

MICHAEL POLANYI:
PERSONAL KNOWLEDGE AND THEOLOGY

MICHAEL POLANYI: HIS THEORY OF PERSONAL KNOWLEDGE
AND
SOME THEOLOGICAL IMPLICATIONS

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SCOPE AND CONTENTS: The question behind the thesis is whether Michael Polanyi's cognitional theory helps in formulating the relationship between human knowing and religious faith. The main outline of his theory, as this writer understands it, is presented relying heavily upon Personal Knowledge but using his other publications to elaborate the descriptive foundation of his theory. The adequacy of Polanyi's description in covering the whole structure of knowing is questioned. An evaluation is made of the theory as an explanation of the knowing process described; the basic commitments which ground the theory and Polanyi's affirmation of the continuity in all realms of knowledge are examined. A link is thus established with which to open the question from which the thesis began.

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PART I

HIS THEORY OF KNOWLEDGE

INTRODUCTION

Polanyi's theory of knowledge clearly begs to be extended from the realm of empirical knowing, upon which he concentrates, to the realm of religious knowing. Polanyi's sub-title to his Personal Knowledge is "Towards a Post-Critical Philosophy". In this endeavour he claims to stand in the tradition of St. Augustine:

St. Augustine brought the history of Greek philosophy to a close by inaugurating for the first time a post-critical philosophy. He taught that all knowledge was a gift of grace, for which we must strive under the guidance of antecedent belief.¹

Polanyi expresses it in these words:

We must now recognize belief once more as the source of all knowledge. 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.²

Thus Polanyi accepts the continuity of all domains of knowledge and claims: "Any act of factual knowing presupposes somebody who believes he knows what is being believed to be known. . . . Every act of factual knowing has the

¹ Michael Polanyi, Personal Knowledge (1958), p. 266.

² Loc. cit.

structure of a commitment."³ When he goes so far as to say, "I regard the Pauline scheme of grace and faith as the only adequate conception of scientific discovery,"⁴ he seems to be extending an open invitation to a Christian expansion of his theory.

It is the theological implication of Polanyi's theory that is of major concern to this writer. Yet, all cognitional theories have implications for theology. Perhaps those with implications which appear to discourage theology are too often neglected in religious and theological circles. In any case, Polanyi's theory should not be accepted immediately simply because it encourages our endeavour. It must be examined and evaluated as a satisfactory description and explanation of the way we do know, i.e., of the data of consciousness. The significance of this explanation must be examined critically by the standards of philosophy.

The concern of this paper is the relation of faith and knowledge. It is with this question in mind that Polanyi's theory of knowledge is approached. Yet this paper is no more than a prolegomenon to any answer to the question of the relation of religious faith and human knowledge. The question can only be fully put after an evaluation of the cognitional theory in its own right.

³ Personal Knowledge, p. 313.

⁴ "Faith and Reason", The Journal of Religion, 41 (Oct. 1961), 246.

CHAPTER I

A PRESENTATION OF POLANYI'S COGNITIONAL THEORY

1. Rejection of the Impersonal Objectivity of Empiricism

Science is a system of beliefs to which we are committed. Such a system cannot be accounted for either from experience as seen within a different system, or by reason without any experience. . . . In leading up to this position, the logical analysis of science decisively reveals its own limitations and points beyond itself in the direction of a fiduciary formulation of science. . . .¹

To justify a position such as this, Polanyi had to start by "rejecting the ideal of scientific detachment,"² and by modifying the conception of knowledge represented by impersonal objectivity and universality. The focus of Polanyi's attack is the positivistic conception of science put forth in the earlier years of this century by Ernest Mach in Vienna; this conception was advocated in England in modified form by Ludwig Wittgenstein in his earlier years, and by Bertrand Russell to a lesser extent. By 1966 Polanyi concedes that, in its extreme form, "modern positivism is no longer widely held today" within the physical sciences; yet he is still unable to see any "essential alternative to it emerging so far."³

¹ Michael Polanyi, Personal Knowledge, p. 171.

² Ibid., p. xiii.

³ "The Creative Imagination", Chemical and Engineering News, 44 (April, 1966), 86.

In its extreme forms, the positivistic conception of science involved two particular claims that continue to influence the general thinking of the twentieth century. First, the only meaningful language is scientific language which does not "go beyond experience by affirming anything that cannot be tested by experience."⁴ Second, and derivative, a scientific theory is "merely a convenient summary of experience."⁵ That is, all concepts other than sense data (mass, atoms, light waves, genes, etc.) are purely logical constructs and all reference to them could be replaced (if more clumsily) by statements which refer only to sense data.

The claims of positivism can be seen to be linked directly with the earlier empiricism of Locke and Hume. With the separation of reason and experience as sources of knowledge, objectivity becomes a matter of impersonal or passive detachment such that the empirical data (which is the same universally) will not be distorted by pre-conceived ideas. Polanyi's rejection of such an impersonal empirical objectivity as a criterion for knowledge, including empirical science, is not meant to be the substitution of subjectivity as the criterion for knowledge. Polanyi's concept of personal

⁴ Personal Knowledge, p. 9.

⁵ Loc. cit.

knowledge is clearly meant to be objective "in the sense of establishing contact with a hidden reality."⁶ The reality that is to be known through the empirical sciences is considered to require more active participation by the knower than the term "empirical experience" normally suggests; as such it cannot be known impersonally.

Not the criterion used by working scientists. The first point in Polanyi's attack is simple: impersonal empirical objectivity is plainly not the criterion used even in the exact sciences of physics and chemistry in acquiring or verifying scientific knowledge. Reaching back to the beginning of modern science, he points out that the Copernican system is accepted as more objective than the Ptolemaic view by virtue of the criterion of greater intellectual satisfaction and "at the price of rejecting the evidence of our senses."⁷

Evidence is presented to offset the "text-book" accounts of Einstein's discovery of the Theory of Relativity - evidence which purports to show that Einstein's discovery in no way depended upon new experimental or empirical data, but was rather an intellectual discovery of "rationality in nature."⁸

⁶ Personal Knowledge, p. xiii.

⁷ Ibid., p. 3. To describe the Copernican system as the more objective of the two may not be the best terminology. From the point of view of explaining relationships within the solar system in a way that is valid anywhere within the system, the Copernican system is the more adequate; but from the point of view of describing the movements in relation to a person on the earth, the Ptolemaic is more satisfactory.

⁸ See Personal Knowledge, p. 11.

Although positivism would query the "rationality" discovered, there is nothing in the view of a scientific theory as a convenient summary of experience which seems to be necessarily at odds with Polanyi's evidence; positivism scarcely claims that one has only to have a certain number of experiences, or access to a certain amount of data based on such experiences, to discover automatically a convenient summary. Nevertheless, his evidence does suggest the need for a more balanced emphasis upon the discoverer, as over against the data, in the contribution of each towards a discovery.

Greater weight must be given to the evidence for the common scientific practice of quietly disposing of "contradictions to current scientific conceptions . . . by calling them 'anomalies'."⁹ Ironically enough, Polanyi is able to cite the very experimental data of Michelson and Morely, to which Relativity is often claimed to have been the response, as not giving the results required by the theory.¹⁰ Little attention was paid to these experimental discrepancies, although at the time "relativity had yet made few predictions that could be confirmed by experiment."¹¹ The evidence was set aside "in the

⁹ Personal Knowledge, p. 293.

¹⁰ Ibid., pp. 9-13.

¹¹ Ibid., p. 14.

hope that it would one day turn out to be wrong."¹² Scientists had "so well closed their minds to any suggestion which threatened the new rationality achieved by Einstein's world-picture, that it was almost impossible for them to think again in different terms."¹³

Speaking more generally, we may say that there are always some conceivable scruples which scientists customarily set aside in the process of verifying an exact theory.¹⁴

This insistence of Polanyi's upon the personal involvement in all scientific knowing, even within the most exact sciences, points forward to the quality of this personal coefficient as he will develop it. It is a skilful art with the power of recognizing rationality in nature "before ever approaching the field of experience."¹⁵ Modern physics and relativity have restored a blend of geometry and physics not dissimilar to that of Pythagorean thought and such that "the laws of physics . . . appear as particular instances of geometrical theorems."¹⁶ Thus the confidence placed in modern

¹² Personal Knowledge, p. 13.

¹³ Loc. cit. Other rejections of anomalies are cited: the H. H. Baker observations, p. 293f; the hypnotic demonstrations by Mesmer and Elliotson, p. 51f; extra-sensory perception evidence, p. 23f; evidence for falling meteorites in France in the 18th century, p. 138; etc.

¹⁴ Ibid., p. 20.

¹⁵ Ibid., p. 15.

¹⁶ Loc. cit.

physical theory owes much "to its possessing the same kind of excellence from which pure geometry and pure mathematics in general derive their interest,"¹⁷ an excellence which Polanyi calls one of intellectual beauty. Thus empiricism is valid only as one maxim of the scientific method, "the application of which itself forms a part of the art of knowing."¹⁸

This intellectual quality which plays a large role in the acceptance of modern theories is set in contrast with the qualities ascribed to theoretical formulations by the positivist schools:- a more economical description of facts; simple; fruitful; symmetrical. It is Polanyi's claim that these terms are pseudo-substitutes, "used for smuggling an essential quality into an appreciation of a scientific theory, which a mistaken conception of objectivity forbids us openly to acknowledge."¹⁹ They are "used to play down man's real and indispensable intellectual power for the sake of maintaining an 'objectivist' framework which in fact cannot account for them."²⁰ Such descriptions of scientific formulations are all "pseudo-substitutes for 'true'."²¹

17 Personal Knowledge, p. 15.

18 Ibid., p. 153.

19 Ibid., p. 16.

20 Ibid., p. 16f.

21 Ibid., p. 166.

Despite the rejection of impersonal, empirical objectivity for the exact sciences, Polanyi concedes that classical mechanics approaches this ideal very closely. If one assumes no random observational errors,²² and no anomalies which one sets aside, one "may succeed in restoring at least fictionally the conception of impersonal knowledge in classical mechanics."²³ But "probability statements can never be strictly contradicted by experience."²⁴ The descriptive and human sciences have laboured over the difficulty of affirming the criterion of impersonal objectivity because the more refined their empirical methodology has become, the more obviously they depended upon a statistical methodology. But within still more recent times the so-called exact sciences have affirmed and accepted the statistical formulations of quantum mechanics and of statistical thermodynamics.

Pursuing the statistical method further, Polanyi shows that a statement of probability admits that an occurrence²⁵ may or may not happen; it cannot be contradicted by any conceivable

²² Which error itself is estimated by statistical methods.

²³ Personal Knowledge, p. 21.

²⁴ Loc. cit.

²⁵ Such as the finding of an electron at a designated place on a specified occasion.

event. Since no "strictly objective" prediction of an event can be understood by the assignment of a numerical probability value,²⁶ Polanyi understands the meaning of such a value to be its "guidance to our personal participation in the event to which the probability statement refers."²⁷ A numerical probability is taken to be a measure of the personal expectation of a particular event, and the reciprocal of the measured probability a measure of the personal surprise at the occurrence of the event.

There is "an important sense in which a probability statement can be controverted (though not contradicted) by the events."²⁸ If one is repeatedly surprised by the events forthcoming, he will begin to suspect the correctness of the probability statement. Although highly systematized methods have been developed to assist in this decision, these methods themselves involve statistical statements such that ultimately the decision must be made after a "personal act of appraisal which rejects certain possibilities as being too improbable to be

²⁶ Personal Knowledge, p. 21: "Even if we assume that all external perturbations and all observational errors are entirely eliminated."

²⁷ Ibid., p. 21. See also below, p. 27, for the relationship between this limited guidance and the fiduciary mode of assertion.

²⁸ Ibid., p. 22.

entertained as true."²⁹ Yet, how improbable the possibility must be to determine such a decision will depend upon the assurance with which the original probability statement was held.³⁰ Not only is there this act of personal knowing in the assessment of probability; prior to such assessment is the personal recognition of some orderly or apparently orderly pattern whose significance is to be assessed. Thus in affirming such fundamental laws of nature as those of statistical thermodynamics and kinetics, "we accredit our capacity for knowing randomness from order in nature and that this distinction cannot be based on considerations of numerical probabilities, since the calculus of probabilities presupposes . . . our capacity to understand and recognize randomness in nature."³¹

Dangers of objectivism as a cultural ideal of knowledge. To justify his concept of personal knowledge in empirical science, Polanyi had to start with a rejection of impersonal objectivity. However, it would probably be true to say that his larger moral

²⁹ Personal Knowledge, p. 24.

³⁰ To use Polanyi's illustration on p. 23: If I put 5 black balls and 95 white balls into a sack and shake them up, no series of draws would shake my confidence in the truth of the probability statement, "the probability of drawing out a black ball is (or is only) 5 per cent," that was not sufficient to shake my confidence in my own memory or sanity. A person less confident of himself mathematically would have his confidence in his mathematical reasonableness shaken before his confidence in his sanity.

³¹ Ibid, p. 40.

and cultural commitments first drove him to reject the impersonally objective character of knowledge, the implications of which seem to him to challenge his other commitments. In his 1963 introduction to Science Faith and Society, he writes that Marxism had challenged him to answer such questions as "What philosophy of science had we in the West to put against [the Marxist philosophy]? How was its general acceptance among us to be accounted for? Was this acceptance justified? On what grounds?"³² And like the Marxist theory, his account "of the nature and justification of science includes the whole life of thought in society."³³ His claim is that the ultimate justification of his scientific convictions lies always in himself.³⁴

There is no doubt that Polanyi affirms a sense of moral responsibility among the primary motives of mankind; and not least of the moral commitments which he accepts is that of the search for and publication of truth.³⁵ While he is far from "assuming that a materialistic interpretation of moral motives must always result in moral inversion,"³⁶ he considers

³² Science Faith and Society, p. 9.

³³ Ibid., p. 9.

³⁴ Loc. cit and Personal Knowledge, p. ix.

³⁵ See Personal Knowledge, pp. 203, 234, 299.

³⁶ Ibid., p. 233.

it "dangerous to rely on it that men will continue indefinitely to pursue their moral ideals within a system of thought which denies reality to them."³⁷ It is not dangerous because people may lose their ideals but because, "they might slip into the logically stabler state of complete moral inversion."³⁸ The moral nihilism which springs from the excessive and disappointed moral aspirations of modern man can easily be turned into political action "if this can be based on nihilistic assumptions."³⁹

Polanyi's "opposition to a universal mechanical interpretation of things" is "on the ground that it impairs man's moral consciousness,"⁴⁰ because such objectivity "requires a specifiably functioning mindless knower."⁴¹ The universe envisaged by the ideal of an absolutely impersonal knowledge would be devoid of the very people "capable of creating and upholding scientific values,"⁴² together with all other moral and cultural values.

³⁷ See Personal Knowledge, p. 234.

³⁸ Loc. cit. Moral inversion involves a disappointed rejection of society because of its failure to live up to standards of moral perfection. For more on this theme see Polanyi's little book, Beyond Nihilism, (1960).

³⁹ Ibid., p. 237.

⁴⁰ Ibid., p. 153.

⁴¹ Ibid., p. 264.

⁴² Ibid., p. 142.

Polanyi's absolute commitment to such values is part of the framework from which he starts to develop a theory of personal knowledge as an alternative. His alternative must have a conception of man and of human society "such as to account for man's faculty in forming these conceptions and to authorize the cultivation of this faculty within society."⁴³

2. The Inarticulate and Traditional Framework of Knowledge

Having rejected as impossible and undesirable the concept of an impersonally and empirically objective knowledge, Polanyi turns to an analysis of the structure of personal knowledge and of the elements involved in acts of personal knowledge.

The following assertions serve as a starting point for Polanyi's whole analysis of that strand of personal knowing to be set forth in this section:

⁴³ Personal Knowledge, p. 142. Polanyi's conception is consistent in contrast to that of the verifiability principle of logical positivism. See W. Herberg, "At the Boundary of the Church and the World", (mimeographed lectures, 15th Annual Conference on Evangelism of the United Church of Canada, 1962), 12: "But the greatest difficulty of logical positivism was the impossibility of assigning meaning to the principle of verifiability not itself a logical mathematical statement not itself an empirical statement. Therefore it is meaningless. The corrosive acid of logical positivism ate away not only metaphysics and ethics and theology; it ate itself away." See also below, pp. 23f.

Science is operated by the skill of the scientist and it is through the exercise of his skill that he shapes his scientific knowledge.⁴⁴

I have entered on an analysis of the arts of skilful doing and skilful knowing, the exercise of which . . . ranges far further afield . . . in shaping our fundamental notions of most things which make our world.⁴⁵

I shall take as my clue . . . the well-known fact that the aim of a skilful performance is achieved by the observance of a set of rules which are not known as such to the person following them.⁴⁶

Little argument is needed to persuade us that skilful doing is accomplished by practising rules often not specifiable and not consciously known, whether in the crafts,⁴⁷ in connoisseurship,⁴⁸ or in the arts.⁴⁹ The acquisition of such skills is dependent on some kind of master-apprentice relationship, through which the apprentice "unconsciously picks up the rules of the art, including those which are not explicitly known to the master himself."⁵⁰ Such a relationship involves an a-critical submission to, or trust in, the authority of the master as a carrier of a tradition. "A

⁴⁴ Personal Knowledge, p. 49.

⁴⁵ Ibid., p. 64.

⁴⁶ Ibid., p. 49.

⁴⁷ Ibid., p. 53.

⁴⁸ Ibid., p. 54.

⁴⁹ Ibid., pp. 50f.

⁵⁰ Ibid., p. 53.

society which wants to preserve a fund of personal knowledge must submit to tradition."⁵¹

It is an easy transition from this dependence on a skilful tradition to a distinction between "the articulate contents of science . . . successfully taught all over the world in hundreds of new universities," and "the unspecifiable art of scientific research"⁵² without which little creative headway is made. The most obvious application of research in such a context is to experimental-observational research, which is the very stronghold of the application of the criterion of impersonal objectivity. But this aspect of scientific methodology is intimately bound up with both discovery and verification. Hence science at its most empirical level is associated with the authority and tradition of the scientific community. "The large amount of time spent by students of chemistry, biology and medicine in their practical courses shows how greatly these sciences rely on the transmission of skills and connoisseurship from master to apprentice."⁵³

Such intellectual skills or frameworks will also include the ineffable pre-suppositions which underlie the method by which specific assertions of the exact sciences,

⁵¹ Personal Knowledge, p. 53.

⁵² Loc. cit.

⁵³ Ibid., p. 55.

for instance, are arrived at, and will include the broader cultural framework as expressed in our language. The narrower framework of the various articulate systems of thought are not independent of the broader cultural frameworks:

Different languages . . . sustain alternative conceptual frameworks, interpreting all things that can be talked about in terms of somewhat different allegedly recurrent features In learning to speak, every child accepts a culture constructed on the premises of the traditional interpretation of the universe, rooted in the idiom of the group to which it was born, and every intellectual effort of the educated mind will be made within this frame of reference.⁵⁴

Although stress is laid upon the inarticulate or tacit co-efficient of the intellectual framework, this is understood to be an underlying part of the whole framework without which the articulate and explicit knowledge has no meaning. Hence, one can be said to dwell within the whole framework.⁵⁵

At this point one can observe Polanyi's account of the inarticulate and traditional framework of knowledge linking with his rejection of an impersonally objective criterion for knowledge as both impossible and undesirable. It is impossible because of the inarticulate and personal nature of the framework upon which all knowledge depends; it is impossible further, because even the articulate systems of

⁵⁴ Personal Knowledge, p. 112.

