion**	Moments of Theological Knowledge
1. " <u>Heuristic Surmise</u> " finding a problem strategic intuition	1. " <u>Selective Function</u> " indwelling a tradition	1. <u>Historical Theology</u> (includ. exegesis and interpretation): "What <u>has been</u> the Christian witness of faith?"
2. " <u>Passionate Quest</u> " seeking a solution questing intuition	2. " <u>Heuristic Function</u> " integrating clues to a coherence	2. <u>Systematic Theology</u> (includ. moral theology): "What <u>is</u> the Christian witness of faith?"
3. " <u>Claim to Discovery</u> " holding a conclusion concluding intuition	3. " <u>Persuasive Function</u> " demonstrating relevance by application to future instances	3. <u>Practical Theology</u> (includ. ecumenical theology): "What should the Christian witness of faith now <u>become</u> ?"
4. <u>Foundational Theology</u> : provides theology with a methodology and is concerned with the interrelation of specializations. "What are the criteria of meaning and truth in theology?"		

* Cf. pp. 215-222.

** Cf. pp. 179-187.

historical-practical, and it is practical only if it is historical-systematic. Moreover, there arises the distinct theological task of accounting not only for the differentiation of functional specialties but for their interrelation and fundamental unity, and this constitutes a fourth theological specialty, foundational theology. Thus, if the relationship of functional specialties in theology to the three-phase process of scientific discovery is basically clear, a brief consideration of each specialty in the common theological enterprise may suggest further the implications Polanyi's account of the structure of tacit knowing holds for foundational theology.

Historical Theology: The special function of the first phase of theological inquiry is to discover the historical meaning and truth of the Christian faith. Historical theology (including exegesis and interpretation) answers the question, "What has been the Christian witness of faith in the past?" On the basis of Polanyi's cognitional theory, we can distinguish between the meaning and truth of the Christian faith as it has been borne existentially by adherents of the Christian religion, and the meaning and truth of the Christian faith as it has been borne representatively by Christian texts and other cultural forms of expression.⁶¹ We can distinguish, in other words, between the

⁶¹PK, p. 58.

tacit witness of faith or the "lived history" of the Christian religion, and the explicit witness of faith or the "expressed history" of the Christian religion. Historical theology subsidiarily attends from concrete historical expressions of faith (texts, rites, social institutions, etc.), in order to attend focally to that which they manifest (the implicit faith of the Christian life).⁶²

As a moment within the integral scientific process of theological discovery, the special task of historical theology is to "surmise clues" to the discovery of religious knowledge. As Polanyi explains: "The words of prayer and confession, the actions of the ritual, the lesson, the sermon, the Church itself, are the clues of the worshipper's striving towards God."⁶³ Dwelling within the framework of the Christian tradition--the meanings and truths expressed by all those who have in fact borne testimony to their faith in the past--historical theology exercises in a special way the selective

⁶²PK, pp. 87-95; Cf. also the section on "experience and report" in the essay "Sense Giving and Sense Reading" KB, pp. 189-92. Polanyi's distinction between "experience" and "report", which is correlative to the distinction between existential and representative meaning and truth, is very similar to a distinction Lonergan makes between two senses of the word history. "There is history (1) that is written about, and there is history (2) that is written. History (2) aims at expressing knowledge of history (1)." Method, p. 175. The term "expressed history", which I have used above, is more general than "written history" and includes not only literature but all cultural forms which bear meaning.

⁶³PK, p. 281.

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function of theological discovery. Scientific passion functions selectively, we have seen, by distinguishing between data which are of scientific value and those which are not.⁶⁴ According to Polanyi, only a small fraction of all knowable facts are of scientific interest, and theologically this means that selective passion serves as a guide in assessing what is of greater and lesser value to the theological community as a whole, all Christians in general and theologians in particular. It is worth recalling here that theological value or interest is to be represented, on the basis of Polanyi's cognitional theory, as the joint outcome of three contributing factors: certainty (accuracy), systematic relevance (profundity) and intrinsic interest.⁶⁵ In the case of historical theology, certainty or accuracy is of special importance. Thus, while it would be a mistake to assume that any theological specialty is guided by only one criteria of scientific value (just as it would be wrong to reduce a specialty to its primary function in the process of discovery), nevertheless, as a special moment within the three-phase process of discovery, the most essential role of historical theology is, to use Ogden's words, "provision of accurate and readable translations of significant texts, together with critical inter-

⁶⁴PK, p. 135.

