

## II

### THE STRUCTURE OF TACIT KNOWING

The centrality of knowing in our daily and professional lives is commonly overlooked. Deciding and acting are far more obvious, and their significance often subsumes that of knowing. We often try to know in order to act. However, valuing does not provide the context for knowing. Rather, it is by knowing that we constitute a world for ourselves which is the context for our acting. One value of men of genius is that they provide us with ways of understanding reality, be it through art, science, history, philosophy or theology. The works of these men constitute a major portion of our cultural heritage, revealing the meaning of ourselves and our society, providing a context and basis for our future knowing and acting,

But knowing and valuing are intimately intertwined, mutually influencing one another. Just as we must know what is valuable in order to do it, so there are intellectual values which we either discover for ourselves or which are passed to us through our tradition. Additionally, knowing is itself an activity which can be experienced by us just as our deliberating and deciding can be, though it is more difficult to pay attention to,

Of course the world does not make complete sense to us. More of it is unknown, than known. We are constantly facing novel situations which we incompletely understand. Even when we are in familiar situations, few, if any, are exactly alike. We must constantly apply what knowledge we do have in innovative ways to understand them the best we can. Additionally, what happens in a situation has consequences which we do not foresee. Our knowledge, too, has implications we have yet to realize.<sup>1</sup> Part of maturing in any area is determining what those are. Thus, human knowing is an extremely open and resilient activity.

We rely on our knowledge and our ability to apply it to get along in the world. That ability resides in our acts of perceiving, understanding, and responsible judging. We are guided in these acts by our own appraisal of them, and by our appraisal of the power of our conceptual frameworks to make sense of reality. In the process we modify both the framework and ourselves, simultaneously becoming ourselves as persons and constituting the world we live in. In this chapter we will be concerned with the most basic acts of knowing and with Polanyi's theory of the logic of tacit knowing. This will partially account for our ability to know and develop within a variety of contexts,

### 1) PERCEPTION AND TACIT INTEGRATION

Viewed naively, perceiving seems to yield a relatively stable world, there for anyone else to perceive as we have, independent of ourselves. However, empiricism notwithstanding, if there is any place for the subjectivist to make his stand, it is on the level of perception, for what we are conditions what we perceive. It is commonly accepted that different animals have different kinds of perceptions, and we are no exception. We perceive differently from dogs and cats, for example, and many of these differences will be accounted for ultimately on the basis of our different physiologies. Our cultural background, interests, values and skills partially account for differences in perceptions between people. None of this should be taken as evidence that what we perceive is merely subjective. It is reasonable to suppose that different sets of physiological processes on the side of the person are matched by different sets of things and events which are not the person, but which, in relation to the physiological processes yield perceptual experience. The fact that things are perceived differently does not mean that there are no things to perceive, or that perception is merely subjective. Likewise, that different people have different perceptions does not mean that they cannot have, under suitable conditions, similar perceptions, or that their perceptions are merely subjective

because they are different. Just as the chemist understands something that the physicist does not, so the painter can see what the musician does not, and the musician can hear what the painter does not. What each perceives is real, though it is not readily accessible to the other and may never be.

Perception, then, is made possible by a native biological endowment, which we can exploit in a variety of manners, though we cannot fully control what or how we perceive. For the most part perception is spontaneous. We do it seemingly without effort. However, some effort is involved, and as Polanyi's theory of tacit knowing unfolds, we will see why we rarely notice it. We most readily notice the effort necessary to perceive when our body is not working properly, or when the perceived object is itself difficult to make out. If our eyesight is deteriorating, our futile efforts to focus are manifest in sore eyes or headaches. If we are trying to find a friend in a crowd we may often see others' faces as his only to have them suddenly transform before our eyes. We may strain to hear voices or music through static on a radio. Though we may strive to perceive correctly, the perception is not of our own making. Both correct and incorrect perceptions arise spontaneously. In phenomenological terms, we are involved in constituting the object. But the constitution of the object is not the creation of it, It is instead the coming to be of the object for the person.

At all levels of knowing constitution has the form of an integrating. Polanyi assimilated part of his theory of perception from the gestalt psychologists, In this theory, the figure, or what I shall refer to as the primary perceptual content, is distinguished from the ground. The figure is that on which we focus, while the ground is literally the background against which the figure appears, Normally the figure is a sharp, highly defined pattern, structure, or gestalt, and the ground is a bit less resolved, The figure can be a melody, a print on a dress, a certain structure of tactile sensations, such as a hand on our back, or an object such as a pen on a

desk,

As the term "gestalt" (structure) implies, the figure is a set of parts which are structured, as in the case of a melody which is a structured set of notes or of a person's expression which is an integration of particular facial features, While we may readily agree that the structure exists as such, it may be more difficult to recognize that we must intentionally, or mentally, integrate a set of particulars before the structure is for as as perceived. To the perceived integration corresponds an integrating by the person.<sup>2</sup>

Perceiving exhibits the form common to all tacit integrations, We are aware of a set of particulars integrated into a whole. When we perceive a person's expression, for example, we integrate the particular features of his face into a whole. Similarly, in vision the stereo images "sensed" by our eyes are integrated into one view. However, we do not rely only on the particulars which are integrated into a whole for perceiving, but on clues from throughout the perceptual field. For example, we can perceive an object as moving against a background at rest. Also, as Polanyi notes

Snow at dusk throws less light into our eyes than a dinner jacket in sunshine. and if you look at the surface of these objects through a blackened tube. snow may appear dark and the black cloth light. But when we look at them in the usual way, snow will always be seen to be white, and a dinner jacket to be black.<sup>3</sup>

Thus, we can distinguish the perceived object from the clues we rely on to perceive it, though some of the clues are themselves integrated into the gestalt.

Corresponding to this distinction is Polanyi's positing of two levels of awareness. We are aware of the clues and the gestalt, but in different ways. The gestalt is at the focus of our awareness and is termed by Polanyi the focal object. Our awareness of it is focal awareness. We rely on the clues for perceiving coherently, but they are not at the focus of our attention. Our awareness of them is termed subsidiary awareness. We are aware of them in our focusing

on the focal whole, but they are not themselves at the center of our attention. Polanyi has also called the subsidiaries on which we rely the proximal terms of a tacit integrating while the focal object is the distal term.<sup>4</sup>

Tacit integrating has a from-to structure. We are aware from the clues, and ultimately, as we shall see, from our body, to the focal object. This structure is evident in our relying on the clues for perceiving coherently. However, the structure is not dyadic, but triadic, for the clues and the focal object are for a subject, the perceiving person.

