Knowing and Being

Essays by Michael Polanyi

Edited by Marjorie Grene

The University of Chicago Press

International Standard Book Number: 0-226-67284-0 (clothbound); 0-226-67285-9 (paperback)

Library of Congress Catalog Card Number: 76-77151

The University of Chicago Press, Chicago 60637
Routledge & Kegan Paul Ltd., London E.C.4

Published 1969.

Printed in the United States of America

94 93 92 91 90 89 88 87 86 98765

Contents

Acknowledgements

Acknowledgement is gratefully made to the following publishers and periodicals for permission to reprint the essays in this collection:

1. To the Cambridge University Press for permission to reprint *Beyond Nihilism* (1960).
2. To the *American Scholar* for 'The Message of the Hungarian Revolution', *35* (1966), 261–276.
3. To *Encounter* for 'Two Cultures', *13* (1959), 61–64.
4. To *Minerva* for 'The Republic of Science', *1* (1962), 54–73, and for 'The Growth of Science in Society', *5* (1967), 533–545.
5. To *Science* for 'The Potential Theory of Adsorption', *141* (1963), 1010–1013, copyright 1963 by the American Association for the Advancement of Science, and for 'Life's Irreducible Structure', *160* (1968), *1308–1312*, copyright 1968 by the American Association for the Advancement of Science.
6. To the International Union of Crystallography for 'My Time with X-rays and Crystals', reprinted from *Fifty Years of X-ray Diffraction*, P. P. Ewald, ed., 1962, published for the International Union of Crystallography by A. Oosthoek, Utrecht.
7. To *Philosophy* for 'The Unaccountable Element in Science', *37* (1962), 1–14; for 'The Logic of Tacit Inference', *41* (1966), 1–18; and for 'Sense-Giving and Sense-Reading', *42* (1967), 301–325.
8. To *Mind* for 'Knowing and Being', *70* N.S. (1961), 458–470.
9. To *Reviews of Modern Physics* for 'Tacit Knowing: Its Bearing on Some Problems of Philosophy', *34* (1962), 601–616.
10. To *Brain* for 'The Structure of Consciousness', *88* (1965), 799–810.

Introduction

It is one of the paradoxes of modern epistemology that we take science as the paradigm case of knowledge, yet insist upon a conception of wholly *explicit* truth. For science lives by discovery and ever further discovery; without the itch to solve problems, to follow hunches, to try out new and imprecise ideas, science would cease to exist. Yet discovery cannot be explained in terms of wholly formalizable, wholly explicit knowledge. The problem inherent in this contrast—between truth and the search for truth—was put for us by Plato when he made Meno ask:

> Why, on what lines will you look, Socrates, for a thing of whose nature you know nothing at all? Pray, what sort of thing, amongst those that you know not, will you treat us to as the object of your search? Or even supposing, at the best, that you hit upon it, how will you know it is the thing you did not know?

In other words, as Michael Polanyi has argued on a number of occasions, this single question asked by Plato at the very start of inquiry into the nature of knowledge already puts paid to the centuries of effort in which men have sought to formulate canons of wholly explicit truth. Instead, he insists, we must alter radically the foundation of our epistemology, and admit as essential to the very nature of mind the kind of groping that constitutes the recognition of a problem.

How, positively, can we do this? Polanyi's solution to the problem of *Meno* rests on the distinction, which he introduces in Chapter Four of *Personal Knowledge*, between two kinds of awareness: *focal* and *subsidiary*. The types of knowledge grounded in these two kinds of awareness he has later called 'knowledge by attending to' and 'knowledge by relying on'. His central thesis is that no knowledge is, or can be, *wholly* focal. And in the case of a problem, the subsidiary aspect looms large. We do not know, in the focal sense, what we are looking for, and yet we can look for it, because we rely, in looking for it, on clues to its nature, clues

through which we somehow anticipate what we have not yet plainly understood. Such clues we hold in *subsidiary* rather than *focal* awareness.

The class of examples through which Polanyi introduces this distinction is that of tool-using; reading is another paradigm case. I follow the marks on a page, relying on them in order to attend to the meaning, to attend, in fact, indirectly, to the person who wrote them. The same structure holds for a problem. Focally, at the centre of attention, we are aware, so far, of the problem only as a puzzle, a discomfort, a conflict. If, however, it is a good problem, and if we are on the track of a solution, the clues on which we are relying do have a bearing on the solution: they are in fact aspects of the entity we are seeking to comprehend.