⁶⁵PK, pp. 134-42. Cf. Chapter Four, pp. 154-55.

pretations that risk expressing the meaning of such texts in contemporary terms."⁶⁶

The history of the Christian religion is, of course, continuous with the rest of human history, and, consequently, the discovery of the historical meaning and truth of the Christian faith takes place within the wider framework of historical inquiry generally. Historical theology is cognate, then, with all other historical inquiries and subject to the common criteria of historical investigation. It is important to keep in mind, however, that the historical value of past events depends, like the scientific value of facts of nature, "on their bearing on a scholarly context."⁶⁷ In this case, the context is the history of the Christian witness of faith. Just as historical theology is theological, then, to the extent it functions within an integral three-phase process of discovery, so it is historical to the extent it functions selectively within the broader horizon of general secular history.

Finally, to regard historical theology as a moment in the process of theological knowing is to recognize it as an act of "self-centered" or scientific integration (and not, in other words, an act of "self-giving" or existential integration). To insist on the necessity of indwelling a tradition

⁶⁶ "The Task of Theology," p. 29.

⁶⁷ PK, p. 137.

of faith is to acknowledge that subsidiary clues are not intrinsically meaningful in themselves but only have meaning in terms of their bearing on a focal object. Explicit historical expressions of faith, to repeat, manifest tacit existential faith. But, while a scientific integration of historical expressions of faith ("expressed history") bears on existential integrations of faith ("lived history"), it does not in itself constitute nor require such an existential integration. According to the logic of tacit knowing, then, historical theology can neither be content merely to exhibit explicitly the past for its own sake nor require a tacit act of self-surrender. It is, rather, a special moment in the tacit process of scientific discovery.

Systematic Theology: The special function of the second phase of theological inquiry is to discover the comprehensive meaning and truth of the Christian faith. Systematic theology (including moral theology) answers the question, "What is the Christian witness of faith?" As such, it is related to all other systematic inquiries in philosophy and the special sciences and subject to the same basic criteria. While historical theology attends to the existential meaning and truth of faith and seeks to express such faith in contemporary terms, it nevertheless dwells within the past in order to discover what has already been expressed by others. Systematic theology functions heuris-

tically in the present in order to discover what is properly intended by all expressions; whether or not anyone up to now has expressed it. The difference between the two specialties; then, is a logical one, and rests upon the distinction between subsidiary components of a comprehensive entity (which are discovered in the historical moment of theological inquiry) and the comprehensive entity itself (which is discovered in the systematic moment of theological inquiry). Polanyi's analysis of the structure of tacit integration reveals that a comprehensive entity has two logically distinct levels (subsidiarily known particulars and a focally known whole) and cannot be reduced to a specification of its subsidiary components.⁶⁸ Accordingly, systematic theology relies in its operations on the results of historical investigation, but the reality which it comprehends cannot be explained simply in terms of discoveries in historical theology.

As a second phase of the integral process of theological discovery, systematic theology seeks a coherent integration of subsidiary clues surmised in the first phase of inquiry, and manifests in a special way the heuristic function of scientific passion. It involves crossing the logical gap which separates the many historical expressions

⁶⁸KB, p. 184.

of Christian faith from the one comprehensive reality which such faith intends. Heuristic passion, Polanyi explains, can guide and sustain the integrative effort of comprehension only because the knower--in this case the theologian--believes it is apposite, that the process is, in fact, not one of contrivance but discovery.⁶⁹ Indeed, in the case of systematic theology the intimations which evoke such strivings are themselves the historical expressions of this faith.⁷⁰

If the ontological implications of the act of tacit knowing have been made clear, then it is evident that the objective of the functional specialty called "systematics" is the comprehensive discovery of reality itself. And, in as much as the discovery of faith is a discovery of reality, the comprehensive effort of systematic theology will be faithful to the traditional witness of faith to the extent that it makes such faith understandable, that is, to the extent that it expresses the same understanding of reality universally given with existence as such and consequently expressed by cognate systematic disciplines. Its achievement, in other words, represents the universal intent of

⁶⁹ PK, p. 63.

⁷⁰ In Ogden's words, the task of systematic theology is "to achieve an understanding of the Christian witness that, however different it may be from all previous witnesses and their theological interpretations, appropriately grasps their essential meaning." "What Is Theology," p. 31.

the Christian faith itself. As Polanyi's account of tacit comprehension makes clear, the passionate quest for coherence leaves no arbitrary choice open to the theologian.