We can also recognize four aspects of tacit integration in perceiving. First, the subsidiary particulars and awareness have the function of bearing on the whole. The relation between the subsidiaries and the focal object is functional. Second, there is a difference in appearance in the particulars if they are taken by themselves or in terms of the whole. As integrated they appear in the whole. A good example of this is the visual experience of the night sky once constellations have been recognized. The individual stars appear differently when seen in the context of a whole than when viewed outside that context. This is the phenomenal aspect of tacit integration. However, the manifestation of this aspect in perception is both more subtle and complex than that example indicates, and its full characterization rests on the discussion of indwelling yet to come. At present we can say that the subsidiaries appear in the coherent perception as a whole, not as clues per se, but as aspects of the perception. The third aspect, the semantical, is that the particulars find their perceptual meaning in terms of the Whole. Returning to the example of perceiving a person's expression through an integrating of the particular features of his face, we find that the meaning of the particulars is the expression. However, we should not conclude that the full meaning of the particulars is given in perceiving. I shall expand on this below, The fourth and final aspect is the ontological. Basically, this is that the integrations exist. They are not merely subjective constructs, but

coherencies in the world; in this instance perceptual coherencies.<sup>5</sup>

## 2) UNDERSTANDING

Understanding is the most brilliant use of our intellectual powers for Polanyi. Judgment uses similar powers, though not to the same extent.<sup>6</sup> Perceiving strives for coherency, but it is of a far different kind than that discovered in understanding. Polanyi more commonly uses the term "intuition" when he discusses understanding, though he also uses the terms "insight", "comprehension", "discovery", and the generic term "tacit integration". I shall reserve the use of "comprehension" for the discussion of comprehensive entities in Chapter VI. "Discovery" will be used for the most part to refer to original insights by scientists. "Tacit integration" will be restricted to discussion of integrations in general.

The term "intuition" poses the most difficulties for it calls to mind a residue of meanings which tend to devalue our mental powers. Intuition often is referred to pejoratively as mysterious and mystical, and appeals to intuition are rejected as unscientific or unobjective. Intuition is distrusted for it is considered imprecise and subjective. In our chauvinistic society it is associated with women, while reasonable conclusions are drawn by men who do not let their feelings run away with them. Intuition's unsavory emotional cast is contrasted with the hardheadedness of logic, which, it is contended, must be substituted for vague intimations that something feels right, especially when these claims cannot be proven with certainty. While vagueness and uncertainty are inherent in understanding at various stages in its unfolding, understanding, or intuition, is itself the source of what clarity and precision we do have in knowing. Objectivists for the most part tend to deemphasize the process of knowing and to focus on knowledge itself, especially that knowledge which is to them clear, precise, and generally accepted. Yet that knowledge is achieved as the result of a slow movement into the unknown where the truly great mind goes beyond previously accepted results. In this section I

will provide Polanyi's description of this process. In later chapters I will discuss the role of clarity and precision and show how logic, an instance of the most precise knowledge, relies on understanding.

Polanyi's description applies most accurately to discovery, the achievement of an original thinker of an insight into a problem not yet solved by another. The effort required can be immense, spanning days, weeks, months, or years. Yet, each of us achieves understanding many times every day. Most of our insights are routine and we scarcely notice them. However, all of us have also experienced the solving of a problem akin to the discoveries of scientists. It is in these periods of solving what are for us the more intransigent problems that the process of insight or intuition is most acutely experienced.

Polanyi takes much of his account of discovery from Poincare. That account has been discussed also by Poincare's colleague Jacques Hadamard and bears a striking resemblance to the articles on insight written by E.D. Hutchinson.<sup>7</sup> Polanyi makes two original contributions to the discussion. The first is his recognition of the distinction between subsidiary and focal awareness. The second is his emphasis on anticipatory intuition. Just as we are constantly making perceptual sense of our environment in perceiving, so we also try to make sense of the world by understanding it.

What we perceive may itself be conditioned by our efforts to understand. The first stage in this process is the occurrence of anticipatory intuition. This is the recognition of a problem, or, viewed from another angle, it is the recognition that there is a coherency to be discovered. That recognition may be more or less clear. If we have solved no problems of a similar kind before, we may not be able to specify at all what we are looking for. On the other hand, if the problem is of a routine mathematical nature, for example, we may be able to state many of the characteristics of the solution, even though we have not yet attained it. For the

scientist, the gift of anticipatory intuition is especially important for it enables him to discover good problems.

A good problem must not only tell him the probable presence of something hidden in a certain direction in nature, but also assess the chances of reaching this hidden truth and anticipate with a reasonable degree of reliability whether the result will be worth the time, effort and money that will be needed for finding it.<sup>8</sup>

Anticipatory intuition can be as great a feat, or greater, than the intuition which solves the problem. One characteristic of a master in any field is his ability to determine what problems are significant, which insignificant, and which can be solved and when. Inquiry begins after we have a problem, not before, and the significance of the inquiry is directly related to that of the problem.

Anticipatory intuition supplies us with knowledge of coherency between ignorance and fully explicit knowledge. Polanyi calls it a kind of foreknowledge, an intimation of coherence. If we had fully explicit knowledge we would be able to specify what the coherence is. Anticipatory intuition, on the other hand, yields an anticipation of that coherence which provides guidance for inquiry. Though we can formulate rules and techniques for solving problems, we shall see that they have inherent limitations and that they presuppose informal mental acts for their use. However, the anticipation is neither a rule nor a technique, but a striving for coherence which we can experience.<sup>9</sup>

With his theory of anticipatory intuition Polanyi provides a solution for the paradox of the Meno. To paraphrase Socrates in the Meno, we do not seek what we know, for since we know it there is no need for the inquiry. Nor do we seek what we do not know, for in that case we do not even know what we are to look for.<sup>10</sup> The paradox seemingly paralyzes the quest for knowledge. Nevertheless, we do move from the unknown to the known, so there must be some way out of the paradox. We move from the unknown to the known because we can recognize that there is an unknown to be known. This is the recognition of a problem. We resolve the paradox by recognizing that we have knowledge

which is between ignorance and fully explicit knowledge.

The second phase of discovery is preparation. This is usually a period of intense effort to solve the problem, where our efforts often become compulsive. Our imagination yields images and clues which may have a bearing on the solution. Our feelings also are oriented to solving the problem and contribute to the tension we experience. We may find it difficult to concentrate on other projects, experiencing a dissociation of ourselves from everything but the problem.

If illumination, or the final intuition or insight, does not occur during this stage, we may temporarily give up the project, letting other concerns dominate our attention. These periods are times of incubation. Our imagination continues working on the problem while we are not giving it our attention. It is at such times that a chance remark, memory or event may trigger the insight which solves the problem.

Whether the insight comes during the phase of preparation or incubation it is always surprising. What was vague, unclear and difficult prior to the insight may now seem clear and incredibly simple. There is a release of the tension built up in trying to solve the problem. Where before we may have felt inadequate and frustrated, now our intellectual passions are those of satisfaction with ourselves and our idea. Indeed, the fulfillment of these passions can be extremely dramatic as in the famous example of Archimedes. Our appreciation of the beauty of our discovery can be as passionate as Kepler's.

••• what I firmly believed long before I had seen Ptolemy's Harmonics--what I had promised my friends in the title of this fifth book, which I named before I was sure of my discovery-- what sixteen years ago I urged to be sought--that for which I have devoted the best part of my life to astronomical contemplations, for which I joined Tycho Brahe ... at last I have brought it to light, and recognized its truth beyond all my hopes .... So now since eighteen months ago the dawn, three months ago the proper light of day, and indeed a very few days ago the pure Sun itself of the most marvelous contemplation has shone forth-- nothing holds me; I will indulge my sacred fury .... If you forgive me I shall rejoice.

