Tradition & Discovery

The Polanyi Society Periodical

R. Melvin Keiser and Rosemary Moore, eds. and commentators, *Knowing the Mystery of Life Within:
Selected Writings of Isaac Penington in their Historical and Theological Context*
Reviewed by Walter Gulick
Richard Dawkins, *The God Delusion*
Reviewed by William J. Kelleher

Preface

This issue of *TAD* includes the call for papers (pp. 8-11) for both the June 13-15, 2008 Chicago, Loyola conference celebrating the fiftieth year of publication of *Personal Knowledge* and the June 26-28, 2008 Budapest Polanyi conference. Note (p. 9) that the Polanyi Society is kicking off its 2008-2009 membership drive now because we need to raise some funds for the June 2008 Loyola conference. Our membership cycle normally runs on the academic year beginning in Sept. Some may have received a recent reminder letter asking you to pay 2006-2007 dues. Let me press the flesh right now to encourage you to make a generous tax deductible (for US citizens) contribution along with your 2008-2009 membership dues. The Polanyi Society is an incredibly efficient low-budget scholarly society and we must make a special appeal if we are to remain solvent when sponsoring a major conference like that upcoming in June 2008. Also you will find in this issue the program for the Polanyi Society annual meeting to be held in San Diego on November 16 and 17, 2007.

Zhenhua YU originally put together the essays in this *TAD* as part of a special issue of the Chinese journal *New Philosophy* that focused on Polanyi's thought and its links with other Western thinkers. He did the translations himself and this second volume for 2006 should be out any day. He also made arrangements with *New Philosophy* to publish his own, Gulick's and my essays in English in *TAD*. Thanks go to Professor Wang Zhongjiang for granting permission to include these essays. Zhenhua YU's essay comments on the ways Scandinavian philosophers interested in Wittgenstein and Polanyi have discussed tacit knowledge. My essay discusses Polanyi's account of the "comprehensive entity," reviewing Marjorie Grene's efforts to link Polanyi and Continental thinkers and suggesting Polanyi's realism may be akin to medieval realism. Gulick's essay examines tacit knowing and seeks to clarify and elaborate upon Polanyi's claims. He distinguishes unconscious, inarticulate and conscious processes and explores schematization as the process whereby inarticulate learning (skills, memories, habits) is internalized.

Phil Mullins

NEWS AND NOTES

Andrew Grosso's *Personal Being: Polanyi, Ontology and Christian Theology* has recently been published by Peter Lang. It will be reviewed in a forthcoming issue of *TAD*.

Craig E. Mattson's review essay, "Thinking Aloud in Public: Michael Polanyi as Public Intellectural" appeared in *Christian Scholar's Review* (Vol. XXXVI, No. 1: 77-86). He comments on five recent books in the Polanyi literature: Scott and Moleski, *Michael Polanyi Scientist and Philosopher* (2005); Moleski, *Personal Catholicism: The Theological Epistemologies of John Henry Newman and Michael Polanyi* (2000); Gill, *The Tacit Mode: Michael Polanyi's Postmodern Philosophy* (2000); Jha, *Reconsidering Michael Polanyi's Philosophy* (2002); and Jacobs and Allen (eds.), *Emotions, Reason and Tradition: Essays on the Social, Political and Economic Thought of Michael Polanyi* (2005).

Walter Mead's essay "The Insights of Micahel Polanyi" is forthcoming in *Modern Age*. Mead is also negotiating with *The Political Science Reviewer* to do a special Polanyi symposium issue. *The Political Science Reviewer* is an annual that regularly devotes issues to consideration of a major thinker's contributions. The 2005 issue was a fiftieth anniversary issue on Voegelin's *New Science of Politics*; hopefully, a future issue will celebrate the fiftieth anniversary of *Personal Knowledge*.

Richard Allen, editor of *TAD's* sister journal *Appraisal*, and SPCPS, is seeking assistance with the editing of *Appraisal* and running the web site. If you are interested, contact Allen at rt.allen@ntlworld.com.

McEnerney Lectures Available on Polanyi Society Web Site

Michael Polanyi's McEnerney Lectures were delivered in February of 1962 on the campus of the University of California, Berkeley. This series of four lectures was originally recorded by KPFA, a Berkeley radio station, and was broadcast in the summer of 1964. The audio files became part of Pacifica Radio Archives. After about a year's work with Pacifica Film Archives, the Polanyi Society now has been granted the right to put, for research purposes, the downloadable audio files for each of the four lectures on the Polanyi Society web page (http://www.missouriwestern.edu/orgs/polanyi/) You will find the McEnerney Lectures (as well as the audio file posted in 2006 with the 1966 conversation between Polanyi and Carl Rogers) under the link on the main menu titled "Essays and Lectures (audio files) by Michael Polanyi." Use your mouse to click on the lecture title links to play these MP3 files; you must have one of approriate standard audio player software packages (such as RealPlayer[free]) on your machine in order to play MP3 files. If you right click, you can save the audio file to your local computer and play the file later. There is an introduction to the context of the McEnerney lectures written by Phil Mullins (with the help of several others). Also there is information in the introduction about how to purchase disk copies of the lectures from Pacifica Film Archives.

Polanyi Society Travel Funds Available

For students and others requiring assistance for attending the Society's annual meeting scheduled for San Diego in November 2007, limited funding is available. Society members are urged to call the availaility of this assistance to the attention of those whom they consider worthy candidates. Those interested inapplying for this funding, as well as those able to assist in making thisfunding available, should contact Walter Mead (wbmead@insightbb.com) and see the information on the Polanyi Society web site (http://www.missouriwestern.edu/orgs/polanyi/).

2007 Polanyi Society Annual Meeting Program

      This year's annual meeting will be in San Diego, CA on November 16 and 17, 2007. The preliminary version of the program printed below will be finalized (adding hotel meeting rooms) in the October 2007 *TAD*. As soon as complete information is available, it will be posted on the Polanyi Society web page (http://www.missouriwestern.edu/orgs/polanyi/). Papers will be available for downloading by late October.The Polanyi Society annual meeting will again this year will be an "Additional Meeting" held in conjunction with the annual meetings of the AAR and SBL. For information, go to the AAR/SBL web site: http://www.aarweb.org/annualmeet/default.asp. It is not necessary to register for the AAR/SBL meetings in order to attend the Polanyi Society annual meeting.

Friday, November 16, 2007--4:00 pm - 6:30 pm (hours requested)

Jere Moorman, Presiding

4:00 William Coulson, Center for Studies of the Person, San Diego
"On Having Misread Polanyi's Theory of Personal Knowledge"
Respondents:
Dale Cannon, Western Oregon University
Philip Rolnick, St Thomas University

5:15 William Kelleher, La Canada, CA
"Personal Knowledge as Pure Self-Reflection"
Respondents:
Phil Mullins, Western Missouri State University
Diane Yeager, Georgetown University

Saturday, November 17, 2007   9:00 am – 11:30 am (hours requested)
Joint Session with North American Paul Tillich Society

9:00 Walter Gulick, MSU-Billings, Presiding
Theme: *How Tillich's Recently Retrieved Paper, "Participation and Knowledge: Problems of an Ontology of Cognition," Engages Polanyi's Thought*

Co-Presenters:
Durwood Foster, Pacific School of Religion
Richard Gelwick, Bangor Theological Seminary

Respondents:
Donald Musser, Stetson University
Robert Russell, Center for Theology and the Natural Sciences, GTU, Berkeley

11:15 Business Meeting:
Walter Mead, Illinois State University, Presiding

"Personal Knowledge at Fifty"

Call for Papers

June 13-15, 2008 the Polanyi Society is sponsoring a conference at Loyola University, Chicago on the theme "Personal Knowledge At Fifty." *Personal Knowledge* was published in May, 1958 and this conference will celebrate this event as well as provide an opportunity to reappraise Michael Polanyi's *magnum opus* and its philosophical agenda in terms of developments in philosophy, science and the globalization of culture.

The conference will be organized like the 1991 and 2001 Polanyi Society conferences at Kent State University and Loyola University, Chicago. There will be several plenary speakers as well as parallel sessions in which conference participants present and discuss papers with others interested in the session's particular topic. Invitations for plenary speaker are presently pending. This will be a conference that builds in many opportunities for discussion as well as a trip for those interested to the archival Polanyi Papers at the Regenstein Library of the Univeristy of Chicago.

Proposals are invited for papers that discuss the themes or impact of *Personal Knowledge* and the importance of Polanyi's philosophical ideas in the contemporary world. Below are a few suggested general categories within which papers might be grouped; these are intended merely to stimulate reflection. The final program will organize sessions in terms of rubrics fashioned in light of proposals submitted.

Personal Knowledge, Postcritical Philosophy and Postmodernism
Personal Knowledge As Fiduciary Philosophy and the the History of Philosophy
Personal Knowledge And William Poteat, Marjorie Grene, Wittgenstein, Phenomenology, etc.
Personal Knowledge and Contemporary Discussions of Emergence
Personal Knowledge On Religion
Personal Knowledge And Contemporary Philosophy of Science
Personal Knowledge And Political Philosophy
Personal Knowledge, Moral Inversion and Polanyi's Criticism of Culture
Personal Knowledge and Polanyi's Reformulations in Later Writing
Personal Knowledge: Shortcomings
Proposals for panel presentation on topics are invited.

Proposals will be blindly reviewed by a panel of jurors and should be no longer than 250 words. On the first page of the proposal, give your proposed paper title (or panel title), your name and your e-mail address. On the second page, repeat the title and provide an abstract. Mail proposals as e-mail attachments to Phil Mullins (mullins@missouriwestern.edu). Proposals will be reviewed in two or three batches. The initial deadline is Oct. 15, 2007 with projected response by December 1, 2007. Please forward proposals early in order to facilitate conference planning.

MEMBERSHIP RENEWAL/FUND DRIVE

In this issue, there is a call for papers for the international Polanyi conference, set for June 10-13, 2008 at Loyola University, Chicago, which celebrates the publication of *Personal Knowledge.* Like the 2001 conference also at Loyola, this event is sponsored exclusively by the Polanyi Society. That is, the 2008 conference is not like the annual meeting held in conjunction with a larger professional society that considers the Society an affiliate and gives us space at a preferred rate. Nor is the upcoming Loyola conference like the 1991 conference at Kent State University that was generously subsidized by that university. Unfortunately, it is necessary for the Polanyi Society to cover all of the expenses of organizing the 2008 Loyola conference; we must also remain solvent enough to cover other annual operating expenses associated with the annual meeting and the publication of *TAD*. The Organizing Committee for the 2008 Loyola conference is investigating strategies modestly to improve the finances of the Society. We welcome any suggestions about possible funding sources for the Loyola conference. One necessary funding option--getting Society members to reach into their pockets to pay annual dues and make contributions--is outlined below.

Membership dues for the Polanyi Society are still only an unbelievable $25/academic year. The first issue of a new TAD volume normally includes a flyer asking for dues payment. In the 2007-2008 academic year the Society will be more diligent about dues collection and we will remind you about the opportunity to support the Loyola conference. You may get a first and second payment notice reminding you that it is time to renew your membership. You are invited **now** to combine your dues payment with a contribution. If you have not paid your 2006-2007 dues, you may combine that with your 2007-2008 dues and contribution. In order to encourage you to "think generously," please review the chart below that sets forth some "rungs" on the contribution ladder. We hope you will reach as high as it is possible for you conveniently to stretch. Unlike the Public Broadcasting System and National Public Radio drives in the US, we do not have Polanyi Society coffee mugs, book bags and other memorabilia to distribute to those who are generous. But for those who do stretch (at least $50), we can provide a copy of any of the following if you identify your preferences: (1) a remaindered copy of Andy Sanders' 1988 book, *Michael Polanyi's Post-Critical Epistemology: A Reconstruction of Some Aspects of "Tacit Knowing"*; (offered in 2001 but there are about 20 copies left); (2) paper copies of any available old issues of *TAD* that you want (all those since 1991 are on the web site but the paper copies have not yet been discarded); (3) an audio CD of Polanyi's 1962 McEnerney Lectures (now also available for downloading from the web site).
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Donation Range	Designation	Acknowledgment
$20-50	Associate	1 year membership
$51-$100	Friend	1 year membership
$101-$500	Benefactor	1 year membership
$500	Patron	3 year membership

All donors will be acknowledged in the program of the 2008 Loyola Conference. The Polanyi Society is a 501C3 tax deductible non profit organization; the Society sends (to those who pay US income tax) charitable donation letters for donations above $25. Dues and donations can be sent by post, fax or e-mail to Phil Mullins. Credit cards donations are welcome. See the flyer insert to go to the Loyola Conference web page on the Polanyi Society web site (http://www.missouriwestern.edu/orgs/polanyi/).

Call forPapers

Reconsidering Polanyi - 2008, June 26-28, Budapest

"In such men the traditional forms for holding moral ideals had been shattered and their moral passions diverted into the only channels which a strictly mechanistic conception of man and society left open to them. We may describe this as a process of *moral inversion*. The morally inverted person has not merely performed a philosophic substitution of material purposes for moral aims; he is acting with the whole force of his homeless moral passions within a purely materialistic framework of purposes."

"… a free society is one accepting the service of truth and justice, and … totalitarianism is the outcome (by inversion) of a skepticism denying intrinsic force to the ideas of truth and justice…"

<div align="right">Michael Polanyi</div>

Polanyi, the philosopher, is mostly known as a theorist of knowledge. His philosophy proceeds from the analysis of knowing to address many important topics including ontology, social theory, theory of the person and the practical dimensions of science. His theory of knowledge rests on ethical, social and existential pillars beside his Gestalt-based theory of cognition.

On the 50th anniversary of the publication of his masterpiece, *Personal Knowledge*, the aim of the conference is the reappraisal of this perplexingly rich, highly original and refreshingly unconventional philosophy in the light of the current intellectual milieu as well as from historical perspectives.

The conference is open to contextual, historical, and analytical approaches including – but not limited to – the following list of topics:

- Personal knowledge in light of social and historical epistemology
- Tacit knowledge and the new results of cognitive psychology
- Reappraising Polanyi's *The Logic of Liberty*
- The cognitive functions of emotions
- Polanyi on the production and management of knowledge
- The postcritical and postmodern perspectives
- Embodiment and tacit knowing
- Polanyi and the concept of emergence
- Polanyi and understanding technology

Confirmed Speakers:
Richard Allen, Chairman and Editor of *Appraisal,* Nottingham
Bob Brownhill, (formerly:) University of Surrey, UK
Dale Cannon, Western Oregon University, Monmouth
Márta Fehér, University of Technology and Economics, Budapest
Walter Gulick, Montana State University, Billings

Chris Goodman, President of *Appraisal*
Karl Hall, Central European University, Budapest
Stefania Jha, Boston University, Boston
Tihamér Margitay, University of Technology and Economics, Budapest
Phil Mullins, Missouri Western State University, General Editor of *Tradition & Discovery*
Hans-Joerg Rheinberger, Max Planck Institute for the History of Science, Berlin
Otto Sibum, Max Planck Institute for the History of Science, Berlin
Yu Zhenhua, East China Normal University, Shanghai

Conference committee:

Tihamér Margitay (BUTE), chair, Department of Philosophy and History of Science
Márta Fehér, (BUTE) vice-president of the MPLPA, Editor of *Polanyiana*
Richard Allen, Chairman and Editor of *Appraisal*
Phil Mullins, Missouri Western State University, General Editor of *Tradition & Discovery*
Éva Gábor, (BUTE) President of the Michael Polanyi Liberal Philosophical Association
Benedek Láng, (BUTE), Department of Philosophy and History of Science

Practical details:

- **Conference language:** English

- **Registration fee**: 30 EUR

- **Deadline for abstract submission**: Sept 15, 2007 via the following link: http://www.polanyi.bme.hu

The number of the participants is limited. Applicants will be informed about the outcome of their applications no later than the 30th October, 2007.

- **Accommodations** for conference participants will be available both on campus at the Budapest University of Technology and Economics and in nearby hotels

1) - on campus accommodation is available in the guesthouse of the University for approximately 55-65 EUR /night including breakfast

2) - Rooms in four-star hotels in 5-15 minutes walking distance from the conference venue:

(a) Danubius Hotel Gellért 80-120 EUR/night including breakfast, use of sauna, pool and historic steam bath: http://www.danubiushotels.com/en/budapest-hotels/danubius-hotel-gellert-budapest/hotelrooms

(b) Park Hotel Flamenco 90-110 EUR/night including breakfast, use of sauna, pool and fitness room: http://www.danubiushotels.com/en/budapest-hotels/danubius-hotel-flamenco-budapest

For more information visit http:// www.polanyi.bme.hu or write to Benedek Láng: http:// www.conference@filozofia.bme.hu

Tacit Knowledge: A Wittgensteinian Approach

Zhenhua YU

ABSTRACT Key Words: Wittgenstein, K.S. Johannessen, the strong thesis of tacit knowledge, intransitive understanding, pragmatic turn in epistemology.

Influenced by later Wittgenstein's philosophy, a group of Scandinavian philosophers, with K.S.Johannessen as the leading figure, make a unique contribution to the ongoing discussion of tacit knowledge. They differentiate the strong and the weak interpretations of tacit knowledge, and put their emphasis on the former. Based upon his practice-centered interpretation of later Wittgenstein's philosophy, Johannessen makes much out of Wittgenstein's notion of intransitive understanding to argue for the strong thesis of tacit knowledge and advocates a pragmatic turn in epistemology.