⁵⁵ For a fuller account of the structure of tacit knowing, see below, chapter 2.

knowledge depend for the most part on the acceptance of the authority of the tradition and are in no sense impersonally tested. Mistakenly to claim this impersonal criterion for empirical science is undesirable because, in obscuring the dependence of knowledge on the personally inarticulate and the traditional, the relationship is denied between the domain of science and the domains of all other articulate systems of knowledge within the overall cultural tradition of society. Once this interrelated communal nature of all knowledge is recognized, it is necessary to introduce "explicitly the moral aspirations of man as an extension of his more specifically intellectual passions."⁵⁶

If all knowledge depends partly upon tradition and authority, upon acceptance of and incorporation into a community, there emerges a potential danger to which Polanyi points: "This socially cultivated knowledge will make the life of thought in society dependent at second hand on the civic institutions of society, that is on group loyalty, property and power."⁵⁷ But these institutions are sustained by the civic culture in which "loyalty is parochial, property appetitive, and public authority violent," i.e., the civic culture contains coefficients "that are essentially at var-

⁵⁶ Personal Knowledge, p. 214.

⁵⁷ Ibid., p. 215.

iance with the universal intent of intellectual or moral standards,"⁵⁸ whose individual cultures are themselves sustained by the civic institutions. In particular, "in the Western type of modern society the authority of science is fully established throughout the educational system;"⁵⁹ that is, science is in the position of proclaiming with the authority of the civic institutions a criterion of knowledge which Polanyi believes to be logically self-destructive. Moreover, the "inter-twining of civic exigencies with the ideals of morality will remain precarious"⁶⁰ in an age which so thoroughly attempts to elevate impersonal critical knowledge to the pinnacle.

3. The Inarticulate and Personal Passion for Knowledge

The affirmation of a great scientific theory is in part an expression of delight. The theory has an inarticulate component acclaiming its beauty, and this is essential to the belief that the theory is true A scientific theory which calls attention to its own beauty, and partly relies on it for claiming to represent empirical reality, is akin to a work of art which calls attention to its own beauty as a token of artistic reality.⁶¹

⁵⁸ Personal Knowledge, p. 215.

⁵⁹ Ibid., p. 221.

⁶⁰ Ibid., pp. 215f.

⁶¹ Ibid., p. 133.

These quotations introduce certain aspects of Polanyi's cognitional theory which are never far below the surface.

First, his theory is not just a description of how we know; it has to do with something real to be known, which is different from any empirical "already out there now reality".⁶² To this we will turn in the next section in the context of the framework of commitment.

The other aspect of his theory which can be ignored no longer may be termed the "fiduciary mode" of all knowledge. Clearly the fiduciary mode of knowing had come to the surface with the emphasis on the importance of authority and tradition in forming intellectual interpretative frameworks, and particularly in the claim that even the articulate part of such frameworks is accepted second-hand by most people. Yet there is a distinction between that expression of the fiduciary mode and the one that is to be examined in this section. In the previous section it was emphasized that most articulate knowledge is of the kind, "I believe p because the

⁶² See Bernard Lonergan, Insight (1958), p. 251, where the "already out there now real" is defined: "'Already' refers to the orientation and dynamic anticipation of biological consciousness: . . . 'Out' refers to the extroversion of a consciousness that is aware . . . of objects distinct from itself. 'There' and 'now' indicate the spatial and temporal determinations of extroverted consciousness. 'Real', finally, is a subdivision within the field of the 'already out there now': part of that is mere appearance; but part is real; and its reality consists in its relevance to biological success or failure, pleasure or pain."

masters assert p to be true." The nature of this fiduciary act of trust in the masters of the intellectual community differs, depending upon what it means for the masters to assert p to be true. I may be content to believe p if the accredited intellectual masters claim to know p; but I may not want to believe p on the authority of those who only believe p too.

This section, then, deals with the fiduciary mode of the assertions of those one normally thinks of as the accredited knowers upon whom the majority depend for their second hand knowledge or belief. If the content of a sentence cannot be verified, its personal assertion in speech or writing involves some kind of personal act of assent to the truth of the sentence; that is, by implication, to put the statement into the fiduciary mode. When I write or speak the sentence p in sincerity, this is only a shorthand expression for "I assert p to be true." But, according to Polanyi, if I assert this short of impersonally objective proof, the real meaning of speaking or writing p is "I believe p."⁶³ The question is how one arrives confidently at the place where he can make this assertion at first hand. Polanyi's answer is that our assertions are validated for us by the function of our intellectual passions. The intellectual passions (of scientists) are no mere psychological by-product, but fulfil the logical function of affirming that something is intellectually precious within

⁶³ See Personal Knowledge, pp. 27-30, 253ff.

science; they are that "complex system of emotional responses by which scientific value and ingenuity of many kinds are appreciated."⁶⁴ It is Polanyi's purpose to show "that this appreciation depends ultimately on a sense of intellectual beauty; that it is an emotional response which can never be dispassionately defined."⁶⁵ It is his claim that this grasp of scientific beauty responds to the evidence of our senses to evoke a new vision of reality, which will be the guide for the interpretation of all future experience.

Our assertions are validated for us by the functioning of our intellectual passions. In the realm of the empirical sciences, of course, such personal validation cannot be independent of empirical methods of verification, since "no scientific theory is beautiful if it is false and no invention is truly ingenious if it is impracticable."⁶⁶

Three functions are attributed to the scientific intellectual passions: the selective, heuristic and persuasive functions. The selective function is "that of distinguishing between demonstrable facts which are of scientific interest, and those which are not."⁶⁷ Although two important criteria

⁶⁴ Personal Knowledge, p. 133. See also p. 134.

⁶⁵ Ibid., p. 135.

⁶⁶ Ibid., p. 195.

⁶⁷ Ibid., p. 135.

of the scientific value of known facts must remain those of the objectivist ideal, namely observational accuracy and systematic precision, Polanyi claims that it must not be an exclusive ideal. Pushed too far, it will detract from the bearing of scientific knowledge upon its subject matter, particularly if that subject is to include living beings. This ideal itself derives from the activity of an intellectual passion - a misguided passion - and its very formulation leaves no room for the mind by which it is formulated. Thus a further criterion must be included which is listed as that of "intrinsic interest".⁶⁸ This interest depends "ultimately on a sense of intellectual beauty," responding to "the evidence of our senses" to suggest to us "the kind of questions that it should be reasonable and interesting to explore."⁶⁹

This "appreciation of scientific value merges . . . into the capacity for discovering it; . . . Such is the heuristic function of scientific passion."⁷⁰ A true discovery is not a strictly logical performance; it involves the solution or the crossing of a logical gap, i.e., there is an irreversible character to discovery that excludes "any strictly formalized procedure . . . as a means of achieving discovery."⁷¹

⁶⁸ Personal Knowledge, p. 136.

⁶⁹ Ibid., p. 135.

⁷⁰ Ibid., p. 143.

⁷¹ Loc. cit. See also below, p. 64.

Although all knowing takes place from within some interpretative framework, discovery involves a change in that framework. Thus the personal and inarticulate capacity to judge of intellectual beauty is in some degree the determinate factor in asserting something as known. However, the "intellectual passions . . . may be altogether misdirected, as were those of Laplace in formulating his objectivist ideal; and even those which lead aright . . . may be interwoven with others that are inherently erroneous."⁷² Hence the distinction must be drawn between competent scientific "discoveries" which turn out to be mistaken and unscientific guesses which are not only false but incompetent.

The conclusion seems to be that most scientific knowledge is believed second-hand because those who assert the knowledge are believed to be competent to judge scientific intellectual beauty. This belief in the competence of the expert depends upon his status within the scientific community, the community of scientific authority and tradition.

Yet a major discovery may itself threaten or even upset this status. Hence, Polanyi distinguishes the persuasive function of the intellectual passions. The discoverer is now faced with the problem of persuading other competent scientists to cross the same logical gap over which his discovery has taken him. This activity is "the mainspring of all fundamental

⁷² Personal Knowledge, p. 144.

controversy,"⁷³ and such a struggle is "clearly a process of verification,"⁷⁴ for "a general unbelief imperils our own convictions by invoking an echo in us."⁷⁵

Nevertheless, there is a distinction to be made between this personal element in the process of verification, and the more personal affirmation which results in what Polanyi calls validation. The distinction is parallel to that made between the domain of empirical science and the domains of the other articulate systems of knowledge. This distinction is not absolute since both validation and verification depend upon the intellectual passions; the distinction "merely modifies the conditions of a process of self-satisfaction."⁷⁶ Nor is the distinction held to be absolute relative to experience, for the acceptance of any articulate system depends "to some extent on the content of relevant experiences."⁷⁷ Yet, the empirical sciences must make sense of the clues of experience

⁷³ Personal Knowledge, p. 159.

⁷⁴ Ibid., p. 171.

⁷⁵ Ibid., p. 150.

⁷⁶ Ibid., p. 195.

⁷⁷ Ibid., p. 202. See also p. 194: "All art lies between two limits However abstract, it will echo some experience, and would be as meaningless to someone lacking any such experience, as arithmetic would be to a person living in a gaseous universe." See also p. 286: "Doubts directed against the clues as facts may thus shake the internal evidence of the [religious] system relying on them."

in a way not demanded in the other domains, and because of this:

It is justifiable . . . to speak of the verification of science by experience in a sense which would not apply to other articulate systems. The process by which other systems than science are tested and finally accepted may be called, by contrast, a process of validation.⁷⁸

Polanyi first develops his emphasis on assertion as validated for us by the function of our intellectual passions, i.e., on the fiduciary mode of assertion, in the context of probability statements.⁷⁹ We have discussed why such statements cannot be strictly contradicted by experience; a probability statement is not a fully explicit formulation of knowledge; as such it can only guide our personal involvement in the event. In other words, there is a personal decision involved in placing our confidence in statistically dependent assertions; this personal element is formulated by Polanyi as "I believe p," or its equivalent "I believe that p is true." Although this confidence may vary in degree,⁸⁰ and even "with a numerically ascertainable degree,"⁸¹ the fiduciary element cannot be cast in the form of an impersonal probability state-

⁷⁸ Personal Knowledge, p. 202.

⁷⁹ See above, pp. 11f.

⁸⁰ See Personal Knowledge, pp. 26f.

⁸¹ Ibid., p. 31.

ment.⁸² However, the two can be combined in some such way as "I believe p with 80% assurance."⁸³

The very method of empirical science, then, has built into it the necessity for the fiduciary act of validation, since even the formulations of the exact sciences depend upon the statistical method as one of the maxims for verification.⁸⁴ And no fiduciary assertion based on the statistical method can be expressed with the following confidence: "I believe p with 100% assurance." It would appear that such a statement would be the only real equivalent for Polanyi of: "I know p."⁸⁵

4. Basic Commitments Involved in Affirming Personal Knowledge

There are two complementary poles in Polanyi's framework of commitment. His insistence upon the subject's involvement in the knowing situation, such that his intellectual

⁸² Personal Knowledge, p. 29.

⁸³ Ibid., pp. 31f.

⁸⁴ Ibid., p. 30. This is true both for the formulations of classical mechanics, and for the statistical formulations of modern physics. "Any correlation between a measured number introduced into an exact theory and the corresponding instrument readings, rests on an estimate of observational error which cannot be definitely prescribed by rule. This indeterminacy is due in the first place to the statistical fluctuations of observational errors." (p. 19) The same indeterminacy is true for the introduction of observational data into a statistical formulation. Of course, the indeterminacy is compounded in the case of a statistical formulation, because its predictions are also in the form of probability statements.

⁸⁵ See below, p. 121.

passions provide his final criteria of truth, implies that all knowledge must be personal; but if such knowledge is to be in any sense objective and not merely the expression of the subjective passions, there must be knowledge of some "thing", of something "real", of something real "outside" the knower. Polanyi's framework or structure of commitment, then, includes the logic of assent or the fiduciary mode which was the subject of the previous section. Yet the complementary nature of these two poles in his commitment structure has meant that the one pole could never be affirmed without at least implicitly raising the other.⁸⁶

We will elaborate, first, the personal pole of commitment. The subject's involvement in knowing through the exercise of his own self-established criteria is held up in contrast to an impersonal, empirical objective criterion of knowledge. But it was only within his discussion of the intellectual passions that the logic of this commitment was pointed up. The criterion of objective knowledge has itself no impersonal objective test; this criterion is itself a personal assertion stemming from a

⁸⁶ See Personal Knowledge, p. 5: "One may say . . . that a theory which we acclaim as rational in itself is thereby accredited with prophetic powers. We accept it in the hope of making contact with reality; so that, being really true In this wholly indeterminate scope of its true implications lies the deepest sense in which objectivity is attributed to a scientific theory." See also p. 133, as quoted above p. 20, where the major emphasis is on the intellectual passions.

misguided intellectual passion. The lack of consistency in personally affirming an absolutely impersonal knowledge, which is unable to recognize any persons, allows Polanyi to claim:

Our conceptions of man and human society must be such as to account for man's faculty in forming these conceptions Only by accrediting the exercise of our intellectual passions in the act of observing man, can we form conceptions of man . . . which endorse this accrediting.⁸⁷

Implicit in this claim are two points which Polanyi is careful to pick up and elaborate upon as he attempts his justification of personal knowledge. He repeatedly points out "that we must accredit our own judgment as the paramount arbiter of all our intellectual performances . . . claiming that we are competent to pursue intellectual excellence as a token of hidden reality."⁸⁸ The first implication of this claim is: "This self-accrediting is itself a fiduciary act . . . which legitimates in its turn the transposition of all my ultimate assumptions into declaration of my own beliefs"⁸⁹ This self-accrediting is itself a fiduciary act because there is no impersonal criterion for testing it. Only such a personal, fiduciary act is consistent with a personal concept of knowing, and is demanded for consistency; thus the whole system remains intentionally circular.

⁸⁷ Personal Knowledge, p. 142.

⁸⁸ Ibid., p. 265.

⁸⁹ Loc. cit.

The second implication of self accrediting⁹⁰ involves the second pole of the commitment structure - commitment to a "hidden reality" to be known. One part of this hidden reality was pointed to in the original expression, namely, man - conceived of as exercising intellectual powers.⁹¹ The fiduciary mode of knowing either involves one in an absolute subjectivity or must involve a "personal choice, seeking, and eventually accepting, something believed . . . to be impersonally given."⁹²

The double polarity of the framework of commitment is the method used by Polanyi to establish the concept of the personal as neither subjective nor objective. Because of submission to requirements acknowledged as independent of itself the personal is not subjective; because the personal is guided by individual passions, it is not objective either. The personal transcends the disjunction between subjective and objective; "by trying to say something that is true about a reality believed to be existing independently of our knowing it, all assertions of fact necessarily carry universal intent."⁹³

⁹⁰ See Personal Knowledge, p. 142 as quoted above, p. 30.

⁹¹ See Study of Man, p. 66.

⁹² Personal Knowledge, p. 302. Putting together phrases from pp. 300 and 311, we get: "To avoid subjectivity, the fiduciary mode of knowing must "be merged in the wider framework of commitment," in which there is a "claim to speak of reality" existing independently of our knowing it, which "serves thus as the external anchoring of our commitment in making a factual statement."

⁹³ Ibid., p. 311.

Thus, within such a commitment structure, "every act of factual knowing has the structure of a commitment."⁹⁴ Every revision of the current standards of scientific merit will be made in the light of more fundamental intellectual standards which, within the framework of commitment, are "assumed to be pre-existing and universally compelling."⁹⁵ Such changes of intellectual standards involve "existential" change for those who accept them, and the "hazards of such existential changes cannot be probed or delimited."⁹⁶ They must be taken "in the hope that the universe is sufficiently intelligible to justify this undertaking."⁹⁷ This hope is really a part of the universal pole of the commitment framework. There would be little sense in talking about the intellectual passions submitting to an independent reality, if that reality in part and in total was not sufficiently intelligible to justify such submission.

We have seen that the thought of truth implies a desire for it, and is to that extent personal. But since such a desire is for something impersonal, this personal motive has an impersonal intention. We avoid these seeming contradictions by accepting the framework of commitment, in which the personal and the universal mutually require each other. Here the personal comes into existence by asserting universal intent, and the universal is constituted by being accepted as the impersonal term of this personal commitment.⁹⁸

⁹⁴ Personal Knowledge, p. 313.

⁹⁵ Ibid., p. 302.

⁹⁶ Ibid., p. 318.

⁹⁷ Loc. cit.

⁹⁸ Ibid., p. 308.

Truth, thus conceived, "allows for any degree of personal participation in knowing what is being known."⁹⁹ There is no change in the structure of commitment as one moves from the domain of the sciences, in which authentic experience dominates in intellectual achievements, through to the domains of the arts and of religion, in which authentic feeling dominates, and objects and emotions previously experienced are merely recalled and echoed. But as "we pass thus from verification to validation and rely increasingly on internal rather than external evidence,"¹⁰⁰ the existential changes in accepting new interpretative frameworks are more comprehensive.

One might well say that Polanyi's theory of knowledge comes to its conclusion with the following spirited commitment to the framework he has outlined and to its implications:

The growth of the modern mind within these great articulate systems is secured by the cultural institutions of society. A complex social lore can be transmitted and developed only by a vast array of specialists. Their leadership evokes some measure of participation in their thought and feeling by all members of society. The civic culture of society is even more tightly woven into the structure of society. The laws and the morality of a society compel its members to live within their framework. A society which accepts this position in relation to thought is committed as a whole to the standards by which thought is currently accepted in it as valid. My analysis of commitment is itself a profession of faith addressed to such a society by one of its members, who wishes to safeguard its continued existence, by making it realize and resolutely sustain its own commitment, with all its hopes and infinite hazards.¹⁰¹

⁹⁹ Personal Knowledge, p. 320.

¹⁰⁰ Ibid., p. 321.

¹⁰¹ Loc. cit.

Polanyi's theory is of particular interest to theology because of the implications of the final section in his justification of personal knowledge, entitled "Acceptance of Calling". There is need only to recall Polanyi's positing of the almost passive acquisition of one's cultural framework through simply belonging to a particular community, to realize how little freedom Polanyi claims for deliberate intellectual commitments, sustained by the intellectual passions. Yet he accepts these accidents of personal existence, one's starting point in space and time, as the concrete opportunity for exercising such personal responsibility as a sense of calling. Acceptance is part of the structure of commitment, and taken seriously means a realization of the absurdly remote chance of successfully exercising personal responsibility. Polanyi's structure of commitment is then seen to find a paradigm in the Christian scheme of faith and grace. "We undertake the task of attaining the universal . . . because we hope to be visited by powers for which we cannot account in terms of our specifiable capabilities."¹⁰² "Commitment is a personal choice, seeking, and eventually accepting, something believed . . . to be impersonally given."¹⁰³ Polanyi finds in the hope for this power or this "grace" a clue to God.¹⁰⁴

¹⁰² Personal Knowledge, p. 324.