At the same time, such clues are also aspects of ourselves: they are points in our own attitudes, skills, memories, or crypto-memories, hunches. To put it in existentialist language, they are aspects of our transcendence, and at the same time of our facticity. So we live in the tension between what we are and what we seek: between the world whose facticity we share and ourselves whose shaping makes the world a world. Our explicit awareness, the focal core of consciousness, is always founded in and carried by the tacit acceptance of something not explicit, which binds, heavily and concretely, ourselves to and within our world. This means that knowledge is always personal. The impersonal aspect of knowledge arises from and returns to personal participation in the search for and acceptance of the object to be known. For only the explicit, formulable core of knowledge can be transferred, neutrally, from person to person. Its implicit base (since it is not verbalized and cannot be formulated and so impersonalized) must be the groping *of someone*.

But while personal, the subsidiary, or tacit, root of knowing is primarily directed away *from* the inner core of my being *to* the focal centre of my attention. All knowledge consists in a *from–to* relation. Of course, subsidiary knowledge is mine: indeed, it is what, relevantly to the present focal point of my attention, I have assimilated to my very self; it is what, out of my being-in-the-world, I have interiorized to the point where I can rely on it to guide me towards a distally located goal. All knowing—whether tacit, as in perception or in skills, or explicit (though never totally so), as in the mastery of an intellectual discipline—displays this

dual structure. I attend *from* a proximal pole, which is an aspect of my being, *to* a distal pole, which, by attending *to* it, I place at a distance from myself. All knowing, we could say, in other words, is orientation. The organism's placing of itself in its environment, the dinoflagellate in the plankton, the salmon in its stream or the fox in its lair, prefigures the process by which we both shape and are shaped by our world, reaching out from what we have assimilated to what we seek.

Unlike the traditional ideal of a wholly explicit, self-guaranteeing truth, from–to knowledge cannot be instantaneous; it is a stretch, not only of attention, but of effort, effort must be lived, and living takes time. Knowledge, therefore, is imbedded both in living process (as Piaget, too, has argued in *Biologie et Connaissance*, and as Suzanne Langer is arguing in her study of *Mind*) and in the uniquely human form of living process: in history.

Yet, be it noted, the emphasis on the personal participation of the knower, and on knowing as a form of living process, does *not* entail, in Polanyi's theory, a retreat to an irrational subjectivity. We are dealing, again, with a from–to structure, not with 'pure inwardness'. Polanyi is *not* suggesting, as Kierkegaard or Sartre would do, that I seek in some isolated, empty centre the utter self-sufficiency of my original choice of myself. It is, indeed, quite true, as Polanyi and others have convincingly argued, that pure objectivity, pure exteriority, is impotent to account for the existence of conscious life, or, indeed, of any life at all. Laplacean science contains no concepts which could by the wildest stretch of the imagination make intelligible the existence of an *I*. The atomic topography of my central nervous system is not myself; it is a set of objectified conditions of my existence, and only self-delusion can equate my existence with its conditions, however complex and however necessary. But that is another story: see the essays of Part Four below. The point here is that pure activity, like pure potency, is equally an illusion. The assimilation of the world into total inwardness would be as self-contradictory, as annihilating, as the collapse of the active centre into the pure exteriority of atomism. But that is not our situation. In the from–to stretch by which we grope our way forward out of and into and within a world, we both make and are made, possess and are possessed, in tension, indeed, and even paradox, but not in contradiction. For what we have here is not an all-or-none affirmation or denial, but a *polarity*.

We may even call it, following the lead of that Goethean concept, a tension between Faustean energy and *Hingabe*, 'das ewig Weibliche'. The action through which we appropriate is also the passion through which we give ourselves to being. Our self-integration is also self-surrender, our self-surrender is also the process through which we find ourselves.

As the emphasis on the personal does indicate, however, the conception of from–to knowledge puts *responsibility* squarely at the centre of epistemology. Responsibility appears as the human way of being an active centre: total, indeed, in that only *I* can surrender myself to being, to the sheer factual contingencies, the social lore, the practical and intellectual disciplines, to which, however, I must pledge myself in order both to affirm my being and at the same time to submit, through these manifold *nexus*, to the goals of my further search. Let me again compare Polanyi's view here briefly with Sartre's. It is *I* who make my values values; on this they both agree. But I do so, Polanyi argues, by acknowledging these values responsibly, as standards, as principles which I assert, and accept, *with universal intent*. For Sartre, of course, since such an acceptance takes me beyond myself, it is inevitably in bad faith. For Polanyi, it may be so, as it is, for instance, in his epistemological example of pseudo-substitution. But it need not be so. The risk of forfeiture, like the risk of error, is always with us; living is the hope of achievement and the risk of failure. But this risk, this tension, need not be, except for the mistaken dream of utter self-containment and pellucidity, a stretching on the rack. It evokes, rather, in the perspective of tacit knowing, a sense of calling. Within the limitations of my facticity, and relying on the limited powers it gives me, I ought to strive for an integration, a comprehension, which I could not, indeed, acquire by my own unaided efforts, by which I may, with grace, in part achieve.