In the ongoing discussion of tacit knowing/knowledge, the Scandinavian Wittgensteinians are a very active force. In close connection with the Swedish Center for Working Life in Stockholm, their work provides us with a wonderful example of the fruitful collaboration between philosophical reflection and empirical research. In the Wittgensteinian approach to the problem of tacit knowing/knowledge, Kell S. Johannessen is the leading figure. In addition, philosophers like Harald Grimen, Bengt Molander and Allan Janik also make contributions to the discussion in their own ways. In this paper, I will try to clarify the main points of their contribution to the discussion of tacit knowing/knowledge.

The Target of Attack

According to Johannessen, one of the salient features of the traditional conception of knowledge is that it is basically propositionally oriented, that is, it underscores the inner relationship between knowledge and language. Anything qualified as knowledge must be capable of being articulated by verbal means, or in some notational form.[1]

The historical development of this propositionally-oriented understanding of knowledge is briefly delineated by the Wittgensteinians. Harald Grimen suggests its origin in Greek philosophy.[2] For instance, in Plato's dialogue *Laches*, the theme of which is courage, Socrates claims that "And that which we know we must surely be able to tell."[3] Laches, who is a distinguished general, says: "I fancy that I do know the nature of courage, but, somehow or other, she has slipped away from me, and I cannot get hold of her and tell her nature."[4] According to Socrates' standard, now that Laches cannot tell the nature of courage, he does not know what it is.

The idea that what counts as knowledge must be capable of being verbally articulated and what cannot be told is not knowledge was strengthened in modern times. As Johannessen points out, from Galileo's famous saying "The book of Nature is written in mathematical language," to Leibniz's dream of an universal language, i.e., his *characteristica universalis*, to logical positivists' view of knowledge, the propositionally oriented

understanding of knowledge became more and more prominent and influential. He claims that, within the framework of logical positivism,

> [K]nowledge and language are woven together in an indissoluble bond. The requirement that knowledge should have a linguistic articulation becomes an unconditional demand. The possibility of possessing knowledge that cannot be wholly articulated by linguistic means emerges, against this background, as completely unintelligible.[5]

However, this doctrine of logical positivism has been called into question since World War II. Johannessen observes:

> It has in fact been recognized in various camps that *propositional* knowledge, i.e, knowledge expressible by some kind of linguistic means in a propositional form, is not the only type of knowledge that is scientifically relevant. Some have, therefore, even if somewhat reluctantly, accepted that it might be legitimate to talk about knowledge also in cases where it is not possible to articulate it in full measure by proper linguistic means.[6] (italics original)

Johannessen, using Polanyi's terminology, calls the kind of knowledge that cannot be fully articulated by verbal means tacit knowledge.

Tacit Knowledge: Strong and Weak Interpretations

One of the contributions that the Wittgensteinians make to the discussion of tacit knowledge is the clarification of different meanings of the term. The most important distinction that the Wittgensteinians bring forth is the following: tacit knowledge as something that **cannot** be articulated verbally **in principle** in contrast to tacit knowledge as something that **is not** articulated by verbal means, but **can** be articulated linguistically. The distinction is a consensus among the Wittgensteinians; however, everyone has his version of it. In the following, I will take Grimen's discussion of different interpretations of the concept of tacit knowledge as an example to illustrate the distinction, with reference to other Wittgensteinians at various points.

Polanyi has a famous saying which goes together with his term "tacit knowledge," that is, "We know more than we can tell," which is diametrically opposed to the aforementioned claim by Socrates: "that which we know we must surely be able to tell." According to Grimen, there are different interpretations of Polanyi's saying and the concept of tacit knowledge. I shall focus on those which are epistemologically interesting.[7]

The first interpretation is called the Gestalt thesis of tacit knowledge. When one is engaged in a certain activity, such as playing piano, riding a bicycle, swimming etc., one has to rely on certain unproblematic background, otherwise the activity cannot be fluently carried on. On the contrary, if one focuses on the background and tries to articulate it by linguistic means, one will obstruct the performance of the activity. That is to say, the unarticulated background which is necessary for the performance of a certain activity cannot be articulated by the agent himself in the process of performance. The knowledge that the agent has about this unproblematic background is a kind of tacit knowledge. It is worth mentioning that this interpretation of tacit knowledge only claims that for the sake of not obstructing the performance of an activity, the agent can not articulate verbally the background on which he relies, it does not claim that this kind of knowledge is verbally unarticulatable in principle. For what the agent cannot articulate linguistically in the process of performance,

can well be articulated by others or by himself after the performance. In Grimen's view, this interpretation of tacit knowledge is clearly influenced by Gestalt psychology, so he calls it "the Gestalt thesis of tacit knowledge." He holds that Polanyi's thinking is close to the Gestalt thesis.

The second interpretation can be characterized as "the thesis of epistemic regionalism." All the knowledge that one has constitutes a vast, loosely knit and not perspicuous system. At any given moment, one can only reflect on small parts of this knowledge system and verbally articulate them. No one can articulate the whole system simultaneously. In terms of having a perspicuous overview of the knowledge that we have, we are all regionalists. This amounts to the fact that, at any given time, we always have certain verbally unarticulated knowledge in our thinking and action, namely, tacit knowledge. Grimen calls this interpretation of tacit knowledge "the thesis of epistemic regionalism." In light of this interpretation, no specific element of knowledge is in principle verbally unarticulatable; but at a given moment, the knowledge that we can verbally articulate is limited. We cannot verbally articulate all that we know. There is no unifying perspective from which we can verbally articulate at the same time all the knowledge that we possess.

It is interesting to note that, notwithstanding these different emphases, the focus of both the Gestalt thesis of tacit knowledge and the thesis of epistemic regionalism is on the verbally unarticulated knowledge contained in the background of our thinking and acting. We rely on a lot of things that we take for granted but normally don't articulate by verbal means. Tacit knowledge in this sense covers a wide range of things. The "absolute presuppostions" of natural science discussed by Collingwood is a paradigm case of this type of tacit knowledge, according to Allan Janik.[8] In this connection, Grimen alludes to Habermas' understanding of lifeworld. [9] In the same vein, Johannessen mentions various implicit knowledge within a culture. [10]

The third interpretation is the strongest, and Grimen calls it "the strong thesis of tacit knowledge." From this perspective, there are specific kinds of knowledge which are in principle verbally unarticulatable, which means that, in those cases, there exists a logical gap between our capacity of cognition on the one hand, and our capacity of verbal articulation on the other. The knowledge that is in principle verbally unarticulatable, is tacit knowledge. Grimen holds that this interpretation of tacit knowledge is more radical than the Gestalt thesis of tacit knowledge and the thesis of epistemic regionalism, because the latter two don't claim that there are specific kinds of knowledge which are in principle verbally unarticulatable. That is the reason Grimen entitles this interpretation "the strong thesis of tacit knowledge" and characterizes "the Gestalt thesis of tacit knowledge" and "the thesis of epistemic regionalism" as the weaker theses. Grimen claims that the strong thesis of tacit knowledge is more connected to the Wittgensteinian tradition and he doubts whether Polanyi supports this position. He prefers to discuss tacit knowledge from the perspective of the strong thesis. Similarly, Johannessen also emphasizes that when we say that tacit knowledge is something which is not possible to articulate adequately by linguistic means, we mean this "not possible" in a logical sense: "Tacit knowledge is thus knowledge which, for logical reasons, cannot be adequately articulated by linguistic means."[11]

Influenced by the propositionally-oriented understanding of knowledge, people might say that the experience which can hardly be fully articulated by verbal means should not be called "knowledge," rather it should be called "intuition." However, Grimen refuses to adopt this ambiguous and mysterious term— intuition—to describe this kind of epistemic phenomenon.[12] He thinks that we have good reasons to call it "knowledge.".First, the strong thesis of tacit knowledge doesn't claim that tacit knowledge is completely unarticulatable. What is absolutely unarticulatable doesn't make much sense in epistemology. All knowledge can be articulated, but not all knowledge can be articulated verbally. According to Grimen's terminology, the

concept of articulation covers more than the concept of language. Besides verbal articulation, we have other modes of articulation, such as, for instance, action. Grimen holds that as far as the articulation of knowledge is concerned, action as a mode of articulation is as fundamental as language. Tacit knowledge cannot be fully articulated by verbal means, but can be articulated in action. The theory of tacit knowledge will enhance our theoretical sensitivity to non-verbal modes of articulation. Thus, the strong thesis of tacit knowledge is not concerned with the distinction between what is articulatable and what is unarticulatable, but with the distinction between verbal articulation and non-verbal articulation. Mystical intuition is normally deemed as unarticulatable in principle, therefore has to do with the first distinction. In contrast, tacit knowledge in the strong sense is articulatable: although it cannot be articulated by verbal means, it is still open to non-verbal modes of articulation.

Further, Grimen points out that tacit knowledge can also be learned, transferred, accumulated and criticized. Of course, the modes of learning, transferring, accumulating and criticizing tacit knowledge are different from those of verbally articulated knowledge. For example, we can simply resort to words and statements so as to transfer verbally articulated knowledge, while the transference of tacit knowledge relies more on first-hand experiences, examples and guided instructions of the master. Again, to criticize verbally articulated knowledge, we can examine the statements of knowledge, but in order to criticize tacit knowledge, we must appeal to action or practice.

To sum up, according to Grimen, although the modes of articulating, learning, accumulating and criticizing tacit knowledge are different from those of verbally articulated knowledge, tacit knowledge and verbally articulated knowledge have many features in common: they are both able to be articulated, learned, transferred and criticized. Thus, although it is tacit in the sense that it cannot be adequately articulated by verbal means, it still is a member of the family of knowledge, and not something else. We can legitimately call it tacit **knowledge**.

Three Types of Examples of Tacit Knowledge

Inspired by Wittgenstein's later philosophy, Jakob Meløe, a Norwegian philosopher, developed a contextual pragmatics which is later known as praxeology. Since the 1960's, praxeology has become an important Wittgensteinian tradition in Scandinavia. Methodologically, one of the most prominent features of praxeology is its careful analysis of examples. Therefore, praxeology is basically a case-oriented contextual pragmatics.[13] The case-oriented approach is fruitfully carried out by the Wittgensteinians in their discussion of the problem of tacit knowledge.

With the distinction between the strong thesis and the weaker theses of tacit knowledge discussed above, the Wittgensteinians distinguish themselves by focusing on the strong thesis. The examples they choose to analyze in favour of the strong thesis are of the following three types.

The first type has to do with the experience of the sense qualities. We will find sources for this kind of examples in Wittgenstein's writings. Let's take a look at the following paragraphs from Wittgenstein's *Philosophical Investigations*:

> Comparing *knowing* and *saying*:
> how many feet high Mont Blanc is——

> how the word "game" is used——
> how a clarinet sounds.
> If you are surprised that one can know something and not be able to say it, you are perhaps thinking of a case like the first. Certainly not of one like the third.[14] (italics original)

> Describe the aroma of coffee. ——Why can't it be done? Do we lack the words? And *for what* are words lacking?——But how do we get the idea that such a description must after all be possible? Have you ever felt the lack of such a description? Have you tried to describe the aroma and not succeeded?[15] (italics original)

The knowledge of sense qualities, such as that of the sound of a clarinet or the smell of coffee, is inexhaustible by verbal descriptions. There is a limit to verbal articulation of such knowledge. Johannessen develops the point a step further and talks about a certain type of aesthetic knowledge, for instance, the knowledge that I have of the unique sound of a particular performance of a piece of music. No matter how hard I try to verbalize what I know about its tonal colouration, there is always something left about it, and my interlocutor can only have very vague ideas of what the sound is like. For a thorough communication of what I know, the best choice would be to perform fragments and passages of the work in question. This is, on the one hand, the best way to prove my knowledge of the tone color of the piece of the music, and, on the other hand, it is also the best way to provide the person I talk to with a first hand experience, that is, the immediate exposition to the sound, for him to gain the knowledge that I intend to convey.[16] As Grimen points out, for the acquisition of the knowledge of sense qualities, first hand experience is indispensable. The indispensability of first hand experience is an indication of the inadequacy of verbal descriptions of sense qualities.[17] Moreover, Allan Janik argues that once the people we intend to communicate our knowledge of sense qualities have had the requisite first hand experiences themselves, the demand for verbal explanation ceases to press upon us.[18]

The second type has to do with physiognomy-recognizing. I know perfectly well the appearance of my friend. My knowledge of his face can be demonstrated by the fact that I can pick him out instantly in a large crowd. But on being asked how I can do this, I get stuck. Of course, I can enumerate certain features of his face; however, as Johannessen points out, these verbal descriptions provide only a pitifully insufficient basis for someone else to attempt his identification.[19] With these verbal descriptions only, the person, to whom I want to convey my knowledge of the face of my friend, will not succeed in identifying my friend's physiognomy. To accomplish this, what is needed is the first hand experience of it. Here again we see the gap between the knowledge of somebody's face and its verbal description. The difficulty of verbally articulating the knowledge of a friend's face does not lie in the amount of details, because as Grimen points out, a good artist can capture the characteristics of a face with a few lines without presenting the complexity of all the details. What is difficult to accomplish verbally can be easily done visually. This indicates that the gap between the knowledge of somebody's face and its verbal articulation is a logical one. It is not a question of degree. Grimen generalizes the example of face-recognizing by talking about various gestalt-identifying activities which cover identifying various contexts or situations of human action.[20]

The third type concerns skill. Craftsmanship is a paradigm case of skill. No doubt craftsmanship involves certain occupational knowledge. When asked about the process that leads to his remarkable products, the skillful craftsman might mention certain general features of his performance, such as some rules of thumb, some hints about the methods and the use of the tools, etc. However, his skill is not exhausted by these verbal descriptions of his action. Johannessen claims that the occupational knowledge embodied in a skill finds its

primary expression in the very practice of the occupation. Therefore, it is impossible for the skillful craftsman to express his entire occupational knowledge in a purely linguistic form, and it is equally impossible for an apprentice to become a skillful craftsman simply by reading these verbal descriptions. What is crucial here is practice. That is why, in addition to his verbal instructions to his apprentice, the craftsman would continually show it by doing it. That also explains the fact that practice is a necessary precondition for the apprentice to gain the expertise in the occupation. [21] Skill lies in proficiently carrying out a sequence of steps that constitute an action which Grimen calls the choreography of an action. Grimen notes the difficulty for both a skillful performer and a keen observer to fully articulate by verbal means different kinds of choreography in manual work, care-taking, etc. The inadequacy of verbal articulation of the choreography of an action is made clear by an interesting observation that he offers about the instruction manuals for building and repairing machines: the verbal instructions are always accompanied by the visual illustrations. Grimen claims that without these visual illustrations in each step, it would be very difficult or even impossible to understand these instruction manuals. [22]

The latter two types of examples can also be found in Polanyi's writings. It is interesting to note that Polanyi's use of these examples is different from that of the Wittgensteinians. While the Wittgensteinians use these examples to illustrate the logical gap between knowledge and verbal articulation, thus in support of the strong thesis of tacit knowledge, Polanyi's emphasis is on the from-to structure of tacit knowing based upon two kinds of awareness, which is more related to the Gestalt thesis of tacit knowledge, to use Grimen's terminology.

A Justification for the Strong Thesis of Tacit Knowledge

The Wittgensteinians all believe that tacit knowledge in the strong sense exists. But Harald Grimen feels that it is hard to justify this thesis[23]. In my view, however, this is exactly what Johannessen wants to accomplish with his practice-centered interpretation of later Wittgenstein's philosophy.

Grimen does not tackle the issue in length, but he mentions in passing two possible approaches to the task of justifying the strong thesis of tacit knowledge: (1) one might think of some pre-verbal experiences that are not covered by language or (2) one may argue that it is language that creates the basis for some experiences that are beyond verbal articulation. Grimen himself prefers the second approach and thinks that the first one is indefensible. Since Grimen is too brief here, it is difficult to know the substance of these two approaches that he has in mind. However, what is clear from his presentation is that there can be at least two ways to argue for the strong thesis of tacit knowledge, that is, arguments can proceed either on the pre-linguistic level or on the linguistic level.

Polanyi deploys both strategies in his effort to bring to light the tacit dimension of human knowledge. It is not difficult to see that as far as the goal of arguing in favor of tacit knowledge is concerned, the real difficulty lies not in the pre-verbal level. Pre-linguistic intelligence is tacit by definition. What constitutes a real challenge is to argue for the tacit dimension in the domain of explicit knowledge. Polanyi traces man's tacit powers to animal's inarticulate intelligence and argues that not only on the pre-verbal level, but also in the domain of explicit knowledge, tacit powers constitute man's ultimate faculty of acquiring and holding knowledge. Methodologically, Polanyi's approach is a mixture of conceptual analysis and empirical research.

Johannessen operates primarily on the linguistic level to argue for the strong thesis of tacit knowledge. Working in the Wittgensteinian tradition, Johannessen's approach is more a logical-grammatical one than an empirical one. With a practice-centered interpretation of Wittgenstein's later philosophy, he uncovers the built-in tacit dimension in our use of language. I would summarize Johannessen's argument in the following way.