¹⁰³ Ibid., p. 302.

¹⁰⁴ Ibid., p. 324.

Yet on the whole he emphasizes not this "given" aspect of personal knowledge, but its universal "intent". It is from this point that we shall seek for the direction to relate Polanyi's epistemology to a theology of faith rather than from his attempt to treat the arts and religion as sharing continuously with scientific knowledge in a fiduciary mode.

CHAPTER II

THE INARTICULATE COMPONENT OF PERSONAL KNOWLEDGE

1. Introduction

In the general introduction to Personal Knowledge and to Polanyi's cognitional theory in the last chapter, the role of the personal intellectual passions was introduced. These passions operate tacitly, according to Polanyi's analysis of the actual knowing process. Thus, in some sense, "tacit knowing is in fact the dominant principle of all knowledge,"¹ and all knowing "ultimately relies on a tacit process."²

Clearly, the tacit or inarticulate component in Polanyi's theory is of critical importance in two specific ways. First it is of major importance in an evaluation of the adequacy of his theory of knowing as taking account of the actual data of consciousness. To this evaluation we will turn in the next chapter. Second, an adequate understanding

¹ The Study of Man, p. 13.

² "Tacit Knowing: Its Bearing on Some Problems of Philosophy", Reviews of Modern Physics, 34 (Oct. 1962), 602; henceforth this reference will be simply designated by the article's title, "Tacit Knowing".

of the structure of tacit knowing is necessary for the evaluation of the deeper philosophical implications of Polanyi's theory in its explanation of the data of consciousness, to which we will turn in the fourth chapter. Polanyi himself seems to have recognized more fully the importance of this notion of tacit knowing after the publication of Personal Knowledge, and he has done much in subsequent writings to bring out more clearly its bearing on the knowing process and some of its philosophical implications. To this clarification we turn now.

Tacit knowing and personal knowledge. It is wise to clarify here the distinction in these phrases, since there is both a distinction and an overlapping in the use of the terms "personal" and "tacit".³ A tacit activity is purported to be involved in the process by which one comes to all knowledge, whether such knowledge be in the inarticulate form of perception, skills, connoisseurship, or whether the knowledge be the articulation of scientific theories and religious doctrines. Personal knowledge, in its largest reaches, would be the knowledge that depends upon this structure; however, Polanyi reserves this term substantially for the articulate and systematized knowledge which depends upon the tacit process, and which is guided by those tacit powers which are peculiar to human knowing, namely, the intellectual passions.

³ See Personal Knowledge, pp. 132f.

Tacit component or tacit structure. Polanyi's use of "tacit" is not uniform throughout all his writings. In the earlier writings he uses it in the natural sense of "unformulated" or "non-articulated", to refer to one component in the totality of knowing. However, in his later and clearer works tacit knowing is applied to the whole structure of knowing, including both its non-articulated and explicit elements.⁴ It is in this developed sense that the term will be used here, and other terms will be used to substitute for the more normal sense of tacit.

In Personal Knowledge, a mass of material illustrative of tacit knowing is provided.⁵ Throughout, unity is to be found in the search for the structure of personal knowledge or

⁴ See "Tacit Knowing", p. 34: "It seems appropriate to extend the meaning of 'tacit knowing' to include the integration of subsidiary to focal knowing. The structure of tacit knowing is thus the structure of this integrative process, and knowing is tacit to the extent to which it has such a structure." See also "The Logic of Tacit Inference", Philosophy, III (Jan. 1966), 3: "I shall call this act of integration tacit knowing." Henceforth this reference will be simply designated by the article's title, "The Logic of Tacit Inference".

⁵ The illustrative material is found in Personal Knowledge, Chapters 4 and 5; the master key summarizing these chapters is found as the introduction to Chapter 6 on page 132; the first and second paragraphs on page 49 can then be understood in the light of this master key.

of tacit knowing, i.e., in the search for the principles which guide all forms of knowing from the very primitive and completely inarticulate learning of animals through to the explicit expression of knowledge in adult humans. This unity of purpose is clearer in the later writings because they are usually of a more summary nature and provide the illustrative material as examples of the structure to which the reader is introduced at the beginning.

The structure which Polanyi attempts to show as that of all knowing has a tacit component and is called the tacit structure of knowing. Such knowing has "the structure of an integrative process,"⁶ and illustrations are provided of what is integrated in the process of knowing. One of the primitive forms of knowing, "the act of visual perception"⁷ or more generally "sensory perception, and particularly the way we see things,"⁸ provides the very paradigm of the structure which is posited for all kinds of knowledge at all levels.⁹ Polanyi turns to the example of perception, with its act of integration, to find "a logic by which . . . tacit powers [of the mind] can achieve and uphold true conclusions."¹⁰ Thus we may con-

⁶ "Tacit Knowing", p. 602.

⁷ Ibid., p. 605.

⁸ "Faith and Reason", Journal of Religion, 41 (1961), 241.

⁹ Loc. cit. and "Tacit Knowing", p. 605.

¹⁰ "The Logic of Tacit Inference", p. 1.

clude that, in all the analysis of the various illustrations from the various areas of knowing, there are to be found only different elements of the one structure. The key expression of this structure is to be found in perception, and the key term in the analysis of the structure is integration.¹¹

The readers' clue to what Polanyi is saying about tacit knowing has been introduced; Polanyi's clue for the investigation itself will now be introduced. As a result of his analysis of the actual operation of science, he had come to the not very original conclusion that the "exact sciences are a set of formulae which have a bearing on experience."¹² This seems to be an articulate, explicit form of knowledge. However, Polanyi has shown that in "accrediting this bearing" through verification, or in interpreting this bearing for the application of the formulae, there are no precise and complete, explicit and articulate, rules.¹³ In other words, science is an activity inasmuch as science is a doing, a discovery, a

¹¹ This term, which is featured in his later writings, finds little expression in any of his three books; he uses such terms as "understand", "insight" and "intuition"; "conception" is frequently used for this purpose in a different sense from its more specialized use elsewhere; "comprehension" is also used. See Personal Knowledge, pp. 90f and p. 91, note 1.

¹² Personal Knowledge, p. 49.

¹³ Cf. Lonergan, op. cit., p. 46: "Just as insight is a necessary intermediary between sets of measurements and the formulations of laws, so also it is needed in the reverse process that applies known laws to concrete situations."

testing and an applying. To the extent, then, that we are prepared to admit that science is an area of knowing and a source of knowledge, then we must say that it is a skilful activity. Thus Polanyi seeks to "grasp . . . the nature of the scientist's personal participation by examining the structure of skills."¹⁴

Having reached this far by a methodical exploration or examination of what science is really like, Polanyi hit upon his clue to the structure of knowing. His clue in the investigation was "the well-known fact that the aim of a skilful performance is achieved by the observance of a set of rules which are not known as such to the person following them."¹⁵

2. The Structure of the Tacit Component

The structure of practical skills. Polanyi's discussion of such skilful activities as bicycle riding and swimming helps to persuade his readers that there are skills that are truly known even when these skills have never been analysed so as to be made explicit, and when in fact such an analysis would be of little help to anyone who did not first possess the skill.¹⁶ To the extent that

¹⁴ Personal Knowledge, p. 49. In Lonergan's terminology (in Insight), which has certain advantages here, Polanyi seeks insight into the nature of the scientist's insights by examining the structure of skills.

¹⁵ Ibid., p. 49.

¹⁶ "To know a skill" equals "to know how to do something," and can only be articulated, if at all, in terms of an analysis and not in itself. In Polanyi's terminology it is a "practical knowledge". See Personal Knowledge, p. 50 and "Tacit Knowing", p. 603, where the recognition of a physiognomy is classed as an intellectual skill.

knowing has the structure of a skill, some implications are immediately obvious:

- (a) In the case of skills that cannot be fully analysed, transmission by prescription is impossible.¹⁷ Therefore a dependence upon a master-apprentice relationship is necessary,¹⁸ unless skills are to be allowed to disappear temporarily and perhaps permanently.¹⁹
- (b) In the case of skills that can be fully or largely analysed,²⁰ the implication is not as clear. Knowledge of the rules of art are not themselves a knowledge of the art. A person may know all the rules about how to swim, and not know how to swim. Such explicit rules must "be integrated into the practical knowledge of the art. They cannot replace this knowledge."²¹ Even if this integration is effected in such a way as to be made into a machine for present use and transmission, the machine

¹⁷ See Personal Knowledge, p. 53.

¹⁸ See above, pp. 15-20.

¹⁹ See Personal Knowledge, p. 295.

²⁰ The growth of industrialization had done this for many practical skills which in the past depended upon a traditional craft framework. There have been losses in the process, but there have also been gains. Standardization may have reduced the quality of a product as compared to the product of a master-craftsman, but it has also greatly increased the quality over the product of a poor craftsman.

²¹ Personal Knowledge, p. 50 (*italics mine*); as far as I have noticed this is the only use of the term in that work.

becomes itself a tool, an extension of a person's skill; we shall see²² that the knowledge of how to use tools also has a tacit structure.

In taking his initial clue from an articulate area of knowledge, Polanyi at least suggests that tacit knowing is to be understood as the integration of inarticulately known activities into an articulate knowledge. Actually, it is the "characteristic powers of integration"²³ exercised in tacit knowing which are inarticulate. In the knowledge of practical skills, the integrated knowledge of how to do something is ineffable; the rules of art upon which one relies may or may not have been articulated. However, most skilful performers will be able to articulate after analysis only a small proportion of the rules they follow. Sometimes such knowledge of the rules will be ineffable because it is subliminal,²⁴ but sometimes such knowledge will be potentially almost entirely explicit.²⁵

Two kinds of awareness. Polanyi develops a special terminology to describe the structure of skilful activities. When we ride a

²² See below, pp. 50f.

²³ "The Logic of Tacit Inference", p. 3.

²⁴ Ibid., pp. 5f, and "Tacit Knowing", p. 603.

²⁵ When Polanyi writes in "Tacit Knowing", p. 602, that such knowledge of the rules of an art is only known tacitly, he means that such knowledge can be only tacitly known while it is being integrated in an active performance.

bicycle we are aware both of successfully riding a bicycle and of moving the handlebars and changing speed - but in different ways. We are "focally aware of our intended performance and aware of its particulars only subsidiarily, by attending to the performance which they jointly constitute."²⁶ When we attend focally to what should be only subsidiarily attended to, the performance is marred or fails. If the hands are watched in piano playing, the performance ceases to provide the desired melody, etc. As a rule "the two alternative kinds of knowing do not completely extinguish each other."²⁷ An alternation between focal awareness of the hands and the melody may improve the performance - at least in the long run.

Although focal and subsidiary awareness are Polanyi's original terms, and continue to be used as a convenient shorthand, he defines the terms more carefully later. In particular, we should note that, by definition, subsidiary and focal awareness are simultaneously exclusive. We are subsidiarily aware of something or some action when, and only when, we are

²⁶ "Creative Imagination", Chemical and Engineering News, 44 (1966), 89 (*italics mine*).

²⁷ "Faith and Reason", Journal of Religion, 41 (1961), 239.

relying on our awareness for the purpose of attending to some entity or performance focally.²⁸

In summary, we may say that a practical skill is the result of a tacit integration of subsidiarily known rules upon which we rely for a skilful, focally attended to performance. The structure of skilful knowing is then the "structure of this integrative process, and knowing is tacit to the extent to which it has such a structure."²⁹

3. Physiognomy,³⁰ Perception, Wholes and Meaning

Polanyi derived the definition of subsidiary and focal awareness from the findings of Gestalt psychology, but it is

²⁸ "Tacit Knowing", p. 601: "We know subsidiarily the particulars of a comprehensive whole when attending focally to the whole which they constitute To the extent to which they are known subsidiarily in terms of something else, they cannot be known at the same time in themselves."

²⁹ Ibid., p. 602. This classification of knowing was suggestively labeled "gerundive knowing" by Carl Rogers in a discussion of one of Polanyi's lectures in 1962; see Richard L. Gelwick, Michael Polanyi: Credere Audi - His Theory of Knowledge and its Implications for Christian Theology (Ph.D. dissertation, Pacific School of Religion, 1965), p. 21, note 25. Dr. Gelwick had the opportunity of consulting with Polanyi during the preparation of his dissertation, and his dissertation was referred to in correspondence from Polanyi.

³⁰ "Tacit Knowing", p. 603: "The characteristic appearance of a disease; of the specimen of a species; of the mood in a face; of the identity of a person, I shall call their physiognomy." In Personal Knowledge, this term is not used, and the art of recognizing such a physiognomy is included under the category of connoisseurship.

obviously in his discussion of wholes³¹ of various kinds that his work is most dependent upon the work of this school of psychology. The parallelism between knowing how to perform some practical skill and knowing how to recognize a physiognomy or whole is so close that Polanyi calls the latter an "intellectual skill, in which a complex pattern of delicately graded features takes the place of a dexterously co-ordinated set of muscular acts."³² In fact, the parallelism is so close that there needs to be no repetition of the argument to show the structure of such recognition of wholes. The physiognomy may well be known and identified, whereas we may have no identifiable knowledge of the particular features which make up the whole. Conversely, we may be given a minute focal description of the features of a physiognomy but be unable to identify it. There is a tacit integration process which is achieved only by attending focally to the whole, while relying subsidiarily upon the particulars. It should be noticed again that it is this process which is the inarticulate characteristic of

³¹ Wolfgang Kohler, Gestalt Psychology (1947), pp. 177f: "In the German language . . . the noun 'Gestalt' has two meanings: besides the connotation of shape or form as an attribute of things it has the meaning of a concrete entity per se, which has, or may have, a shape as one of its characteristics . . . it is the meaning of Gestalt in which the word refers to a specific object and its organization that is now generally meant when we speak of Gestalt Psychology."

³² "Tacit Knowing", p. 603f.

tacit knowing; the particulars may or may not be articulated; the whole can be identified and designated, but only articulated in terms of the particulars.³³

This kind of intellectual skill does make possible a new kind of interpretation of the tacit process which can then be read backward into practical skilfulness and which can provide as well a link forward to those articulate domains of knowledge which are our major concern. "The characteristic physiognomy of a man may be said to be the meaning of the clues which point to it."³⁴ But, as is pointed out by Polanyi, this necessitates the recognition of two kinds of meaning. The more usual kind is when a word or symbol means something else. But in the case of physiognomy, a tune, a pattern, or the performance of a practical skill, their "meaning is somewhat problematic, for though they are clearly not meaningless, they mean something only in themselves [i.e., as wholes] We may describe the kind of meaning which a context possesses in itself as existential, to distinguish it from . . . representative meaning All kinds of order . . . have existential meaning, but contrived order usually also conveys a message."³⁵

³³ But when a particular is thus focally designated and ceases to function as a clue to some whole, "it looks different from what it looked like as a clue." See "Tacit Knowing", p. 604.

³⁴ "Tacit Knowing", p. 604.

³⁵ Personal Knowledge, p. 58.

With the application of meaning to the whole, Polanyi introduces the term understanding to describe the act of integration.³⁶ He parallels this term with intuition and insight and in a recent paper he says that "tacit knowing can . . . be identified with understanding."³⁷ With the introduction of "meaning" to describe the result of "understanding", Polanyi has moved philosophically outside the range of any narrow empiricism. For Polanyi, "understanding may be recognized as the faculty, cast aside by a positivist theory of knowledge, which the theory of tacit knowing acknowledges as the central act of knowing."³⁸ It is toward this type of affirmation that Polanyi was groping in Personal Knowledge when he talked about the dynamic character of making sense of particulars for some purpose or in some coherent context: there is intellectual effort involved on the part of the knower.³⁹

³⁶ Personal Knowledge, p. 91, note 1.

³⁷ "Tacit Knowing", p. 605. This lack of uniformity in usage, together with some suggestion of confusion, spoken of earlier (p. 43), as to whether tacit knowing is the process of understanding or an inarticulate, subsidiary component of understanding, is a confusing aspect of his major work. Although his later writings have moved to a more consistent usage, confusion will continue until a revision of Personal Knowledge appears.

³⁸ Ibid., p. 605.

³⁹ See pp. 61f.

Although the discussion of the intellectual skills associated with the recognition of wholes as the meaning of particulars has given a forward look into the larger domains of meaning, such skills are clearly associated with perception. Polanyi is not prepared to accept perception as a purely passive, sentient experience.

The origin of the intellectual striving which . . . shapes our understanding . . . must lie in an active principle. It stems in fact from our innate sentience and alertness, as manifested already in the lowest animals in exploratory movements and appetitive drives, and at somewhat higher levels in the powers of perception.⁴⁰

Polanyi acknowledges a debt to Gestalt psychology for much of the evidence showing that "perception is a comprehension of clues in terms of a whole."⁴¹ Seeing has supplied the material for the discoveries of this school, and Polanyi has expanded the discoveries "into a theory of knowledge."⁴² However, perception usually operates automatically, and the psychologists have given preference to "examples of the type in which perception goes on without any deliberate effort on the part of the perceiver and is not even corrigible by his subsequent reconsideration of the result."⁴³ Seeing is knowing, for Polanyi; but seeing is not an automatic physical operation.

⁴⁰ Personal Knowledge, p. 96.

⁴¹ Ibid., p. 97.

⁴² "Tacit Knowing", p. 605.

⁴³ Personal Knowledge, pp. 97f.

Seeing can be the paradigm for all knowing because it has the same structure as the tacit knowing so far discussed, and because the integrative process of perception is a form of intelligent effort. For this reason a series of illustrations is provided⁴⁴ to convince the reader that one must learn to see, in the sense of recognizing objects. Prior to such learning one experiences the world of sensation without controlling it intellectually.⁴⁵

If we rely on the evidence supplied by the Gestalt psychologists:

Seeing is an act of comprehension for which we rely, in a most subtle manner, on clues from all over the field of vision as well as on clues inside our body, in the muscles controlling the motion of the eyes and in those controlling the posture of the body.⁴⁶

If Polanyi has made his point, then the "act of comprehension" is an intelligent act of integration, the appearance of the perceived object with constant properties is the "joint meaning" of the clues,⁴⁷ and perception is a domain of tacit knowing.

⁴⁴ Personal Knowledge, pp. 96, 98f: "Tacit Knowing", p. 610; "Creative Imagination", Chemical and Engineering News, 44 (1966), 86.

⁴⁵ Personal Knowledge, p. 99: A baby, for instance, can "see only coloured patches of no definite shape or size, appearing at no particular distance and undergoing perpetual changes of shade and colour."

⁴⁶ "Faith and Reason", Journal of Religion, 41 (1961), 241; see also, "Tacit Knowing", p. 605 and "Creative Imagination", p. 86.

⁴⁷ "Logic of Tacit Inference", p. 7.