This theory of knowledge, first adumbrated in *Science, Faith, and Society* (Oxford, 1945), and systematically developed in *Personal Knowledge* (Routledge, 1958), has since been consolidated and expanded in a number of directions. In the present volume I have collected a group of papers which exemplify this development.

Personal Knowledge, starting with the critique of the positivist claim for total objectivity in scientific knowledge, exhibited the culture of science as a subculture in our society, given existence

and authority by our fundamental evaluations. Indeed, it is a subculture which claims for itself—and for which the layman claims—an overriding authority, over against all other evaluations or appraisals, which are conceived as merely 'emotional' or 'subjective'. The dilemma of the modern mind, Polanyi argues, arises from the peculiar relation between this scientistic claim and the unprecedented moral dynamism that has increasingly characterized the social and political aspirations of the last century or more. This interpretation, presented in outline in the 'Conviviality' chapter of *Personal Knowledge*, was elaborated in Polanyi's Eddington lecture, *Beyond Nihilism*, which here represents the broadest social and political framework of his analysis of science and scientific knowledge. This lecture was delivered in 1959; its optimism sounds alien, in 1969, to American ears, but its diagnosis of our situation is clearly pertinent, even though we may question the prognosis.

Seeing our general intellectual situation in this light, moreover, we can both understand, and seek to alter, the refusal of social scientists to acknowledge the normative nature of their disciplines; this theme Polanyi develops in the second essay of this collection, 'The Message of the Hungarian Revolution'. To remedy fundamentally the claims of scientism, however, we must consider explicitly the structure of scientific discovery itself. A transition to this problematic is provided by the note on Snow's 'Two Cultures' which concludes Part One.

It was, indeed, the problem of the organization of science which moved Polanyi, in the first instance, to embark on philosophical reflection. Twenty years ago, when there was a vigorous movement for scientific planning, he was concerned to justify to himself and others his belief that centralization is incompatible with the life of science, a view represented here, in Part Two, in the essay 'The Republic of Science'. Fundamentally, what makes such a libertarian form of organization, operating indirectly through consensus rather than directly through planning, necessary to science is the unspecifiability inherent in the processes of discovery, of understanding and even of verification (or falsification). For what is essentially unspecifiable must either resist or be stifled by the specifiability of a master plan. The thesis of unspecifiability as an essential ingredient of any knowledge held by any one or any group as knowledge formed, of course, a

central theme of *Personal Knowledge*; it is reaffirmed and consolidated in the first essay of this section. But on the other hand, if science so understood demands a free and consensual administration, any administration, including the institution of science, also demands authority. The role of tradition and authority in science, in its balance with that of originality or novelty—which is often treated as if it could flourish somehow in vacuo, outside *any* traditional context: this role is discussed and exemplified in Essay 8 in reference to the Velikovsky case, and in Essays 6 and 7 in terms of incidents from Polanyi's own scientific career.

The essays on tacit knowing included in Part Three proceed directly, as Polanyi's epistemology has always done, out of his preoccupation with the nature of scientific discovery: of scientific life, as distinct from a pristine but unreal scientific 'logic'. In this way they too carry forward themes already stated in *Personal Knowledge*, but in a form refined and elaborated in his later writing. *Personal Knowledge* was directed not so much to tacit knowing as to the problem of intellectual commitment, the question how I can justify the holding of dubitable beliefs. The theory of tacit knowing is indeed the foundation of the doctrine of commitment, but while the latter probes deeper into the foundation of human personality, the former is more far-ranging. It reveals a pervasive substructure of all intelligent behaviour.

The theory of tacit knowing has been worked out most plainly in Chapter One of *The Tacit Dimension*, and it may be of assistance to the reader if I summarize its argument briefly here. Polanyi starts with the fact that we know more than we can tell, witness the import of experiments in subception (see Essays 11 and 12 of the present volume). He could also take, as he has done in other essays, including those that follow here, the case of seeing with inverting spectacles, the recognition of a physiognomy, stereoscopic seeing, the feat of medical diagnosis: the instances are endless. Take the second case: the achievement of normal vision with inverting lenses. After a period of disorientation I come to rely on the clues available within my body in order to attend to, to see effectively, the things out there. The function of my subsidiary knowledge is to direct me to the coherent sight of my surroundings. This is the *functional* import of tacit knowing: it guides me from proximal, interiorized particulars to the integration of a coherent, distal whole. This is the familiar lesson of gestalt