The sense of a pre-existent task makes the shaping of knowledge a responsible act, free from subjective predilections. And it endows, by the same token, the results of such acts with a claim to universal validity.⁷¹

To achieve a comprehensive understanding of the Christian faith, then, which is the special function of systematic theology, is to accept such claims as justified, even though admitting the limitations imposed by the intentional meaning and truth of the Christian witness itself. In Polanyi's view, this opportunity to exercise personal powers of comprehension within limitations imposed by a particular tradition "is regarded as the person's calling--the calling which determines his responsibilities." ⁷²

In meeting this responsibility and seeking a conceptual language which might express as clearly as possible the universal intent of the Christian faith, the systematic theologian accepts his calling and acknowledges that his comprehensive vision, whatever its differences from current secular philosophical and scientific discoveries, is finally understandable by the same fundamental criteria of meaning and truth to which they too must submit. Given the character of the present theological situation--the new and critical

⁷¹SM, p. 36.

⁷²SM, p. 36.

challenge to theology's significance and validity which have rendered the cognitive status of the discipline itself problematic⁷³--it is possible to recognize the centrality of systematic theology among the three functional specialties of theology. It is not surprising, then, that the task of comprehending its own conditions of possibility as a cognitive enterprise has largely fallen to the systematicians. And this is as it should be, in as much as the self-reflective task of theology is, as Ogden points out, quite properly a systematic one.⁷⁴ Yet, given the advanced stage of development which theology has attained, this fundamental task must be undertaken within each phase of theological discovery, and, in this sense, constitutes a theological specialty in itself, namely foundational theology. Before taking a final look at the question of foundations, however, the third phase of theological discovery must be considered briefly.

Practical Theology: The special function of the third phase of theological inquiry is to discover the practical meaning and truth of the Christian faith. Practical theology answers the question, "What should the Christian witness of faith now become?" In its orientation to praxis the theological specialty which completes the integral pro-

⁷³This has been discussed at length in Chapter One.

⁷⁴"The Task of Theology," p. 32.

cess of discovery has the character of a practical science and is, thus, continuous with similar inquiries, especially the human sciences, the various arts and other religions, sharing identical criteria of meaning and truth.

The third moment of tacit knowing is the claim to discovery. Such an achievement, it has been argued, not only involves the active participation of the scientist but culminates in his transformation and thereby commits him responsibly in the present and for the future, modifying his conceptual framework and shaping his very existence. Moreover, not only is the change irrevocable, but the claim to have made contact with reality necessarily legislates for himself and others with universal intent and, thus, brings the theologian into practical dialogue with respect to the question of the possibilities of authentic human existence.⁷⁵ Herein lies the final acceptance of a comprehensive discovery, its decisiveness for human existence. In the affirmation of the practical meaning and truth of the Christian faith, we can see the significance of Polanyi's account of the way

⁷⁵Polanyi explains the practical character of scientific discovery when he writes: "My account of scientific discovery describes an existential choice. We start the pursuit of discovery by pouring ourselves into the subsidiary elements of a problem and we continue to spill ourselves into further clues as we advance further, so that we arrive at discovery fully committed to it as an aspect of reality. These choices create in us a new existence, which challenges others to transform themselves in its image. . . ." TD, p. 80. Italics added.

a comprehensive discovery includes anticipations of an indefinite range of further applications, and commits the knower to bring these to bear on new situations.⁷⁶ The standards of coherence implied in the discovery of Christian faith become the theologian's own standards, for which he is fully responsible. Thus, as a special function of theological inquiry, the task of practical theology can be broadly conceived as the discovery of Christian responsibility in the present and for the future.

If the implications of Polanyi's account of the process of scientific discovery are recognized, then it becomes clear that such a task should not be too narrowly conceived. The discovery of the practical meaning and truth of the Christian faith is a phase in an integral process of theological inquiry. As such, it cannot be limited to an understanding of the expressions of faith through the forms of religion, anymore than the responsibility of Christian faith can be limited to the performance of official ministerial functions. Practical theology, in other words, includes much more than simply "homiletics," "catechetics," or what is sometimes called "pastoral theology". Its task is the larger and far more difficult one of comprehending the possibilities of authentic Christian existence as such in every aspect of contemporary life. Practical theology, in short, answers the question of

⁷⁶ KB, p. 467.

the relevance of Christian faith in each and every situation.