In contrast to the preceding periods, the moment of illumination is effort- less. Insight is "a

spontaneous coalescence of the elements which must ... combine to its achievement." It is "a process of emergence rather than a feat of operative action."

In addition, insight may not merely yield one idea, but can lead to a flood of ideas, all related to the problem at hand or to related problems. Philosophers are familiar with this when they get a key insight into a great thinker. It has implications throughout his philosophy, and they may be revealed fairly rapidly. Likewise, scientific laws have implications extending beyond what is specifiable in their concise formulation and these may become apparent to the scientist when he discovers the apt formulation of the law. Thus, one insight, if it is a key one, can lead to others, and to the revealing of future fruitful lines of inquiry. It is this expectation that the insight will prove fruitful in presently unspecifiable ways that is the major mark of its truth for Polanyi.

The product of the final intuition is an integration. The integration may appear to be, in a loose sense, the reintegration of the perceptual field, as when we recognize a significant gestalt. Such is the experience we have recognizing constellations. The same kind of integration occurs in word puzzles where we try to form words out of scrambled letters. With effort, "c,u,r,o,c" may be reorganized as "occur", It is this kind of integrating which permits us to recognize individuals, be they people we know or examples of different species or of parts or functions of animals. As I shall discuss more fully later, it is the basis of connoisseurship and the descriptive sciences, as well as having some affinities with the types of insights we have in learning skills.

The pattern can be more intelligible. Then, though it is expressed in a patterned set of symbols, such as a mathematical equation, the pattern itself may be the organization of a set of experiences or possible experiences, which is not itself experienced, or perceived, but only understood. Or, as in physics, it may be an organization which we cannot in principle

experience. Intuition, then, ranges from the discovery of integrations of the perceptual and imaginative kind to the absolutely unimaginable. Though the object of understanding can seem quite similar to that of perceiving, the difference which does exist is ultimately enormous since understanding can have as its object a non-sensible coherence. Perceptual and intelligible coherence are separated by a logical gap, which is crossed by the insight. One can manipulate data as much as he wishes, but he will not recognize a coherent pattern by doing so. He must have an insight.

However, like perceiving, understanding has a physiological component. The imagination, through which most of the effort to understand is made, relies on physiological functions for its own functioning, though it transcends those functions in its orientation to intelligibility. When we discuss indwelling we will consider the role of the body in knowing more fully. As Innis has noted, the primary model Polanyi uses for understanding understanding is perceptual, and sometimes excessively so. For example, Polanyi states:

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. Scientific knowing consists in discerning Gestalten that are aspects of reality. (His emphasis)

This is, he also notes, "the power which we exercise in the act of perception." Thus, there would appear to be no distinction between perceiving and understanding in the sense that understanding would simply be a more acute perceiving; possessed by the intellectually gifted in the case of scientific discoveries. The above was written in 1963 as an introduction to Science, Faith, and Society, originally published in 1946. The analysis of understanding as a perceiving is mirrored in that text in his constant use of visual descriptive terms to discuss what is discovered by scientists. For example, in discussing the coherencies discovered by science he notes "that in natural science the final whole lies not within the powers of our

shaping, but must give a true picture of a hidden pattern of the outer world."(My emphasis)

However, that tendency is counterbalanced by Polanyi's distinction of perceptual data as sensible gestalts and the meaning which that data has. That meaning is "intangible" and requires an insight to discover it. Thus, there are two kinds of "perception" which appear to blend into one another when the intelligible pattern which is discovered is of something which we can experience as a whole or of which we can build a representative construct, such as providing a set of images to illustrate how an automobile engine works. Seeing the pattern of operation involves a reorganization of our perceiving of the engine. We can also consider the reorganization of the imagination needed to shift from understanding the solar system in terms of the Ptolemaic model to understanding it in terms of the Copernican. That transformation was guided by the new Copernican conception of the solar system. As we proceed we shall see that Polanyi is more interested in descriptive than in explanatory science. It is in the former that his view of personal knowledge finds its more obvious confirmations, though it is in contemporary conceptions of the latter that it finds its most serious challenges.

Understanding's similarities with perception stem from the fact that both are tacit integrations. They share the general structure and the four aspects of tacit integration. Like perceiving, understanding exhibits the from-to structure of tacit integrations. We attend from a set of subsidiaries; in this case clues - intellectual passions, images and symbols, memories, and sometimes past understanding and knowledge - to the focal object, the intangible meaning or coherence we seek. The distinction between subsidiary and focal awareness also holds, for we attend from the subsidiaries to the focal object. The triadic structure of tacit integrating is also evident. The problem, our effort to solve it, and its solution are for us. In fact, our participation in understanding is more personal since we have more control over the process. We do not have complete control, but we can frustrate our desire to understand certain

problems, just as we can make an additional effort to devote our time and energy to solving them.

The structure of discovery is functional. The subsidiaries, the clues from which we attend, have the function of prompting our understanding of the solution. By clues I mean all the subsidiaries which have a bearing on the focal whole in understanding. We may consider here the efficacy of images and symbols in understanding. A clear instance is the construction of images as aids in solving geometrical problems, or the advantage Arabic numerals have over Roman numerals for calculation. These instances are clear partially because they are the result of developed knowledge. More commonly clues cannot be made explicit, have an indeterminate bearing on the solution, and are transient. The structure is also phenomenal. Just as the sky looks different when we organize a set of particulars into a constellation, so, by the insight, some of the clues become part of the solution, altering our intending of the object. The subsidiaries appear in the focal object, though they are not focused on in themselves. For example, if we are trying to understand another person, the images, memories, feelings, perceptions from which we attend to the other person can coalesce into an intelligibly patterned whole with the occurrence of insight. They 'appear' within the pattern, though our attention is not focused on each of them in themselves, but on the pattern itself.

Third, the relation of the subsidiaries to the focal whole is semantical. The meaning of the subsidiaries which are integrated is found in the integration which relates them to one another. Their entire meaning need not be found there, but at least part of it is. For example, some particulars, such as molecules of oxygen, can be integrated into more than one kind of focal whole. Thus, we could not completely understand oxygen by understanding it as integrated in a water molecule.

By "meaning" Polanyi primarily means the bearing which subsidiaries have on a focal

whole. The meaning of a symbol is found in what it symbolizes, and the meaning of a part in a machine is its relation to the purpose of the machine, embodied in its interrelationships to the other parts. However, this definition is too restrictive. A focal Whole which is not, in turn, a subsidiary of another focal whole cannot have its meaning in its bearing on a focal whole. Instead, its meaning is its coherence; that is, the manner in which it is integrated in itself. Polanyi characterizes meaning in both ways.

Insight not only yields the integration of the particulars relevant to the discovery, but is also an integration of the person. Our intellectual passions and efforts to understand find the realization of their meaning in understanding as achieved. If they do not, then we feel compelled to begin the process anew. Dissatisfaction with our own performance corresponds with what is for us an inadequately integrated object, or a partial solution, just as we have a favorable appraisal of our performance if we think we have attained the solution.

Fourth, the integrations discovered in understanding exist if the understanding is correct. However, to discover if the understanding is correct, at least in science, requires a period of verification, the fourth phase of discovery. So we shall turn our attention to Polanyi's notion of judgment.