(1) The use of language is a rule-following activity

Since the early 20th century, a rationalistic view of the nature of language, which we can find in Russell, Whitehead, logical positivists and early Wittgenstein, has been very influential in philosophy and other related areas such as linguistics, cognitive psychology, and computer sciences. The concept of rule plays a central role in the rationalistic understanding of language. The logical form of language is the sole feature that matters in such an analysis of the nature of language.[24] It is this rationalistic understanding of language that the later Wittgenstein wanted to call into question. According to later Wittgenstein, the rationalistic view is insufficient for an adequate understanding of the nature of language because too much is left in the dark. Johannessen points out, later Wittgenstein came to see that "the *use* of language was not something that was only contingently related to its nature: it should instead be thought of as *constitutive* of it" (italics original) .[25] Thus, the use of language in various situations became the focus of his later philosophy. This is what is often called "the pragmatic turn" in philosophy of language. According to later Wittgenstein's pragmatic view of language, it is not the concept of rule but the rule-following behavior that is in the center of stage. The use of language is essentially a rule-following activity. In commenting on later Wittgenstein's philosophy, Johannessen declares: "What is most striking is perhaps his turning away from dealing with rules and their logical form to investigating what it means to *follow* rules"(italics original)[.26]

(2) The application of linguistic rules is ruleless

Since the 1980's, the theme of rule-following has been recognized as the very center of Wittgenstein's later philosophy . Different from Gordon Baker's interpretation of rule-following, the emphasis of which is more on the rule-aspect of the rule-following activities,[27] Johannessen highlights the practice-aspect of rule-following. [28]

> [T]here is far more to rule following than the rule that is followed. The rule itself is the least important element in the analysis that Wittgenstein made of the phenomenon of rule-following. It is the *very act of following it* and how to establish its identity that occupies the center of his interest.[29]

To understand the practice-aspect of the rule-following behavior, it is important to see the difference between a rule and its application. Wittgenstein claims that a rule can be interpreted in different ways; therefore, it cannot determine how it is to be applied. But can we formulate another rule which will lay down how the first rule should be applied? To Wittgenstein, this is a futile effort, because the same problem will arise once again to the second rule. Thus, if we try to solve the problem of the application of a rule by appealing further to other rules, we will end up with an infinite regress. In a word, the application of a rule is not determined by the rule itself and by other rules.[30] Johannessen summarizes this line of argument with a brief statement:"The application of rules is accordingly in principle ruleless."[31] Applying this general thesis about the application of rules to the particular case of the use of language, we arrive at the following conclusion: "In the final instance

there cannot be rules that lay down how a semantic rule or a definition should be applied. The application of a definition (semantic rule) is and must necessarily be performed without the support of any further rules" [32]

3) Practice as the expression of intransitive understanding

Though not the first one who attaches great importance to the notion of intransitive understanding in Wittgensteinian scholarship, Johannessen distinguishes himself by working out a Wittgensteinian conception of tacit Knowing/knowledge with his brilliant elaboration of intransitive understanding.[33]

Wittgenstein introduced the term "intransitive understanding" in the following passage in his *Philosophical Grammar*:

> If I say: "I understand this picture" the question arises: do I mean "I understand it *like that*"? With the "*like that*" standing for a translation of what I understand into a different expression? Or is it a sort of intransitive understanding? When I am understanding one thing do I as it were think of another thing? Does understanding, that is, consist of thinking of something else? And if that isn't what I mean, then what's understood is as it were autonomous, and the understanding of it is comparable to the understanding of music. [34]

A passage that conveys a similar message in *Philosophical Investigation* runs like this:

> We speak of understanding a sentence in the sense in which it can be replaced by another which says the same; but also in the sense in which it cannot be replaced by another. (Anymore than one musical theme can be replaced by another.) In the one case the thought in the sentence is something common to different sentences; in the other, something that is expressed only by these words in these positions. (Understanding a poem.)[35]

The paradigm cases of intransitive understanding can be found in our experience of different forms of art, such as picture, music, poem, etc. Johannessen makes a careful and detailed analysis of intransitive understanding and attempts to spell out its various aspects. In his view, in our immediate traffic with art, intransitive understanding has the following characteristics: 1) In contrast to transitive understanding which can be translated into other medium of expression, intransitive understanding is autonomous, it does not relate to anything else. 2) In intransitive understanding, a work of art is grasped individually as an entirety of sense and expression. 3) In intransitive understanding, to understand a work of art is to experience it. Intransitive understanding is a particular kind of experience. 4) Intransitive understanding involves a feeling of familiarity with a work of art. In sum, Johannessen claims that the important thing about intransitive understanding is that "it is self-sufficient in the sense that the point of it is wholly *immanent* in undergoing it." [36] The intransitive understanding in our aesthetic experience can only be adequately expressed in the aesthetic practices, in our immediate traffic with works of art, both as artists or as beholders. Of course, in the aesthetic situations, verbal expressions are also used. We often make remarks like "You have to see it like this," or "You have to hear it like this."[37] However, these remarks are extremely vague. "At most they could be said to be employed to gesticulate towards something that is clarifyingly embodied in the accompanying examples."[38] In some cases, "words are of no help anymore. Ways of responding and acting must do in their place. It is thus no accident that the ostensive content of the pointing gesture remained verbally unarticulated."[39]

Although our aesthetic experiences typically illustrate intransitive understanding, one should not be misled to think that intransitive understanding is confined to the aesthetic realm; it is not. Intransitive understanding is a global phenomenon. It is at work ubiquitously. In the use of language, for instance, there is also an element of intransitive understanding. We have seen that the use of language is a rule-following activity. The application of the linguistic rules is ruleless. But this is only a negative statement. Then the question is, positively speaking, what guarantees the competent application of the linguistic rules?

> The application of semantic rules and definitions is not, however, a completely spontaneous and unfounded reaction. It is anchored in a kind of experience having the character of intransitive understanding and judgmental power that in a logical sense cannot be cast in the form of propositional knowledge or articulated as a system of rules.[40]

The competent use of rules, such as the fact that they are applied in the same way in various situations, is secured by intransitive understanding. We are well justified to call the intransitive understanding and the judgmental power in our use of language, which cannot be put into the form of propositional knowledge, tacit knowledge. According to Jonhanessen, this aspect of our use of language is underscored by Wittgenstein with his concept of practice.

> This aspect of our grasp of a natural language is thus said to have a tacit dimension that should not be overlooked when scrutinizing Wittgenstein's view of the relationship between language and world. Wittgenstein is in fact using the concept of practice to underline this very element in our linguistic handling of reality. [41]

In commenting on Wittgenstein's comparison: "The understanding of language…is …of the same kind as the understanding or mastery of a calculus, something like the *ability* to multiply,"[42] Johannessen remarks:

> Once more we get an indication that there is a kind of understanding that is an integrated part of being a competent user of language, but which cannot be expressed *by* language. This is what I have chosen to call *intransitive* understanding. It is internally related to this overarching grasp of language that is only adequately expressed in the competent exercise of the manifold of practices that constitute human language. [43]

The intransitive understanding in the competent use of language can only be adequately expressed in various forms of practices. Language is insufficient to give it a full expression. This implies a logical gap between verbal articulation and intransitive understanding and points to a concept of tacit knowledge in the strong sense.

Let us recapitulate Johannessen's justification for the strong thesis of tacit knowledge: The use of language is a rule-following activity. However, the linguistic rules do not determine their application. The application of the linguistic rules is ultimately determined by intransitive understanding which cannot be fully articulated by verbal means and can only be adequately expressed in actions or practices. Thus there is a built-in element of tacit knowledge in our use of language. As I understand it, these are the main points of Johannessen's argument for the strong thesis of tacit knowledge through his creative interpretation of later Wittgenstein.

Towards a Pragmatic Turn in Epistemology

Johannessen reminds us of the fact that practice is one of the key concepts of Wittgenstein's later philosophy. He holds that the philosophy of later Wittgenstein can be viewed as a kind of practice philosophy, which "operates from the insight that there exists a complicated network of the mutually constitutive relations between concept formation, human reaction and activities and what we call reality." [44] He advocates a pragmatic turn in epistemology on the basis of his practice-centered interpretation of later Wittgenstein. This involves a pragmatic view of meaning, a pragmatic view of concept of concept and a pragmatic view of knowledge.

Let us look at the pragmatic view of linguistic meaning first. The crucial question is: What gives words meaning? What makes various kinds of signs meaningful vehicle of human communication? According to Wittgenstein, it is not interpretation, but practice which is decisive in sense making. In the context of the discussion of the rule-following behaviour, interpretation is characterized by Wittgenstein as "the substitution of one expression of the rule for another. "[45] Johannessen points out that interpretation to Wittgenstein is something that involves conscious intellectual activity and to interpret means to form a hypothesis. Interpretation as a hypothesis-making intellectual activity cannot determine meaning. Wittgenstein makes this point crystal clear with the following remarks: "Any interpretation still hangs in the air along with what it interprets, and cannot give it any support. Interpretations by themselves do not determine meaning." [46] Therefore, if we submit to the idea that acting according to rules is a matter of interpretation, we will find ourselves in the following predicament: on the one hand, by one interpretation, every course of action can be made out to accord to with the rule; on the other hand, by another interpretation, it can also be made out to conflict with it. Thus we end up with an inevitable conclusion which is absurd: there would be neither accord nor conflict here. Wittgenstein's way out of this logical impasse is the following: "What this shows is that there is a way of grasping a rule which is *not* an *interpretation*, but which is exhibited in what we call 'obeying the rule' and 'going against it' in actual cases".[47] This non-interpretive way of grasping a rule is acting (obeying a rule or going against a rule) in actual cases, that is, practice: "obeying a rule" is a practice. [48]

Back to the question of what gives various signs meaning so that they will function well in human communication, we have seen that interpretation does not determine meaning. But this is only a negative answer. Positively, what determines meaning? At this juncture, the concept of practice is called upon by Wittgenstein to accomplish the task: Practice gives words their meaning.[49]

The pragmatic view of meaning is interwoven with a pragmatic view of concept. What is the nature of concept? In Johannessen's view, one of the features of the traditional understanding of concept is that it takes it for granted that concepts can be verbally articulated in their entirety. [50] We can have a glimpse of it by looking at what is taught even today in logical textbooks concerning the nature of concept: "A legitimate and scientifically respectable concept is established if and only if we are able to specify the necessary and sufficient conditions for using the verbal expression of the concept." [51] This is called into question by the pragmatic view of concept which emphasizes the constitutive role of practice in the formation and application of concepts. According to the pragmatic view, our conceptual hold on the world is not exclusively revealed in our ability to formulate correct propositions about reality. It is in a fundamental sense anchored in certain forms of action. If one claims to have mastered a given concept, one has to be accepted as a competent performer of the established form of action which incorporates the concept. Johannessen lays out the principle of conceptual

mastery in the perspective of the pragmatic view of concept as follows: "The grasp that a given concept gives us on the world is basically and most adequately expressed in practice." [52] The performance of a certain practice is considered to be the primary mode of expression of a given concept. Taking the concept of chair as an example, according to the pragmatic view of concept, Johannessen argues, the mastery of the concept lies not so much in the ability to produce propositions with the linguistic expression "chair" as in the ability to deal with real chairs in an adequate way, for instance, sitting on them with ease, taking them as furniture in our actions, etc.[53] The mastery of a concept has a built-in element of tacit knowledge. Johannessen claims:

> Against the outlined background it should no longer represent a problem to talk about rules or concepts which can be formulated only incompletely as regards content, at least when it is a question of formulating the content by verbal means. We have noted that the criterion of their adequate mastery is in their application. The knowledge which is built into that mastery can consequently be considered to have a partial and non-reducible expression in action. Therefore it is not possible to put into words this aspect of action in which the intellectually explicable part of the concept is necessarily embedded. [54]

The mastery of a concept (a rule) cannot be completely formulated by verbal means. It has a "partial and non-reducible expression in action." This is a beautiful expression which indicates that the built-in knowledge in the mastery of a concept is tacit in the strong sense.

With the pragmatic view of meaning and concept, we are at the threshold of the pragmatic view of knowledge. Johannessen points out that an important presupposition of the traditional propositionally oriented conception of knowledge is that "knowledge only makes sense as some sort of *product*."[55] Obsessed with knowledge as a finished product, the mainstream conception of knowledge in Western philosophy loses sight of the process-perspective on knowledge which takes knowledge also as a part of an ongoing process embedded in particular kinds of human activities aiming at certain goals. In contrast, the pragmatic view of knowledge underlines the process-aspect of knowledge: [56] "Conceptions of knowledge incorporating the process-perspective are normally called pragmatic—derived from the Greek word *pragma*, which among other things mean *action*." [57]

According to Johannessen, our practically acquired knowledge about reality has a complex structure. He takes pains to spell out in four respects the important factors involved in human knowledge from a pragmatic process-perspective: (1)The *linguistically articulatable content* of our practically acquired conceptual hold on reality. To the extent that this content is verbally articulated *de facto*, it is legitimate to talk about *propositional knowledge*. It is a product which is abstracted from our practical hold on reality. (2)The *performative aspect* of the enacted practice which encapsulates certain conceptual content. It constitutes the basis of the above-mentioned abstraction. Johannessen suggests calling it the *skill* aspect of knowledge, or simply *competence knowledge*.(3)The *familiarity aspect* of our practically acquired conceptual hold on reality. It is achieved by means of specific encounters with the conceptualized phenomena. Johannessen calls it the familiarity aspect of knowledge, or *familiarity-knowledge*. (4)The *judicious* aspect of our practically acquired conceptual hold on reality. By this expression, Johannessen means the judgmental power employed in the establishing, application and mediation of knowledge.

The pragmatic analysis of knowledge reveals that our knowledge of reality is not a purely intellectual affair. Our practically acquired conceptual hold on reality cannot be exhausted by propositions. Factors like

"the *skills* involved in *handling* the conceptualized phenomena, our reflective *familiarity* with them, expressed in the *sureness* in our behaviour towards them, and the *judgmental power* exercises in applying or withholding a given concept on a particular occasion . . . . are all relevant to the establishment of knowledge, but they cannot themselves be fully and straightforwardly articulated by verbal means."[58] We have seen that the linguistically articulatable aspect is a product of the abstraction of the non-linguistic aspects of our practically acquired knowledge of reality. It is the competence-knowledge, familiarity-knowledge and judgment that make propositional knowledge possible.

> Propositional knowledge is not something that can be acquired independently of other elements of knowledge. A whole group of considerations are indissolubly interwoven and will always be more or less present in all situations leading to the formation of knowledge. …Propositional knowledge simply cannot be established in the absence of competence-knowledge, familiarity-knowledge and a certain degree of judgment. …We could therefore take as our motto the claim that all propositional knowledge rests on an inescapable foundation of competence-knowledge, familiarity-knowledge and judgment. [59]

Johannessen accepts Polanyi's term "tacit knowledge" to designate the non-linguistic aspects of our practically acquired conceptual hold on reality. On another occasion where he discusses the mastery of natural language, he reformulates the above insight of pragmatic view of knowledge in the following way:

> There is more to our language mastery than can be expressed in a system of rules or propositions. This tacit, "surplus" knowledge is displayed in the very acts of *applying*—or abstaining from applying—language in all sorts of contexts. …In fact, we have now set the stage sufficiently to realize that the following reasoning represents a cogent argument: since propositional knowledge is essentially verbal, and since tacit knowledge is involved in any kind of linguistic mastery, it follows that propositional knowledge is essentially dependent on tacit knowledge.[60]

Two points, in my view, merit special attention, with respect to the pragmatic view of knowledge that Johannesses elaborates: 1) It is quite clear that Johannessen argues not only for the existence of tacit knowledge in the strong sense, but also for the primacy of tacit knowledge over propositional knowledge. Tacit knowledge is the foundation of propositional knowledge. All propositional knowledge is rooted in tacit knowledge. Here Johannessen, from a Wittgensteinian perspective, reaches a point about human knowledge that is shared by Michael Polanyi, Gilbert Ryle and Michael Oackeshott. 2) It is impressive that Johannessen differentiates various types of tacit knowledge in the strong sense, namely, competence-knowledge, familiarity-knowledge and judgment. The discussion of tacit knowing/knowledge makes a great contribution to epistemology by digging out the tacit dimension of human knowledge. This is where the inspiring secrecy of human knowledge is embedded. The concept of tacit knowing/knowledge discloses a very fertile field that needs to be carefully explored. In this regard, the Wittgensteinian case-oriented approach will show its strength in capturing different varieties of tacit knowledge. Johannessen's differentiation of tacit knowledge may not be complete, but it certainly points in the right direction of deepening the study of tacit dimension of human knowledge.

Concluding Remarks

In my view, a prominent merit of the Wittgensteinian approach to tacit knowing/knowledge is that

it alerts us to some distinctions concerning the problem of articulation of knowledge. Firstly, it is the distinction between what is articulatable and what is unarticulatable. As Grimen rightly points out, the theory of tacit knowledge has no interest in anything which is completely unarticulatable. The object domain of the theory of tacit knowledge is knowledge, and knowledge can always find a mode of articulation, though not necessarily verbal articulation. Secondly, it is the distinction between what can, in principle, be articulated by verbal means and what cannot. On the side of what cannot be verbally articulated, we find tacit knowledge in the strong sense. Thirdly, it is the distinction, within what can be articulated by verbal means, between what is articulated and what is not articulated. On the side of what is not articulated, we find tacit knowledge in the weak sense, no matter it is understood in terms of the Gestalt thesis of tacit knowledge or of the thesis of epistemic regionalism. In other words, the discussion of tacit knowledge is not concerned about the distinction between what is articulatable and what is not in the absolute sense; the strong thesis of tacit knowledge is concerned with the distinction between what is in principle verbally articulatable and what is not, while the weaker theses are concerned with, in the domain of knowledge which is in principle verbally articulatable, what is verbally articulated and what is not. In summary, with regard to the problem of articulation, at least the aforementioned three distinctions should be taken into consideration. The Wittgensteinian approach to tacit knowing/ knowledge strongly enhances our theoretical sensitivity towards these distinctions.