Polanyi has described how science is continually revolutionized and perfected while remaining firmly rooted in its tradition. "Each generation of scientists," he writes, "applies, renews, and confirms scientific tradition in the light of their particular inspiration."⁷⁷ Moreover, he finds paradigmatic of the way science thus advances, the way the Christian scriptures "serve [the Christian generally and the practical theologian especially] as a creative tradition to be upheld and reinterpreted in new situations in the light of his conscience."⁷⁸ To affirm a discovery in theology--as in any science--is to commit oneself responsibly to uphold and to demonstrate its significance and validity. And as the logic of tacit knowing transposes truth claims into a fiduciary mode, making truth the rightness of an action, so theological discovery commits the theologian to bring the Christian witness of faith to bear on ever new situations. In Polanyi's words:

Such processes of creative renewal always imply an appeal from a tradition as it is to a tradition as it ought to be. That is to a spiritual reality embodied in tradition and transcending it. It expresses a belief in this superior reality and offers devotion to its service.⁷⁹

In its service to the Christian faith, practical

⁷⁷SFS, p. 56.

⁷⁸SFS, p. 56.

⁷⁹SFS, pp. 56-7.

theology exercises in a special way the persuasive function of scientific passion. In the quest for discovery, heuristic passion seeks contact with a reality that is universal. Having made such contact, heuristic passion is transformed into persuasive passion and sets out to communicate its discovery to others. Just as there is no impersonal way of surmising the historical meaning and truth or seeking the comprehensive meaning and truth of Christian faith, so there is no impersonal way of affirming the practical meaning and truth of such faith. The theologian who finds himself converted to a comprehensive vision of reality is personally obliged to persuade others to accept that same vision by showing its universal relevance to human existence. The objective of practical theology, understood in terms of Polanyi's cognitional theory, is conversion.

Like the heuristic passion from which it flows, the persuasive passion too finds itself facing a logical gap. To the extent to which a discoverer has committed himself to a new vision of reality, he has separated himself from others who still think on the old lines. His persuasive passion spurs him now to cross this gap by converting everybody to his way of seeing things, even as his heuristic passion has spurred him to cross the heuristic gap which separated him from discovery.⁸⁰

Persuasive passion at once binds the theologian to the Christian community which shares his comprehensive vision and spurs him to discover the relevance of that vision for the present

human situation. And since it is for the sake of authentic existence that all theological inquiry finally exists, practical theology, as the third phase of theological discovery, can be understood as the end of theology not only in the sense that it concludes the process of discovery in theology, but also in the sense that it is in terms of its objective that theology finds its justification.

We have seen that a theology of discovery--theology conceived as an integral process of tacit knowing--has a bipolar or from-to structure because it is an integration of subsidiarily known particulars (the traditional witness of faith surmised in the Scriptures and subsequent expressions of the Christian religion) and a focally known whole (the significance and validity of Christian faith affirmed for human existence in the present situation). Furthermore, it should be clear that, while all three phases of theological inquiry manifest the same structure of integration or comprehension, each stands in a different relation to its two poles. Systematic theology, as a functional specialty, is distinctive in that it manifests neither pole in itself but precisely their integration, whereas historical theology especially manifests what Polanyi calls the "proximal pole" of tacit knowing (the traditional witness of faith), and practical theology, the "distal pole" of tacit knowing (the responsible task of existence in the present). The dif-

ferentiation of these three functional specialties in theology, and their interrelation is the task of foundational theology. Hopefully the significance of Polanyi's cognitional theory for that task has been established. If so, then it remains only to summarize briefly by recapitulating the foundational task as a specialty in theology.

* Foundational Theology: The special task of foundational theology is to provide theology with a method and with criteria of meaning and truth firmly grounded in cognitional theory. It answers the question, "What is theology?". In doing so, foundational theology clarifies the various tasks theologians perform and indicates how each presupposes and complements the others. As a theological specialty, the foundational task differs from the specialties of historical, systematic and practical theology--which constitute moments in the integral three-phase process of theological inquiry--in its fully self-reflective character. Thus, foundational theology is not directly concerned with the objects that theologians discover (the witness of faith, the human situation, and their integration) but with the operations that theologians perform. It seeks, in short, to discover the conditions and possibilities of theological discovery itself.