### 3) JUDGEMENT

There are references to judgment throughout Polanyi's work, but there is not the detailed treatment of judgment as a tacit integration that we find with perception and understanding. This might suggest that Polanyi did not have the systematic understanding of judgment that he had of insight and perceiving. However, I think that there is substantial evidence that he viewed judgment as a tacit integrating which is just as significant an epistemological act as understanding. Judgment uses powers-similar to those used by understanding, though not to the same extent. Understanding is concerned with discovering

coherence, or intelligibility. In doing so, it crosses a "logical gap" which exists between data and their organization into a significant whole. This means that there is no set of rules which, if followed, would guarantee the occurrence of insight. Judgment is concerned with crossing a similar logical gap. There is no way to consider evidence as sufficient grounds for judging prior to judgment, unless we are dealing with a hypothetical situation. The evidence is constituted as sufficient when we judge. Just as there is no formal link between data and insight prior to insight, so there is no formal link between the grounds for judging, which verification includes data, prior to the judgment. Thus judgment is not completely rule-governed either, though it is subject to rules far more than is understanding. This will be evident when we consider verification in science. However, while judgment crosses a logical gap, it adds nothing to the discovery except the acceptance of it by us as real. It thus exercises our intuitive powers to a lesser degree than does understanding. Judgment is not a purely cognitive act, but is a responsible decision. That is, the judgment is not as effortless as is the achievement of perceptual coherence or the achievement of insight. We judge in the light of standards we set for our performance. We may assimilate some of these standards from our culture, but ultimately they come down to our satisfaction with our performance. The scientist, for example, judges according to his scientific conscience, by which he determines if he has met the contemporary standards for achieving a discovery of value to science. Polanyi introduces the notion of conscience into judging because for him we are evaluating our fidelity to our authentic desires to know the truth. To decide to assert something without satisfying our intellectual conscience could be mere naivete or deceit; an act of incompetence or the act of a charlatan.

What the particular grounds are vary with different kinds of judgment. In Chapter IV we will consider scientific verification and the acceptance of theories by the individual

scientist. In Chapter V where the topics include the sociology of scientific knowledge, the acceptance of theories by the scientific community and what Kuhn has termed paradigm shifts will be discussed. However, the most general ground for accepting discovery as true is our belief that the coherence we affirm will manifest itself in the future in presently indeterminate ways. This includes the heuristic value the discovery should have for leading us to other discoveries. But besides this anticipation of the fruitfulness of the discovery which I discussed earlier when I noted that insight often reveals more possibilities for integration than the particular coherency for which we were striving, there is also an increasing concreteness of our affirmations as we approach fully verified knowledge. This means that they are "more fully grounded in focally observed evidence." But an exact fit between theory and data is only approached, rarely attained. Deviations from the theory can be explained either as disconfirming evidence or anomalies, and it is up to the person to judge which is the case,

As we shall see, coherencies are affirmed as true also because of their intellectual beauty. They satisfy our intellectual passions. However, it is in our own appraisal of our performance, our judgment, that we determine if we have in fact met the standards which they set. The realization that we have leads to the decision to accept the coherence as real. As Polanyi notes, "we must accredit our own judgment as the paramount arbiter of all our intellectual performances."

As well as these general grounds, the conditions for judgment can include the observance of specific rules, respect for particular principles, conformity with past knowledge, and so on. All the grounds prior to the judgment are subsidiaries which have a bearing on the focal object, the existence of the coherency we are deliberating about. We use them, trying to ascertain if they have been met similarly to the manner in which clues are used to aid us in understanding. We attend to the coherence as a possible reality from these subsidiaries. But as I noted, the grounds for judging are, in themselves, insufficient to lead to judgment. They are only seen as sufficient in the context of the decision to accept

the coherence as real given the grounds. There is no evidence that Polanyi posited an intuitive grasp of the sufficiency of the grounds which leads to a decision to posit the object of judgment as Innis contends. Instead, in judgment we are free to accept or reject, and the judgment is the decision to accept or reject the coherence as real. By that decision there is a coalescence of the subsidiaries and the focal object similar to the intuitive grasp of understanding.

The triadic structure of tacit integration is evident in judgment. We focus on the content of judging as a possible existent from a set of clues which we, for the most part, do not attend to in themselves. I qualified the above statement for we can shift our attention, making what was previously subsidiary into the focal object, as when we question the validity of some of the possible grounds of judgment. In this case we would in turn focus on the grounds relying on a different set of subsidiaries. The object of judgment and the process of judging are also for us. Not only are we aware of them, but we have a heightened sense of responsibility for our actions compared to understanding and, especially, perceiving.

The relation of the subsidiaries to the focal whole is functional, for we attend from the possible grounds of judgment for the purpose of establishing a contact with reality to which we may confidently assent. The phenomenal aspect is apparent in the fact that the grounds only appear as grounds in" the judgment. Likewise, the grounds derive their meaning as grounds from their bearing on the judgment. Thus, judgment displays the semantical aspect of tacit integrations. Most importantly, it is in judgment that we assent to something being real. The ontological aspect comes to the fore. Tacit knowing yields knowledge of reality. This has two major implications.

First, it means that meaning is existential. Existential meaning is the meaning a thing, quality, relation and so on has in itself. Tacit knowing is the discovery of a meaningful world. Polanyi contrasts existential meaning with denotative or

representative meaning. For example, if a stick is used as a pointer, then it has representative meaning. If we consider it outside the context of pointing, then it has existential meaning only. Pure mathematics has existential meaning for Polanyi, "while a mathematical theory in physics has a denotative meaning," An interesting problem arises if we consider discredited, scientific theories, If we focus on the theories themselves their meaning is existential, as is mathematics, However, they also have a representative meaning, but the objects which they denote do not exist, We can avoid problems by noting that such theories denote possible objects, It is in judgment that we decide if objects have the existential meaning they would have if the theory were true, Thus, the meaning the term "electron" has in a scientific theory would be the meaning electrons would have if they exist and if the theory is true,

Second, the world itself consists of integrations, If we know reality, if to know is to claim that our understanding of reality is correct, and if understanding is a discovery of integrations, then we should conclude that reality consists of integrations.

This latter result in turn implies a profound shift in the understanding of understanding. Most analyses of understanding have focused on its content as abstract and universal. This makes it difficult to understand how understanding can be concrete, as it must be if we discover the real meaning of things and events in the world. However, if we recognize that abstracting and universalizing are also integrating we can understand how one act can situate us in the more abstract realms of mathematics and science and in the everyday world we live in. It is abstraction which allows the baby to realize that every time he moves his arm a certain way his hand appears in front of his face. But it is the integrative aspect of understanding which is the correlation of different aspects of a number of experiences, permitting the generalization. Similarly, Newton's second law is highly abstract and is universal. However, its simplicity and scope are displayed in its use in successfully integrating a number of aspects of experience. May I suggest, then, that the difference between the life world and the realm of

theoretical thought is not a difference between the concrete and the abstract, for both are concrete in their abstractness. Abstraction yields an integrated reality. Perhaps the difference is to be found in systematic as opposed to unsystematic understanding.