We have seen that the focus of the Wittgensteinian approach is on tacit knowledge in the strong sense, namely, knowledge which is hard to fully articulate by verbal means and which has a non-reducible expression in actions or practices. In my view, this focus on knowledge in action can be traced back to Wittgenstein himself, who claims in *Philosophical Investigation*:

> The grammar of the word "knows" is evidently closely related to that of "can," "is able to."
> But also closely related to that of "understand." ('Mastery' of a technique.)[61]

> But there is also *this* use of the word "to know": we say "Now I know!"—and similarly "Now I can do it!" and "Now I understand!"[62]

Obviously, by interpreting "to know" in terms of "I can do it" or "I understand," Wittgenstein emphasizes here action-inherent knowledge, or action-constitutive knowledge, or knowing how, to use Gilbert Ryle's terminology. Wittgenstein not only holds but also lives this action-oriented conception of knowledge. Some biographical materials attest to it.

In his "Biographical Sketch," G. H. von Wright says the following about Wittgenstein:

> Knowledge, for Wittgenstein, was intimately connected with doing. It is significant that his first studies were in the technical sciences. He had a knowledge of mathematics and physics not derived from extensive reading, but from a working familiarity with mathematical and experimental techniques. His many artistic interests had the same active and living character. He could design a house, make a sculpture, or conduct an orchestra. Perhaps he would never have achieved mastery in those fields. But he was no "dilettante." Every manifestation of his multi-dimensional spirit came from the same earnest drive to create.[63]

Norman Malcolm also says:

> He has an obvious relish for a mechanical problem. …He always had a keen apprecia-
> tion of sound workmanship and a genuinely moral disapproval of the flimsy or the slip-
> shod. He liked to think that there might be craftsmen who would insist on doing their
> jobs to *perfection*, and for no reason other than that that was the way it *ought* to be. [64]

Allan Janik points out that in the Western philosophical tradition since Socrates, craftsmanship has been discredited.[65] Wittgenstein's appreciation for craftsmanship and his relish for technical issues constitute a challenge to this tradition. This intellectual orientation also explains why the Scandinavian Wittgensteinians feel so congenial to what is going on in the Swedish Center for Working Life in Stockholm.

Endnotes

[1] One may find that in the discussion of the theory of tacit knowing/knowledge, terms like "the propositional" and "the verbal" are used interchangeably. This is justifiable to the extent that the propositioal is taken as a paradigm case of the verbal. However, one should also bear in mind the difference between them. Evidently, the extension of the verbal is much broader than that of the propositional. There are cases of non-propositional expressions which are still verbal expressions. For instance, in my discussion of modern Chinese metaphysics, I emphasize two forms of non-propositional expressions that modern Chinese philosophers deployed to articulate metaphysical Truth, namely, poetic expressions and metaphysical statements. Cf. Yu Zhenhua, "How to Say What Cannot Be Said?—The Reponses of Two Chinese Philosophers to Wittgenstein's 'Silence'," Bergen: SVT working paper, No.1, 1996; also Yu Zhenhua, "Reflections on the Controversy of Science vs. Metaphysics in Modern China," Bergen: SVT working paper, No.7, 1998.

[2] Cf. Harald Grimen, "Tacit Knowledge and the Study of Organizations," Bergen: LOS Center (Norwegian Research Center in Organization and Management), working paper, 1991. The paper was originally published in Norwegian. The English translation was first prepared by Bjoern Wikner, then improved by Judith Larsen. Later it was revised by Harald Grimen. My discussion of Grimen's ideas is based upon the English text.

[3] Plato, *The Collected Dialogues of Plato*, edited by Edith Hamilton and Huntington Cairns, Princeton: Princeton University Press, 1961, p. 133.

[4] Plato, *The Collected Dialogues of Plato*, p.137.

[5] Kjell S. Johannessen: "Rule Following, Intransitive Understanding, and Tacit Knowledge," in *Essays in Pragmatic Philosophy*, II, Oslo: Norwegian University Press, 1990, pp. 104-5.

[6] Kjell S. Johannessen: "Rule Following, Intransitive Understanding, and Tacit Knowledge," p.105.

[7] In addition to the interpretations listed here, Grimen also mentions an interpretation of tacit knowledge which is interesting sociologically, but not quite relevant epistemologically. It is called the thesis of conscious under-articulation. In this view, tacit knowledge is something that we consciously attempt to conceal, to under-articulate, or even try to avoid articulating. For example, in marriage or political compromise, it is wise for the partners not to tell all they know about each other. This conscious under-articulation helps maintain a good relationship in marriage or political compromise, which might collapse because of over articulation. Grimen argues that this un-articulation or under-articulation of what one knows is in a sense tacit, because nobody talks about it. In my view, Allan Janik's discussion of trade secrets also falls under this category. "Guildmasters from time immemorial have been acutely aware of the ways in which their status, power and standard of living often depended upon keeping the tricks of the trade from the uninitiated."[7] (Cf. Allan Janik, "Tacit Knowledge, Working Life and Scientific Method," in Bo Göranzon and Ingela

Josefson eds. *Knowledge, Skill and Artificial Intelligence*, London: Springer-Verlag, 1988, p. 54). Guildmasters' manipulation of knowledge in the form of the tricks of the trade is a typical case of tacit knowledge in the sense that it is consciously under-articulated or even un-articulated.

⁸ Allan Janik, "Tacit Knowledge, Working Life and Scientific Method," p. 55.

⁹ Harald Grimen, "Tacit Knowledge and the Study of Organizations".

¹⁰ Kjell S. Johannessen: "Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality," in *Uniped*, Vol.22, No.3, 2000. The article was originally published in Norwegian. I am referring to the manuscript of the English translation.

¹¹ Kjell S. Johannessen: "Rule Following, Intransitive Understanding, and Tacit Knowledge," in *Essays in Pragmatic Philosophy*, II, pp. 105.

¹² Allan Janik echoes Grimen in this respect in discrediting Hubert Dreyfus' suggestion of using the term "intuition" instead of "tacit knowledge." Cf. Allan Janik, "Tacit Knowledge, Rule-following and Learning," in Bo Göranzon and Magnus Florin eds. *Artificial Intelligence, Culture and Language: On Education and Work*, London: Springer-Verlag, 1990, p. 48.

¹³ Cf. Gunnar Skirbekk, "Wittgensteinian Influence on Norwegian Philosophy," in *Wittgenstein and Norway*, eds. Kjell S. Johannessen, Rolf Larsen, Knut Olav Åmås, Oslo: Solum Forlag, 1994. pp.181-195.

¹⁴ Wittgenstein, *Philosphical Inverstigations*, translated by G.E.M. Anscombe, second edition, Oxford: Blackwell Publishers, 1958, &78.

¹⁵ Wittgenstein, *Philosophical Investigations*, & 610.

¹⁶ Kjell S. Johannessen: "Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality".

¹⁷ Harald Grimen, "Tacit Knowledge and the Study of Organizations.".

¹⁸ Allan Janik, "Tacit Knowledge, Working Life and Scientific Method" , p. 56. It is interesting to note that, in his discussion of this type of examples, Allan Janik's emphasis is on non-visual qualities rather than on visual qualities. He sees the difference between the two as the following: "My initial claim was that machines, i.e. digital computers, could not *experience* non-visual sensations. I would not claim that they could have visual sensations either but that, since vision, unlike other sensory experience, is essentially multi-dimensional, it can be described with the sorts of coordinates which permit simulation by a machine; whereas tastes, smells, etc., can only be described metaphorically to those who have not actually experienced them. To say this, however, is to say that they can be described only by comparison with other sensations which is to say that they can only be experienced by the human body." Cf. Allan Janik, "Tacit Knowledge, Rule-following and Learning," p. 46-47.

¹⁹ Kjell S. Johannessen, "Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality".

²⁰ Harald Grimen, "Tacit Knowledge and the Study of Organizations.".

²¹ Kjell S. Johannessen, "Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality."

²² Harald Grimen, "Tacit Knowledge and the Study of Organizations".

²³ Harald Grimen, "Tacit Knowledge and the Study of Organizations".

²⁴ Johannessen, citing Morris Weitz and John Rawls as examples, criticizes this rule-focused approach in philosophy of language, aesthetics and political philosophy. Cf. Kjell S. Johannessen, "Language Art and Aesthetic Practice," in *Wittgenstein and Transcendental Philosophy*, eds. Kjell S Jonhanessen and Tore Nordenstam, Vienna: Verlag Hoelder-Pichler-Temsky, 1981, pp.113-119.

²⁵ Kjell S. Johannessen: "Rule-Following and Intransitive Understanding" in *Aritifical Intelligence, Culture and Languange: On Education and Work*, eds. Bo Göranzon and Magnus Florin . London: Springer-

Verlag, 1990. p.38.

[26] Kjell S. Johannessen: "Rule Following, Intransitive Understanding, and Tacit Knowleldge," p. 109.

[27] Compare Gordon Baker, "Following *Wittgenstein*: Some Signposts for *Philosophical Investigations* Paragraphs 143-242" in *Wittgenstein: To Follow a Rule*, eds. S. Holtsman and C. Leich, London: Routledge and Kegan Paul, 1981, pp.31-71.

[28] Kjell S Johannessen, "The Concept of Practice in Wittgenstein's Later Philosophy," *Inquiry*, Vol. 31, No. 3, 1988, pp. 357-69.

[29] Kjell S. Johanessen, "Rule-Following and Intransitive Understanding," p. 40.

[30] For the textual evidence of this interpretation of Wittgenstein, I would suggest &84, &85, and &86 of Wittgenstein's *Philosophical Investigations*.

[31] Kjell S. Johanessen, "Rule Following, Intransitive Understanding, and Tacit Knowledge," p. 122.

[32] Kjell S. Johanessen, "Rule Following, Intransitive Understanding, and Tacit Knowledge," p. 109.

[33] Kjell S. Johanessen fully acknowledges Jörg Zimmerman's contribution in drawing our attention to intransitive understanding in Wittgenstein's philosophy. Cf. Kjell. S. Johannessen, "Philosophy, Art and Intransitive Understanding," in *Wittgenstein and Norway*, pp. 220-221.

[34] Wittgenstein, *Philosophical Grammer*, edited by Rush Rheese, translated by Anthony Kenny, Oxford: Basil Blackwell, 1974, p. 79.

[35] Wittgenstein, *Philosophical Investigations*, &531.

[36] Kjell. S. Johannessen, "Philosophy, Art and Intransitive Understanding," p. 244.

[37] Wittgenstein claims: "Here it occurs to me that in conversation on aesthetic matters we use words: 'You have to see it like this, this is how it is meant'; 'When you see it like this, you see where it goes wrong'; 'You have to hear this bar as an introduction'; 'You must hear it in this key'; 'You must phrase it like this' (which can refer to hearing as well as to playing). " Cf. Wittgenstein, *Philosophical Investigation*, p. 202. Johannessen makes much out of this passage. He points out that it is typical of our talk about aesthetic matters to have this "like this"-element.

[38] Kjell. S. Johannessen, "Art, Philosophy and Intransitive Understanding," p. 232.

[39] Kjell. S. Johannessen, "Art, Philosophy and Intransitive Understanding," p. 233.

[40] Kjell S. Johannessen, "Rule Following, Intrasitive Understanding, and Tacit Knowledge," p. 109.

[41] Kjell S. Johannessen, "Rule Following, Intransitive Understanding, and Tacit Knowledge," p. 109.

[42] Wittgenstein: *Philosophical Grammar*, p.50.

[43] Kjell S. Johannessen, "Rule Following, Intransitive Understanding, and Tacit Knowledge," p. 118.

[44] Kjell S. Johannessen, "Rule Following, Intrasitive Understanding, and Tacit Knowledge," p. 110.

[45] Wittgenstein, *Philosophical Investigations*, translated by G.E.M. Anscombe, Blackwell, 1967, &201.

[46] Wittgenstein, *Philosophical Investigations*, &198.

[47] Wittgenstein, *Philosophical Investigations*, &201.

[48] Wittgenstein, *Philosophical Investigations*, &202.

[49] Wittgenstein, *Remarks on Colour*, edited by G.E.M.Anscombe, translated by Linda L. McAlister and Margarete Schättle. Oxford: Basil Blackwell, 1978, &317.

[50] Kjell S. Johannessen, "Rule Following, Intransitive Understanding, and Tacit Knowledge," p. 126.

[51] Kjell S. Johannessen, "Action Research and Epistemology," in *Concepts and Transformation*, Vol.1, No. 2/3, 1996, p. 292.

[52] Kjell S. Johannessen, "Action Research and Epistemology," p.293.

[53] Kjell S Johannessen ,"Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality."

[54] Kjell S. Johannessen, "Rule Following, Intrasitive Understanding, and Tacit Knowledge," pp. 112-3.

[55] Kjell S Johannessen, "Knowledge and Reflective Practice," in *Dialogue, Skill and Tacit Knowledge*, edited by Bo Göranzon, Maria Hammarén and Richard Ennals, John Wiley & Sons, 2006, p.232.

[56] In my conversation with professor Kjell S Johannessen, he emphasizes that we should give credit to Michael Polanyi for giving prominence to the process-aspect of human knowledge.

[57] Kjell S Johannessen, "Knowledge and Reflective Practice," p. 233.

[58] Kjell S Johannessen, "The Concept of Practice in Wittgenstein's Later Philosophy," *Inquiry*, Vol. 31, No. 3, 1988, p.357.

[59] Kjell S Johannessen, "Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality."

[60] Kjell S Johannessen, "Action Research and Epistemology," pp. 294-5.

[61] Wittgenstein, *Philosohical Investigation*, & 150.

[62] Wittgenstein, *Philosohical Investigation*, & 151.

[63] G. H. von Wright, "Biographical Scketch," in *Wittgenstein*, Oxford: Basil Blackwell, 1982, p. 20.

[64] Norman Malcolm: *Ludwig Wittgenstein: A Memoir*, Oxford: Oxford University Press, 1958. pp. 85-6.

[65] Allan Janik: "Tacit Knowledge, Working Life and Scientific Method," pp. 62-3.

Submissions for Publication

Comprehension and the "Comprehensive Entity":

Polanyi's Theory of Tacit Knowing and Its Metaphysical Implications[1]

Phil Mullins

ABSTRACT Key Words: Michael Polanyi and Marjorie Grene, comprehension and the comprehensive entity, ontological aspect of tacit knowing, being-in the-world and tacit knowing, post critical and medieval realism. *This essay discusses Polanyi's ideas about the "comprehensive entity." It shows how Polanyi's philosophical perspective emphasizes comprehension. It outlines Polanyi's careful approach to ontological questions and shows how Marjorie Grene and to some degree Polanyi linked the theory of tacit knowing to ideas in Continental philosophy about being-in-the-world. It suggests that Polanyi's post-critical philosophical realism, like Peirce's realism, is more akin to medieval realism than contemporary discussions.*

> . . . [I]t needs a frankly epistemological approach to metaphysics to set right the epistemological errors of Descartes with which modern . . . philosophy began.[2]

> . . . [W]hat we need, again, is to articulate an analytical pluralism, a metaphysic which will allow us to acknowledge the existence of a rich variety of realities, not all of which need exist in identifiable, spatio-temporal separateness. Minds are not separate from bodies, yet persons capable of 'minding' are richer and more highly endowed than persons or individuals not so capable.[3]

I. Introduction

The comments above come from Marjorie Grene, who, as readers of this journal likely know, was an American philosopher who spent about twenty years working closely with Michael Polanyi. Polanyi trained in medicine and chemistry and worked many years as a researcher in physical chemistry but his interests and scholarship gradually shifted to economics and philosophy in the last half of his life in the middle decades of the twentieth century. As a philosopher, Polanyi was a maverick, if one compares him to most thinkers contemporary with him in the British and American scene. Indeed, Polanyi was sometimes dismissed by professional philosophers since he did not seem to make the normal modern philosophical assumptions and did not seem interested in what were taken to be up-to-date philosophical questions. Polanyi met Grene in 1950 and she was a philosopher with a more traditional philosophical background; although she was suspicious of much contemporary philosophy, she certainly was a figure with a deep appreciation for the history of the Western philosophical tradition. From 1950 until the publication of a collection of Polanyi essays that she edited in 1968, Grene was very seriously engaged with Polanyi in philosophical discussions. Clearly, Grene was greatly influenced by Polanyi but she also greatly influenced Polanyi.[4] Indeed, I think she should be recognized as a backstage collaborator with Polanyi at certain stages of his philosophizing. In fact, Polanyi readily acknowledges her contributions to *Personal Knowledge: Toward A Post-Critical Philosophy*, which was first published in 1958. About his work with Grene and his *magnum opus*, he says in his Acknowledgements,

"Our discussions have catalysed its progress at every stage and there is hardly a page that has not benefited from her criticism. She has a share in anything that I may have achieved here."[5]

Grene's comments in the epigrams above come from her book *The Knower and the Known*, which was published in 1966, although most of it was written in 1961-63, not very long after Grene's several years of intense work with Polanyi to transform his 1951-52 Gifford Lectures into *Personal Knowledge* (1958). In this essay, I want to explore what Grene hints at when she calls for "a frankly epistemological approach to metaphysics," which she indicates will "set right the epistemological errors of Descartes with which modern . . . philosophy began." Her "epistemological approach to metaphysics" is a Polanyian approach, as she acknowledges in her subsequent discussion in this book and in later publications. Grene helps Polanyi hammer out the ideas that develop into his theory of tacit knowing and this epistemological approach implies a certain account of metaphysics. In her second quotation above, Grene hints at something of the contours of that account of a Polanyian metaphysics when she mentions "an analytical pluralism" that provides ways to "acknowledge the existence of a rich variety of realities," and not all of those realities "exist in identifiable, spatio-temporal separateness." She specifically identifies "minding" as a peculiar human endeavor best understood without focusing on the identifiable, spatio-temporal distinctness of existing things.