There are differences to be noticed between perception and skills as forms of tacit knowing. "In the case of perception we are attending to an object separated from most of the clues which we integrate into its appearance; [the subsidiarily known clues or parts] and the [focally known whole] are then largely different objects, joined together by tacit knowing."⁴⁸ In the case of the appearance of a physiognomy, the subsidiarily known clues consist "of things seen in isolation and the [focally known whole] consists of the same things seen as a coherent entity."⁴⁹ In the case of a skilful performance, the particular activities may be known in isolation, but the performance consists of the same activities integrated into a coherent performance. But these differences do not touch upon the characteristic structure of tacit knowing, namely, "the powers of integration, merging the subsidiary into the focal."⁵⁰ The meaning which is understood in each case is something less tangible than the clues, something more intelligible, something less 'already out there now real'.⁵¹

⁴⁸ "Logic of Tacit Inference", p. 3 (*italics mine*); object is a dubious term to apply to muscle contractions and sentient experience.

⁴⁹ Loc. cit.

⁵⁰ Loc. cit.

⁵¹ See "Logic of Tacit Inference", p. 4; and above, p. 21, note 62.

4. Tools and Language

All the characteristic features of the structure of tacit knowing apply to the skilful use of tools.⁵² However, it is when our skilful use of tools is compared with practical skills not making use of external tools, that another important aspect of tacit knowing is disclosed: "We endow a thing with meaning by interiorizing it and destroy its meaning by alienating it."⁵³ That is, a tool is used skilfully in proportion to its use as an extension of the body; we become as little aware of the tools focally as we are of our bodily actions. The batter hitting the ball feels the bat hitting the ball rather than the actual impact of the bat on his palm and fingers and reacting against his muscles. He is only subsidiarily aware of these particulars as long as he is batting.⁵⁴

Thus our "subsidiary awareness of tools and probes can be regarded now as the act of making them form a part of

⁵² "Tools are akin to the particulars of a comprehensive entity, for an object is a tool by virtue of the fact that we rely on it for accomplishing something to which we are attending when using the tool." A skilful performance, whether through use of a tool or through bodily movements alone "is paralysed by attending focally to its particulars." ("Tacit Knowing", p. 604, italics mine) A tool is . . . another example of the merger "of a thing in a whole (or a gestalt) in which it is assigned a subsidiary function and a meaning in respect to something that has our focal attention." (Personal Knowledge, p. 61, italics mine)

⁵³ "Logic of Tacit Inference", p. 9.

⁵⁴ When he has been 'caught out' he may become focally aware of his still tingling fingers!

own body."⁵⁵ Polanyi describes this rather rhetorically in Personal Knowledge. But in more careful language elsewhere, he says:

We may say that when we learn to use language,⁵⁶ or a probe, or a tool, and thus make ourselves aware of these things as we are of our body, we interiorise these things and make ourselves dwell in them. Such extensions of ourselves develop new faculties in us; our whole education operates in this way; as each of us interiorises our cultural heritage, he grows into a person seeing the world and experiencing life in terms of this outlook.⁵⁷

We may be said to live in the particulars which we comprehend, in the same sense as we live in the tools and probes which we use and the culture in which we are brought up.⁵⁸

The structure of tacit knowing can now be understood "as an act of indwelling by which we gain access to a new meaning."⁵⁹

The establishment of the tacit structure of language, itself, is a major plank in Polanyi's analysis of tacit knowing. We rely on language as a pointer to its meaning, namely, that to which we attend, that to which the language points.⁶⁰ At the simplest level, language means that which it denotes.

⁵⁵ Personal Knowledge, p. 59.

⁵⁶ In Personal Knowledge, p. 59, he explains: "Hammers and probes can be replaced by intellectual tools."

⁵⁷ "Logic of Tacit Inference", p. 10.

⁵⁸ Ibid., p. 11.

⁵⁹ "Tacit Knowing", p. 606.

⁶⁰ See Personal Knowledge, pp. 57-59.

If we become focally aware of a word, it will lose its meaning. In other words, an attempt to analyse a word (or language), to find its definition (or grammar), is akin to an analysis of the use of a tool or the performance of a skill. Such definitions are only guiding rules or maxims. This kind of knowing about how to use a word must be integrated into a knowledge of the use of the word which is its meaning. It is this integration which is inarticulate or tacit.

Such a tool-like aspect of language is discussed at a more subtle level by contrasting text and meaning. In this case the text may be much more complex and not denotative in the primary sense. Although the meaning is verbally conveyed, the text is but a verbal tool upon which one depends subsidiarily. The meaning may be retained when the text can no longer be remembered focally. Polanyi illustrates this with a personal anecdote:

My correspondence arrives at my breakfast table in various languages, but my son understands only English. Having just finished reading a letter I may wish to pass it on to him, but must check myself and look again to see in what language it was written. I am vividly aware of the meaning conveyed by the letter, yet know nothing whatever of its words. I have attended to them closely but only for what they mean and not for what they are as objects. If my understanding of the text were halting, or its expression or its spelling were faulty, its words would arrest my attention. They would become slightly opaque and prevent my thought from passing through them unhindered to the things they signify.⁶¹

⁶¹ Personal Knowledge, p. 57.

This kind of knowledge, or meaning, resembles in its tacitness the kinds of knowledge that I have described as ineffable, but differs from them profoundly by its verbal origin Tacit knowledge is manifestly present, therefore, not only when it exceeds the powers of articulation, but even when it exactly coincides with them, as it does when we have acquired it a moment before by listening to or reading a text.⁶²

Besides analysing the use of language as a tool, Polanyi hints at the consideration of language as an extension of perception in the way that knowledge of wholes is so considered. Thus, in one of his most recent articles, the discussion of the tacit knowledge of words is introduced immediately after that of perception: "A set of sounds is converted into the name of an object by an act of tacit knowing which integrates the sounds to the object to which we are attending."⁶³ This would be a follow-up to the earlier discussion of gestalt-wholes,⁶⁴ in which the notion of a new kind of meaning, an existential meaning was introduced; this was the meaning that such a whole as a physiognomy has in itself. To consider the object as the meaning of subsidiarily relied upon words, is to use meaning in the more familiar representative sense. But then a new kind of whole comes into view.

⁶² Personal Knowledge, pp. 91f.

⁶³ "Logic of Tacit Inference", p. 8.

⁶⁴ See above, pp. 47f; p. 52, note 52.

Polanyi chooses to regard the word and object as amalgamated or integrated into one whole.⁶⁵ One comes to know a language by learning how to integrate word and object into that whole which is the recognized meaning of the word. This integrative process is tacit and personal; therefore, there is a sense in which words do not mean anything in themselves; the person means something by their use; the hearer understands something by their use; a personal message is conveyed and a personal message is received.⁶⁶

Thus, at its most elementary denotative level, language involves the integration of a perceived word or sign upon which one relies subsidiarily, and a perceived (or remembered or imagined) object upon which one also relies subsidiarily, into the sign-object whole to which one attends focally.

The basic point which Polanyi had made in his criticism of an objective, impersonal understanding of science was "that in all applications of a formalism to experience

⁶⁵ See Personal Knowledge, p. 50: "The distinction between two kinds of awareness allows us readily to acknowledge these two kinds of wholes and two kinds of meaning." See also "Tacit Knowing", p. 605.

⁶⁶ See Study of Man, p. 22'.

there is an indeterminacy involved."⁶⁷ It was this indeterminacy which set him off on an examination of tacit knowing. At this point he claims to have shown an "extension" of this indeterminacy in that "the process of applying language to things is also necessarily unformalized: that it is inarticulate."⁶⁸

5. Operational Principles of Language and Universals

In a further analysis of language, Polanyi shows why he regards "the unspecifiable part of knowledge as the residue left unsaid by a defective articulation."⁶⁹ He calls the first operational principle of language to which attention is drawn, the representative, and the second, the operative. Since words must be used frequently enough for "the meaning of a word to be found and manifested by its repeated usage,"⁷⁰ a language must use a limited number of words. On the other hand, words must be used consistently if they are to have any definite meaning. Thus the necessary poverty of words involves the need for some integrative act of generalization such that words can be taken to designate "a class to which we attribute a substantial

⁶⁷ Personal Knowledge, p. 81.

⁶⁸ Loc. cit.

⁶⁹ Ibid., p. 88.

⁷⁰ Ibid., p. 78.

quality."⁷¹

Since the meaning or message that can be expressed by words is thus limited, language needs a grammar so that "combinations of words can jointly express an intended meaning."⁷² Just as the necessity of limiting the number of words opened up a new door to the intelligent use of language by what might well be classed as another operational principle of language, so the necessity of grammar opens up a new door to the intelligent manageability of language. This operative principle permits a reorganizing of words in such a way as to reveal new aspects of experience. Within this domain of the symbolic the tacit coefficient of language seems virtually to disappear, since to operate symbols is to articulate. But this is a false supposition. The operation of symbols can be extended to the point that we do not fully understand our own operations.⁷³ At this point, our operations have become ineffable, and until our ineffable operations become articulate through a re-integration with our tacit knowledge, there will exist a state of mental uneasiness. There is no complete set of rules to predict the outcome. There

⁷¹ Personal Knowledge, p. 80.

⁷² Ibid., p. 79.

⁷³ Ibid., p. 79: Just as "utterances without definite meaning are not language," so the operation of symbols without understanding cannot be said to be articulation.

may be a decision to correct or modify the use of language to integrate it once again with our tacit knowledge. There may be a decision to re-integrate by a new understanding of the language with all the implications this may eventually lead to in our understanding of the universe. Or, we may simply dismiss as meaningless the text resulting from these operations. In other words, even the highly formalized operations of a deductive science or of logic, in which new empirical experience plays no part, involves a tacit understanding of the significance of the operations which has, at least potentially, profound implications for the understanding of experience.

In summary:

A tacit coefficient now appears to be integral to all explicit statements. The bearing of a statement on experience can only be known tacitly; no statement can carry conviction unless it is understood, and all understanding is tacit.⁷⁴

6. Universals and Empirical Induction

Language is a tool which enables the preservation and communication of knowledge, and permits us to re-organize our knowledge in such a way as to provide clues for further knowledge. As a tool, the use of a language has a tacit structure. Beyond this, a language cannot be rich enough to supply a separate tool for each intellectual activity; this

⁷⁴ "Tacit Knowing", p. 605.

necessary poverty of a language has led to universal constructs and to grammatical rules. And so the question arises as to "how the same term can apply to a series of indeterminately variable particulars."⁷⁵ Polanyi rejects modern or traditional nominalistic theories which teach "that general terms are merely names designating certain collections of objects."⁷⁶ Rather, he claims:

Languages are the product of man's groping for words in the process of making new conceptual decisions, to be conveyed by words. Different languages . . . sustain alternative conceptual frameworks, interpreting all things that can be talked about in terms of somewhat different allegedly recurring features.⁷⁷

The use of general terms has three strata of intensions: the first "comprises the readily specifiable properties which a class of things are known to share apart from their common key-figure."⁷⁸ The second "comprises the known but not readily specifiable properties which these things share Hence the fruitfulness of a Socratic enquiry into the meaning of words."⁷⁹ The third and deepest level of intensions is formed "by the indeterminate range of antici-

⁷⁵ Personal Knowledge, p. 113.

⁷⁶ Loc. cit.

⁷⁷ Ibid., p. 112.

⁷⁸ Ibid., p. 115.

⁷⁹ Loc. cit.

pations expressed by designating something This intension comprises a range of properties which only future discoveries may reveal - confirming thereby the rightness of the conception conveyed by our term."⁸⁰

In Personal Knowledge, Polanyi points to this capacity for conceiving objective classifications as an extension of the tacit knowing involved in articulation. The analysis of this structure is more complete in later papers; in these works the problem of how a universal concept is formed⁸¹ is tackled by examining the perceptual paradigm of knowing "in which we rely on our awareness of a great many clues to which we are not attending at the time, for seeing things in a particular way which is the meaning of these clues comprehended by us."⁸² In the forming of universal concepts to designate collections of objects the process is similar, but the data is supplied by many particulars which do not have a common local or temporal setting.

Polanyi deals with two special points concerning the formation of such concepts. He asks first whether there is

⁸⁰ Personal Knowledge, p. 116.

⁸¹ See "Tacit Knowing, p. 609, where the problem of universals is stated: "Plato was the first to be troubled by the fact that in applying our conception of a class of things, we keep identifying objects that are different from each other in every particular."

⁸² "Tacit Knowing, p. 609.

"any evidence that tacit knowing can establish a uniform meaning for clues, which, regarded in themselves, have nothing that is the same in them."⁸³ In giving an affirmative answer, examples are given from the field of perception to show that "tacit knowing can in fact integrate conflicting clues in various ways."⁸⁴ When using a stereoscope, for instance, a different and contradictory visual clue is presented to the different eyes, and the tacit act of perception resolves the contradiction by forming a new "stereoscopic image", which reveals the "joint meaning of conflicting clues"⁸⁵ in terms of a new quality.

The case of a general or universal term is considered to be analogous:

In speaking of man in general we are not attending to any kind of man, but relying on our subsidiary awareness of individual men, for attending to their joint meaning. This meaning is a comprehensive entity The concept represents all men - past present and future - jointly, and the word 'man' applies to this comprehensive entity.⁸⁶

⁸³ "Tacit Knowing", p. 610.

⁸⁴ Ibid., p. 610. The illustration not mentioned is the case of a solution involving an optical illusion. See pp. 607f, for the Ames experiment.

⁸⁵ Ibid., p. 610.

⁸⁶ "Logic of Tacit Inference", p. 11.

Despite this similarity, Polanyi raises the question of the differences between a perceptual and a conceptual joint meaning. Compared with stereoscopic images, "general conceptions are abstract, featureless;"⁸⁷ there is a "curiously unsubstantial character"⁸⁸ to the joint meaning. He concludes that the tacit powers of knowing "can focus our attention on the joint meaning of particulars, even when the focus to which we are attending has no tangible centre."⁸⁹ The argument has importance for us in terms of other aspects of Polanyi's analysis of cognitional structure, but it is difficult to see its necessity here. Does the three-dimensional stereoscopic image have any more tangible centre than a universal concept? It is true that we 'see' it, but what we see

⁸⁷ "Tacit Knowing", p. 610.

⁸⁸ Ibid., p. 610. Polanyi is quite careless in his use of such metaphysical terms as 'unsubstantial'. Here, he appears to be using it in a quite common sense way; in a similar consideration of universals in the "Logic of Tacit Inference", p. 13, he says of the concept of the mind that its indeterminacy makes it "the more real, the more substantial;" and of the complex entity which a universal is, he writes: "The metaphysical claim of tacit knowing requires that this entity be real." (p. 11) In Personal Knowledge there is expressed the hope that "the conceptions to which [man] is committed are true." (p. 112) Polanyi approaches a technical use in which "to be true," "to be real," and "to be substantial" seem to be used interchangeably.

⁸⁹ "Tacit Knowing", p. 611. The use of "unsubstantial" earlier seems to be the equivalent of saying that the joint meaning "has no tangible centre."

is only 'appearance' according to any crudely realistic philosophy.⁹⁰ If such an image is real, it is not because it is 'seen'!

The problem of how a universal concept is formed is part of the problem of empirical induction.⁹¹ A set of strict rules for deriving general laws from individual experience fails because "each instance of a law differs . . . in every particular from every other instance of it."⁹² Such variable experiences can "be subsumed under the same law only by relying on our awareness of them as clues to it"⁹³ The integrative procedure is the same as that of forming universal concepts, and it "does not essentially differ from that of perception"⁹⁴ to which Polanyi affiliates it. In other words, "the discovery

⁹⁰ In fact, what we 'see' could only be termed an optical illusion by such a philosophy. In any case, perception can be wrong, although "it certainly has a considerable likelihood of being true." (Ibid., p. 612) It is Polanyi's claim that "we must accept the veridical powers of perception as the roots of empirical science." (Ibid., p. 612f) If we are prepared to do this despite the possibility of error in the tacit integration of perception, then "we cannot reasonably refuse to accept other tacit veridical processes having a similar structure." (Ibid., p. 613).

⁹¹ "Tacit Knowing", p. 609.

⁹² Loc. cit.

⁹³ Loc. cit.

⁹⁴ Ibid., p. 612.

of a theory integrates observations into their theoretical appearance.⁹⁵

7. Summary

The structure of tacit knowing is that of a tacit integration of subsidiary elements into a focal element. By definition, one is not focally or explicitly aware of subsidiary elements in the process of tacit knowing. We rely on the subsidiary elements as rules or maxims or tools; we attend to the performance of practical skills or intelligent skills. We rely on the subsidiary elements as clues to the meaning of more comprehensive entities or of a language. The necessary poverty of a language involves a tacit development of universal classifications and of grammar. We rely on practical and intellectual tools, including language and other articulate systems of thought, as we rely on our own body; so we can be said to dwell in the intellectual framework or culture on which we rely. We acquire practical and intellectual skills by literally dwelling in our bodies and in a culture, and by accepting our reliance on these; in the latter case this involves an act of affiliation with intellectual and

⁹⁵ "Logic of Tacit Inference", p. 3 (*italics mine*). Polanyi does not use "appearance" in a derogatory sense, as designating the "not real" aspect of the "already out there now" object. In perception, the appearance is the meaning of the sense data; in the integration of parts, the whole is the joint appearance, the meaning of the parts; and so, in discovery, the theory is the theoretical appearance or joint meaning of the clues. Presumably "theoretical" indicates that such a use of "appearance" is by way of analogy; the appearance, which is a theory, is not seen nor is it tangible.

social communities, and in the former case an identification of ourselves as body-mind wholes. All knowledge relies on this tacit reliance on our bodies (or perception) and upon our intellectual framework (or tradition); but of these perception is held to provide the more basic paradigm for all knowing.

Although perception is a tacit process, it is not a passive one; it involves the intellectual integrating activity of the person in making sense of the given sentient data. Thus in every area of tacit knowing there are three elements upon which we rely, three elements which we trust, three aspects which call for belief. There is a reliance on the perceptual power of our bodies in which we dwell, on the authority of the traditional framework in which we also dwell, and upon the tacit integrative process as an act of our tacitly intellectual and logical passions making sense of a real world.

PART II
EVALUATION

INTRODUCTION

The first part of this paper has been in the form of an introduction to Polanyi's thought. The first chapter presented the main outline of his cognitional theory in Personal Knowledge, whereas the second chapter elaborated one central element of his theory, the structure of tacit knowing. The attempt has been made throughout to show the major shape of his argument, prescindng from any discussion of elements which are either an extension of his basic theory or which seemed to involve conflicts with the main thrust of his theory.

This part of the thesis, the evaluation, will proceed in two steps. This chapter involves an examinatin of the structure of knowing presented by Polanyi in the light of one major question: does it correspond to the actual data of consciousness, to the way we are conscious of ourselves as knowing? The next chapter will turn primarily to an evaluation of some of the broader philosophical implications of his theory of knowledge. Towards the conclusion of that chapter we will look briefly at the implications of his theory for the area of theology.

Because of our concern to present only the basic framework of Polanyi's thought in the first chapter, it will be necessary in these evaluative chapters to introduce new material: (i) material which seems to be at odds with his basic theory, (ii) material which might improve his basic theory had he appreciated its implications, and (iii) that material which represents Polanyi's extension of his basic theory into the field of religion.