#### 4) SKILLS AND INDWELLING

Tacit integrating is not confined to cognitive pursuits. Perceiving, understanding and judging are also operative in the learning and performance of skills, where we integrate bodily processes for the performance of some end. Skills provide the best illustration of indwelling, an understanding of which will provide us with the background for understanding one of the two basic meanings of tacit knowing as unspecifiable.

In learning or performing a skill I attend from my body to the goal of my performance. I rely upon my imagination, perceiving and other cognitional acts, and upon kinesthetic sensations as providing clues for my successful performance. However, as in all tacit integrating, I do not focus on these in themselves. For example, in riding a bicycle I am aware of my body and the adjustments which I continually make to maintain my balance, but this awareness is subsidiary to the awareness of my goal in riding the bicycle. In tennis we rely on bodily clues for situating ourselves on the court, hitting the ball and so on. Though we rely on a certain "feel" or "touch" we do not attend directly to this, but to hitting the ball and other actions. The same is true in driving a car and in numerous other cases. When some of these activities become habitual we can do them automatically.

The enormous capacity of our nervous system for integrating and assimilating routines permits us to direct our attention to other concerns, often of a "higher" or more complex nature. The learning of skills is not automatic. It is guided by intelligence. Through a series of trials, errors and discoveries we eventually master a task. No set of rules can be specified

which affords us complete guidance. The best we can do is have a set of maxims. "Maxims are rules, the correct application of which is part of the area which they govern." Rules, or maxims, have to be implemented, and their implementation presupposes some ability on the part of the person. Without the ability maxims are mere ideals. With the ability they are set within the context of human capabilities which they presuppose and hope to develop. Thus, there is an inherent limitation to maxims, for there is a point where we must concede that there are no maxims for applying maxims. This is part of the meaning of them as part of the art they "govern". The point of limitation is where human performance presupposes itself. If we ask someone to perform a task, he will perform that task within his natural abilities, But we cannot ask him to perform his natural abilities, for then he would have to use his abilities to perform them, which would be impossible.

Knowing is also an art for Polanyi. We can provide rules or methods for knowing, but at some point we must acknowledge that there are no rules for applying rules. The rules must be interpreted and implemented by the person, and that presupposes the use of his tacit intellectual powers, capacities of the person which can be positively exploited, but not created, Thus, we can see that it is impossible to specify a method for knowing which could be performed automatically and would guarantee results. Since the rules have to be interpreted, the performance cannot be automatic. Because knowing and all arts are human achievements, and we can fail to achieve, there is no possibility of discovering a method which guarantees results, The futility of self-manipulation is also evident, for it presupposes the intellectual freedom of the manipulator. He too can only follow maxims.

For a skillful performance we rely on our body in successfully following maxims. This relation can be generalized. Polanyi notes that

the special character of our body lies in the fact that it is the only collection of things which we know almost exclusively by relying on our awareness of

them for attending to something else.

The term for this reliance is "indwelling". A good example of indwelling is Polanyi's account of how we use a probe to explore a blind cavity. In learning to use a probe I would assimilate the impacts made on my "hand by the probe as it came into contact with the object. At first I might attend to these impacts themselves. But soon the experience would become less strange as I shifted my attention from the impacts to the Object and relied on the impacts as clues concerning the shape of what I was exploring. The impacts would become the proximal terms of a tacit integrating. I would be aware of them and the action of the probe as I am of my body in any skillful performance. The probe becomes, in this sense, an extension of my body. The same thing happens in driving a car, playing a piano, or using a tennis racket. The process of assimilating the impacts is an interiorization of the object. However, the interiorization is of particulars which, when integrated, mean something beyond themselves. The interiorization of the particulars leads to the exteriorization of the object. The interiorization is a process of dwelling in the set of particulars or clues. Indwelling is operative not only in performing skills, but in all the cognitional acts discussed earlier. For example, perception relies upon clues "hidden deep within the body", and understanding and judgment depend upon the imagination, or upon previous knowledge which we likewise dwell in. In general

meaning arises either by integrating clues in our own body or by integrating clues outside, and all meaning known outside is due to our subsidiary treatment of external things as we treat our body. We may be said to interiorize these things by pouring ourselves into them. It is by dwelling in them that we make them something on which we focus our attention.

We see, then that we are not pure intellects, but radically embodied. Even in our most abstract pursuits our imagination and our feelings are the carriers of our sense of mastery and familiarity, and they provide us with clues leading to their, and our, self-transcendence.

## 5) LOGICAL UNSPECIFIABILITY

Indwelling helps us understand the meaning of knowing as tacit. As a first approximation tacit literally means silent, unexpressed, Knowing, knowledge and clues functioning subsidiarily in their bearing on a focal whole function tacitly. We can readily understand why the significance of the tacit dimension, to use Polanyi's characteristic terms, has been overlooked by many, We intend reality from it, and it requires a special effort to make many of these subsidiaries focal objects in their own right.

Polanyi shows that there is a tacit dimension by claiming that knowing, and in some cases knowledge, is unspecifiable. He has also used the term "unaccountable" interchangeably with "unspecifiable". The use of these terms is misleading, for sometimes "unspecifiable" simply means unspecified, and "unaccountable" means not accountable in terms of rules or formal operations. Sometimes, though, Polanyi thinks that the relevant acts or subsidiaries cannot be specified at all. Then, as far as the person is concerned, they cannot be known at all, In some cases they may be knowable by scientific investigators.

More commonly Polanyi means that though we may be able to make our knowledge explicit or have explicit knowledge of our cognitional acts, when we use knowledge and when we know, both the knowledge and the knowing are not made explicit, but remain tacit. If either were made explicit, then they would be at the focus of our attention, but since they function subsidiarily, they must be tacit. For example, if we are using our knowledge of the countryside to try to determine where we are going to drive next we do not assiduously mentally articulate every idea we have. Similarly, when a scientist is using the theoretical knowledge he has gained to help him solve a particular problem he need not make every consideration explicit. When he formulates his solution he may want to do this, but not while he is trying to know. If we try to make the knowledge we are using explicit, then our concern

shifts. Rather than using the knowledge to make plans or solve a problem, we are using other skills to objectify what was previously subsidiary. As explicit the function and appearance of the knowledge changes. The same is true for knowing. If we are trying to understand something, and then try to make our understanding an object of itself, our interest shifts from our previous project. The function of understanding has changed, and our experience of it is quite different.

These two examples are particular instances of a general characteristic of knowing which Polanyi terms its logical unspecifiability. It is virtually an analytic truth that an integration cannot be specified in terms of its unintegrated particulars. A whole, as an integration, cannot be specified in terms of its parts unless we surreptitiously consider the parts in their bearing on the whole. The objects of tacit knowing and the products of skills are integrations. Also, tacit knowing and skillful performance, as integrations, are integrations in their own right. Thus, we cannot specify knowing as such adequately in terms of its singular acts without considering their interrelationship in a comprehensive, intentional integrating. The implications of this become evident if in the course of a comprehensive performance we shift our attention from the goal of the performance to any of the subsidiaries. The performance disintegrates.