What I do in the discussion below is focus attention on Polanyi's claims about "comprehension" and the "comprehensive entity," presenting these as key Polanyian philosophical ideas. They are ideas that have metaphysical implications. Although it is possible to discuss earlier suggestions about these ideas, I focus my attention on discussions in Polanyi texts published from the period of *Personal Knowledge* (1958) until about a decade after this book. Polanyi seems first to have worked out his notions about "comprehension," and then his ideas about the "comprehensive entity" develop. He moves beyond the ideas articulated in *Personal Knowledge* and in Grene's discussion in *The Knower and the Known,* which is substantially based upon *Personal Knowledge*. I point out that "comprehensive entity" becomes a frequently used philosophical term in Polanyi's philosophical lexicon after *Personal Knowledge* and that the term comes to have a broader meaning than in its first use. I argue that Polanyi came to view this locution as a very useful one that served to set forth clearly some implications of his theory of tacit knowing. In the final analysis, I contend that Polanyi's comments about the "comprehensive entity" and the ontological aspect of tacit knowing need to be viewed strictly as ways to re-articulate his claims about the active shaping of knowledge. That is, Polanyi's claims regarding the "comprehensive entity" must always be seen within the context of his claims about "comprehension." Nevertheless, what Polanyi says about "comprehensive entities" helps to sketch out Polanyi's metaphysics, which as Grene points out is a metaphysics approached through epistemology. Such a metaphysics is pluralistic; it acknowledges a rich variety of realities.

I acknowledge that, in this essay, I am following up on an interest that first emerged in two earlier essays that have been part of the recent discussion in the Polanyi literature of "Polanyi's realism." In my articles in *Polanyiana*[6] and *Tradition and Discovery*,[7] I argued that "comprehensive entity" is a Polanyian philosophical notion that helps to clarify the nature of Polanyi's realism. I suggested that Polanyi is very interested in the indeterminate range of meaning of real things. Real things affect human beings and some real things (such as minds and problems, as opposed to cobblestones) have what Marjorie Grene implies might be regarded as having intensiveness[8] and Polanyi later regarded as having depth.[9] This is their rich potential for revealing future significance. Polanyi's interest in the growth of meaning I dubbed the "polyvalent" focus of his realism. But Polanyi also is very concerned to clarify the tacit foundations of human knowledge of real things and this interest I called the "bodily" focus of his realism. I argued that the "comprehensive entity" is

a philosophical idea that Polanyi uses to hold together the polyvalent and bodily aspects of his discussions about realities.

The discussion that follows is not intended merely to repeat the case I put forth earlier for the polyvalent and bodily aspects of real entities and the '"comprehensive entity" as a Polanyian vehicle used to weld together these two elements. I hope instead to shed some new light on the Polanyian notions about "comprehension" and the "comprehensive entity" by approaching my topic from a somewhat different direction, although connections with my earlier discussions can surely be drawn. I begin with Polanyi's account of "comprehension" in his *magnum opus*, *Personal Knowledge*.

II. The Active Nature of Comprehension

The term "comprehension" is prominently featured in the "Index" of *Personal Knowledge,* which was prepared by Marjorie Grene and her children.[10] Polanyi seems to have had a clear sense in the period in which he was writing *Personal Knowledge* that he was working out a novel account of "comprehension." All of the later discussions of "comprehensive entities" are ultimately rooted in this active view of "comprehension" that Polanyi traces back to Gestalt. In the 1957 "Preface" (i.e., original) to *Personal Knowledge*, he references Gestalt psychology as a source for his conceptual reform:

> I have used the findings of Gestalt psychology as my first clues to this conceptual reform. Scientists have run away from the philosophic implications of gestalt; I want to countenance them uncompromisingly. I regard knowing as an active comprehension of the things known, an action that requires skill. Skillful knowing and doing is performed by subordinating a set of particulars, as clues or tools, to the shaping of a skillful achievement, whether practical or theoretical.[11]

He criticizes and adapts Gestalt claims for "spontaneous equilibration." "Equilibration" for Polanyi is not mechanical. "Equilibration" is an integration of subsidiaries of the sort that is involved in a skillful performance by an interested, attentive knower. Thus "comprehension" is an achievement, an outcome reflecting the active shaping of the agent. In *Personal Knowledge*, this emphasis upon active shaping is found in Polanyi's discussion of many topics such as perception, tool use, language use, problem solving, and scientific discovery. Active shaping implies a centered subject and the creation and implementation of standards of value:

> Comprehension is an unformalizable process striving towards an unspecifiable achievement, and is accordingly attributed to the agency of a centre seeking satisfaction in the light of its own standards. For it cannot be defined without accrediting the intellectual satisfaction of the comprehending centre.[12]

Polanyi uses this emphasis upon active shaping to define his sense of person and of human excellence. Ultimately, in Part Four of *Personal Knowledge*, Polanyi also offers an account of morphogenesis in terms of active shaping and achievement.

Comprehension and the somatic process which accompanies comprehension, represent therefore

a kind of equilibration that can be defined only in terms of intellectual rightness. Morphogenesis, operating under the direction of a morphogenetic field, is a somatic process of the same kind but following morphological rightness as a standard of achievement. Yet it may be described as equilibration, to distinguish it from the operation of a machine-like framework, and also to illustrate the inexhaustible resourcefulness shown by the morphogenetic process. Once it is recognized that this resourcefulness is mobilized in the service of an achievement which can be appreciated only in morphological terms, we find that this implies awarding to it success or failure, by standards which we ourselves set to the process as being appropriate to itself. The morphogenetic field (or its organizer, if there is one) is then defined as the agency of this success and as that which has failed if success is not achieved.[13]

Polanyi's account of "comprehension" in *Personal Knowledge* cannot, of course, be understood apart from his fundamental distinction between focal and subsidiary awareness. The quotation above from the "Preface" of *Personal Knowledge* indirectly references this distinction by identifying skillful knowing and doing as action performed by subordinating a set of particulars to a practical or theoretical focus of attention. In terms of the development of Polanyi's philosophical ideas, he first suggests the distinction between subsidiary and focal awareness in his November, 1952 seventh Gifford lecture in the second series, which is titled "Two Kinds of Awareness."[14] There is an early section of Chapter 4 in *Personal Knowledge* (1958) with the same title and here Polanyi introduces his fundamental distinction in *Personal Knowledge* and this distinction then becomes central to the discussion in the rest of his book.[15] In analyzing the case of using a hammer, Polanyi says, "I have a *subsidiary awareness* of the feeling in the palm of my hand which is merged into my *focal awareness* of my driving in the nail."[16] A little later, Polanyi comments on the limitation of an exclusive orientation toward explicitness, which is found in much of the Western philosophical tradition, when he says "we may describe such a performance as *logically unspecifiable*, for we can show that in a sense the specification of the particulars would logically contradict what is implied in the performance or context in question."[17] Finally, at the end of this section discussing "two kinds of awareness," Polanyi reformulates his distinction in terms of its implications for the nature of meaning. Particulars which we assimilate or dwell in are matters we are subsidiarily aware of and they must be integrated if we are to grasp their focal or conjoint significance: "all particulars become meaningless if we lose sight of the pattern which they jointly constitute."[18]

III. The Early History of the "Comprehensive Entity" and Grene's Restrictive Account

The term "comprehensive entity" is not in the "Index" for *Personal Knowledge*. Although there is much discussion of "comprehension"—and this clearly is an important term—"comprehensive entity" was not a key term in Polanyi's early philosophical vocabulary. Polanyi does use the term in *Personal Knowledge* in discussing the "three-storied" character of perception in biology.[19] He argues that we can be aware of an animal's active-perceptive responses only in relation to a focal awareness of the animal as an individual. We must see the particulars of an animal's activity subsidiarily in a focus upon the whole animal in order to know what the animal is knowing or doing. Further, Polanyi says,

. . . when the subsidiary particulars of a comprehensive entity are as highly complex and variable as in these cases, attempts to specify them can do no more than highlight some features, the meaning of which will continue to depend on an unspecifiable background that we only know within our understanding of the entity in question.[20]

It seems likely that the limited use of "comprehensive entity" in *Personal Knowledge* and the fact that it is used in conjunction with "three-storied" knowing is what led Marjorie Grene, in *The Knower and the Known*, to suggest that "comprehensive entity" is a term reserved for objects of knowledge that are living: "But when the knower is engaged in the business of knowing living things, further, the object of knowledge itself is, in Polanyi's language, a *comprehensive entity*."[21] A bit later she puts it this way: "To know life is to comprehend comprehensive entities; to know knowing is to comprehend those particular achievements of living things which consist in their acts of comprehension. Mind is once more a natural reality, and nature once more both the medium and the object of mind's activity."[22] Grene captures an essential Polanyian insight here: knowing living forms necessarily involves recognizing their achievements. That is, living creatures deploy tacit powers as agents and to understand this agency presupposes that we recognize a centered subject capable of action in a least some minimal sense. Nevertheless, Grene's restrictive discussion of "comprehensive entity" is somewhat misleading. "Comprehensive entity" became a term Polanyi very frequently used after *Personal Knowledge* and Grene's account does not reflect the more general way in which Polanyi eventually came to employ the term.

Although *The Knower and the Known* is first published in 1966, Grene's January, 1974 "Preface to the Paper-bound Edition" indicates that the book was written from 1961-1963 only three years after the publication of *Personal Knowledge*. Most of her Polanyi references are to *Personal Knowledge*, although there are also references to the Duke Lectures (unpublished, but given in February and March of 1964, and thus probably a late addition to her text[23]) and to Polanyi's 1962 essay "Tacit Knowing: Its Bearing On Some Problems of Philosophy."[24] The 1962 essay uses "comprehensive entity" but in a reference, similar to the use of the term in *Personal Knowledge*, to knowing a man.[25] The Duke Lectures, however, use the term many times and the context is not always one that implies the term applies only to living things. The Duke Lectures include a good bit of material that appears also in the Terry Lectures (1962) and other lectures that Polanyi delivered in 1961 and 1962. In all of this writing, Polanyi seems to think of "comprehensive entity" as simply a term useful to identify any object of knowledge, living or otherwise. A "comprehensive entity" is a focal whole (i.e., an object of attention) that includes (or comprehends) subsidiaries (i.e., particulars of which the knower is subsidiarily aware).

In fact, "comprehensive entity" is a term that also appears several times in *The Study of Man*,[26] which was published in 1959, just a year after *Personal Knowledge*. This short book Polanyi identified as an "extension" of the inquiry found in *Personal Knowledge*, which recapitulated "relevant parts of its argument;" Polanyi suggested that this book "might be read as an introduction" to *Personal Knowledge*.[27] Sometimes the context in which "comprehensive entity" is used in *The Study of Man* is one in which the term refers to knowing living things or their achievements but in other contexts the term is used more broadly.[28]

Although there is a broader use of "comprehensive entity" in *The Study of Man*, clearly Polanyi continued to emphasize that an active sense of "comprehension" is the key to his views. He stresses the importance of "personal participation" in "tacit and explicit knowledge" and indicates that he is developing a "theory of knowledge." Speaking again about Gestalt psychologists, he says

> They were probably unwilling to recognize that knowledge was shaped by the knower's personal
> action. But this does not hold for us. Having realized that personal participation predominates both
> in the area of tacit and explicit knowledge, we are ready to transpose the findings of Gestalt-

psychology into a theory of knowledge: a theory based primarily on the analysis of comprehension.[29]

This theory of knowledge (usually called the theory of tacit knowing) insists that "the structure of tacit knowing is manifested most clearly in the act of understanding. It is a process of comprehending: a grasping of disjointed parts into a comprehensive whole."[30]

IV. The Amplification of Polanyi's Philosophical Project

Grene suggests that it is sensible to see the development of Polanyi's philosophical ideas in terms of two successive moments, the articulation of "the fiduciary programme" which occurs primarily in *Personal Knowledge* and the articulation thereafter of the theory of tacit knowing.[31] She argues that *Personal Knowledge* employs a method (certain to antagonize professional philosophers) that "consisted essentially in broadening and stabilizing the interpretive circle through a series of analogies, by showing that human activities of many kinds are structures in the same hopeful yet hazardous fashion as those of science."[32] Grene says Polanyi articulates an "analogical foundation" for his ideas about the role of commitment in science. This shows us "science as one instance of the way in which responsible beings do their best to make sense of what is given to them and yet what they, by their active powers, have also partly already enacted."[33] Grene contends, however, that Polanyi already in *Personal Knowledge* is moving toward something firmer than his "analogical foundation" insofar as he was exploring unspecifiability and was aware (immediately after publication) that his distinction between focal and subsidiary awareness was the most original element in *Personal Knowledge*. After *Personal Knowledge*, Grene suggests that Polanyi amplifies his insight about "two kinds of awareness" in a way that provides a "strengthening and extension of his conception of the tacit foundation of knowledge."[34]

Grene's account of Polanyi's development parallels Polanyi's own description in the "Introduction" to *The Tacit Dimension* where he points out that his "reliance on the necessity of commitment has been reduced by working out the structure of tacit knowing."[35] The articulation of this structure, Polanyi claims, "shows that all thought contains components of which we are subsidiarily aware in the focal content of our thinking, and that all thought dwells in its subsidiaries, as if they were parts of our body."[36] Polanyi says much the same thing in the "Preface to the Torchbook Edition" of *Personal Knowledge* that was written in June of 1964 when *The Tacit Dimension* was in press. Here he acknowledges that there is, in *Personal Knowledge*, "a parallel line of argument" to the "fiduciary programme." This line "goes deeper" since it reckons with the fact that "this fiduciary element is intrinsic to the tacit component of knowledge."[37] Commenting on his new book in press (*The Tacit Dimension*) and his later writing, Polanyi says that he is "less occupied with the justification of our ultimate commitments and concentrates instead on working out precisely the operations of tacit knowing."[38] My suggestion in the preceding section is that Polanyi's term "comprehensive entity" comes to be frequently used almost immediately after *Personal Knowledge* and is a term whose original meaning gets enlarged. This enlarged meaning of "comprehensive entity" needs always to be understood in conjunction with Polanyi's emphasis upon "comprehension," the active shaping of achievements by a person. However this enlargement of the term's meaning is part of the movement from "the fiduciary programme" to Polanyi's fuller articulation of the theory of tacit knowing.

V. Aspects of "Comprehensive Entities" and the Link Between Knowing and Being

There are important ideas about "comprehensive entities" that Polanyi develops after *Personal*

Knowledge that are worth review. These seem to be a bridge to a clear statement of the metaphysical implications of Polanyi's perspective. The 1961 essay "Knowing and Being"[39] outlines several important things about "comprehensive entities" and is an early Polanyi effort to comment on ontological questions. Some of the ideas here are also in other publications of the period (and even *Personal Knowledge,* although they are not explicitly identified as matters concerning the "comprehensive entity"), but Polanyi's ideas are nicely collected in this essay. First, Polanyi points out that "comprehensive entities" have unspecifiable particulars.[40] He compares and contrasts two examples, prehistoric sites visible only from the air and the diagnosis of a hystero-epileptic fit. It is possible, Polanyi affirms, with many "comprehensive entities," to identify some particulars but specifiability remains doubly limited: "Specifiability remains incomplete in two ways. First, there is always a residue of particulars left unspecified; and second, even when particulars can be identified, isolation changes their appearance to some extent."[41] A second point that Polanyi emphasizes is that it is extraordinarily difficult—perhaps he thinks impossible—to specify relations of particulars to each other within a "comprehensive entity." Here he gives several cases; the clearest is the case of topographic anatomy. Polanyi contends that it is easy to identify organs of the body but their "mutual relation inside the body can be grasped only by a sustained effort of the imagination, based on the partial aspects revealed by successive stages of dissection."[42] Later in the article, Polanyi says that particulars can be elements we are aware of "uncomprehendingly, i.e., in themselves, or understandingly, in their participation in a comprehensive entity."[43] In sum, Polanyi argues, in this 1961 article, not only that a knower cannot exhaustively identify the particulars that constitute a "comprehensive entity," but also that a knower cannot very easily set forth the relationship of particulars to each other within a "comprehensive entity."