CHAPTER III

EVALUATING THE COGNITIONAL STRUCTURE

1. Facit Knowing as One Component in the Total Structure of Knowing

Attention has been drawn earlier¹ to Polanyi's distinction between the general structure of tacit knowing and the particular coefficient of tacit knowing operating within articulate systems of thought. Again, a distinction is made² between the act of verification and that of validation, both of which utilize tacit powers. The quotations which follow draw attention to the act of discovery which presumably results in the content asserted by the act of assent; both acts, claims Polanyi, are tacit and logically akin. Moreover, discovery apparently moves from experience, through tacit knowing to a content which is asserted by reference back to experience.

¹ See above, p. 37.

² See above, pp. 26ff.

The act of assent proves once more to be logically akin to the act of discovery; they are both essentially unformalizable, intuitive mental decisions.³

The difference between the two lies in the width of the logical gap that is being crossed.⁴

An articulate assertion is composed of two parts: a sentence conveying the content of what is asserted and a tacit act by which this sentence is asserted. The articulate assertion can be tested by separating its two parts and tentatively cancelling the act of assertion, while the unasserted sentence is being confronted with experience.⁵

We have discussed the type of belief involved in the holding of second-hand knowledge⁶ - a belief which trusts the authority of the teachers of the tradition - and the act of affiliation by which "the novice accepts apprenticeship to a community which cultivates this lore, appreciates its values and strives to act by its standards."⁷ In the previous chapter we have seen the range of tacit knowing extending from the act of perception to the intellectual acts of knowing universals and of empirical induction. Since the publication of Personal Knowledge, Polanyi has worked out very carefully the structure of tacit knowing, and has supported his description

³ Personal Knowledge, p. 261.

⁴ Loc. cit.

⁵ Ibid., p. 254.

⁶ See above, pp. 15-20

⁷ Personal Knowledge, p. 207.

with ever more evidence from the various empirical sciences.⁸

The question that needs now to be raised is whether tacit knowing is but one element in the total structure of knowing. Is the similarity in structure of all instances of tacit knowing the whole story? Has Polanyi really looked at all the forms of tacit knowing which he mentions to discover whether they all have the same structure? Do not the instances of tacit knowing (alike or different in structure) demand to be treated themselves as a part of the particular data to be relied upon subsidiarily in an attempt to focus on the overall structure of knowing?⁹ In Personal Knowledge there seems to be some sort of hierarchical structure of knowing with articulate level built upon articulate level and each separated by a logical gap crossed only by an act of tacit knowing;¹⁰

⁸ See Gelwick, op. cit., p. 221f. He suggests that this has been done partly as a strategic retreat and as a first step in building up support for the controversial necessity of basing such knowledge on profoundly metaphysical and religious commitments if one is not to escape from an impersonal objectivity which destroys the reality of the knower into a personal subjectivity which destroys the reality of the known.

⁹ Lonergan, in Insight, speaks of such data as part of the data of consciousness, to be integrated and affirmed by introspective insights (introspective tacit acts, in Polanyi's terms) as the ground for rational self-affirmation. See pp. 274f and Ch. II.

¹⁰ Personal Knowledge, pp. 260f.

in some of his recent papers Polanyi speaks of tacit knowing as penetrating its object in stages.¹¹ These hints suggest that close attention should be paid to the total structure of knowledge that may be implicit in his theory.

A structure of articulate knowledge. The clearest hint of such a structure is given in terms of mathematical problem solving.¹² Polanyi accepts the grammar of discovery outlined by H. Poincaré,¹³ in four stages: Preparation, Incubation, Illumination and Verification.¹⁴ The actual discovery¹⁵ follows upon the illumination, which is "the leap by which the logical gap is crossed,"¹⁶ the "informal act of discovery"¹⁷

¹¹ See "Tacit Knowing", p. 610. See also "The Structure of Consciousness", Brain, LXXVIII (Nov., 1965), 803ff, and Personal Knowledge, p. 327.

¹² Personal Knowledge, p. 125: "It seems to me that any serious attempt to analyse the process of discovery should be sufficiently general to apply to all fields of systematic knowledge, and I should like to contribute to this programme here by identifying and acknowledging the powers on which we rely in solving mathematical problems."

¹³ Science and Method, London (1914), referred to in Personal Knowledge, pp. 121, 261. Polanyi uses the terminology of G. Wallas, The Art of Thought, London (1946), pp. 40ff.

¹⁴ In mathematics, validation would be Polanyi's term rather than verification; see Personal Knowledge, p. 121, note 3.

¹⁵ In Personal Knowledge, p. 121, the term used is "tentative discovery"; on p. 130, it is "supposed discovery".

¹⁶ Ibid., p. 123.

¹⁷ Ibid., p. 261.

an "insight"¹⁸ or an "intuitive mental decision."¹⁹ In other words, illumination is the stage in discovery with which Polanyi has dealt extensively in his analysis of tacit knowing. One might only emphasize again what he has said concerning the similarity of this structure with that of the integration of subsidiary particulars into a focally known whole by noting his approval of the heuristic maxim of G. Poya: "Look at the unknown!"²⁰ As interpreted by Polanyi, this really means "that we should look at the known data, but not in themselves, rather as clues to the unknown; as pointers to it and parts of it."²¹ We have a conception of the solution "in the same sense as we have a conception of a forgotten name. By directing our attention on a focus in which we are subsidiarily aware of all the particulars that remind us of the forgotten name, we form a conception of it."²² The formulation of a discovery follows, then, upon a tacit act of discovery. The tacit act of discovery depends upon the preparation which

¹⁸ Personal Knowledge, p. 121.

¹⁹ Ibid., p. 261.

²⁰ How to Solve It, p. 112 as quoted in Personal Knowledge, p. 127.

²¹ Personal Knowledge, p. 127.

²² Loc. cit.

includes the presentation of the pertinent mathematical clues or data.²³ But this leaves out of account the final stage in the grammar of discovery, namely, Verification.²⁴

Polanyi acknowledges that the discovery "is only the envisagement of a solution which has yet to be tested."²⁵ The envisagement of the solution involved a tacit act of discovery; although the verification relies upon explicit symbolic operations, this formal computation "depends on tacit affirmations, both at the beginning and the end of each chain of formal reasoning."²⁶ Polanyi claims that this act of assent is logically akin to the act of discovery.²⁷

²³ Such tacit integration in mathematics may use as data conceptual data which has no experiential reference - data which cannot be defined descriptively, but only in their relationships. Although this is not so obvious in the case of empirical discovery, many concepts of empirical science refer to the properties of things, which are only defined in the formulations of the discovery and are not properties which can be experienced and descriptively defined.

²⁴ Discussion of the incubation stage is omitted; it is a stage the readers will be familiar with in their own experience, and from the point of view of a theory of knowledge rather than a pragmatic method it can be assimilated with the stages on either side.

²⁵ Personal Knowledge, p. 130.

²⁶ Ibid., p. 131.

²⁷ Ibid., p. 261.

In other words, a tacit component of knowing enters into the overall structure of articulate knowing in at least two stages - as the act of discovery and as the act of assent or assertion.

It does not appear immediately obvious that the structure of the act of assent is logically akin to the act of discovery: - except that both do involve a tacit component. Polanyi's analysis of discovery is his achievement; another vital question is the structure of the act of assent, or of the validation-verification of the discovery. This is the act of personal commitment to the truth of the discovery. Polanyi's failure to follow up the structure of this act would seem to contribute to his difficulty in grounding man's knowledge in a way that avoids an atomistic subjectivity or a traditional authoritarianism.²⁸

Is there any significance in the fact that Polanyi makes no attempt to translate Poincaré's structure of discovery from the domain of mathematics to that of empirical science? If this were done, the act of verification could not be entirely written off as a tacit act of the intellectual passions, a validation. However dependent the selection of empirical evidence for verification may be upon the heuristic expectations of the scientists,²⁹ the discoveries of the empirical sciences

²⁸ See below, pp. 114ff, 121-125.

²⁹ Whether these expectations be those of the new discoverer or of the critical scientific community. See Personal Knowledge pp. 30, 167.

are to some degree grounded through subsequent empirical verification.³⁰

Polanyi recognizes the importance of the validation of knowledge; in fact, his emphasis is upon the need for the assertion concerning the truth of things rather than a kind of false detachment which pretends to hold all knowledge as hypothetical. Yet all that he says about this tacit act of verification involved in assent makes it ultimately dependent upon either an a-critical belief³¹ in and affiliation with a society maintaining an articulate system of knowledge, or upon the intellectual passions. The "intellectual beauty of a theory is a token of its contact with reality,"³² and "truth lies in the achievement of a contact with reality."³³ A "theory has an inarticulate component [namely, the intellectual

³⁰ Would the structure of verification be the reverse of integration, perhaps even akin to destructive analysis? For this suggestion see Personal Knowledge, p. 115.

³¹ "A-critical" is a shorthand word for Polanyi to indicate the tacit quality of a belief, which is therefore free from explicit criticism and subject only to tacit doubt. See below p. 114 and note 83.

³² Personal Knowledge, p. 145.

³³ Ibid., p. 147.

passions] acclaiming its beauty, and this is essential to the belief that the theory is true."³⁴ But what is he actually saying? The intellectual passions judge the intellectual beauty of a theory, and thus affirm its truth. To be beautiful is to be true, and beauty is affirmed tacitly. Does this claim anything more than that a person may be competent to affirm the truth he believes he has discovered?

By making validation the really significant component of the act of knowing rather than verification, Polanyi has opened the door to a rather dubious type of terminology, i. e., to talk about different kinds of reality which are *indwelt* rather than affirmed and about which one can make true assertions without affirming their existence as facts. When we affirm the statements of mathematics, our affirmation "betokens the reality of its conceptions and the truth of its assertions."³⁵ Thus a scientific theory "which calls attention to its own beauty, and partly relies on it for claiming to represent empirical reality, is akin to a work of art which calls attention to its own beauty as a token of artistic reality."³⁶ In mathematics, the arts, and in religion, "thought operates indwellingly within a universe of its own creation."³⁷ The

³⁴ Personal Knowledge, p. 133.

³⁵ Ibid., p. 192.

³⁶ Ibid., p. 133; see p. 201.

³⁷ Ibid., p. 195; see p. 199.

utterances of these domains "denote no tangible object;"³⁸ and so "God cannot be observed, any more than truth or beauty can be observed." He exists "not as a fact," and "religion, considered as an act of worship, is an indwelling rather than an affirmation."³⁹ It would be unfair, perhaps, to place too much emphasis upon the significance of these quotations⁴⁰ when they are brought together out of their immediate context. Yet they do point up certain limitations in Polanyi's analysis of the structure of knowing and a certain carelessness in the use of terminology centering about the final stage of the structure.

In summary, discovery occupies the centre of Polanyi's analysis of the total structure of knowing. The process of affirming the truth of discovery tends to be entirely merged with the act of discovery itself. "Discovery, or supposed discovery, will always come to us with the conviction of its being true. It arrives accredited in advance by the heuristic craving which evoked it."⁴¹ Within the realm of empirical

³⁸ Personal Knowledge, p. 193.

³⁹ Ibid., p. 279 (*italics mine*).

⁴⁰ And it may be that Polanyi means no more in speaking of different kinds of reality than he does when he speaks of the hierarchical character of knowledge and the gradual penetration to the knowledge of more comprehensive entities which are increasingly real. See "Tacit Knowing", p. 610.

⁴¹ Personal Knowledge, p. 130

science Polanyi's own dictum concerning the positivists provides the necessary safeguard: "A scientist can accept . . . the most inadequate and misleading formulation of his own scientific principles without ever realizing what is being said, because he automatically supplements it by his tacit knowledge of what science really is, and thus makes the formulation ring true."⁴² But within the other domains of knowledge, one could ask for a criterion for validation less independent of empirical experience and more consistent with his own assertion that "the acceptance of different kinds of articulate systems as mental dwelling places . . . all . . . depend to some extent on the content of relevant experiences;"⁴³ even for some religions, he claims, "doubt directed against clues as facts may thus shake the internal evidence of the system."⁴⁴ Although there may be different levels of reality, surely there are not different kinds of reality in the sense that some kinds exist and some do not.⁴⁵

Another method than that of exact sciences. It should be remembered that, for Polanyi, the empirical experiences or perceptions which provide the clues for empirical sciences and

⁴² Personal Knowledge, p. 169.

⁴³ Personal Knowledge, p. 202.

⁴⁴ Ibid., p. 236.

⁴⁵ See above, p. 78 and note 40; and below, pp. 107ff.

in some sense for the acceptance of the framework of mathematics, art and religion, are themselves the result of an intelligent integration of sensory and bodily clues. A percept is a tacit integration of the meaning of such clues relative to us, i.e., descriptively. This means that perception partakes of the same structure as that of the articulate knowing discussed in the previous section under the designation, grammar of discovery.

The tacit integration of the given clues into a percept or into an articulate formulation is similar. The total structure is the same. But a question must be asked about the similarity of the "entities" one becomes focally aware of. Is a formulation which expresses relationships among clues the same kind of "entity" as a percept which expresses some kind of intelligible, yet concrete, unity or wholeness in the clues? It may appear to be quibbling to question the similarity of structure between a kind of tacit knowing which integrates clues into a whole and one which integrates clues into one formulation of relationships. But to emphasize the similarity of the structure in this case may be to overlook the difference between the entities that are perceived and those that are discovered; this oversight could well cause trouble in a full metaphysical expansion of Polanyi's philosophy. At the level of cognitional description it means that Polanyi is very loose in his use of terms: thing, object, entity; discover; and to a certain extent, true and real.

In one of his latest papers, Polanyi has given an excellent thumb-nail sketch of the difference in method between the exact and the life sciences:

The ideal of the exact sciences, derived from mechanics, aims at a mathematical theory connecting tangible, focally observed objects The structure of biology is very different from this ideal The particulars of living beings are known as such by attending from them to their joint meaning which is the life of the organism. . . . Thus the tangible focal objects of exact science have been split into two halves. We have the tangible bodies of living beings that are not viewed focally, while at the focus of attention we have such intangible things, as life and mind.⁴⁶

The overall structure of this method of empirical knowing can be set forth briefly:

Tacit knowing may penetrate its object in stages. We may first recognize a man, then discover what he is doing, then again realize what his motives might be, and eventually reconsider our conception of his personality. An aspect apprehended by the integration

⁴⁶ "Logic of Tacit Inference", p. 13. See also Lonergan's Insight, p. 463: "In physics and chemistry, measuring is a basic technique that takes inquiry from the relations of things to our senses to their relations to one another. But when one mounts to the higher integrations of the organism, the psyche, and intelligence, one finds that measuring loses both in significance and in efficacy Classical method can select among the functions that solve differential equations by appealing to measurements and empirically established curves. What the differential equation is to classical method, the general notion of development is to genetic method. But while the differential equation is mathematical, the general notion of development is not. It follows that . . . measurement . . . possesses no assignable efficacy when it comes to particularizing the general notion of development."

of elementary particulars thus becomes, in its turn, a clue to a more comprehensive entity, and so on. I have also hinted that we thus gradually penetrate to things that are increasingly real.⁴⁷

That this particular method of knowing is part of mathematical development (and consequently of the empirical sciences whose method depends upon mathematical correlations) does not entirely escape Polanyi's attention.⁴⁸ In this method there are clearly "various levels of knowledge" which "form a hierarchy of comprehensive entities."⁴⁹ In this hierarchy one can distinguish the similar tacit structure of each step, starting

⁴⁷ "Tacit Knowing", p. 610. A more fully developed statement of his Body - Mind theory is to be found in "The Structure of Consciousness", Brain, 88 (1965). See also Personal Knowledge, particularly in Chapter 11, pp. 327-346, but also pp. 174-184 and the conclusion of Section 10, p. 264.

⁴⁸ See Personal Knowledge, p. 261. He speaks of the method of mathematical induction which Poincaré regarded as the prototype of all mathematical innovation:- "It starts by proving a series of theorems which apply to successive whole numbers, each consecutive theorem being derived from the previous one, and proceeds to conclude that the theorem is true generally for all numbers. To draw such inferences the mind must look back upon a series of demonstrations and generalize the principle of its own past operations." This whole process is set out in a very helpful manner in Lonergan, op. cit., pp. 13-19; there he analyses 'development' which is later taken up into his genetic method, a method similar to Polanyi's unnamed biological method.

⁴⁹ Polanyi, "Science and Man's Place in the Universe", in Harry Woolf, ed., Science as a Cultural Force (1964), p. 70.

with perception, knowledge of whole, . . . on to knowledge of minds and persons. There is a very real sense in which it is this particular method of knowing which is of chief interest to Polanyi,⁵⁰ and as he analyses the structure of tacit knowing it is the steps in this hierarchy which he has in mind.

Yet the question remains as to whether he has clearly distinguished the method of the exact sciences from biological method. The question is raised for us at an important level by such a statement as this:

All knowledge is based on indwelling, and this is how the consecutive stages of indwelling form a continuous transition from the understanding of the inanimate to the understanding of man's moral responsibility From the minimum of indwelling, exercised in a physical observation, we move without a break to the maximum of indwelling which is a total commitment.⁵¹

Thus we conclude that Polanyi fails fully to explain tacit knowing, as one recurring component in the whole structure of knowing; and he fails to distinguish clearly different methods of empirical discovery. Does not a theory of knowledge, which is knowing about knowing, use for its clues these very methods which are the stages or moments within the whole structure of knowing?

⁵⁰ He uses the similarity in the structure of evolutionary and child development to help in grounding his theory of knowledge in the final part of Personal Knowledge.

⁵¹ Science as a Cultural Force, ed., Harry Woolf, p. 71. Yet just prior to the statement quoted, there is a paragraph which might suggest a different picture, with perception standing at the intersection of two methods - moving in one direction is the method of the exact sciences, in the other direction the method of the life sciences.

2. Acceptance of a Tradition

In all the activity of discovery through the process of tacit knowing,⁵² the discoverer depends in some way on his competence as a knower. The grounding of this dependence will be considered in the next chapter. However, we have already seen⁵³ that Polanyi uses the personal term "I believe" in connection with any verified assertion, to express this self-confidence or dependence upon oneself as a knower. We differentiated this process of discovery from the second-hand acquisition of knowledge through the acceptance of a tradition and dependence upon the authority of the transmitting community. Such an acceptance implies the kind of trust in the community that involves a personal act of affiliation. This trust and act of affiliation, with its acceptance of the social lore of the larger community or of the articulate system of knowledge of an intellectual community, is also termed by Polanyi an act of belief. "The learner like the discoverer, must believe before he can know But the amount of knowledge which we can justify from evidence directly available to us can never be large. The overwhelming proportion of our factual beliefs continue therefore to be held at second hand through trusting

⁵² Whether this process is the whole structure of knowing or one element in the structure.

⁵³ See above, pp. 21f.

others.⁵⁴

There is a real sense in which the structure of learning is the same as that of discovery. There is the same tacit process of making sense of clues. But instead of looking for the clues, one trusts the authority; instead of looking through the clues at the unknown, the 'unknown' is provided by the authority, and the learning consists in the sometimes almost routine act of understanding how an earlier discovery of the unknown makes sense of the clues provided. Learning has thus the same structure as discovery with much more guidance, more obvious clues, less search for an 'unknown' to be known. To this extent it is legitimate for both discoverer and learner to express their dependence upon themselves as knowers in the form "I believe".