In general, then, tacit integration constitutes a leap which, if reversed, results in a disintegration of the whole. In perception the logical unspecifiability of the whole is evident in the impossibility of focusing on the figure and the ground simultaneously. If we attend to any of the particulars a new perceptual integration is achieved, which precludes having the previous figure as the focal whole. Logical unspecifiability is best illustrated in discovery by considering the semantical aspect of tacit integrations. The unspecifiability of the focal object rests on the fact that insight crosses a logical gap separating the particulars and the intelligible whole. What was previously unrelated or not unified can be either related or unified in unexpected manners through understanding. What was not clear in terms of prior formulations, clues, images, anticipations, is very clear after understanding has been

achieved, and would not be clear without that understanding. The symbols used to express our understanding receive their meaning from their bearing on the idea we are trying to express. If we attend to the symbols independently of their reference they become meaningless. Words become simply marks on a page. In skills the unspecifiability is apparent in the functional aspect of tacit integration. The implications of logical unspecifiability for the semantic and functional aspects of integrations combine when tools become odd, but useless, objects if we focus on them without reference to the task at hand.

Again we see why no rules are sufficient to induce a discovery or to lead us to judgment. Both of these acts are integrations and the rules are useful only in their bearing on the successful performance of the comprehensive acts. Observance of them cannot be substituted for the acts themselves.

## 6) TACIT LOGIC

Polanyi considers the relation between the subsidiaries and their integration to be logical. He is clearly deviating from the notion of deductive logic where there is a rigorous derivation of conclusions from premises following strict rules. Instead, just as premises imply certain conclusions in deductive logic, so subsidiaries "imply a range of integrations in tacit knowing. However, the "implication" is not a strict one, for it is not completely rule-governed. For example, if we consider acts of insight which reveal possible coherencies in the world, or empirical judgments which need not be logical truths, or true in all possible worlds, then the "premises" do not strictly imply the "conclusions", for things could be otherwise,

Polanyi defines logic as "the rules for reaching valid conclusions from premises assumed to be true," This definition is too narrow, for we do not need true premises to have a valid logical argument. However, given his narrower definition, it is possible to conceive of premises which "imply" conclusions where the implication is not necessary and is therefore not grasped formally, but informally. Let us consider two cases. The first is that certain

subsidiaries in understanding "imply" certain ways of understanding them. This is most easily grasped if we consider the case of modifying the images we used in our attempts to understand something so that they are more suggestive of the coherency. They condition the occurrence of certain understandings more than others. A second case would be an empirical judgment. An empirical judgment can be specified in terms of a syllogism. "If my cat walks with a limp, then it has something wrong with its leg. My cat is walking with a limp. Therefore, my cat has something wrong with its leg." This is logically valid, but the fact that it is valid does not guarantee that it is true. My cat may not be walking with a limp, and the syllogism will still be logically valid. The fact that my cat is walking with a limp is not realized by following the rules of logic alone. Rather it is realized by the informal acts of perceiving the cat, understanding that it may be limping, and judging that it is in fact limping. This judgment in turn permits us to imply that something is wrong with my cat. However, what is significant here is that in some sense the perception and understanding of the cat provide premises for an informal inference yielding knowledge of contingent being. The perception is seen to be a "premise" in being tacitly integrated by understanding. The understanding in turn becomes a "premise" by being integrated in the coalescence of grounds for judgment in the actual judging. The link between premise and conclusion is a tacit integration. Since it yields true results using true "premises" it is "logical", I find Polanyi's theory of a tacit logic confusing and inconsistent with much of his thought. First, logic specifies rules, but tacit knowing is not completely rule-governed. Second, if one follows the rules of formal logic, he necessarily arrives at conclusions validly. conversely, he could start with true "premises" in tacit logic, and, through informal thinking, "derive" false conclusions. One of the strengths of Polanyi's philosophy is that it recognizes the possibility of error. But this precludes a tacit logic in the strict sense of that term. Third, we are faced with the

confusing prospect of applying formal terms to an informal process. Fourth, it is not needed. There are implications which logically follow from his analysis of tacit integration. I am referring primarily to the impossibility of specifying focal wholes in terms of their subsidiaries alone, However, this can be concluded using formal logic, There is no need of a tacit logic here. Fifth, I think one of the advances of Polanyi's thought is that he breaks with formal logic as specifying the laws of thought, or as providing the core of philosophic method. Formal logic does not need to be placed in the context of a new logic, . Rather, it need; to be placed within; the context of human knowing. If tacit logic is anything less than an account of what knowing is, then it too needs to be placed within that context. If it is not less than that, then why term it "Logic"? We do not need a new logic as much as we need to recognize that we take our stand on acts of knowing, and we need to know what those acts are and how they are related to one another. The relation is not primarily logical, but intentional.

In tacit logic the "implication" is not a logically necessary one because the premises", or subsidiaries, have an indeterminate bearing. Thus, tacit logic does not have strict rules. We can still be intelligent and understand the same experience in different ways, though not all of these understandings may be correct. Likewise, people who share a similar context of beliefs and judgments can come to differing judgments on the same issue. Now, my intent here is not to challenge the laws of formal logic, for Polanyi claims that we judge with universal intent. My point is that the precision and rigor we associate with logical deduction. and mathematical proof emerge at the end of the knowing process. Before they emerge our knowing and our knowledge have an indeterminate scope. This indeterminacy is of two kinds. First, in trying to understand, there is an intrinsic vagueness to our intimations. In coming to judge, there is an inherent uncertainty. By reflection the process of knowing we can come to know this clearly and precisely. But this knowledge does not eliminate the vagueness and the uncertainty which surrounds other questions prior to their

resolution. However, it may lead us to the decision to trust our vague intimations as being our intending of the real world, and, hence, as objective. Not only does our considering of certain clues have an 'indeterminate scope, but the clues themselves also have indeterminate implications. This is also the case with knowing and knowledge. A true judgment yields knowledge of what will manifest itself in not fully predictable manners in the future. Knowing, then, is partial in most cases. Because of this, known facts have implications we have not yet realized. Determinate knowledge can be indeterminate, in that it has an indeterminate bearing on future knowledge and knowing. Knowing too is indeterminate, for it is incomplete. Though knowing maybe complete with respect to some questions, it is not with respect to all. To know a fact is but a minor moment in a larger process. We use what we know in our attempts to know more. Reality, then, is in a large measure indeterminate for us, for we do not have complete knowledge of what it is. In turn, we are in contact with reality as such heuristically, in terms of emotional and intellectual intimations.

We can see, then, that rigorous, precise, logically-ordered knowledge does emerge, but that it is not the whole of knowledge. We can have clear knowledge without being able to specify any strictly logical connection between the conditions for our knowledge and the knowledge itself. Again, the connection is a tacit integrating, and it can 'integrate disparate particulars yielding universal knowledge. To illustrate this let us return to the discussion of unspecifiability.