In "Knowing and Being." Polanyi is also interested in the process through which occurs the "elucidation of a comprehensive entity."[44] He identifies two complementary efforts that "contribute jointly to the same final achievement, yet it is also true that each counteracts the other to some extent at every consecutive step."[45] One effort concentrates attention on the particulars of the entity and this weakens for the moment a knower's sense of the coherence of the entity. The contrary effort is a "move in the opposite direction towards a fuller awareness of the whole" and this is a move in which "the particulars tend to become submerged in the whole." [46] Polanyi contends that "an alternation of analysis and integration leads progressively to an ever deeper understanding of a comprehensive entity."[47] Later in the essay, he contends that " all manner of discovery proceeds by a see-saw of analysis and integration similar to that by which our understanding of a comprehensive entity is progressively deepened."[48]

Polanyi points out in this essay that "there is a close analogy between the *elucidation of a comprehensive object* and the mastering of a skill."[49] For Polanyi, the arts of knowing and doing are structurally akin and always are blended. This leads Polanyi to say, "it is apposite therefore to include skilful feats among comprehensive entities."[50] He acknowledges that most frequently we speak of "*understanding* a comprehensive object or situation and of *mastering* a skill," but he points out that we also are comfortable speaking of "*grasping* a subject or an art."[51] The way in which comprehension is always a skillful integration of elements Polanyi often treats by discussing knowing in connection with indwelling. He claims that "the structure of knowing, revealed by the limits of specifiability, thus fuses our subsidiary awareness of the particulars belonging to our subject matter with the cultural background of our knowing."[52] The knower's physical and mental habits or skills must coalesce in an achievement or performance and this performance makes possible— and indeed is (to use the language above)—what a "comprehensive entity" is: "our subsidiary awareness of the particulars of a comprehensive entity is fused, in our knowing of the entity, with our subsidiary awareness of our own bodily and cultural being."[53] Polanyi thus describes knowing as an indwelling—an activity of

distributing our intentionality across a range of different particulars which must then be coordinated. He acknowledges that when the indwelt structure changes, the knower's being changes:

> To this extent knowing is an indwelling: That is, a utilization of a framework for unfolding our understanding in accordance of a framework with the indications and standards imposed by the framework. But any particular indwelling is a particular form of mental existence. If an act of knowing affects our choice between alternative frameworks, or modifies the framework in which we dwell, it involves a change in our way of being.[54]

In the "Preface to the Torchbook Edition" of *Personal Knowledge* (written in 1964 while *The Tacit Dimension* was in press),[55] Polanyi makes much the same claim by pointing to "participation" and Heidegger's being-in-the-world: "All understanding is based on our dwelling in the particulars of that which we comprehend. Such indwelling is a participation of ours in the existence of that which we comprehend; it is Heidegger's *being-in-the-world*."[56] In his final paragraph, Polanyi comes back to this note that draws tightly together indwelling, being-in-the-world, and participation, understood as the active shaping of comprehension: "Indwelling is being-in-the-world. Every act of tacit knowing shifts our existence, re-directing, contracting our participation in the world."[57]

To summarize, Polanyi's account describes the "comprehensive entity" as accessible through indwelling and skillful integration. Any "comprehensive entity" is an achievement or performance. Polanyi's account is a perspective that does not make a sharp distinction between the process of understanding and the product understood. In "Knowing and Being," Polanyi forthrightly claims that "knowledge is an activity which would be better described as a process of knowing."[58] Polanyi's account is a perspective that marks how impossible it is ontologically to separate the knower and the known. The human mode of being is bound up inextricably with the process of knowing and that includes those objects we attend to. Since we indwell, we are beings-in-the-world. The modification of the knower's "framework"[59] is a modification of his/her human being.

VI. The Active Nature of Comprehension in *The Tacit Dimension*

Before exploring further some of the connections between Polanyi's indwelling and being-in-the-world, it is helpful to examine the ways in which Polanyi extends his account of the active nature of comprehension in *The Tacit Dimension* (1966) and some other late essays. Polanyi offers here additional comments on his adaptation of Gestalt ideas and he expands some of the ideas about the "comprehensive entity" found in the 1961 essay "Knowing and Being."[60] In *The Tacit Dimension*, Polanyi describes his own philosophical perspective as one in which "the structure of Gestalt is . . . recast into a logic of tacit thought. . . ."[61] He contends that

> Gestalt psychology has assumed that perception of a physiognomy takes place through spontaneous equilibration of its particulars impressed on the retina or on the brain. However, I am looking at Gestalt, on the contrary, as the outcome of an active shaping of experience performed in the pursuit of knowledge.[62]

Polanyi emphasizes that he wants to extend the interest of Gestalt, moving from perception to other, higher forms of knowing: "Perception, on which Gestalt psychology centered its attention, now appears as the most

impoverished form of tacit knowing."[63] Polanyi thus argues that the recasting of Gestalt into a "logic of tacit thought" effectively "changes the range and perspective of the whole subject. The highest forms of integration loom largest now. These are manifested in the tacit power of scientific and artistic genius."[64]

What Polanyi here calls the "logic of tacit thought" is what he referred to in his 1957 "Preface" to *Personal Knowledge* as the "active comprehension of the things known, an action that requires skill."[65] He sets forth this logic in *The Tacit Dimension* in terms of two structural descriptions of tacit knowing, the functional and phenomenal structures, as well as two additional aspects of tacit knowing, the semantic and ontological aspects. From the functional structure (concerned with the from-to movement of knowing),[66] the phenomenal structure (concerned with the appearance at the focus)[67] and the semantic aspect (concerned with the meaning or significance of the two terms of tacit knowing)[68] of tacit knowing, Polanyi says, "we can deduce a fourth aspect, which tells us what tacit knowing is a knowledge of. This will represent its *ontological* aspect."[69] It is of significance that Polanyi portrays ontological conclusions as a deduced aspect, an inference that follows when the functional and phenomenal structure of tacit knowing and its semantics are taken as premises. Later in *The Tacit Dimension*, Polanyi comes back to the "ontological aspect" by pointing out that tacit knowing produces an understanding of a comprehensive entity and what is known in a particular comprehensive entity "makes an "*ontological* reference to it."[70] But not all "comprehensive entities" are identical and Polanyi spells out the important metaphysical implications of this:

> The structural kinship between knowing a person and discovering a problem, and the alignment of both with our knowing of a cobblestone, call attention to the greater depth of a person and a problem, as compared with the lesser profundity of a cobblestone. Persons and problems are felt to be more profound, because we expect them yet to reveal themselves in unexpected ways in the future, while cobblestones evoke no such expectation. This capacity of a thing to reveal itself in unexpected ways in the future I attribute to the fact that the thing observed is an aspect of a reality, possessing a significance that is not exhausted by our conception of any single aspect of it. To trust that a thing we know is real is, in this sense, to feel that it has the independence and power for manifesting itself in yet unthought-of ways in the future. I shall say, accordingly, that minds and problems possess a deeper reality than cobblestones, although cobblestones are admittedly more real in the sense of being tangible.[71]

To summarize, according to Polanyi's account in *The Tacit Dimension*, understanding a "comprehensive entity" makes an ontological reference but some "comprehensive entities" are more real than others insofar as they have a potential depth of significance that overshadows the significance of mere tangibility.

In his discussion here, Polanyi also emphasizes that "comprehensive entities" are acts of comprehension, skillful performances that are real.[72] This means that it is "plausible," Polanyi contends, "to assume the correspondence between the structures of comprehension and the structure of the *comprehensive entity which is its object*."[73] Polanyi's use of the language of correspondence here might be taken to suggest that it is possible fully to separate the knower from the known as different presences located in different realms. However, I believe it is a mistake to take Polanyi's correspondence metaphor in a way that presupposes this dualism. Polanyi's interest is in the parallelism between the structure of comprehending and the structure of the comprehensive entity. Looked at from the point of view of the knower, knowing is an indwelling and an integration of particulars, an active performance. Looked at from the point of view of the known, the

comprehensive entity is a sustained union or conjoining of particulars. That union reflects the way in which subsidiaries inform or under gird the union without absolutely determining it. Those particulars are what the knowing subject dwells in or assimilates to his or her body.

Polanyi develops several ideas concerned with the levels or stratification and dual control in comprehensive entities. Again such discussions are framed from the point of view of the known (the comprehensive entity) and are basically antireductionist claims. In *The Tacit Dimension*, he speaks of "the ontological counterpart" of some elements of tacit knowing.[74] He uses the same phrase in "The Body-Mind Relation," a 1968 publication;[75] here his conclusion points again to the parallelism between tacit knowing and comprehensive entities: "The logical structure of tacit knowing is seen to cover the ontological structure of a combined pair of levels."[76] In the same way that a subsidiary awareness of particulars in their bearing on a focus cannot be reduced to focal awareness of particulars, Polanyi contends that the higher level of control in a comprehensive entity cannot be reduced: the "ontological counterpart" claims

(1) that the principles controlling a comprehensive entity would be found to rely for their operation on laws governing the particulars of the entity in themselves; and (2) that at the same time the laws governing the particulars in themselves would never account for the organizing principles of a higher entity which they form.[77]

Put another way, Marjorie Grene, quoting the Duke lectures, says Polanyi is affirming that "for all cases of tacit knowing, 'the structure of comprehension reappears in the structure of that which it comprehends'" and this means "we can . . . 'expect to find the structure of tacit knowing duplicated in the principles which account for the stability and effectiveness of all real comprehensive entities.'"[78]

From the careful way in which Polanyi couches all his discussions of "ontology," it seems clear that any claims about the being of entities are inferences intimately tied to epistemological claims. Polanyi provides a "frankly epistemological approach to metaphysics," to return again to the challenge from Grene quoted as an epigram at the beginning of this essay.[79] Polanyi does, in *The Tacit Dimension* and some other writing after *Personal Knowledge*, discuss the active nature of comprehension in terms that focus upon the object comprehended, the "comprehensive entity" and its dynamics. Polanyi does carefully use ontological language ("ontological" aspect, reference, counterpart) in some of these discussions. But it is important not to miss Polanyi's fundamental emphasis upon the active nature of comprehending by construing such discussions about "comprehensive entities" as a leap to ontological conclusions (i.e., to a noumenal realm of things in themselves) made as an addition to or move beyond his epistemology. Polanyi does not begin with a Cartesian framework that presupposes an external world from which the knowing subject is fundamentally set apart. Knowing for Polanyi is an ongoing activity in the world and the nature of the knower is fundamentally that of a living, historical being immersed in and intimately bound up with the world.

VII. Comprehension, "Comprehensive Entities" and the Nature of the Real

Polanyi claims the human mode of being is bound up inextricably with the ongoing process of indwelling the environment in which humans are located. Part of that environment is natural but certainly much is social. The world is not fundamentally other than or separated from a person, but a person's being is a worldly participating kind of being which thinkers like Heidegger and Merleau-Ponty have dubbed "being-in-the-world." Grene has followed out this connection between Polanyi's ideas about indwelling and twentieth

century continental philosophical thinkers more than Polanyi himself.[80] Heidegger first develops being-in-the-world as an alternative to Cartesian metaphysics emphasizing mind and extended nature. Grene notes that "what Heidegger is doing in his depiction of human being as being-in-the-world is to renounce radically and once for all the attempt to get at our natures through the concept of consciousness. It is a radical move against the *cogito* as the starting point for philosophy." [81] But Grene points out that Heidegger's anti-Cartesian turn is not radical enough; what is needed is an account of being-in-the-world that is much more realistic, more biologically grounded, more attuned to embodied human notions that figures like Polanyi have developed:

> . . . the fundamental counter-Cartesian turn we need in philosophy is to recognize that there is a living world of which we are part. Being-in-a-(human)-world is our way of being-in-an-environment, as all living things are, and in particular as one variant of the way all animals are. And that means that human beings, like any other animate being must be embodied.[82]

In some of Merleau-Ponty's writing, Grene contends that she finds "the most effective account so far of what it is to be in a world; to be a person living his (her) life in the odd fashion vouchsafed us by the contingencies of global, biological and human history."[83] Grene seamlessly links Polanyi and Merleau-Ponty, suggesting that Merleau-Ponty's *The Phenomenology of Perception* and Polanyi's *Personal Knowledge* "convey the same message, but in the opposite order."[84] Whereas Polanyi tends to focus on human knowing and its ontological implications, Merleau-Ponty tends to focus on human being-in-the-world and its epistemological implications. Merleau-Ponty restores perception "to its proper, primary place in our lives. For vision is not only in fact the primary sense of most of us; it is paradigmatic for the way we are in the world. Vision puts us out there with things and events and at the same time brings them here to us."[85] Clearly, Polanyi's ideas about active human comprehension and "comprehensive entities" make very similar points in his 1961 essay "Knowing and Being" (discussed at length above) when he says "a peculiar combination of skillful doing and knowing is present in the working of our sense organs" and this means "our perception is effectively co-determined also by messages from the internal ear, from the muscles which keep our body and head in its position, as well as by an ample range of memories."[86] Polanyi make the same claims for the active nature of comprehension in *The Tacit Dimension* when he describes the "logic of tacit inference" and that includes his attention to the "ontological aspect" deduced from the functional and phenomenal structures and the semantic aspect of tacit knowing.

With Merleau-Ponty and Polanyi, Grene proclaims "there is no fundamental contrast between me-in-here and everything-else-out-there;" such an ontological dichotomy "makes nonsense of a world that is living, complicated, messy as you like, but real. I am myself one instantiation of that world's character, one expression of it, able also in an infinitesimal way, to shape and alter it."[87] This perspective might be called a lived or participating realism or, following hints in Grene's recent writing, an ecological realism.[88]

The variety of realism that Polanyi and Grene espouse at first seems odd when seen in the context of contemporary philosophical discussions of realism and anti-realism.[89] However, Polanyi's account focusing on human beings as real beings-in-the-world able to attend to "comprehensive entities" in the environment suggests that perhaps this post-critical variety of realism reaches over contemporary discussions and fits more aptly into discussion in the medieval tradition in the West. That is, Polanyi's "post-critical philosophy" circumvents the modern turn in Western philosophy by returning to the roots of this modern turn.

The great medieval controversy was between what were then called realists and nominalists and, in terms of the historical development of Western thought, the nominalists won the day. Contemporary philosophers normally regard the debate between the medieval realists and nominalists as a controversy centered on the status of universals. Are universals a part of reality or are they human constructs? But this may not be the most interesting way to construe this debate. I believe that Cornelis de Waal is correct in pointing out that the American philosopher Charles S. Peirce insightfully recognized that the nominalist "no" regarding whether universals are part of reality and the realist "yes" to this question are in fact responses grounded in fundamentally different philosophical assumptions about what counts as being real.[90] Both realists and nominalists aim to distinguish what is real from what is a figment. The nominalists think of reality as what is "confined to what is external to the mind,"[91] that which is outside and forces itself upon us. The nominalist emphasis is thus upon outward constraints upon the human mind and this is addressed in terms of matters of location (a spatial metaphor). But the realists think of reality in terms of true judgments, as that which "is the object of a conclusion one cannot avoid drawing."[92] That is, real things are not dependent upon what any particular person thinks, although they are not incognizable. Real things are not figments; they are matters about which there will be eventually be agreement. Agreement is based upon reasoning that eventually yields common conclusions. Realists don't necessarily deny that a given real thing may be a resistant, external thing, but they point out that this is in fact an inference drawn that is itself compelling. Peirce rather nicely summarized these fundamentally different notions of the real by contrasting the nominalist interest in "the fountain of the current of human thought" and the realist interest in the destination toward which that current of thought is flowing, "the unmoving form to which it is flowing."[93]

The difference here is between a metaphysical orientation focused first and foremost on what is external to human minds and an orientation in which attention is focused ahead on a projected limit at which minds will all ultimately arrive as creatures engaged in inquiry. With the nominalist metaphysical orientation, the ontological status of any purported real entity that is not altogether external to a person's mind is problematic. Ultimately, mind itself is problematic. Such realities seem to lack basic tangibility and therefore come to be regarded as complex phenomena that must be somehow tied to some more tangible elements or, alternatively, they are understood in terms of the oddities of language reference. There is a certain pressure within this metaphysical orientation to establish a primary "existence" that trumps all qualities of that which shows itself. The history of modern philosophy in the West has, of course, often been concerned to spell out these matters. The second metaphysical approach that focuses upon a projected limit at which agreement is reached is clearly an approach in which knowing and the ontological status of entities are regarded quite differently. Knowing and being are woven inextricably together within this ontological orientation. The ontological status of entities is not tied largely to "existence" and tangibility, but to an entity's intelligibility and its prospect for greater intelligibility.

Peirce, of course, adopts the second, or medieval realist, metaphysical orientation and he is very critical of the "nominalist" cast of all modern philosophy after Descartes.[94] With the Platonic tradition, Peirce emphasizes human inquiry, although he transforms inquiry into a pragmatic context. Inquiry is the human vocation in a changing world and human beings as members of a community of inquiry are collectively engaged in adjusting our dispositions to respond in ever more nuanced ways to that changing world. The real is that about which there will be agreement "in the long run."[95]

Polanyi was not a thinker like Peirce who was intimately aware of the discussions in philosophy in the Western tradition. He was aware of certain themes and turning points in the history of Western philosophy and he fortunately had Marjorie Grene to assist him in negotiating the history of philosophy.[96] Polanyi did

sense that his philosophical orientation was a new key so he dubbed his work "post-critical." Much of his effort to work out what "post-critical" philosophy is concerned with focuses on discussions of the nature and structure of "comprehension" and "comprehensive entities." Grene helped Polanyi connect his perspective with Continental thought that rejected the modern turn of Western philosophy by exploring human being-in-the-world. As the epigrams opening this essay suggest, Grene perhaps has a clearer sense of the metaphysical implications of Polanyi's theory of tacit knowing than he did himself.

Those metaphysical implications of "post-critical' philosophy fit into the metaphysical orientation of medieval realists. Polanyi, like Peirce, follows Plato in emphasizing the special human vocation as focused on inquiry or understanding. Understanding for Polanyi is "comprehension," an active shaping of knowledge by a human being who has the capacity to dwell in and tacitly integrate an extraordinary range of particulars. Humans integrate tacitly held particulars to attend to "comprehensive entities" and such entities can be viewed as skillful human performances or achievements that serve or realize self-set standards. But "comprehensive entities" are realities and some realities are more richly significant than others, according to Polanyi. Such richly real "comprehensive entities" have the capacity to be understood more deeply as human inquiry proceeds. For Polanyi and Grene, human beings are bio-social creatures that dwell in and adjust to our changing environment. Our "indwelling is a participation of ours in the existence of that which we comprehend; it is . . . *being-in-the-world*."[97] Human beings are members of communities of inquiry and the on-going project of persons in such communities is to explore the intricacies of that encompassing, inexhaustible reality called the cosmos. Put another way—that again is strangely akin to Peirce's views—it is the growth of meaning[98] as humans take up their vocation of inquiry that Polanyi calls for and celebrates.

Endnotes

[1]An early version of this essay was delivered as a paper titled "The Comprehensive Entity as a Key Idea in Polanyi's Thought" at the 2001 Loyola Conference of the Polanyi Society. This expanded version of the essay is a slightly revised version of the essay that was recently published in Chinese in *New Philosophy* (v: 7, n. 2).