Nevertheless, there is a distinction of sufficient importance to warrant a difference in terminology - in fact, to warrant talking about another kind of structure of knowing, i.e., a structure of belief.⁵⁵ The basic element in this second-hand knowing or belief is the dependence upon the tradition-bearing community and community authorities. Polanyi makes an excellent analysis of the organization of society which makes possible the transmission of the social lore and

⁵⁴ Personal Knowledge, p. 208.

⁵⁵ This latter terminology will not be used further because of Polanyi's double use of "belief". See above, pp. 21f.

the articulate systems of knowledge of a society; he makes clear the necessity of such acquisition of knowledge by dependence on authority, and shows that the necessity is an acknowledgement of a common good.⁵⁶ He analyses the stability of different societies, which are based on quite different conceptions of truth and reality.

All of Polanyi's analysis has raised a crucial point concerning knowledge held in dependence upon tradition. What are the criteria to be used to distinguish between the truths of different societies? How does one validate one's beliefs? This is a particularly acute question as Polanyi sets it forth because articulation itself is one of the forms of knowledge communicated through the tradition of the community, and language itself implies a world view. There would appear to be no standing outside one's inheritance to evaluate it, and to validate or reject it. In Polanyi's language, a person dwells in his tacitly acquired culture as in his own body; this knowledge, most of it acquired through affiliation with society, is the tool which must be used for all discovery and explicit criticism.

We must now recognize belief once more as the source of all knowledge. 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

⁵⁶ Personal Knowledge, p. 212.

rely for our mastery of things. No intelligence, however critical or original, can operate outside such a fiduciary framework.⁵⁷

Polanyi's only answer to the question of how to judge between the truths held by different societies is in terms of consistent ultimate commitments. Specifically, his answer is in terms of man's higher powers, of tacit knowing, of his intellectual passions.

Every acceptance of authority is qualified by some measure of reaction to it or even against it
Indeed, whenever I submit to a current consensus, I inevitably modify its teaching: for I submit to what I myself think it teaches and by joining the consensus on these terms I affect its content.⁵⁸

There is an "essential restlessness of the human mind, which calls ever again in question any satisfaction that it has previously achieved."⁵⁹ This demand to satisfy the restless urge of the mind "operates by phases of self-destruction"⁶⁰ as one demolishes a hitherto accepted structure through which one had previously acquired a satisfactory intellectual control over the universe.

This answer points forward to the decisions that Polanyi takes on some basic philosophical issues. It is in the next chapter that we must inquire about the validity of the positions arrived at as explanations of his descriptive analysis of the process of knowing. It is upon this validation of one's ultimate commitment concerning what is true that the validation

⁵⁷ Personal Knowledge, p. 266.

⁵⁸ Ibid., p. 208.

⁵⁹ Ibid., p. 196.

⁶⁰ Loc. cit.

or verification of all other tacitly acquired knowledge depends. In this chapter, we have asked if a clearer analysis of the whole structure of knowing would have provided more help for such an ultimate validation. To this end, we have asked questions about the possible development of some suggested clues in Polanyi's works which have not been brought to the fore.

CHAPTER IV
SOME BASIC PHILOSOPHICAL IMPLICATIONS

The major emphasis in the previous evaluative chapter was upon the adequacy of Polanyi's account of knowing as descriptive of the data of consciousness. Since this data, our awareness of ourselves as understanding, is the empirical data for cognitional theory, we turn in this chapter to an evaluation of Polanyi's larger theory of knowing as an explanation of this data. Our first consideration will be of the philosophical implications of his description of knowing upon our notion of the real.

In the previous chapter, we raised the question of whether Polanyi's account of knowing did not deal too exclusively with the descriptive aspects of knowing to the neglect of explanation, too much with discovery to the neglect of verification. We will inquire in this chapter whether this neglect has implications for the significance of his whole theory as we turn to the question of relativism and subjectivism, and to the question of how the ultimate commitments involved in his theory may be grounded.

1. The Real

The real not known in sentient experience. If there is one clear point in Polanyi's theory, it is just this: sentient experience is not knowledge, and the sentiently experienced is not the real.

As we move to a deeper, more comprehensive, understanding . . . we tend to pass from more tangible particulars to increasingly intangible entities; to entities which are (partly for this reason) more real: more real, that is in terms of my definition of reality, as likely to show up in a wider range of indefinite future manifestations.¹

This is one thesis with two aspects. The initial argument of Personal Knowledge² is devoted to one aspect: the destruction of the positivist argument that only sentient experience is knowledge. The evidence for empirical knowledge does not come ready-marked any more than do the clues for new empirical discoveries. There is a personal involvement in both discovery and verification which depends upon sentient clues, but it is not controlled by them.

The other aspect of Polanyi's thesis is his examination of the structure of this involvement, the structure of tacit knowing. Knowledge depends upon previous commitments to the nature of the real, upon sentient clues, and upon the person's capacity to know tacitly or to integrate the clues in such a way as to revise previous commitments in the direction of a fuller notion of reality. The tacitly known, which is an intellectual integration of sentient clues, is a "feature" of reality.³

¹ "Tacit Knowing", p. 610.

² See above, pp. 4-12.

³ See "The Logic of Tacit Inference", p. 1.

Polanyi's definition of reality as, "that which may yet inexhaustibly manifest itself," implies the "presence of an indeterminate range of anticipations in any knowledge bearing on reality."⁴ Although a "successful integration of a thousand changing particulars into a single constant sight makes me recognize a real object,"⁵ there is a sense in which Polanyi's stand on the nature of the real permits of no strictly empirical reality; the real object of perception cannot be experienced sentiently whether by sight or touch. What are thus depended upon are clues from all over the field of vision, touch, etc., "as well as on clues inside our body, e.g., in the muscles controlling the motion of the eyes and in those controlling the posture of the body The clues on which we rely for looking at an object will then appear to us in terms of the shape, color, size, position, and other visible features of the object. This is their meaning to us; and this meaning is considerably displaced away from our body where many of its clues are situated."⁶ Even on the level of empirical objects, then, the real is the meaning of the strictly sentient; the real is a clear and distinct perception, selecting and integrating sentient and other clues.

⁴ See "The Logic of Tacit Inference", p. 4. See also, Personal Knowledge, p. 116: "When we believe that we have truly designated something real, we expect that it may yet manifest its effectiveness in an indefinite and perhaps wholly unexpected manner. This intension comprises a range of properties which only future discoveries may reveal - confirming thereby the rightness of the conception conveyed by our term." As expressed for mathematical reality, see p. 139.

⁵ "Logic of Tacit Inference", p. 2. See Personal Knowledge, p. 99: the act of observation "establishes a conception of reality experienced in terms of a subsidiary awareness of the coloured patches which had previously been experienced as such in an act of contemplation."

⁶ "Tacit Knowing", p. 605.

As we have mentioned earlier,⁷ learning to perceive objects is an intelligent act, and when this ability is acquired we have a "perceptive framework, which enables us to see ever new objects as such."⁸ There is a sense in which this perceptive framework is constantly changing as we learn to make sense of our total environment. "This happens on a minor scale when we discredit the irresistible testimony of our eyes by classing something seen as an optical illusion."⁹ Again there is the instance of being taught by the impressionist painters to accept the perceptive clue which shows "shadows coloured merely by contrast to their coloured neighbourhood."¹⁰

On the other hand, it would not be clear in the first part of Personal Knowledge that Polanyi makes a distinction between the corrections of a perceptive framework and the acceptance of the fuller, but complementary, explanation of reality which leads men like Copernicus to give "preference to man's delight in abstract theory, at the price of rejecting the evidence of our senses."¹¹ He even suggests that, as we thus learn to rely increasingly on theoretical guidance for the interpretation of experience, we "would correspondingly reduce the status of our raw impressions to that of dubious and possibly misleading appearances."¹² This type of language

⁷ See above, pp. 49f.

⁸ Personal Knowledge, p. 103.

⁹ Ibid., p. 319.

¹⁰ Personal Knowledge, p. 319.

¹¹ Ibid., p. 3.

¹² Ibid., p. 4.

has led to criticism of Polanyi as one whose philosophy is too little bound to the empirical world of sense.¹³ However, if one takes at all seriously the great importance he places upon the field of biology with its dependence upon description and perception, such a Cartesian phrase as his description of "raw impressions" above would need to be sharply discounted.¹⁴ As Gelwick says:

The sharp division that seemed to plague the theory of knowledge from ancient Greece onward is avoided Knowledge is bodily knowledge, but it is not reducible to mere sensory experience. It is an accomplishment, a feat of intelligence. In this difference, we glimpse how the alternatives begun with Descartes and Locke are refused by Polanyi for the framework of his epistemology.¹⁵

On the other hand, the very way Polanyi presents the method of biology could leave him open to the opposite criticism, namely, that he has not freed himself sufficiently from a dependence upon the notion of the real as the experienced. However, he does indicate the necessity of introducing explanatory notions for understanding the more comprehensive wholes or entities of biology. Even machines cannot be understood in terms of physics and chemistry, but must be understood in terms of their "operational principles."¹⁶ Even at a simplest approximation, an organism cannot be understood in

¹³ May Brodbeck, "Review of Personal Knowledge", American Sociological Review, 25 (1960), 582f.

¹⁴ For evidence that Polanyi explicitly rejects such criticism, see "Tacit Knowing", p. 606f, and "Logic of Tacit Inference", p. 10.

¹⁵ Op. cit., p. 169.

¹⁶ Personal Knowledge, pp. 328ff.

terms of the inorganic sciences, but must be understood to function as a machine, such that "in this respect an organism is represented by operational principles of the kind which define machines".¹⁷ In the light of this, and such explicit statements as the following, it is clear that it would be easier to place Polanyi on the side of a one-sided rationalism than on the side of empiricism.

Everyone knows that you cannot inquire into the functions of living organisms without referring to the purpose served by them and by the organs and processes which perform these functions. Yet we must pretend that all such teleological explanations are merely provisional. The story goes round among biologists everywhere that teleology is a woman of easy virtue whom the biologist disowns in public, but lives with in private.¹⁸

¹⁷ Personal Knowledge, p. 334. Let it be emphasized that Polanyi represents an organism as a machine only as a first approximation, and that beside this notion of an "operational principle" common to machines and organisms, he goes on to speak of peculiar "organismic" functions which cannot be aptly formulated in terms of definite operational principles."

¹⁸ Science as a Cultural Force, ed., Harry Woolf, p. 66. This betrays again something of the methodological failure referred to in more detail in the previous chapter. In his emphasis upon the tacit and spontaneous structure of knowing, Polanyi is hesitant in outlining heuristic structures. If this had been done more carefully, the notion of describing the unknown relationships of the exact sciences by an undetermined mathematical function might have been seen as the equivalent to the notion of describing the unknown relationships of the life sciences by undetermined non-mathematical functions such as operational principles and principles of development or emergence. Polanyi is quite aware that the former represents a commitment that the nature of reality is such that it can be, at least partly, represented by mathematical explanations. Is this not paralleled by his commitment that the nature of reality is such that it can only partly be so represented, and that the higher levels of reality must be represented by other kinds of explanation?

Nevertheless, in his analysis of the structure of tacit knowing, there is a great emphasis upon perception as the paradigm; despite the fact that perception is considered as an intellectual integration, a perceived object is out there; it is tangible and substantial; it exists. Trained perception "is basic to all descriptive sciences."¹⁹ Even the real as explained by the discovery of a mathematical theory has an appearance, albeit a theoretical appearance.²⁰ As recently as in the new introduction to Science Faith and Society (1963), Polanyi says:

The capacity of scientists to perceive the presence of lasting shapes as tokens of reality in nature differs from the capacity of our ordinary perception only by the fact that it can integrate shapes presented to it in terms which the perception of ordinary people cannot readily handle.²¹

This can be combined with such a statement as:

God cannot be observed, any more than truth or beauty can be observed. He exists . . . not as a fact The words 'God exists' are not, therefore, a statement of fact such as 'snow is white', but an accreditive statement, such as "'snow is white" is true'.²²

¹⁹ "Logic of Tacit Inference" p. 2.

²⁰ Ibid., p. 3.

²¹ p. 10. The same statement is quoted again in "Tacit Knowing", p. 613, and is paraphrased in "Logic of Tacit Inference", p. 1.

²² Personal Knowledge, p. 279f.

To the casual reader all this would suggest that for Polanyi, the lack of "out there" observability or tangibility detracts from the factuality, reality, and quality of existence rather than enhancing it.

However, on balance, it would appear that Polanyi safely guards himself from either a one-sided emphasis on experience or a one-sided emphasis on reason in his theory of empirical knowing; he maintains a position that is a synthesis of the duality in knowing that has plagued philosophy at least since Descartes. We have seen in his discussion of universals and propositions²³ that Polanyi clearly portrays the dependence of tacit knowing upon experience without its being determined by such experience.²⁴

Yet one may question a terminology that speaks of the "comprehensive entity" of a universal class as being real²⁵ because its meaning "is capable of yet manifesting itself indefinitely in the future."²⁶ In a parallel fashion, Polanyi

²³ See above, pp. 59-63.

²⁴ See "Tacit Knowing", p. 612: "But it is still the course of scientific inquiry in which the metaphysical conception of a reality beyond our tangible experience is written out most clearly, for all to see."

²⁵ "Logic of Tacit Inference", p. 11.

²⁶ "Tacit Knowing, p. 611. See Personal Knowledge, 114.

comes very close to terming the formulations of a discovery real.²⁷ One would be happier with consistent use of the claim that "the truth of a proposition lies in its bearing on reality, which makes its implications indeterminate,"²⁸ and with a similar claim for universals.

Is the real known through communion? This section is headed by a question - a question which is raised for us by certain emphases in Personal Knowledge. It would not be raised by Polanyi's later epistemological writings, nor by his articles in religious journals. By giving a negative answer to this question as a description of Polanyi's position, and having shown that his position strongly precludes either a simple empiricism or a simple rationalism, we will be pointing to the interpretation we understand to be his, namely, that the real is tacitly known.

In Personal Knowledge there is a certain mystical

²⁷ See "Logic of Tacit Inference", p. 3: "a theory integrates observations into their theoretical appearance . . . a coherent entity;" and on p. 4 - "the act of tacit knowing thus implies the claim that its result is an aspect of reality."

²⁸ "Tacit Knowing", p. 612.

emphasis²⁹ to Polanyi's analysis, both of empirical and of religious knowing, that appears to stand apart from the general development of his theory.

Modern physics has demonstrated the power of the human mind to discover and exhibit a rationality which governs nature, before ever approaching the field of experience in which previously discovered mathematical harmonies were to be revealed as empirical facts.

Thus relativity has restored, up to a point, the blend of geometry and physics which Pythagorean thought had first naively taken for granted.³⁰

Polanyi quite clearly considers the astronomical theory of Copernicus as a conscious return to the mystical Pythagorean tradition. This tradition was continued wholeheartedly by Kepler, for whom "astronomic discovery was ecstatic communion."³¹ The intellectual passions of Polanyi's theory are paralleled to this ecstatic communion; in their heuristic function they not only "affirm the existence of harmonies which

²⁹ By mystical emphasis I mean Polanyi's talk about the real as experienced directly by the mind - either for the sake of the experience alone, or as a prelude to understanding and making sense of the experience. See Personal Knowledge, p. 106: "Scientific discovery . . . bursts the bounds of disciplined thought in an intense if transient moment of heuristic vision. And while it is thus breaking out, the mind is for the moment directly experiencing its content" See also, below, p. 100, note 34.

³⁰ Personal Knowledge, p. 15.

³¹ Ibid., p. 7. See another quotation from Kepler on p. 143.

foreshadow an indeterminate range of future discoveries, but evoke intimations of specific discovery and sustain their persistent pursuit throughout years of labour."³²

It is fair to claim that Polanyi does not intend this mystical language to be taken literally as the method of empirical discovery, but that through it he is emphasizing a major philosophical decision and personal commitment, namely, that there is an intelligibility to the universe which cannot be discovered by reliance on the senses alone, and which makes scientific formulations into much more than simple descriptions of empirical reality. In most places this understanding of Polanyi would fit.³³ But there are sections in his analysis of the intellectual passions and particularly of their heuristic function to which we now turn that do not seem to be consistent with such an understanding. Moreover, there is his understanding of the continuity of empirical and non-empirical knowing. Even if his talk about mystical communion must not be taken literally for empirical discovery, we will need to ask whether there are non-empirical realms which are known through the integration of intellectual experiences of the real.

³² Ibid., p. 143.

³³ In support of this understanding see Polanyi's disclaimer of mystical conceptions in favour of naturalistic explanation, in Personal Knowledge, p. 292, and his recent claims that his "scientific intuition" is "not the supreme immediate knowledge, called intuition by Leibniz or Husserl, but a work-a-day skill for scientific guessing with a chance of guessing right." "Logic of Tacit Inference", p. 6. See also "Creative Imagination", Chemical and Engineering News, 44 (1966), 89.

A valid articulate framework may be a theory, or a mathematical discovery, or a symphony it will be used by dwelling in it, and this indwelling can be consciously experienced A true understanding of science and mathematics includes the capacity for a contemplative experience of them.³⁴

Not only is there this urge for both contemplation and intellectual control; the endeavour to maintain this satisfaction "must occasionally operate by demolishing a hitherto accepted structure, or parts of it."³⁵ This destruction is apparently for the two-fold purpose, (a) of establishing a more rigorous and comprehensive framework with which to control experience and for internal contemplation, and (b) of directly experiencing with the mind the content of the heuristic vision in the transient moment of discovery which leads from the disciplined thought of one framework to another.³⁶ Although this intense mystical satisfaction, this act of ecstatic vision, enduring for only a moment, is the "most radical manifestation of this urge to break through all fixed conceptual frameworks,"³⁷ the act of contemplation is a form of breaking out of a conceptual framework. Such "contemplation has no ulterior intention or ulterior meaning,"³⁸ since we are experiencing things directly with our minds; our awareness of things, their sight and sounds, and the smell and touch of them, is not subsidiary to a focus of interest beyond the experience itself.

³⁴ *Personal Knowledge*, pp. 195f; italics mine, to indicate the contrast between the intellectual and mystical aspect of the quotation. On p. 99, Polanyi speaks of the "visionary contemplation of an object" in which one only experiences "the coloured patches as such." That is, "contemplation" is the non-integrated stage before intelligent observation which involves affirmation, commitment and an intelligent conception of reality. See also, p. 197. See above p. 98, note 29.

³⁵ *Ibid.*, p. 196.

³⁶ See *Personal Knowledge*, p. 196.

³⁷ *Loc. cit.*

³⁸ *Ibid.*, p. 197.

In brief, if the integration of tacit knowing is knowledge, contemplation of an intellectual framework is an anti-intellectual act,³⁹ a form of mysticism in which objects take on a kind of "dreamlike reality" which is not the "objective reality" of knowledge. It is dreamlike, "for it is not the focus of an intelligent perception."⁴⁰ This mystical contemplation of a dreamlike reality does not appear to be held up as a method of discovery in this section of Personal Knowledge,⁴¹ although it might be concluded that the desire for mystical communion plays a contributing role in the drive for discovery, along with the desire for the intellectual satisfaction of a more rigorously adequate articulate structure. Yet, in the light of Polanyi's enthusiasm for the Pythagorean tradition, there is a suspicion that the validation of the articulate framework of science really depends on some sort of communion with reality.