psychology. The bearing of particulars on a total pattern produces the phenomenon of pattern. And this is, secondly, the *phenomenal* aspect of tacit knowing. The particulars, therefore, thirdly, bear on what they mean. Reading, indeed, is, once more, a paradigm case of tacit knowing. All *explicit* knowledge, however crystallized in the formalisms of words, pictures, formulae, or other articulate devices, relies on the grasp of meaning *through* its articulate forms: on the comprehension that is its tacit root. And wholly tacit knowing, as in skills, is still a grasp of significance, though without the mediation of articulate utterance. Thus tacit knowing directs us from particulars to the whole which they signify: that is its *semantic* aspect. But in so guiding us, finally, subsidiaries, which are aspects of our being, draw us beyond ourselves to their distal referent. They guide us toward the comprehension of something *real*, in many cases, at least, to the comprehension of a reality having the same structure as our knowing of it: that is, to a whole of parts, whose significance ranges in ways perhaps unguessed by us beyond its specifiable particulars or even beyond the presently visible outline of the whole. This is the *ontological* import of tacit knowing.

All four aspects of tacit knowing are dealt with in Part Three. 'Knowing and Being' stresses the ontological theme: the claim of tacit knowing to bring the knower into contact with reality, a claim which, though never wholly indefeasible, is nevertheless not arbitrary or irrational: it constitutes, indeed, the only rationality in our power. 'Tacit Knowing: Its Bearing . . .', although its philosophical implications are far-ranging, may be read as taking off from the phenomenal aspect, from a reinstatement of 'secondary' qualities as germane to the veridical import of perception. 'The Logic of Tacit Inference', a paper presented at the international meeting on philosophy of science in Jerusalem, effectively resolves the traditional problem of induction by displaying the structure of the non-explicit inference on which scientific discovery depends; thus it develops the functional or integrative dimension of tacit knowing. And finally, 'Sense-Giving and Sense-Reading' elaborates the semantic aspect of tacit knowing, suggesting a context within which the discoveries of contemporary linguists might be acknowledged and understood without recourse to a revival of 'innate ideas'.

Again, as in *Personal Knowledge*, so in Polanyi's more recent

work, the veridical claims of tacit knowing, from perception through the most sophisticated theory building of the sciences, suggest, through their ontological import, the development of an ontology, in particular an ontology of life and mind. All knowing, I suggested earlier, is a kind of orientation: in which we rely on clues within our bodies to reach beyond ourselves, to attend to what is out there. To render such an achievement intelligible we must develop, as the chief, Cartesian-Kantian, tradition of modern thought has forbidden us to do, a theory of the nature of living things in general, and within that theory an account of that aspect of ourselves as living things which we call 'mind'. Polanyi has treated both these cognate themes in a number of recent papers, which are here represented by the pair of essays in Part Four. In the earlier essay, 'The Structure of Consciousness', living beings are characterized as comprehensive entities subject to *dual control*: where the boundary conditions left open by a lower principle, e.g., chemistry or physiology respectively, are prescribed by a higher principle, e.g., physiology or consciousness respectively. In the terminology of the later essay the use of the concept of 'boundary conditions' has changed so as to contrast the boundary conditions characteristic of physics and chemistry with the role of boundary conditions in the sciences of life. We meet here, therefore, a distinction of two types of boundary condition: the test-tube type, where we are interested in the laws exhibited *within* the test-tube, not in it—the boundary condition—itself, and the machine type, where it is the boundary conditions themselves that interest us, and where these constitute the structure or the function in whose interest the lower level laws have been harnessed. Instead of saying, therefore, that in the case of comprehensive entities higher principles govern the boundary conditions defining the system within which lower-level laws are at work, Polanyi now identifies these higher principles with boundary conditions of a special type. It is, however, the same hierarchical ontology of life and mind with which, in both cases, he is concerned.

The elaboration of a coherent philosophy entails the reworking of its *leitmotif* and its application in a variety of contexts. If the themes exemplified in this volume have all been stated, in one way or another, in *Personal Knowledge* and anticipated, even earlier, in *Science, Faith and Society*, Polanyi's fundamental conception of knowledge, and of man as knower, receives a sharper and more

powerful formulation in a number of the essays collected here. And above all, the relevance of his major discovery—that is, of the structure of tacit knowing—to the problems of social philosophy, to the interpretation of science, both its history and its methods, to traditional philosophic problems like those of perception, of universals, of induction and of meaning, to the mind–body problem and to the task of understanding living nature: its relevance in all these areas both strengthens the theory of tacit knowing itself and opens for further reflection roads which more conservative methods find blocked. Of course such restatement of a basic theme, especially through the vehicle of occasional pieces like those collected here, entails some repetition; yet each makes a unique contribution to the whole enterprise. On the other hand, papers of equal interest have been omitted, when they seemed to repeat in very large part the arguments of those included, and even those included have been edited in order to minimize repetitions. If the selection or revision has been faulty, the responsibility is entirely mine.

MARJORIE GRENE
University of California, Davis