The importance of the foundational task for theology as such makes it incumbent on all theologians in each of the three functional specialties to engage in reflection on their own operations and criteria of discovery and to establish

communications between them. At the same time, the difficulty of the foundational task means that some theologians will make this task the object of their special attention.

Finally, of course, foundational theology is a self-authenticating enterprise in as much as the theologian must rely on the very operations he seeks to discover in the process of discovering them. And since, as I have tried to show, the self-authentication of theology involves a resolution of the faith-reason problematic, Polanyi's theory of tacit knowing is significant for understanding and justifying such a task. It has been argued that foundational theology which conceives theology as scientific method in the sense of tacit knowing meets the contemporary challenge to Christian theology's significance and validity. Such a reformulation of the theological task transforms the traditional hermeneutic circle of Christian theology (fides quaerens intellectum; intellectus quaerens fidem) into an explicitly contemporary, scientific formulation, resolving the paradox of understanding and dissolving the dilemma of affirmation. Theology as theology is self-authenticated neither by faith alone nor by reason alone. It is rather a scientific process of discovery, and as such, both faithful and rational.

APPENDIX^{*}THEOLOGY AND NOTIONS OF REASON AND SCIENCE:
A POINT OF COMPARISON IN LONERGAN AND POLANYI

Lonerган frequently speaks of the shift in horizons from a classical notion of reason and science to a modern notion of reason and science. His recent article in The Journal of Religion explores some of the consequences of this horizon shift from the classical to the modern for theology. (Bernard Lonergan, S.J. "Aquinas Today: Tradition and Innovation" The Journal of Religion LV No. 2, April, 1975.) It also brings to mind Polanyi's article written in this same journal some fifteen years ago in which reference is made to three periods of rationalism (Greek, medieval, and modern) and to the possible onset of yet a fourth period (contemporary). (Michael Polanyi, "Faith and Reason" The Journal of Religion XLI No. 4, October, 1961.) How are the two notions of reason in Lonergan related to the four periods of rationalism in Polanyi? The answer is a bit complicated, perhaps, in that it involves a differentiation of neither two nor four but three conceptions of reason and science and introduces the further question of the relation of reason and faith (science and religion), but schematically, I think, it works out something like this.

* This appendix has been published separately under the same title in The Journal of Religion LVI No. 2 (April, 1976).

There are basically three different notions of reason (and science) which can be distinguished in the history of Western religious thought on Lonergan's and Polanyi's accounts.

I. Classical Reason (metaphysical/precritical): In Lonergan, it is the classical horizon. "Aristotelian science was to be causal, necessary, and true. Modern science still speaks of causes but it does not think of end, agent, matter or form."¹

In Polanyi, both the periods of Greek rationalism and medieval rationalism are dominated by this understanding of reason and science. But, A) during the Greek period a disjunctive ideal of faith and reason is presupposed. "What has Athens to do with Jerusalem?" (Tertullian); and B) during the medieval period a conjunctive ideal of faith and reason is presupposed. "Fidem, si poteris, rationemque conjunge." (Boethius).²

II. Modern Reason (empirical/critical): In Lonergan, it is the modern horizon. Empirical science is not causal, necessary or true but "factual", "hypothetical", and subject to the "criterion of verifiability".³ It also involves a shift from "essences" to successively more accurate "systems" by means of a "hypotheticodeductive" method of inquiry. Finally, modern science is "autonomous" and independent of traditional metaphysics.⁴

¹Lonergan, "Aquinas Today", p. 171.

²Polanyi, "Faith and Reason", pp. 237-38.

³"Aquinas Today", p. 171.

⁴Ibid., pp. 171-72.

In Polanyi, it is the period of modern rationalism. Empirical science rests upon grounds of critical reason, the principle of doubt. It is concerned with positive facts, and is objectively verifiable by strict criteria of observation. Its method is "hypothetico-deductive".⁵ Science in the modern sense, moreover, seeks autonomy by rejecting any reliance on tradition. Finally, modern rationalism reaffirms the view that reason and faith are, in Polanyi's words, "incompatible and should be kept strictly separate. . . . but with the new proviso that reason alone can establish true knowledge."⁶ (Kant and Locke).