## 7) OTHER. FORMS OF UNSPECIFIABILITY

The learning and use of descriptive terms display a two-fold indeterminacy which illustrates the meaning of unspecifiability as indeterminacy. The indeterminacy resides both in knowing and in knowledge. Descriptive terms have an indeterminate range of application. In learning to use words we follow a process similar to recognizing a person's face. We can

recognize a person whether he is healthy, sick, happy, or sad. Subsidiaries are organized so that we recognize his expression, and then the series of expressions are integrated as belonging to one person. Likewise, we can apply the word "blue" to a series of qualities which differ in kind and in particulars. For example, "blue" can refer to moods and colors. In reference to colors it can refer to a range of different colors set in differing contexts and so on. If we meet a new instance of the color blue we can often readily assimilate it to our knowledge. However, if it is close to green we may have to revise our notions of both blue and green. In this case the source of indeterminacy of our knowing resides primarily in the object of knowledge. The various instances of blue are not similar to each other in all respects, nor is there one common aspect or set of aspects which exist in all instances of the color. Also, the use of the term is not completely specifiable because it can be modified in the future while retaining its older meanings. The knowing cannot be specified in a set of rules because it is not the same in all instances. It is the integration of particulars, many of which are unique to the particular situation in which they occur and many more of which are unique to the particular knower. However, despite the indeterminacy of descriptive terms, we can distinguish cases where we use them correctly and with confidence though we may not give univocal definitions of them.

In addition to the meanings of unspecifiability which center on indeterminacy and informal acts, there is the more familiar meaning of not being able to state what I know or how I know it. In some cases, as I have mentioned, unspecifiability simply means unspecified, in others it means never specifiable. Polanyi does not draw a sharp line between these two kinds of cases, so it is difficult to determine how far strict unspecifiability extends. As a first illustration I will consider unspecifiable knowledge.

Polanyi gives the example of the doctor's knowledge of the positions of the various

parts of the body. Any competent doctor should know where most of the organs, muscles, systems of the body are in relation to one another, yet he cannot exhaustively specify this knowledge. He cannot present a comprehensive image of the body for the simple reason that the body is an opaque, three-dimensional object. He must then specify the position through language. We would be faced with pages of minute descriptions and pages relating these to one another, if he in fact had enough time to complete the project, which does not seem likely. The fact that he does know the positions without specifying them is evidence of tacit knowledge.

If we turn to knowing, the problem becomes more complex. Polanyi thinks that perceiving relies on unspecifiable clues which are "deeply hidden inside the body and cannot be experienced in themselves by the person." We may be able to arrive at a scientific knowledge of these clues through experimentation, but since the person does not experience them they would seem to be strictly unspecifiable for him. He seems to regard the unspecifiability of clues in understanding as mixed. That is, some may be specifiable, but simply are not specified, and others are strictly unspecifiable. In trying to understand we often do advert to clues, images, symbols, but we rarely, if ever, advert to all of them which have a bearing on the problem for us. Also, after we have understood we still rely upon them in confronting similar problems or situations, but if we can confidently assume our prior understanding we rarely find occasion to advert to them. Our imagination, for example, can flow in habitual patterns when we are speaking and calculating, just as it can when we are typing or playing tennis. We seldom pay attention to the imaginative flow since our concern is to speak or solve a problem, not to introspect.

Understanding exhibits all the types of unspecifiability discussed so far. It is intentional and is tacit in this sense. The clues used in understanding are logically unspecifiable when we are trying to solve a problem using them as subsidiaries.

Understanding itself is logically unspecifiable, for our object is not understanding per se, but what we are trying to understand. Finally, as logically unspecifiable, they are unspecified. This means that the person may not know what he is doing when he is understanding. Even if he does know, he does not rely on that knowledge, but on his natural capacity to understand; that is, on an informal act.

Now, it seems certain that most people do not know what they are doing when they are knowing, though they may know perfectly well. But it is not evident to me that they can never know how they know. In some cases besides perception Polanyi thinks that they cannot. I think that his fundamental philosophic position can be maintained without this claim. Indeed, I believe that it does more harm than good.

This brings us to another argument for the unspecifiability of tacit knowing. His argument that it may be impossible to specify how we know rests upon the logic of tacit integration. For example, Polanyi claims that "the actual foundations of our scientific beliefs cannot be asserted at all." (My emphasis)

They are not asserted and cannot be asserted, for assertion can be made only within a framework with which we have identified ourselves for the time being; as they are themselves our ultimate framework, they are essentially inarticulable.

In his last work, *Meaning*, he extends this result to all judgments. He claims that "we cannot ultimately specify the grounds ... upon which we hold that our knowledge is true." I am concerned with the general principle he bases this conclusion on and the implication it has for the possibility of asserting our ultimate framework. With reference to the grounds he states that we cannot ... see what they are, We cannot look at them since we are looking with them." A slightly different claim is that with any subsidiaries "When we focus upon them, making them explicit entities ... we change their phenomenal character ...."

What is our ultimate framework? The term "ultimate" admits of ambiguities and these should be resolved, If a framework is merely conceptual it cannot be ultimate in one sense,

There is, for example, always the possibility of invoking a higher framework to show that the lower is logically consistent. If we allow tacit assumptions into our framework, as does Polanyi, then there is still the possibility of development of the framework. Thus, any framework which involves products of thinking and knowing cannot be ultimate in a temporal sense, unless it is the final framework in a series of revisions. But there is another sense of ultimate, and this is Polanyi's meaning. Our commitments are ultimate because we cannot extricate ourselves from them without committing ourselves. Likewise, our framework is ultimate because we presuppose it in trying to change it. It sets limits on how far we can go at the time. However, I would like to propose that there is a primary and a secondary ultimacy to any framework. Though frameworks which are subject to revision are "ultimate" while we accept them, there is an ultimate framework of these provisional frameworks which is not open to revision. In phenomenological terms, there is a horizon of horizons. The framework beyond which we cannot go is the mind itself. To specify the activities of the mind is to layout heuristically the range of possible horizons. It includes laying out the general conditions for the acceptance of anything. It is not to layout all the conditions for the analysis in general, but it is to layout some of the conditions. Let me illustrate this.

There are grounds for the existence of a being and grounds for affirming the existence of a being. The grounds for the existence of a being we may term its causes. These may differ from the grounds for affirming the existence of a being. For example, one 'Of the grounds for affirming the existence of a being may be that we experience it. But it is not a cause of its existence that we experience it. Now, Polanyi claims that, in general, affirmations of existence must satisfy self-set standards embodied in intellectual passions. Also, in verification we must have a confirming experience. These are specifications of the grounds in general. They point to a general structure of affirmation which admits of relatively infinite specification (i.e., the

affirmation of anything that exists can satisfy our intellectual passions). This points to the possibility of specifying kinds of grounds and kinds of judgments, which rests upon the possibility of specifying particular grounds and particular judgments. The fact that they can be specified does not controvert their tacit character nor their unspecifiability in the sense of not being able to specify all the grounds of all our judgments. All tacit acts have an indeterminate range of application, and they function tacitly whether we can tell what we are doing or not. I am suggesting that the range of application is not completely indeterminate.

To deny the possibility of specifying the grounds of judgment, to claim that it is impossible for the reasons Polanyi gives, is to place the whole project of knowing tacit integration in jeopardy. There is a performative contradiction between Polanyi's specifying tacit knowing to the extent that he does and the claims that he makes concerning the impossibility of specifying the grounds of judgment. In short, Polanyi lays out in part what is invariant in any framework, and I shall show that if an assumption of his is rejected, the specification of the framework is consistent with the rest of his philosophy. If we turn to the logical and the phenomenal character of tacit knowing there is an apparent problem. First, the tacit acts are subsidiary to the focal object, How can they become focal for themselves? This is similar to the problem we have with specifying our grounds for judgment, for in both cases "We cannot look at them since we are looking with them," Secondly, if they become focal their phenomenal character changes, As focal objects, the acts differ in appearance from themselves as subsidiary. Can we know the acts in their subsidiary functioning if in focusing on them their phenomenal character changes? Polanyi makes tacit integrating a focal "object". How can we reconcile his performance with the problems arising out of his theory?