[2]Marjorie Grene, *The Knower and the Known* (London: University of California Press Ltd, 1966, 1974), 244. Hereafter references simply use the title and page number.

[3]*The Knower and the Known*, 242.

[4]On this point, see my discussion and Grene's brief "Reply to Phil Mullins" (following my essay) in the Library of Living Philosophers volume (XXIX) honoring Grene. Phil Mullins, "On Persons and Knowledge: Marjorie Grene and Michael Polanyi," *The Philosophy of Marjorie Grene*, eds. Randall Auxier and Lewis Hahn (Chicago and LaSalle, IL: Open Court: 2002), 31-62.

[5] Michael Polanyi, *Personal Knowledge; Towards A Post-Critical Philosophy* (Chicago: University of Chicago Press, 1958; Harper Torchbook edition, 1964), xv. Hereafter all references are to the Torchbook edition and are identified simply by *Personal Knowledge* and the page number.

[6]Phil Mullins, "Polanyi's Participative Realism," *Polanyiana* 6:2 (1997), 5-21; see especially 16-21.

[7]Phil Mullins, "The Real *As* Meaningful," *Tradition and Discovery* 26:3 (1999-2000), 42-50; see especially 46-47.

[8]*The Knower and the Known*, 223.

[9]Michael Polanyi, *The Tacit Dimension* (New York: Doubleday & Company, 1966; Anchor Books Edition, 1967), 32. All references hereafter are to the Anchor Books Edition and include only the title and page number.

[10]*Personal Knowledge*, 411. Grene acknowledges that she and her children prepared the "Index" in Marjorie Grene, "Tacit Knowing: Grounds for a Revolution in Philosophy," *Journal of the British Society for Phenomenology*, Vol. 8, No. 3 (October, 1977), 167. This article by Grene (164-171) is an important essay evaluating Polanyi's philosophical contributions; it is cited hereafter by page number as Grene, "Tacit Knowing: Grounds for a Revolution."

[11]*Personal Knowledge*, xiii.

[12]*Personal Knowledge*, 398.

[13]*Personal Knowledge*, 398.

[14]In the new Polanyi biography, Scott and Moleski suggest that there is a hint of such a distinction in the seventh lecture of the first series of Gifford Lectures and that the full-fledged articulation in the second series Gifford lecture titled "Two Kinds of Awareness" grows out of this. See William T. Scott and Martin X. Moleski, *Michael Polanyi, Scientist* and *Philosopher* (New York: Oxford University Press, 2005), 221. Hereafter citations to the biography use the title and page numbers. As early as 1953, Polanyi's friend Joseph Oldham comments in a letter to Polanyi that a letter to Oldham from Marjorie Grene has reported that the ideas in this lecture Polanyi thought the most fruitful in his lectures (see Oldham letter to Polanyi, August 3, 1953, Box 15, Folder 5 in The Papers of Michael Polanyi held by the Department of Special Collections of the University of Chicago Library. Quotations from The Papers of Michael Polanyi are used with permission of the University of Chicago Library. Citations of this material will hereafter be shortened to the letter and date, box number and folder number). Richard Allen suggests that Polanyi's first publication using the distinction is in 1954 with "On the Introduction of Science into Moral Subjects," *Cambridge Journal*, VII, Jan. 1954, 195-207. See Michael Polanyi, *Society, Economics and Philosophy, Selected Papers*, ed. R. T. Allen (New Brunswick, USA: Transaction Publishers, 1997), 382. The Allen collection is cited hereafter in shortened form as *Society, Economics and Philosophy*.

[15] Grene offers some interesting comments on Polanyi's development of his central idea between the Gifford Lectures and the publication of *Personal Knowledge*. She notes that Polanyi was preoccupied with understanding unspecifiability, and she did not at the time understand Polanyi's preoccupation.. She also notes that Polanyi thought his discussion of two kinds of awareness was the most original element in *Personal Knowledge*. Grene outlines how the idea was the key element to the argument of *Personal Knowledge* and is the germ from which the theory of tacit knowing later develops. See Grene, "Tacit Knowing: Grounds for a Revolution," 165 and 168. See my discussion below.

[16]*Personal Knowledge*, 55.

[17]*Personal Knowledge*, 56.

[18]*Personal Knowledge*, 57

[19]*Personal Knowledge*, 364.

[20]*Personal Knowledge*, 364.

[21]*The Knower and the Known*, 223.

[22]*The Knower and the Known*, 224.

[23]The Duke Lectures are a series of five public lectures entitled "Man in Thought." The separate lectures are "The Metaphysical Reach of Science," "The Structure of Tacit Knowing," "Commitment to Science," "The Emergence of Man," and "Thought in Society." The last four lectures repeat the 1962 Terry Lectures at Yale which are the basis for Polanyi's *The Tacit Dimension* (1966). In the new Polanyi biography, see Scott and Moleski's comments on the Duke Lectures (*Michael Polanyi, Scientist* and *Philosopher*, 254).

[24]Michael Polanyi, "Tacit Knowing: Its Bearing On Some Problems of Philosophy,"*Review of Modern Physics*, 34 (1962), 601-616. This essay is included in Michael Polanyi, *Knowing and Beings: Essays by Michael Polanyi*, ed. Marjorie Grene (Chicago: University of Chicago Press, 1969), 159-180. Hereafter

references to Grene's collection are simply identified as *Knowing and Being, Essays By Michael Polanyi.* References to this essay ("Tacit Knowing: Its Bearing On Some Problems of Philosophy") are to the reprinted copy in Grene's collection.

[25]*Knowing and Being, Essays By Michael Polanyi*, 168.

[26]Michael Polanyi, *The Study of Man* (Chicago: University of Chicago Press, 1959). Hereafter cited in abbreviated form as *The Study of Man*

[27]*The Study of Man*, 9.

[28]See *The Study of Man*, 44, 45, 46, 55, 65-66 for instances in which Polanyi uses "comprehensive entity."

[29]*The Study of Man*, 28-29.

[30]*The Study of Man*, 28.

[31]"Tacit Knowing: Grounds for a Revolution," 169.

[32]"Tacit Knowing: Grounds for a Revolution," 167.

[33]"Tacit Knowing: Grounds for a Revolution," 167.

[34]"Tacit Knowing: Grounds for a Revolution," 168.

[35]*The Tacit Dimension*, x.

[36]*The Tacit Dimension*, x.

[37]*Personal Knowledge*, x.

[38]*Personal Knowledge*, xi.

[39]Michael Polanyi, "Knowing and Being," *Mind*, 70 N. S. (1961), 458-470. This essay is also included in Grene's collection *Knowing and Being, Essays By Michael Polanyi*, 123-137. References are to page numbers in Grene's reprinted edition of the essay. Since the title of this important essay is the same as that of Grene's collection in which it appears, in future citations, I use the essay title ("Knowing and Being"), Grene's collection's title (*Knowing and Being, Essays By Michael Polanyi*) and the page number in Grene's collection in which the reprinted essay appears.

[40]See the discussion in "Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 123ff.

[41]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 124.

[42]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 124.

[43]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 128.

[44]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 125.

[45]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 125.

[46]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 125.

[47]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 125.

[48]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 129-130.

[49]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 125.

[50]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 126.

[51]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 126.

[52]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 134.

[53]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 134.

[54]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 134.

[55] *Personal Knowledge*, xi.

[56] *Personal Knowledge*, x.

[57] *Personal Knowledge*, xi.

[58] "Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 132

[59] "Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 134.

[60] *TD* is based upon the 1962 Terry Lectures, which are themselves closely akin to other lectures given in 1961 and 1962, as well as the Duke Lectures in 1964. The period immediately following publication of *PK* (1958) through about 1964 seems to be a time in which implications of the reshaping of Gestalt ideas are becoming very clear to Polanyi. This is also the time in which "comprehensive entity" comes to be a popular term. See also Polanyi's 1963 introduction, "Background and Prospect" (11-12) to the Chicago republication of *Science, Faith and Society* (Chicago: University of Chicago Press, 1964) for some additional comments on the transformation of Gestalt ideas.

[61] *The Tacit Dimension*, 6.

[62] *The Tacit Dimension*, 6.

[63] *The Tacit Dimension*, 7.

[64] *The Tacit Dimension*, 6.

[65] *Personal Knowledge*, xiii.

[66] *The Tacit Dimension*, 10.

[67] *The Tacit Dimension*, 11.

[68] *The Tacit Dimension*, 111-12.

[69] *The Tacit Dimension*, 13.

[70] *The Tacit Dimension*, 33.

[71] *The Tacit Dimension*, 32-33.

[72] *The Tacit Dimension*, 33.

[73] *The Tacit Dimension*, 33-34.

[74] *The Tacit Dimension*, 34.

[75] Michael Polanyi, "The Body-Mind Relation," *Man and the Science of Man*, eds. W. R. Coulson and C. R. Rogers (Charles Merrill Publishing Company, 1968), 85-102. Reprinted in *Society, Economics and Philosophy*, 313-328. Page references are to the reprinted edition.

[76] *Society, Economics and Philosophy*, 323.

[77] *The Tacit Dimension*, 34.

[78] *The Knower and the Known*, 241.

[79] " . . . [I]t needs a frankly epistemological approach to metaphysics to set right the epistemological errors of Descartes with which modern . . . philosophy began." (*The Knower and the Known*, 244).

[80] As the quotation above to the Torchbook Edition "Preface" of *Personal Knowledge* makes clear, Polanyi does make occasional references to Heidegger, but I suspect that he never carefully studied Heidegger. Polanyi apparently did read Merleau-Ponty, probably at Grene's insistence, in the early sixties. References to Merleau-Ponty's work begin to appear in Polanyi's writings in the early sixties. The new introduction (dated December, 1963), "Background and Prospect," to the 1964 University of Chicago reprint of *Science, Faith and Society* identifies *The Phenomenology of Perception* as a book that analyzes "perceived knowledge on the lines of Husserl" and "arrives at views akin to these I have expressed here" (12). The most extensive comment about Merleau-Ponty appears in Polanyi's "The Structure of Consciousness" (first published in 1965, but also in Grene's *Knowing and Being*), 211-224. See the two-page discussion of Merleau-Ponty, 221-223. But Merleau-Ponty is also mentioned approvingly in "The Logic of Tacit Inference" (first published in 1966, but also included in *Knowing and Being* , 138-158). See the discussion in *Knowing and Being*,155-156. Marjorie Grene's most recent and perhaps most important discussions of Polanyi's connections with Merleau-Ponty and Heidegger as well as other contemporary thinkers she believes are akin is in *A Philosophical Testament* (Chicago and La Salle, IL: Open Court, 1995). References to this book below are by title and page number only.

[81]*A Philosophical Testament*, 71.

[82]*A Philosophical Testament*, 76-77.

[83]*A Philosophical Testament*, 80.

[84]*A Philosophical Testament*, 69. See also *The Knower and the Known*, 244 for a simlar view thirty years earlier. Grene noted in 1977, that although she clearly saw the convergence of these books, "Polanyi himself would never quite admit this convergence; in any event the context within which he had developed his view is so different from the milieu of Merleau-Ponty's thought that the two works may certainly count as two major ways of philosophizing toward a similar outcome" ("Tacit Knowing: Grounds For a Revolution in Philosophy," 164 note). Grene holds that in a particular historical situation, philosophers often wrestle with the same fundamental problems and that may produce convergent original solutions

[85]*A Philosophical Testament*, 81-82.

[86]"Knowing and Being," *Knowing and Being, Essays By Michael Polanyi*, 126-127.

[87]*A Philosophical Testament*, 114.

[88]Grene notes in *A Philosophical Testament* (114) that she once called herself a "comprehensive realist" but that she has given up this term as ambiguous. The term may be ambiguous but its connections with Polanyi's discussions of "comprehension" and "comprehensive entities" are clear. In *A Philosophical Testament*, Grene indicates that she presently prefers use the work of the Gibsons to fashion what she regards as a bio-socially grounded ecological approach, which I think might be dubbed "ecological realism." See especially her discussions in "The Primacy of the Real" (113-126) and "Perception Reclaimed: The Lessons of the Ecological Approach" (129-151).

[89] Grene offers an interesting comment in the context of her discussion of realism in *A Philosophical Testament* (113-126). She suggests that much contemporary discussion in philosophy of science has formalistic suppositions about knowledge and misguided notions about perception going back to empiricism. It really an in-house debate about "scientific realism."

[90]Cornelis de Waal very briefly sets forth his case in his recent brief volume *On Peirce* (Belmont, CA: Wadsworth, 2001) in his discussion of Peirce's scientific metaphysics (47-48). He develops a more extensive case in "The Real Issue Between Nominalism and Realism, Peirce and Berkeley Reconsidered," *Transaction of the Charles S. Peirce Society* 32: 3 (Summer, 1996), 425-442. My reading of the development of Western thought draws heavily on suggestions in de Waal. Quotations from de Waal that follow are from *On Peirce* and are noted simply by title and page number. I acknowledge that I draw at least indirectly on the more detailed discussion in de Waal's longer 1996 essay (see especially 425-430).

[91]*On Peirce*, 47.

[92]*On Peirce*, 47.

[93]Charles S. Peirce, *Collected Papers of Charles Sanders Peirce,* eds. Charles Hartshorne and Paul Weiss and Arthur Burks (Harvard University Press, 1965), vol. 8, paragraph 17. Reference by volume and paragraph number to this multi-volume set of Peirce writings are hereafter shortened to the following citation notion: *CP* 8:17. In the same paragraph, Peirce says the disagreement about universals is grounded in these different notions of the real and "the gist of all the nominalist's arguments will be found to relate to a *res extra animam*, while the realist defends his position only by assuming that the immediate object of thought in a true judgment is real."

[94] "Thus in one word, all modern philosophy of every sect has been nominalistic" (*CP* 1: 19). See *CP*1: 15-27 for the general context of this discussion.

[95]*CP* 5:311. The entire paragraph (.311) is an interesting early Peirce discussion that clarifies how he thinks of the real in connection with reasoning in the human community and the positing of a limit. This paragraph also suggests how Peirce modifies Kant in a way to produce something like Polanyi's theory of tacit knowing.

[96] Polanyi does not, like Peirce, dig deeply into medieval or any other philosophical controversies, although he makes some references to them and clearly seems to be working in the realist context of the medieval debate as his attempts to define reality and discuss the nature of entities that are "more real" show. See, for example, Polanyi's 1962 essay "Tacit Knowing and its Bearing on Some Problems in Philosophy" (*Knowing and Being*, 159-180) where Polanyi points to the "wider range of indeterminant future manifestations" of "comprehensive entities" such as the human mind. See also my discussions of Polanyi's accounts of reality in articles cited above in footnotes 5 and 6. Polanyi does touch upon the problem of universals in terms of his theory of tacit knowing and he links the problem of universals to the problem of understanding empirical induction in "Tacit Knowing and its Bearing on Some Problems in Philosophy" (*Knowing and Being*, 166-167). Human comprehension integrates particulars that we dwell in and achieves a focus on a "comprehensive entity" which makes an ontological reference, according to Polanyi. Because we continue to dwell in the world, assimilating new particulars and attending to matters of interest, we recognize new instances of a phenomenon, although the phenomenon may not be absolutely identical with previously recognized instances. Generals or universals are real which means not that they exist in some noumenal realm or outside the mind, but that they are "comprehensive entities," products of integration whose meaning continues to grow.

[97] *Personal Knowledge*, x

[98] See particularly Polanyi's last book done with Harry Prosch for an effort to articulate Polanyi's "post-critical" perspective in terms of the challenge to and recovery of meaning. Michael Polanyi and Harry Prosch, *Meaning* (Chicago: University of Chicago, 1976). See Mary Keeler's "Iconic Indeterminacy and Human Creativity in C. S. Peirce's Manuscripts" (*The Iconic Page in Manuscript, Print, and Digital Culture*, eds. George Bornstein and Theresa Tinkle [Ann Arbor: University of Michigan Press, 1998], 157-193) for a particularly interesting discussion of Peirce's approach to the growth of meaning. See the last section (titled "Critical Thinking and Post Critical Thought," 279-286) of my article "Bible Study, Critical Thinking and Post-Critical Thought: Cultural Considerations" in *Critical Thinking and the Bible in the Age of the New Media*, ed. Charles N. Ess (Lanham, MD: University Press of America, 2004), 269-290 for an effort to put together Peircean semiotics and Polanyi's "post-critical" philosophy to discuss the growth of meaning. It should be noted that Polanyi is much more attuned, as a social and political philosopher, than is Peirce to the social conditions necessary to foster the growth of meaning.

WWW Polanyi Resources

The Polanyi Society has a World Wide Web site at http://www.missouriwestern.edu/orgs/polanyi/. In addition to information about Polanyi Society membership and meetings, the site contains the following: (1) digital archives containing all issues of *Tradition and Discovery* since 1991; (2) a comprehensive listing of *Tradition and Discovery* authors, reviews and reviewers; (3) the history of Polanyi Society publications, and information on locating early publications not in the archive; (4) information on *Appraisal* and *Polanyiana*, two sister journals with special interest in Polanyi's thought; (5) the "Guide to the Papers of Michael Polanyi", which provides an orientation to archival material housed in the Department of Special Collections of the University of Chicago Library; (6) photographs of Polanyi; (7) links to a number of essays by Polanyi.as well as audio files for the McEnerney Lectures (1962) and Polanyi's conversation with Carl Rogers (1966).