In another discussion of the intellectual passions, moreover, Polanyi betrays the same mystical emphasis. Although he clearly distinguishes, to his own satisfaction, between Kepler as a scientist and a mystic,⁴² he parallels Kepler's method of discovery⁴³ with the truth-bearing heuristic passions.⁴⁴ Again, he clearly distinguishes between the intellectually integrated focus of

³⁹ I recognize the difficulty in terminology; I speak of an intellectual experience as an anti-intellectual act. But Polanyi talks of the experience of things with the mind as such an anti-intellectual act, and I am not prepared to develop a new vocabulary. As I use the terms and understand Polanyi to use them, an anti-intellectual act is really "not acting" to integrate intellectual experiences into their focal meaning.

⁴⁰ Personal Knowledge, p. 197.

⁴¹ "Dwelling In and Breaking Out", pp. 195-202.

⁴² Personal Knowledge, p. 144.

⁴³ See Personal Knowledge, p. 7, where it is described as one of ecstatic communion.

⁴⁴ Ibid., p.143.

scientific discovery and the "new vision which accompanies [the discovery]" which is not knowledge.⁴⁵ This new vision of "reality" or of "the general nature of things" is "less than knowledge, for it is a guess; but it is more than knowledge, for it is a foreknowledge of things yet unknown and at present perhaps inconceivable."⁴⁶ It is this still unknown vision of reality to which "our sense of scientific beauty responds;"⁴⁷ yet "only our grasp of scientific beauty, responding to the evidence of our senses can evoke this vision."⁴⁸ Of this section of Polanyi's thought, two things need to be said: first, the language is not precise and the section in itself would be open to various interpretations; second, the language of vision which dominates, bespeaks a mysticism which is not consistent with the language of guessing which is also used. If this section is interpreted in terms of the experience of contemplation which we previously analysed, the vision would be understood as some sort of intellectual or mystic experience.

Interpreted in its own right and in the light of Polanyi's overall emphasis, the analysis of the intellectual passions would have to be criticised as weak methodologically. His reference to an unknown vision of reality evoked by our grasp of scientific beauty responding to the evidence of our senses is a kind of general heuristic definition of the unknown to be discovered.⁴⁹

⁴⁵ Personal Knowledge, p. 135.

⁴⁶ Loc. cit.

⁴⁷ Loc. cit.

⁴⁸ Loc. cit.

⁴⁹ Justification for this interpretation is to be found in "Creative Intelligence", Chemical and Engineering News, 44 (1966), 86.

Such a heuristic definition is part of heuristic structure.⁵⁰

Polanyi, in his emphasis upon the tacit aspect of knowing, in his emphasis upon the "hunches" involved in the pursuing of a heuristic definition into a determinate theory, in his emphasis upon the "personal" aspect of crossing this gap, plays down the possibility of formulating heuristic structures. Let it be granted that an over-emphasis upon formulated methods may tend to cover up the tacit insights involved in discovery. Nevertheless, avoidance of a developed methodology seems to have pushed Polanyi in the direction of ecstatic language which he does not intend to be taken literally.

The danger in the use of such language has been enlarged by the fact of his emphasis upon the continuity of knowing in the various domains, and his apparent approval of placing some kinds of Christian mysticism within this continuity. To describe Christian worship as a "never to be consummated hunch: a heuristic vision which is accepted for the sake of its unresolvable tension," is one thing if it is understood really as heuristic structure;⁵¹ but it is also described as a heuristic vision in the context of the process "known in Christian mysticism as the via negativa . . .

⁵⁰ Lonergan, op. cit., p. 44: "But how can means be ordered to an end when the end is knowledge and the knowledge is not yet acquired? The answer to this puzzle is the heuristic structure. Name the unknown. Work out its properties. Use the properties to direct, order, guide the inquiry."

⁵¹ Personal Knowledge, p. 199: The following quotation is the context - "[The indwelling of the Christian worshipper] resembles not the dwelling within a great theory of which we enjoy the complete understanding . . . but the heuristic upsurge which strives to break through the accepted framework of thought, guided by the intimations of discoveries still beyond our horizon. Christian worship sustains, as it were, an eternal, never to be consummated hunch: a heuristic vision which is accepted for the sake of its unresolvable tension. It is like an obsession with a problem known to be insoluble, which yet follows against reason unswervingly the heuristic command: 'Look at the unknown!'"

which stems from the Mystic Theology of the Pseudo-Dionysius. . . . The radical anti-intellectualism of the via negativa expresses the effort to break out of our normal conceptual framework and "become like little children".⁵² This union with God, sought through absolute ignorance, is described as seeing things "not focally, but as part of a cosmos, as features of God."⁵³ This seems to make the structure of religious knowledge the very opposite of the structure of empirical knowledge, unless continuity is to be found in mystical experience as a form of discovery, a discovery which is never consummated for Christianity. Is this what is suggested in these words?

I have said that the visionary powers of the scientist which lead him to new discoveries subside, once discovery is achieved, into a peaceful contemplation of the result - while religious practices culminate in an endeavour which they seek ever again to achieve. The arts are in an intermediate position. As in science, the heuristic passion of the originator far exceeds in intensity the sentiments induced by his finished product. But the work of art is more akin to an act of religious devotion in remaining, even in its finished form, an instrument of more active and comprehensive contemplation. Though the artist cannot make the public re-live his creative hours, he does make them enter a wide world of sights, sounds and emotions which they had never seen, heard or felt before.⁵⁴

In concluding this section, we must turn to still another aspect of Polanyi's work which has contributed to this mystical note, namely, his terminology of "indwelling" used in the analysis of tacit knowing. There is a danger involved in projecting characteristics of tacit knowing derived from an analysis of one kind of knowing into another area.

⁵² Personal Knowledge, pp. 197f.

⁵³ Loc. cit. This could be interpreted as meaning that God is then known focally as the meaning of the subsidiary particulars, but the tone does not suggest that this interpretation is meant.

⁵⁴ Personal Knowledge, p. 200.

The language of indwelling, in its first application by Polanyi, is used to parallel the use of tools to the use of our bodies in the performance of skilful practical activities. When words and language and articulate frameworks came to be considered as intellectual tools, then one was said to "dwell in" these as in one's body. There is nothing wrong with this extension, for we do dwell in a culture; we are, and our intellectual skills are, determined by such indwelling, even as our practical skills are determined by the bodies we dwell in. But Polanyi seems to give a mystical significance to this indwelling as he moves to a consideration of the abstract arts and religion. The surrender to religious ecstasy "corresponds to the degree to which the worshipper dwells within the fabric of the religious ritual, which is potentially the highest degree of indwelling that is conceivable."⁵⁵ Even if "the Christian faith in everyday action is . . . a sustained effort at breaking out"⁵⁶ of some inadequate intellectual framework (and all are religiously inadequate), the intent of the breaking out is not necessarily in the direction of mystic, non-intellectual communion. The breaking out may be a going beyond the existing framework, a heading toward a new focus on God which can more adequately sustain all the subsidiary clues of experience and understanding. The breaking out is not necessarily for the purpose of contemplating and experiencing God himself, but may be a breaking out which follows, not against reason, but reasonably and unswervingly, "the heuristic command: 'Look at the unknown!'"⁵⁷ The real is the tacitly known. We have examined two possible stands

⁵⁵ Personal Knowledge, p. 198.

⁵⁶ Loc. cit.

⁵⁷ Ibid., p. 199. See the larger context of this quotation in note 51, p. 103 above.

upon the nature of reality which certain aspects of Polanyi's work point to. In substantially rejecting these as valid interpretations of his meaning, the interpretation which we understand to be his has been put forward:⁵⁸ knowledge which is tacitly discovered and tacitly verified or validated bears upon the real. Discovery and knowledge in the empirical sciences (and to a certain extent in all domains), "while using the experience of our senses as clues, transcends this experience by embracing the vision of a reality beyond the impression of our senses, a vision which speaks for itself in guiding us to an ever deeper understanding of reality."⁵⁹ Thus we "make contact with reality in nature by recognizing what is rational in nature."⁶⁰ Polanyi has stood firm upon this explanation of the notion of the real. In the preface to the first edition of Personal Knowledge he writes concerning the knowing that he is to call tacit or personal knowing: "Such knowing is indeed objective in the sense of establishing contact with a hidden reality; a contact that is defined as the condition for anticipating an indeterminate range of yet unknown (and perhaps yet inconceivable) true implications."⁶¹ In 1966, he writes:

[The] phenomenal accompaniment of tacit knowing . . . tells us that we have a real coherent entity before us. It embodies the metaphysical claim of tacit knowing. The act of tacit knowing thus implies the claim that its result is an aspect of reality which, as such, may yet reveal its truth in an inexhaustible range of unknown and perhaps still unthinkable ways.⁶²

⁵⁸ See above, pp. 28ff.

⁵⁹ Personal Knowledge, pp. 5f.

⁶⁰ Ibid., p. 6.

⁶¹ Ibid., pp. xiii-xiv.

⁶² "Logic of Tacit Inference", p. 4; see also "Creative Imagination", Chemical and Engineering News 44 (1966), 86.

In short: "the scientist's quest pre-supposes the existence of an external reality. Research is conducted on these terms from the start and goes on then groping for a hidden truth towards which our clues are pointing."⁶³

Because all knowledge of reality in Polanyi's terms is tacitly discovered and validated, all knowledge must be expressed in the fiduciary mode: the affirmation of the truth of any knowledge in its bearing on reality is another form of a personal expression of faith. For me to say "p is true" is the equivalent of saying "I believe p".

Any act of factual knowing presupposes somebody who believes he knows what is being believed to be known. This person is taking a risk in asserting something, at least tacitly, about something believed to be real outside himself. Any presumed contact with reality inevitably claims universality
Every act of factual knowing has the structure of commitment.⁶⁴

The basis for the grounding of this commitment will be examined in the next section. At the moment, our concern is with the structural aspects of Polanyi's position. He has difficulty in making the distinction between the truth of universal concepts and explanatory formulations as bearing on reality, and the reality on which they bear. He probably never quite identifies formulations with the real but he unmistakably speaks of universal entities as real

⁶³ "Creative Imagination", Chemical and Engineering News 44 (1966), 92. See further, Personal Knowledge, pp. 63, 99, 104.

⁶⁴ Personal Knowledge, p. 313.

entities.⁶⁵ But is there not a distinction to be made between saying that a universal is a concept truly bearing on reality, and saying that a universal is itself real? At any rate, the difficulty comes up in his reference to different domains of reality - empirical, mathematical, artistic and religious. While he insists that all empirical factual knowledge is knowledge of reality because such knowledge is tacitly discovered, not because it is sentiently experienced, he denies that God's existence can be affirmed in the same fashion as that of an empirical fact.⁶⁶

⁶⁵ See "The Logic of Tacit Inference", p. 3, where a theory is called the "theoretical appearance" integrating subsidiarily known objects, and is paralleled to the whole which integrates its subsidiarily known parts. This "theoretical appearance" is the subsidiarily known object now seen as "a coherent entity."

⁶⁶ See the qualification of this criticism above, p. 78, note 40. However, this does not make the criticism superfluous. After all, the mathematical reality of which Polanyi speaks is a reality which may have no relationship to empirical reality. (See Personal Knowledge, p. 189) Again, "however meticulously descriptive and plainly expressive a work of art may be, it must never come any closer in referring to experience than . . . a representation of a conceivable experience, framed in its own harmonious terms, can come to actual experience." (p. 194) Contrast Lonergan, op. cit. with Polanyi on this point: "the analytical proposition [of mathematics or otherwise], by itself, is not a significant increment of knowledge." (p. 306) For him art is not so much a source of human knowledge of reality as a showing forth of "the deep-set wonder in which all questions have their source and ground." (p. 185).

The words 'God exists' are not . . . a statement of fact, such as 'snow is white', but an accreditive statement, such as '"snow is white" is true', and this determines the kind of doubt to which the statement 'God exists' can be subjected. For since '"snow is white" is true' stands for an a-critical act of assertion made by the speaker, it is not a descriptive sentence and cannot be the subject of explicit doubt.⁶⁷

While no fault needs to be found with the form of Polanyi's assertion of facts or assertions of truth, the transfer of discussion to the question of existence and reality from this form has its difficulties. "Snow is white" is a formulation, not a whole whose existence can be affirmed. As such, "Snow is white" is not parallel to the term "God". In fact, the double use of the term "is" in one affirmation, as both a copula and as an ontological term, does not provide a parallel to the use of "exists" in the other. This is not a quibbling over one slip; it is a claim that Polanyi does not anywhere really develop a structure for formulating the expression of truth from which it is convenient to make the transition from a theory of knowledge to a metaphysic.

If all factual statements involve a commitment, then "snow is white" as a statement with any claim to bear on reality and existence implies '"snow is white" is true.' But on this basis, "God exists" or "God is" is closer to being parallel to "snow is white;" likewise, to say '"God is" is true' is close to being parallel to '"snow is white" is true'. But the parallelism is not complete.

To be parallel, the latter affirmation would have to be cast in the form '"white snow is" is true'. When cast in this form, it can be seen that to talk of the existence of God is quite comparable to talking of the existence of white snow; the judgment of the truth of either depends upon the tacit integration of the appropriate clues into their true meaning, and the

⁶⁷ Personal Knowledge, pp. 279f.

verification or validation of their bearing on reality.⁶⁸

This type of ambivalence in Polanyi's work is not unlike that noted in the previous section. There is a continuity in knowledge in the various domains, and yet there are different kinds of reality. God does not exist like empirical reality, yet theology "is a theory of religious knowledge and a corresponding ontology of the things known."⁶⁹ The distinction in the kinds of reality seems to flow from a recognition that the conception of God cannot be in any satisfactory sense defined or explained. He accepts this and does not recognize the role of heuristic definition which, potentially at least, permits the valid affirmation of the existence of the reality thus defined; instead of recognizing the role of heuristic definition he falls back on a mystical experience of the unknown which is not subject to the rational affirmation of its reality and existence.

We may conclude that Polanyi's position on the real is one that seriously attempts to grapple with the duality in man's knowing that has troubled all Western cognitional theorists, at least since Descartes: he explicitly rejects both the rationalism of Descartes who rejected empirical knowledge as mere subjective appearance, and the empiricism of Locke who rejected all knowledge not dependent upon sense experience as mere subjective speculation. In his analysis of empirical knowing, he has provided a framework for the resolution of this duality; he has recognized both the independent, selective and integrative function of reason, and yet the real, though subsidiary role of sensitive and empirical data in the discovery and verification of knowledge.

⁶⁸ See Personal Knowledge, p. 202, the last two paragraphs (part of which is quoted above, p. 27) on verification and validation. For consistency with his own position, as summarized here, Polanyi should be saying with Imergen, op. cit., p. 669: "It is one and the same thing to say that God is real, that he is an object of reasonable affirmation, and that he exists."

⁶⁹ Ibid., p. 261.

In his recognition of the tacit structure of knowing, Polanyi has emphasized that this duality is resolved by regarding belief as the source of all knowledge. It seemed, then, an easy transition from empirical knowledge, so analysed, to a solidarity with other cultural provinces. Yet when this transition is made, does the analysis of discovery in the other domains provide any other criterion than that of "clear and distinct ideas"? That is, does Polanyi find any answer other than a rationalism with no empirical control? Certainly his religious discussion would suggest this conclusion. Perhaps this question can be answered more conclusively after an evaluation of the grounds for particular and ultimate commitments.

2. Grounding of Commitments or Personal Knowledge

The affirmation of tacit knowledge a commitment. Polanyi has correctly sub-titled his major work, "Toward a Post-Critical Philosophy". Although he openly parallels to that of Augustine his thesis that all knowledge depends upon prior belief,⁷⁰ this thesis is an outcome of the critical philosophies and not an attempt simply to turn the clock backward. In fact he considers the first part of his book as a carrying on of the work of criticism, turning the criticism in on critical philosophy itself. But his task as a post-critical philosopher is to restore the legitimacy of holding unproven beliefs so that we can "profess now knowingly and openly those beliefs which could be tacitly taken for granted in the days before modern philosophic criticism

⁷⁰ See Personal Knowledge, p. 266.

reached its present incisiveness."⁷¹ As part of this philosophic programme he must aim at discovering what he truly believes in and at formulating such convictions.⁷² In rejecting the credentials of both medieval dogmatism and modern positivism, his philosophy must ask "our intellectual powers, lacking any fixed external criteria, to say on what grounds truth can be asserted in the absence of such criteria."⁷³

Polanyi's analysis of the structure of knowing has shown conclusively the tacit component in all knowing. But such an analysis only completes the work of the critical philosophers - even if it is, for them, an unwelcome completion. Now all knowledge seems to be subjectively dependent upon self-set standards. The verification of a statement "is transposed into giving reasons for deciding to accept it, though these reasons will never be wholly specifiable,"⁷⁴ and though it will be possible to raise objections that cannot be refuted against such explicit reasons as are given.⁷⁵ This raises a decisive issue for Polanyi's theory of knowledge. All his critical evidence turns into a demonstration of the utter baselessness of all alleged knowledge, unless it is possible to uphold convictions "even when we know that we might withhold our assent."⁷⁶

71 Personal Knowledge, p. 268.

72 Ibid., p. 295.

73 Ibid., p. 265.

74 Ibid., p. 320.

75 Ibid., p. 312.

76 Loc. cit.

We have seen⁷⁷ that the first step in this programme was to ground personal knowledge in a universal claim in contrast to mere subjectivism. This is what Polanyi means by the acceptance of the framework of commitment: "The personal comes into existence by asserting universal intent, and the universal is constituted by being accepted as the impersonal term of this personal commitment."⁷⁸ In the framework of commitment "the personal and the universal mutually require each other."⁷⁹

For Polanyi, the first step in grounding personal knowledge involves the claim that there is a reality which, though it cannot be sentiently experienced, can be tacitly known by everyone. "Any presumed contact with reality inevitable claims universality."⁸⁰ More than this: "Any act of factual knowing presumes somebody who believes he knows what is being believed to be known."⁸¹ The claim to know tacitly, involves not only belief in the particular facts but presupposes prior commitments concerning subjects and objects or, in Polanyi's terms, concerning persons as knowers with universal intent. Thus the affirmation of the tacit process as a process of knowing by which one arrives at discoveries and verifies them, depends upon prior tacit commitments. The affirmation of tacit knowing is a commitment - a commitment to real objects, of which some are knowing subjects. The whole manner of justifying particular beliefs is an authorization of a person's own authority. "Yet so be it. Only this manner of adopting the fiduciary mode is consonant with itself: the decision to do so must be admitted to be

⁷⁷ See above, pp. 31f.

⁷⁸ Personal Knowledge, p. 308.

⁷⁹ Loc. cit.

⁸⁰ Ibid., p. 313.