A solution is had by noting that consciousness is different from sensing, We cannot see seeing, hear hearing, touch touch, and so on, However, consciousness is given to itself by

itself. If I am aware of an apple, awareness is given along with the apple, The phenomenal character of tacit knowing makes it possible to investigate consciousness in that awareness and conscious activities are present subsidiarily in focal intending, For example, our understanding appears in the making present of the intelligibility of the object, It is possible to remember an experience of understanding a mathematical relationship, for example. Focusing on the understanding and not the relationship, the phenomenal character of the understanding certainly changes, However, the understanding itself does not change simply because we focus on it, To understand understanding demands in part a series of tacit integrations of a series of acts viewed focally, as well as their correlative objects, Just as the mere perception of an object does not reveal its intangible meaning, so differing experiences of understanding do not preclude the possibility of having a coherent understanding of them. If we do not conceive of consciousness and non-sensing conscious activities as fully analogous to sensing, then it is possible for the acts to be reflexive. We can think' about thinking, make some inroads to understanding understanding, and judge about judging (even if to deny the possibility). Thus, I must disagree with Polanyi and claim that insofar as we can specify the grounds for judging (look at them) it is because we are looking with them. The problem lies with analyzing judging on an analogy with seeing, not in judging itself. However, though I think we can specify the grounds in principle, I do not think we can nor need do so in all cases.

Even if we could exhaustively specify how we know and what we know, such specification is not absolutely necessary in order to know. We can know more than we can tell, and we can know it without knowing how we know it. Indeed, as in the example of the doctor's knowledge of anatomy, specification may reach a point where it is extremely uninteresting. Because knowing and knowledge do exist without being specified, there is a tacit dimension of mental acts and contents which we rely upon while being in the world.

## 8) TACIT KNOWLEDGE AN AMBIGUITY

We have seen that knowledge is tacit because it need not be specified and because it may be unspecifiable in the situation in which it is relied upon. In cases where knowledge is subsidiary to a focal interest it cannot be made explicit without its character changing. It is no longer relied upon; rather, other subsidiaries are relied upon in intending it.

We have also been developing a model of knowing which we will apply to an understanding of scientific method and of nature and man. In that model knowledge in the fullest sense is what is understood and accepted in a personal judgment. This model applies to Polanyi's description of the process of solving a problem, which is the paradigm of all knowing for him.

However, there is another view of knowing in sharp contrast to this operative in Polanyi's epistemology. We are already familiar with the distinction between two kinds of awareness, subsidiary and focal. In *The Tacit Dimension*, this distinction is equated with the distinction between two kinds of knowledge, tacit and explicit. Let us consider the example in which he draws this relation.

People were put in an experimental situation where they were shown a series of unrelated syllables. After the person was shown certain syllables in the series he was shocked. Eventually the person began to anticipate the shock when shown these syllables, but he could not say why he anticipated the shock. Analyzing this in terms of focal and subsidiary awareness Polanyi claims that the relation between the syllables and the shock was unspecifiable because

... the subject was riveting his attention on the electric shock. He was relying on his awareness of the shock producing particulars only in their bearing on the electric shock. We may say that he learned to rely on his awareness of these particulars for the purpose of attending to the electric shock.

He goes on to say that

Here we have the basic definition of the logical relation between the first and second term of a tacit knowledge. It combines two kinds of knowing. We know the electric shock, forming the second term, by attending to it, and hence the subject is specifiably known. But we know the shock-producing particulars only by relying on our own awareness of them for attending to something else, namely the electric shock, and hence our knowledge of them remains tacit. This is how we come to know these particulars, without being able to identify them.

What is of interest here is that if we rely on the awareness of X for attending to the

focal object, then we know X tacitly. Put this way, this approaches the naive realist claim that awareness is knowing. Now it should be evident that we do not always know the clues we rely on for perceiving, though we have a subsidiary awareness of them. The same holds for clues in understanding and judging. Similarly, we rely on our intimation of coherence, which we experience, for recognizing a problem. The problem is at the focus of our attention, and our knowledge of it is tacit. But though we know the problem by relying on our awareness of the intimation of coherence, we cannot be said to know the intimation of coherence. We are simply aware of it. If we could be said to know it, then we would have to claim that we have tacit knowledge of knowing after we first know successfully, because we rely on our awareness of the achievement of certain acts to guide us in assenting to reality.

There is a need for a distinction between subsidiaries which are known tacitly and those which are not, and a corresponding distinction between subsidiary knowledge and subsidiary awareness. This would help prevent unjustifiable claims being made in the name of tacit knowledge, such as mistaking familiarity with knowledge, experience with knowledge, or the intimation of coherence with knowledge of it. Tacit knowing is especially open to abuse since one can claim that since X is known tacitly, he cannot specify what he knows or how he knows it. It makes it very difficult to determine if he knows what he claims to know for him and for others. It is at this point that Polanyi's philosophy is the most vulnerable. Given Polanyi's view on the unspecifiability of the grounds of judgment and the reasons for it, there is reason to believe that he would have argued against the possibility of such a distinction. If so, his philosophy risks being uncritical.

## 8) CONCLUSION

From the description of tacit knowing we can conclude that Polanyi conceives knowing

as dynamic. His view of reality as that which will manifest itself in unpredictable ways in the future is matched by his description of a knower who assimilates common sense, practical and theoretical knowledge, using it in innovative manners to deal with unique situations.

Knowledge is not dry, or excessively abstract, but is instrumental in our situating of ourselves in a meaningful world. We are embodied knowers, and the acquisition of knowledge constitutes changes in ourselves. In fact the growth of knowledge is matched by a personal development in which, as long as we are progressing, we become ever more satisfying to ourselves as we accredit our successful performances. Thus, the healthy infant becomes more self-assertive and happy as he begins to intellectually and skillfully master his environment. And a similar process occurs in the scientist as he becomes a master of his art.

That we can move from the initial self-development of the infant to the high cultural achievement of the scientist, demonstrates that the dynamism is developmental. Tacit knowing is open-ended. It is a capacity for self-transcendence, which includes the transcendence of our previous achievements. The notion of logical unspecifiability is central to understanding the possibility of self-transcendence. We are not stuck within the framework of a set of rigid rules, but possess a remarkable adaptive and creative ability. This is because we can integrate the same bodily processes into different wholes as well as discovering unique integrations in the world. However, the notion of logical unspecifiability, and the existence of unspecified knowledge and knowing in general, imply that we can accept things for which we may not be able to give fully convincing proofs. This brings us to the central topic of the epistemology of commitment, Polanyi's contention that tacit knowing is a-critical and that his is a post-critical philosophy. Let us turn to Polanyi's notion of commitment and the implications it has for epistemology,

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