III. Contemporary Reason (transcendental/post-critical): In Lonergan, this third conception of reason and science is not properly discussed in terms of "conceptions" at all (although it does involve an historical shift in horizons) for it is at once more general and more radical than conceptions. It takes all conceptions into account, while it goes behind conceptions to their source, "the procedures of the human mind" to reveal an "invariant pattern of operations" which are present whenever knowing takes place.⁷ Lonergan calls this pattern the "integral heuristic

⁵"Faith and Reason", p. 244. Cf. also "Genius in Science", p. 46.

⁶"Faith and Reason", p. 238.

⁷"Aquinas Today", p. 166. Cf. also Method, pp. 4-20.

structure of inquiry" and this new conception of reason "transcendental method".⁸ This can be given clarification by contrast. In his recent Philosophy of God and Theology, Lonergan contrasts the systematic conceptions of reason in Aristotelian and modern science, then adds: "we must now advert to a third. Its basic terms denote the conscious and intentional operations that occur in human knowing. Its basic relations denote the conscious dynamism that leads from some operations to others."⁹ Whereas classical science is grounded in a metaphysics and modern science is grounded in empirical sense data, this transcendental notion is grounded in cognitional theory. "It differs from Aristotelian system inasmuch as its basic terms and relations are not metaphysical but cognitional. It resembles modern science inasmuch as its basic terms and relations are not given to sense, but differs from modern science inasmuch as its basic terms and relations are given to consciousness."¹⁰ The shift here, in other words, is from reason in both the classical sense of logos and the modern sense of logic to the transcendental sense of method. According to the logos of classical science, objectivity is the fruit of self-evident and necessary truths. Reason comprehends the eternal verities. According to the logic of modern science,

⁸Method, p. 13.

⁹Philosophy of God and Theology Philadelphia: The Westminster Press, 1973, p. 7.

¹⁰Ibid., p. 8.

objectivity is the fruit of immediate experience (observation) and rigorous inferences (explicit logic). Reason is hypothetical, the successive expression of ever fuller understandings of relevant data. When reason is conceived as method in the transcendental sense, an invariant pattern of operations,¹¹ then objectivity becomes "the fruit of authentic subjectivity, of being attentive, intelligent, reasonable, and responsible."¹¹ And when reason reflects upon itself, then Lonergan speaks of method as reason's explicit consciousness of its own norms, structures and procedures; the appropriation of one's own conscious and intentional operations.¹² Finally, one can speak again meaningfully of a synthesis of faith and reason. For, in Lonergan's words, if medieval theology can be understood as (classical) "reason illuminated by faith" contemporary theology can be understood as "method illuminated by faith."¹³

In Polanyi, this transcendental notion of reason is precisely what his own "fiduciary programme" establishes.¹⁴ If the classical ideal of scientific knowledge assumed that reason could be comprehensively critical in the sense that its own grounds were clearly and explicitly specifiable, the

¹¹Philosophy of God and Theology, p. 7.

¹²Ibid., pp. 48-9

¹³"Theology and Understanding", p. 138.

¹⁴PK, p. 299.

ideal of science as "personal knowledge" recognizes that behind all formal demonstrations and specifiable procedures lie the informal and tacit operations of the scientist's own mind. Polanyi calls the pattern of these cognitive acts the "structure of tacit knowing" and this new conception of reason "post-critical". In both Personal Knowledge and his article on "Faith and Reason" Polanyi contrasts the formal deductive logic of rational demonstration and the formal inductive logic of empirical generalization to the informal logic of tacit integration which both the "logos" of classical science and the "logic" of modern science presuppose.¹⁵ Moreover, Polanyi believes the traditional division between faith and reason reflects the erroneous assumption "that reason and science proceed by explicit rules of logical deduction and inductive generalization."¹⁶ Actually, however, such formal operations are impotent in themselves and must be grounded in the scientist's own tacit powers of comprehension. In Polanyi's words, "to know is to understand, and explicit logical processes are effective only as tools. . ."¹⁷ The rational application of such "tools" is always a personal performance, an act of ultimate self-reliance. To conceive of reason in a post-critical sense, therefore, is to shift

¹⁵PK, pp. 249-268; "Faith and Reason", p. 244.

¹⁶"Faith and Reason", p. 244.