⁸¹ Loc. cit., italics mine, to indicate that the issue is the grounding.

itself in the nature of a fiduciary act."⁸² Such a fiduciary act can only be subject to tacit doubt which, as such, "must remain intrinsic to a mental act of our own."⁸³

Does tacit knowledge imply relativism? Polanyi would explicitly reply to this question in the negative.⁸⁴ Certainly his whole theory of knowledge implies the rejection of an overall relativism just as he rejects universal doubt as inconsistent with the very assertion of such a principle. But Polanyi means more than this. A scientist, for example, "must commit himself in regard to any important claim put forward within his field of knowledge. If he ignores the claim he does in fact imply that he believes it to be unfounded Only if a claim lies totally outside his range of responsible interests can the scientist assume an attitude of completely impartial doubt towards it. He can be strictly agnostic only on subjects of which he knows little and cares nothing."⁸⁵

This position is supported by his analysis of the fiduciary nature of the assertion of truth. "The concept of commitment postulates that there is no difference, except in emphasis, between saying 'I believe p' or 'p is true'. Both utterances emphatically put into words that I am confidently asserting p, as a fact."⁸⁶ The only truth to speak about is "what I believe to be the truth, and what the consensus ought therefore to be."⁸⁷ Thus the truth is

⁸² Personal Knowledge, p. 256.

⁸³ Ibid., p. 285; for more about tacit doubt, see also pp. 272, 280.

⁸⁴ Ibid., p. 316.

⁸⁵ Ibid., p. 276. The non-scientist, for instance, must commit himself with respect to scientific discoveries which impinge upon his life even if he himself knows little about the theories.

⁸⁶ Ibid., p. 316.

⁸⁷ Loc. cit.

not relative for an individual since he is committed to the truth of his assertion; nor does he consider that the truth is relative for others, that they are free to affirm some other truth; the truth that he affirms, he is committed to with universal intent. In other words, the assertion made from within a structure of commitment is believed to be true, and to bear on an objective reality.⁸⁸

Although the foregoing references show that Polanyi's position is not that of a relativist in the usual sense of the word, they do not clear it of the suspicion that some kind of relativism is involved to the extent that the basic commitments (upon which individual commitments depend) are grounded only in subjective⁸⁹ beliefs. As Polanyi himself admits, even within a particular structure of commitment, "every person may believe something different to be true [though] there is only one truth."⁹⁰ However, his claim is that this variation is freed from arbitrariness and relativism, because each retains his universal intent and, "as each hopes to capture an aspect of reality, they may all hope that their findings will eventually coincide or supplement each other."⁹¹ Within the commitment situation there is the double polarity of the personal and the universal, such that a person can "speak of facts, knowledge, proof, reality etc."⁹² Now from within such a commitment situation Polanyi has distinguished between a

⁸⁸ See Lonergan, op. cit., p. 384.

⁸⁹ For Polanyi, "the subjective is altogether in the nature of a condition to which the person in question is subject." (Personal Knowledge, p. 302). Subjective belief is used above in the sense of "one subject's belief".

⁹⁰ Personal Knowledge, p. 315.

⁹¹ Loc. cit.

⁹² Ibid., p. 303.

competent, though fallible, line of thought and mental processes which are incompetent or subjective. But this judgment is determined by his interpretative framework, and different intellectual systems established on different basic commitments "are separated by a logical gap, across which they threaten each other by their persuasive passions."⁹³ Does Polanyi escape from a relativism concerning basic commitments only at the price of subjectivism?

Moreover, as Polanyi emphasizes, every new discovery involves some alteration in one's interpretative framework, which could involve a change in basic commitments. Not only is there this possibility of intellectual conversion, implying the relativism of our ultimate commitments at any particular moment, but man is not pure intellect. The intellectual passions are a higher integration of self-centred bodily drives.⁹⁴

In a conflict between our appetitive and our intelligent person we may side with one side or the other We may prefer to identify ourselves with the person on the higher level, but this is not invariably the case, and our choice between the levels is part of our ultimate commitment at any particular moment.⁹⁵

We will turn to this question about the relativism of basic commitments in the following section.

⁹³ Personal Knowledge, p. 319.

⁹⁴ See Study of Man, pp. 66f.

⁹⁵ Personal Knowledge, p. 320; see "Creative Imagination", Chemical and Engineering News 44 (1966), 92, the whole of the first new paragraph in the second column.

3. Grounding Commitments or Personal Faith

Any act of factual knowing presupposes somebody who believes he knows what is being believed to be known. This person is taking a risk in asserting something, at least tacitly, about something believed to be real outside himself. Any presumed contact with reality inevitably claims universality. If I, left alone in the world, and knowing myself to be alone, should believe in a fact, I would still claim universal acceptance for it. Every act of factual knowing has the structure of a commitment.⁹⁶

In his analysis of the structure of commitment,⁹⁷ Polanyi shows how he grounds his theory of knowledge, and in so doing he quite clears himself of any charge of relativism. Whether he as clearly frees himself from the subjectivity of a purely rationalist position is a question that must be asked now.

Polanyi not only speaks about the commitment involved in every act of factual knowing, but implies that there are other more basic commitments. He can speak of the commitments that are an integral part of one's intellectual or cultural framework and determine one's view of the nature of things; he also speaks of the revision of this framework through new discoveries. He even speaks of the "conversion" from one framework to another within a larger framework which reflects one's adherence to the community of science. Nevertheless, this is not meant to imply the same kind of possibility of a conversion from one's true ultimate commitments. There are particular commitments within a cultural framework, and there are the ultimate commitments which ground Polanyi's whole theory of knowledge.

Most of these ultimate commitments have been elaborated upon or implied previously, and have been seen to be consistent with a critical

⁹⁶ Personal Knowledge, p. 313.

⁹⁷ Ibid., chapter 10.

analysis of the actual structure of knowing. In bringing them together at this point, we are concerned whether the holding of such commitments is the faith which grounds all knowing; whether such a faith must be intuitively or tacitly held to be true, in the face of other sets of basic commitments, at the risk of ultimate illusion; or whether there is some further method of grounding these commitments.

The grounding commitments. One such ultimate commitment is expressed in the introduction to his chapter on "Commitment" with its first section on "Fundamental Beliefs". This is an affirmation of his belief:

In spite of the hazards involved, I am called upon to search for the truth and state my findings.⁹⁸

Such a belief included within itself the presupposition of knowing subjects and knowable objects, or the possibility of a personal knowledge which bears on reality.⁹⁹ This belief in intelligent persons, defined as centres of unspecifiable intelligent operations, was implied in the analysis of the tacit process and in the acceptance of its results as knowledge.¹⁰⁰ His theory of knowledge implies "an ontology of the mind," which in turn implies "a sociology in which the growth of thought is acknowledged as an independent force."¹⁰¹ Unlike the inconsistencies of objectivism which "require a specifiably functioning mindless knower,"¹⁰² or which "present us with a picture of the universe in which we ourselves are absent,"¹⁰³ this conception of man and society is

⁹⁸ Personal Knowledge, p. 299.

⁹⁹ Ibid., p. 313, quoted above, p. 117.

¹⁰⁰ See above, pp. 111-114.

¹⁰¹ Personal Knowledge, p. 264; see p. 219.

¹⁰² Ibid., p. 264.

¹⁰³ Personal Knowledge, p. 142.

self-authorizing and consistent.

Only by accrediting the exercise of our intellectual passions in the act of observing man, can we form conceptions of man and society which both endorse this accrediting and uphold the freedom of culture in society.¹⁰⁴

To accredit oneself as a knower is to claim that there is something real to be known, and to make a claim to knowledge of at least one knowing person. The nature of the real that is thus known has already been analysed in detail. It is clear that any assertion of truth presumes a contact with reality, and that it is this reality that grounds the universal intent or truth of the assertion.¹⁰⁵ The notion of the real that is thus involved is the basic commitment of personal knowledge that has already been dealt with. Since the real to which Polanyi's analysis of knowing commits him is not fully grounded in the sentiently given, nor indubitably and infallibly grounded in the intellectual passions, this basic commitment affirms that the hazard involved in asserting and affirming the truth is justified by the "hope that the universe is sufficiently intelligible"¹⁰⁶ to be thus known.

Getwick has asserted that the starting point of Polanyi's theory of knowledge is "a belief in and commitment to truth and freedom. All of these pregnant words. . . are key ones in his outlook."¹⁰⁷ This starting point was examined earlier.¹⁰⁸ It is not surprising that it is essentially to the same starting point that we return, as the ultimate grounds of his theory. As early as 1946,

¹⁰⁴ Personal Knowledge, p. 142.

¹⁰⁵ Personal Knowledge, pp. 310, 311, 313.

¹⁰⁶ Ibid., p. 318.

¹⁰⁷ Op. cit., p. 33.

¹⁰⁸ See above, pp. 12-15.

this link has been suggested by Polanyi, namely, that "the search for truth and free institutions . . . is reciprocal."¹⁰⁹

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 Therein is expressed our conviction that truth is real and cannot fail to be recognized by all who sincerely seek it; and our belief in a free society as an organization of its members' consciences for the fulfilment of their inherent obligations to the truth.

Thus to accord validity to science - or to any other of the great domains of the mind - is to express a faith which can be upheld only within a community. . . .

We may try to penetrate one step further by asking what the grounds are on which we hold the conviction that truth is real, that there is a general love of truth among men and a capacity to find it? These convictions (and others closely related to them, like the belief in justice and charity) have recently become involved in a fateful crisis.¹¹⁰

The question still remains: what are the grounds on which we hold these convictions? Is the whole of Polanyi's argument but a systematic course in teaching himself to hold his own beliefs?¹¹¹ Must any inquiry into our ultimate beliefs presuppose its own conclusions, to be consistent? Must it be intentionally circular?¹¹² To all these questions Polanyi seems prepared to answer "Yes".

¹⁰⁹ Gelwick, op. cit., p. 33.

¹¹⁰ Science Faith and Society, pp. 73f; see also p. 71.

¹¹¹ Personal Knowledge., p. 299.

¹¹² loc. cit.

The ultimate assumption that seems very often to ground Polanyi's theory is that "an innate affinity for making contact with reality moves our thoughts - under the guidance of useful clues and plausible rules - to increase ever further our hold on reality."¹¹³ Yet there is also an emphasis on "givenness", on "grace",¹¹⁴ which provides another polar assumption and does much to transform the subjectivity of this purely rationalist position into the new objectivity of personal knowing.

The grounding of basic epistemological commitments. We may take it as axiomatic that the grounding of commitments does not mean some infallible proof. To make indubitability the criterion of knowledge is to impose a criterion that itself is not indubitable. Yet it may be that Polanyi never quite rejects this criterion. Although he uses the terminology of "knowing" throughout, it is always as grounded in trust or faith or commitment. He seems to reserve the strict notion of knowledge for that which is indubitable or, according to himself, for that which is impossible of attainment.¹¹⁵ Having rejected the possibility of such knowledge, he jumps immediately to a heavy dependence upon the intellectual passions rather than upon empirical experience.

One needs to ask whether there is not a knowledge which, though not infallible nor indubitable, depends upon a commitment which is more dependent upon empirical experience, and hence more verifiable. In fact, this is what Polanyi has done in the realm of empirical knowledge. Yet, in his emphasis upon the possibility of doubting all assertions of even concrete factual truth, he fails to make a distinction between the dubitability of "concrete judgments of fact"¹¹⁶ and the affirmations of empirical science and common sense. The latter do depend upon the tradition of an established

¹¹³ Personal Knowledge, p. 403.

¹¹⁴ See above pp. 111f and below, pp. 126f.

¹¹⁵ See above, p. 28.

¹¹⁶ Lonergan, op. cit., p. 408.

community, on belief in this sense, in a way that concrete judgments of fact or tacit knowledge of objects and of wholes do not.¹¹⁷ It is true that, when we make sense of sensual clues and of perceptual clues, there is an element of commitment. But it is a commitment which is not only universal in intent but which is universally made, and in this sense verified; it is a commitment which does not in its universal intent necessitate the exercise of the persuasive function of the intellectual passions for validation. People do, in fact, claim to know objects and to know wholes as particulars within universal classes, because no further clues or questions arise to disturb this claim.¹¹⁸

Empirical and common sense knowledge is not only dubitable; it is not verified in the sense that there are no further clues or questions, because such knowledge is conditioned by the necessity of a dependence upon the tradition and the community.

¹¹⁷ There may be a sense in which the intellectual framework of a culture slightly affects perception, but this is very negligible. To a somewhat larger degree, the framework will affect our integration of perceptual clues into wholes and universals at the level of common sense; but even this is negligible until such descriptive integration is refined in preparation for use in the domain of empirical science.

¹¹⁸ See Lonergan, op. cit., p. 287: Such concrete judgments and refusals to judge oscillate about a central mean. "If the precise locus of that divide can hardly be defined, at least there are many points on which even the rash would not venture to pronounce and many others on which even the indecisive would not doubt. What, then, is the general form of such certitude of ignorance and such certitude of knowledge? Our answer is in terms of the virtually unconditioned."

The criticism has arisen previously of Polanyi's failure to complete the analysis of the cognitional process, and particularly to distinguish adequately between the process of discovery and that of verification. With his emphasis upon the tacit aspects of all knowing, and upon the impossibility of reaching indubitability, verification has been neglected; the role of the tacit intellectual passions has been emphasized to the point that verification has been almost equated with validation at times. He has neglected his own distinction between verification's dependence upon meeting both empirical conditions and the intellectual conditions of intellectual beauty, and validation's dependence only upon the latter conditions. This has led to an inadequate kind of assertion of the continuity of all domains of knowledge from perception to religion. In each domain the final standard, or the condition that must be met, is that of intellectual satisfaction. Even this tends, at points, to move off into a kind of direct communion with reality.¹¹⁹

If the distinction between discovery and verification had been maintained, the steps which Polanyi does take toward grounding more adequately his ultimate commitments would have been simplified, and a more adequate expression of the continuity of all domains of knowledge disclosed.

One step is barely suggested in Polanyi's work; it is the step of asking: does the same structure of knowing that is discovered by an analysis of empirical knowing provide the basis for integrating these clues which our cognitional acts provide into sufficient evidence for an affirmation of the self as a centre of intellectual activity, as a knower? Polanyi's ultimate belief that, in spite of the hazards involved, he is called upon to search for the truth and state his findings, is not so much a fundamental belief as an

¹¹⁹ The preceding few paragraphs have relied heavily on a knowledge of methodology learned from Lonergan, op. cit.

awareness of himself as seeking to know. This awareness, linked with his analysis of the tacit nature of knowing leads him to affirm that his "fundamental belief implies a belief in the existence of minds as centres of unspecifiable intelligent operations."¹²⁰

Polanyi claims: "Any act of factual knowing presupposes somebody who believes he knows what is being believed to be known."¹²¹

But is this claim sufficient as an explanation of the experience? Does not any act of factual knowing which is sufficiently unconditioned for verification and affirmation, presuppose the same kind of affirmation of somebody who knows?

The other, and more deliberate, step which Polanyi takes in the grounding of his basic commitments is to show that the structure of living beings (one domain of the known), of child development, and of evolution are identical with the structure indicated in his theory of knowing. We have previously indicated some shortcomings in his analysis of the structure of biological development and of the failure to deal adequately with development in his theory of knowledge.¹²² Nevertheless, this is a method of grounding that does essentially depend on an unacknowledged grasp of the difference between a merely intellectual formulation and an affirmation which is sufficiently verified through a discovery of a sufficiency of evidence. The last section of Personal Knowledge is devoted to this analysis of biological method and of the nature of evolution;¹²³ a non-biologist is not able to grasp to what degree Polanyi has been able to ground his commitments in this way;

¹²⁰ Personal Knowledge, p. 312.

¹²¹ Ibid., p. 313.

¹²² See above, particularly p. 94, note 18.

¹²³ See also "The Structure of Consciousness", Brain, LXXXVIII (1965), pp. 803ff.

he is more inclined to use Polanyi's insights into the focal character of the higher levels of comprehensive living entities as a tool against some crudely materialistic and mechanistic types of biological method.

Grounding religious and ethical commitments. A full scale or even adequate examination of the method of grounding religious and ethical commitments is entirely beyond the scope of this paper - partly, at least, for the good reason that Polanyi's work does not cover the ground. Nevertheless, the primary concern of this paper is the possibility of formulating the relationship between knowledge and religious faith, and Polanyi is not unconcerned with this relationship. In both areas he would emphasize the element of belief in the sense of a dependence upon the authority and tradition of the religious¹²⁴ or civic community¹²⁵ into which a person is born and to which he affiliates himself in an a-critical act.

Let us turn to the intellectual grounding of religious knowledge or religious faith. There appear to be two different approaches to the grounding of religious faith in Polanyi. The one is the emphasis on the dominant role of the tacit intellectual passion in the validation of all forms of knowledge. There is then a continuity in all kinds of knowledge, and religious knowledge only differs in the degree to which it depends upon this tacit internal evidence, and hence in the depth of self-disposal and commitment involved.¹²⁶

¹²⁴ See Personal Knowledge, p. 282.

¹²⁵ Ibid., pp. 222ff.

¹²⁶ Ibid., p. 321.

As we have seen earlier, this emphasis leads Polanyi to acclaim a kind of mysticism which is not consistent with his general approach. It would seem fair to say that this is the major emphasis of Polanyi in the grounding of religious knowledge in Personal Knowledge. In fact it is this emphasis that has left his whole theory of knowledge most suspect, as implying a kind of rationalism which is free from any empirical grounding and verification.

Nevertheless, there is just a hint of another approach - a hint that is made at several of the most crucial points in the argument of the book and it is this approach which he has emphasized in his later writings. We have noticed his conscious linking of himself with St. Augustine, who "taught that all knowledge was a gift of grace, for which we must strive under the guidance of antecedent belief."¹²⁷ Moreover, in the concluding paragraph of the part of the book dealing with "The Justification of Personal Knowledge", the universal aspirations of personal knowledge are seen to "place us in a transcendent perspective", and the acceptance of the objective "of attaining the universal in spite of our admitted infirmity", is taken in the "hope to be visited by powers for which we cannot account in terms of our specifiable capabilities"; and such hope is "a clue to God".¹²⁸ In this paragraph the grounding of knowledge in grace, in God, does not appear to place God in such continuity with the epistemological commitments. Rather, these commitments are taken as clues; God is the comprehensive entity who makes sense of tacitly knowing individuals. From this point, Polanyi points forward to the final section of his book on "Knowing and Being"; there, after reflection on evolution which he explains by the unspecifiable principle of emergence disclosed in the ever more comprehensive living entities of

¹²⁷ Personal Knowledge, p. 266.

¹²⁸ Ibid., p. 324.

evolution, he is able to conclude:

We may envisage then a cosmic field which called forth all these centres by offering them a short-lived, limited, hazardous opportunity for making some progress of their own towards an unthinkable consummation. And that is also, I believe, how a Christian is placed when worshipping God.¹²⁹

The suggestions here are, admittedly, very tenuous. But it would seem that Polanyi is groping for a metaphysical method which will enable him to define heuristically and affirm God in terms of the empirical methods of knowing that in fact are used, such that religious knowledge is not subjectively grounded in the individual's intellectual passions, but in the intellectual integration of empirical clues. There are several promising implications of such a method: first, religious reality becomes a higher, more inclusive level of reality, but not a different kind of reality; second, natural theology becomes not a form of knowledge continuous with empirical knowledge, but an extension of metaphysics.

¹²⁹ Personal Knowledge, p. 405.

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