¹⁷Ibid.

from both classical formulations and modern formulations to the ground of all formulations, the informal and tacit operations of the human mind itself. According to the logic of tacit knowing, then, objectivity in science is the result neither of metaphysical certainty in the Aristotelian sense nor of empirical observation in the Baconian sense, but rather the fruit of responsible subjectivity, a personal and passionate commitment to inquiry driven by devotion to a universal demand.¹⁸ For in the post-critical sense, a "rational" discovery always commits the discoverer to a vision of reality which transcends his own experience and understanding. Such a post-critical conception of reason, Polanyi believes, makes it possible to speak meaningfully once more of a synthesis of faith and reason and thus has significant implications for a contemporary understanding of method in theology, which, of course, is the direction in which Lonergan's latest intellectual pursuits have moved.

While three notions of reason and science are discernable in Lonergan's and Polanyi's cognitional theories, then, neither is attempting to advance a contemporary conception or formulation (transcendental/post-critical) as an "alternative" to out-dated classical (metaphysical/pre-critical) and modern (empirical/critical) conceptions or

¹⁸PK, p. 64.

formulations. Rather, both are seeking what certainly is (as Polanyi explains) a "conceptual reform"¹⁹ but one which (as Lonergan explains) "adds no new resource. . . but simply draws attention to a resource that has always been used."²⁰ In other words, more important than the shift from classical horizon to modern horizon (which Lonergan so often emphasizes as necessary for contemporary theology), and more important than the rejection of the critical ideal of modern reason (which seems so fundamental to Polanyi's thought and necessary for contemporary theology)--and which taken together suggest fundamentally different understandings of reason and science--is Lonergan's and Polanyi's remarkably similar shift to a transcendental/post-critical understanding of reason and science. Lonergan's notion of transcendental method and Polanyi's notion of post-critical reason are contemporary conceptions to the extent they make explicit the conscious and intentional operations of the subject which lie behind and are presupposed in both classical and modern objectifications. The relevance of Lonergan's account of transcendental method and Polanyi's account of post-critical reason to the traditional task of Christian theology in its self-understanding as fides quaerens intellectum; intellectus quaerens fidem consists neither in

¹⁹PK, p. xiii.

²⁰Method, p. 24.

appropriating nor rejecting the modern conception of reason (empirical/critical) but rather in acknowledging and thematizing the personal performance of the theologian himself. This shift in Polanyi to the personal and tacit source and ground of all explicit formulations of knowing, and in Lonergan to the subject as the source and ground of all conceptualizations of knowing is, I think, the real significance of what I have called the third notion of reason in Lonergan's and Polanyi's thought. The validity of their respective cognitional theories will determine to what extent their achievements contribute to a contemporary conceptual reform and usher in what Polanyi foresees as another "great period of rationalism".

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Section 2. Articles and Papers

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* In the first three sections I am deeply indebted to Richard Gelwick, who compiled and published "A Bibliography of Michael Polanyi's Social and Philosophical Writings" up to 1967 in Intellect and Hope ed. by Thomas A. Langford and William Poteat, pp. 432-446. I have made some corrections and additions to Gelwick's bibliography, and brought it up to date. A bibliography of Polanyi's scientific papers in physics and chemistry has been compiled by John Polanyi and published in The Logic of Personal Knowledge (Routledge and Kegan Paul Ltd., 1961), pp. 239-247.

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A centipede was happy quite
Until a toad in fun
Asked it which leg came after which?
This wrought it up to such a pitch
It fell exhausted in a ditch
Not knowing how to run.

Taoist verse

VITA

Joseph Watkins Kroger was born December 28, 1940 in Cincinnati, Ohio. He attended the University of Dayton where he majored in English and Philosophy and received the degree of Bachelor of Arts in May, 1964. For the next three years he taught English and Religion at Chaminade High School in Dayton, Ohio, and spent his Summers studying Philosophy at Georgetown University in Washington D.C.

In 1967 he began theological studies at the School of Divinity, St. Louis University. His fields of study were Moral Theology and Biblical Studies, and he was graduated with the degree of Master of Arts in May, 1969.

In September, 1969 he began doctoral studies in the Department of Religion at McMaster University. He was granted a teaching fellowship and a University scholarship in that year. The following year he received an Ontario Graduate Fellowship, and in his third year he was awarded a Canada Council Doctoral Fellowship. His major area of concentration is Western Religious Thought.

Since 1972 he has been an Assistant Professor of Philosophy of Religion and Theology in the Department of Religious Studies at St. Michael's College, Winooski Park, Vermont. He is married to Althea Louise (Przybylo) and has one son, Andrew Thaddeus.