Signals, Schemas, Subsidiaries, and Skills:
Articulating the Inarticulate

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ABSTRACT Key Words: Michael Polanyi, Susanne Langer, Eugene Gendlin, Daniel Schacter, tacit knowing, explicit knowing, gestalt, schema, signal, symbol, integration, evocation.
This essay examines Michael Polanyi's notion of tacit knowing and seeks to clarify and elaborate upon its claims. Tacit knowing, which is conscious although inarticulate, must be distinguished from tacit processes, which are largely unconscious. Schematization is explored as a primary tacit process that humans share with all animals. This tacit process organizes and secures, in long-term memory, information of interest provided by receptors and those learned skills conducive to survival. Human empirical knowing integrates schematized subsidiaries into articulate explicitness through culturally-embedded symbols evoked in terms of felt fittingness.

The thesis of this paper is quite easy to state: the tacit dimension of human knowing is implicated in all learning and accomplishing. Its processes and capabilities ought to be included in any adequate philosophical system. Yet for a process so central to education and achievement, there is a comparatively limited amount of attention paid to tacit knowing in scholarly writing, and there is surprisingly little consensus about how it functions. The literature in psychology contains disconnected discussion about various non-conscious contributors to knowledge, but nothing quite as comprehensive as a coherent theory of tacit knowing has emerged in psychology so far as I am aware. The most sustained version of a theory about tacit knowing has been produced by the scientist-philosopher who coined the term: Michael Polanyi. This paper is centered in Polanyi's contributions, which are provocative and substantial. However, I do not always find Polanyi's many discussions of tacit knowing to be entirely consistent or clearly defined. Consequently, I have incorporated ideas from other thinkers insofar as they seem able to deepen and clarify Polanyi's insights. The essay also relies on personal experiences and reflections and so must finally be seen as my very modest attempt, still in process, toward explicating tacit knowing and showing its place within philosophy.

* * *

What is tacit knowing? Polanyi does not offer one stock answer, but rather tends to illuminate the meaning of the term through the use of examples. We will later follow the same procedure. Polanyi typically centers his discussion by speaking of the structure of tacit knowing. This structure distinguishes between subsidiary and focal awareness. Polanyi claims that all focal awareness depends upon the tacit integration of subsidiaries to produce a focal whole. His analysis arises out of gestalt psychology, but greatly expands the scope and ramifications of its psychological origins.

To get a clear beginning point for our discussion, let us examine material from three paragraphs of the well known Preface to the Torchbook edition of Polanyi's *magnum opus*, *Personal Knowledge*:

> When we are relying on our awareness of something (A) for attending to something else
> (B), we are but subsidiarily aware of A. The thing B to which we are thus focally attending,

is then the meaning of A. The focal object B is always identifiable, while things like A, of which we are subsidiarily aware, may be unidentifiable. The two kinds of awareness are mutually exclusive: when we switch our attention to something of which we have hitherto been subsidiarily aware, it loses its previous meaning. Such is briefly, *the structure of tacit knowing.*

Now to the distinction between tacit and explicit knowledge. Things of which we are focally aware can be explicitly identified; but no knowledge can be made *wholly explicit*. For one thing, the meaning of language, when in use, lies in its tacit component; for another, to use language involves actions of our body of which we have only a subsidiary awareness. Hence, tacit knowing is more fundamental than explicit knowing: *we can know more than we can tell and we can tell nothing without relying on our awareness of things we may not be able to tell.*

Things which we can tell, we know by observing them; those that we cannot tell, we know by dwelling in them. (1964, x)

I find the identification of the focal-subsidiary relationship to represent a breakthrough in epistemo-logical analysis. To more fully represent Polanyi's complete vision, the quotation should be augmented by the following claim: "The relation of a subsidiary to a focus is formed by the *act of a person* who integrates one to the other" (1975, 38). Once one becomes aware of some personal examples of attending from some things toward their integrated meaning, one finds this to be a pervasive pattern of how we think and act in the world. Our thought and action are grounded in bodily skills that are easy to overlook, yet if ignored give rise to false forms of understanding and learning.

The structure of tacit knowing, as indicated in the first paragraph quoted, is clearly enough stated, although it should be noted that usually Polanyi speaks of multiple clues at A that are integrated to form B. It should be further noted that in the second paragraph Polanyi calls for a distinction between tacit and explicit knowledge yet analyzes both in terms of the structure of tacit knowing. Should there not be a separate structure of explicit knowing? Yes, I believe there is a more complex structure within one type of explicit knowing: the distinctively human type of knowing utilizing language. Different sorts of explicit achievements may be called articulations, but I will reserve the term "articulate" for states of consciousness and accompanying actions that are shaped by language. Later I will agree with Polanyi that tacit knowing has a <u>from-to</u> structure but suggest articulate explicit knowing is best interpreted in terms of a <u>from-via-to</u> structure. In short, there are both articulate and inarticulate forms of focal awareness, but only articulate consciousness can be largely explicit. As humans with an insatiable need to imbue our experience with language, we usually stress articulate explicit knowing. However, our skillful acts are examples of inarticulate explicit knowing – for example, the playing of a scherzo on a piano, figuring where one is by reading a map, or making free throws during a basketball game.

The sentence in the third paragraph quoted above is suggestive if not yet entirely clear. This seems to be claimed by Polanyi: if we observe an object in order to know it, words are evoked and we can describe it (articulate explicit knowing), whereas if we simply dwell in the subsidiaries, they form a background of understanding for which words are not needed (inarticulate tacit knowing). But is the subsidiary-focal structure, the structure of tacit knowing, involved if we merely dwell in what we have learned? Would it not be helpful to distinguish between passive tacit knowledge in which we dwell (e.g., that which has been internalized and exists in some form of long-term memory) and active tacit knowing such as piano playing,

map reading, and basketball shooting?

What seems missing in the paragraphs under consideration is any mention of what drives or motivates mental activity. But an emphasis on such motivation is not lacking in Polanyi's thought when taken as a whole. In *Personal Knowledge,* Polanyi stresses that intellectual and moral passions are powerful motivating forces, and he also grants an important role to the seeking of satisfactions. In *Meaning*, he and Harry Prosch accentuate the significance of interest in shaping mental activity. Although the role of feelings or emotions in general and passions in particular will not be emphasized in this essay, it should be born in mind that they are the engines powering much tacit activity.

Polanyi indicates in the quotation that we may be aware of the subsidiaries, but that often we are not conscious of them. Indeed, he claims we cannot specify all the subsidiaries involved in tacit knowing (1969, 124). Less clear is whether the focus needs to be conscious. In the quotation, the focal object is said (twice) to be always identifiable. But elsewhere Polanyi indicates we may not be aware of the focal object – as we strain to solve a scientific problem, for instance. "We can focus our attention on the joint meaning of particulars, even when the focus to which we are attending has no tangible centre. It represents our capacity to know a problem. A problem designates a gap within a constellation of clues pointing towards something unknown" (1969, 171). I believe a better – and still Polanyian – way of describing the process of seeking a scientific explanation is to see it as requiring a dialectical interplay between integration (which Polanyi emphasizes), analysis, and evocation (which he sometimes ignores). "All true scientific research starts with hitting on a deep and promising problem, and this is half the discovery. Is a problem a hypothesis? It is something much vaguer" (1969, 118). Thus the scientist begins with a promising but vague problem as a focal whole for which the fitting subsidiaries are sought through evocation. They would serve as the explanatory parts that can be adequately integrated to comprise the articulated whole. Similarly, the pianist focuses on the intuited whole of a piece which evokes the fingers to play correct notes as the fitting subsidiaries to the complete performance. Disaster occurs if the pianist starts observing what notes his or her fingers are playing.

In several places , Polanyi mentions the psychological experiment where a subject is shown the same nonsense syllables before an electric shock is administered. The subject comes to anticipate the shock, but cannot tell what led him to expect it. Polanyi states, "The experiment in question produces a fixed relation between two events, both of which we know but only one of which we can tell" (1969, 142; see also 1966, 7-12). He sees the anticipation of the impending shock as having a gestalt-like character and thus confirming tacit knowing. What is not explicitly known is the experimentally-contrived connection between the syllables and the shock, but it is implicitly known. Should this connection be described as an event as Polanyi does? What exactly is the nature of the integration in this case?

Psychological research carried out during the past several decades has suggested that the non-conscious connections Polanyi wrote about are rooted in an aspect of long-term memory Daniel Schacter labeled the "perceptual representation system" or PRS. This system "is specialized to deal with the form and structure of words and objects, but it does not 'know' anything about what words mean or what objects are used for. Meaningful associations and concepts are handled by semantic memory, which cooperates closely with PRS" (Schacter 1996, 184). PRS plays a role in many examples of priming, where some sort of perception that is not remembered influences a later choice that is fully conscious. Schacter says priming is likely involved in instances of unconscious plagiarism (167). Priming, in turn, is a feature of the hidden world of implicit memory. "Ideas pop to mind unattached to any setting or context, and we believe that we have come up with

them ourselves, even though they derive from a specific experience" (189). The non-conscious action of implicit memory has nothing to do with the repression postulated by Freud as essential to unconscious processes. Rather implicit memory is best seen as one of the non-conscious processes contributing to the broader notion of tacit knowing. The notion of non-conscious processing is controversial in some quarters. Joseph LeDoux, after offering two common arguments against the relevance of non-conscious processing, supplies a number of persuasive counterarguments that support the position taken in this paper (see 1998, footnote 47, 311-312).

Further analysis of the three paragraphs above from Polanyi raises more questions. In the first paragraph, B (the focus) is said to be the meaning of A, but in the second paragraph he states that "the meaning of language, when in use, lies in its tacit component." I find this puzzling: the meaning of language when properly used would seem to be explicit, not tacit. This is but one instance of confusion I have about exactly what Polanyi means by "tacit." The basic dictionary meaning of "tacit" is "to be understood without being put into words," and clearly that is often the meaning Polanyi has in mind. That will be my usage: the tacit is the inarticulate. Why then would he say that the meaning of language in use (the articulate) is tacit (inarticulate)? Meaning is intangible – is that what he means to indicate? Or does he mean to state that language is parasitic upon and expressive of tacitly known material (that which, we will see, has been schematized)? I lean toward the latter interpretation.

My purpose in quoting Polanyi and then raising questions about what he means is twofold. First, in talking about tacit knowing it is important to start with a primary source and become familiar with its vocabulary. Second, I also want to indicate that while Polanyi's general perspective is very insightful, it is not without problems. Clarity and consistency in the use of terms is needed. Moreover, new insights have arisen since Polanyi wrote. I proceed as a philosopher ready to make use of helpful insights from psychology, linguistics, anthropology, biology, or wherever they may come from.

Here, then, is a brief summary of what I mean by tacit knowing. It is, positively speaking, an embodied art of skillful accomplishment. It underlies both heuristic achievements and reversible mental functioning. It is also helpful to say what it is not: it is not the symbol-dependent, articulate aspect of knowing that is in the forefront of human consciousness. Tacit knowing is the sort of knowing we humans share with other animals. It is controversial to state whether or to what extent we have instinctual knowledge lent to us purely by our genes. Surely most knowledge at a tacit, inarticulate level is <u>learned</u>: our genes provide us dispositions and aptitudes that must be developed through practice and experience.

Polanyi surveys the development of human mentality in Part Four of *Personal Knowledge*, and he shows how human thought is dependent upon achievements gained earlier by animals during their evolutionary trajectory. There are a great many abstractive and schematizing processes involved in inarticulate learning. Whether the subsidiary-focal structure is pervasive in all animal learning is an empirical psychological question I am not competent to answer. However, from a philosophical perspective Polanyi's structure of tacit knowing results in the unified consciousness that would be necessary for an animal to respond intelligently to the complex challenges facing it. Without a center of individuality provided by the integration of significant particulars into unified knowledge, an animal would be simultaneously pulled in many incompatible directions and would not be able to survive.

Polanyi speaks of two types of awareness, the subsidiary and the focal. I find it useful to place these

two types of awareness in the context of three levels of responsiveness that have emerged in the evolutionary history of life. Most basic is the stimulus-response provided by receptors. Even the simplest forms of life, like the archea and bacteria, have receptors leading to food. These chemical machines have <u>no center</u> of decision-making as individuals; their survival depends on the viability of their genetic coding for specific activities within a given ecological niche. This first level sort of mechanistic stimulus-response activity characterizes as well the relative complexity of plant functioning. But with the advent of animal life, <u>individual centers</u> of responsible decision-making enter the picture. As we shall see later, at this second level, individual learning emerges within what can now be called consciousness. Animals process and select among the incoming signals provided by receptors, and we shall later explore with Polanyi three types of inarticulate learning. For reasons mentioned in the last paragraph, it makes sense to see the subsidiary-focal and from-to distinctions emerging within this level of responsiveness. The language permeated third level is found only (with controversial exceptions) among humans, and personhood emerges. The use of symbols allows for a great expansion in the power of the <u>individual person</u>, as attested to by our technological prowess. Our focus will be upon the tacit knowing that emerges in many degrees of complexity at the second level, but with Polanyi our attention will not be upon animals studies per se. Our concern will be with the tacit intelligence humans have inherited from other animals and continue to rely upon even as we have superimposed our noisy linguistic learning upon these inarticulate forms of intelligence to such a degree that our less intrusive tacit knowing has been overlooked by most interpreters of our humanity. But not by Polanyi.

Polanyi wants to restrict tacit knowing to conscious states (1975, 41). In order for this restriction to be honored, it is important to <u>distinguish tacit knowing from tacit processes</u>, such as <u>PRS</u>, which may be fully unconscious contributors to the conscious dimension of tacit knowing. Acts of integration, such as the integration of the visual field provided by each of our eyes into three-dimensional vision, are usually not conscious acts. Polanyi sees integrative acts to be the quintessential tacit power (1969, 140), but these include the coordination of muscular particulars in performing some intentional act – they are hardly the subject of conscious attention. Consequently, tacit processes can be understood to be comparable to non-conscious or unconscious processes. Sometimes the unconscious has been reified and treated as a substance or realm (as by Freud), but that is problematic on any score, and what is tacit will not be treated in such a manner. Tacit knowing will be understood to always have a conscious dimension, but tacit processes need not necessarily be conscious.

Why is it important to learn about tacit knowing? First, there is a tacit dimension to all knowing, so if one is to comprehend what makes knowing possible, it is vital to understand the root processes that contribute to the construction of the content of knowledge. Second, once one appreciates the significant contribution tacit knowing makes in the construction of any knowledge, one will not be misled by the objectivism that for years has plagued Western philosophy and contributed to false, unreachable standards regarding what counts as knowledge. Third, when objectivism falls by the wayside, so do objectivist philosophies that have failed to offer helpful vision and guidance for human existence. Positivism and scientism, which reject tacit processes as subjective and unreliable, offer truncated epistemologies based on an illusory objectivity. Fourth, when it becomes clear that our use of language depends upon tacit, non-verbal skills, then the various philosophical schools that tend to assume that knowledge is totally enveloped in language will be called into question. The philosophy of the later Wittgenstein, post-modernists like Rorty and Derrida, and, on some readings, Kuhn, tend to fall prey to some form of relativism or, worse yet, eventuate in incommensurable forms of life. The incoherence introduced into the world by such philosophical views results when language is regarded as inescapable and the reality of the tacit is forgotten. Fifth, a clear rendering of tacit processes eliminates the

need to refer to the dubious reified realm of the unconscious, most famously advanced by Freud, but influential in much speculative theorizing outside psychology as well as within it. Yet clearly there are many non-conscious processes affecting human thought and behavior, and a carefully developed theory of tacit processes and tacit knowing can explicate unconscious dynamics in a helpful way.

*   *   *

Let us begin exploring the varieties of tacit knowing by comparing how we come to know in four different cases (each example being inspired by Polanyi's writings). In the course of examining the cases, key factors involved in tacit knowing will be identified and discussed.

1) I come across an unknown person in a crowd and suddenly recognize her face.

2) I spend quite a bit of time trying to solve a calculus problem by different methods and then later while in bed suddenly the answer comes to me.

3) I learn how to ride a bike.

4) I learn the dimensions of a small chamber branching off a dark cave by using a probe.

*   *   *

1) When I first come face to face with the unrecognized person in a crowd, she looks vaguely familiar, but I have to scan her features several times before I can recall who she is. Her face has a gestalt that allows me to identify her. How do I accomplish this?

Security concerns, heightened by the threat of terrorism, have accentuated the interest in understanding the process of identifying who persons are. Joseph Atick, seeking to develop face recognition technology, tried to imagine how the mind actually processes facial images. "It seemed like a data-crunching problem, how to process millions of subtle pieces of information. But he realized . . . the solution lay in the opposite direction. It was about using as *little* information as possible. . . . [His system] looked at a few dozen points on a face and used those points to create a face print" (O'Harrow 2005, 161). Another recognition technology, fingerprint identification, relies not on recording skin loops and ridges, but on targeting pattern anomalies. Are there clues here to how humans use tacit features to recognize entities?

To recognize a face, we observe certain key features – perhaps cheekbone position, type of chin, extent of lips, size of eyes, length of head, and so on – and integrate them into a comprehensive pattern as we seek to match a remembered pattern. The particular details we integrate are not observed as separate objects, but are indwelt as subsidiaries in a particular pattern (Polanyi 1969, 182). We are aware of these features insofar as they bear in an integrated way upon their joint meaning, the face that is the focus of our conscious attention. Our resulting consciousness has a from-to structure. We are conscious <u>from</u> the subsidiary features <u>to</u> her face as a recognized whole. The integration that occurs is different than a linear summation of clearly described particulars. It is an unspecifiable, tacit act. "Specifiability remains incomplete in two ways. First, there is always a residue of particulars left unspecified; and, second, even when particulars can be identified, isolation changes their appearance to some extent" (1969, 124). Presumably if no specific gestalt from among the reservoir of accessible gestalts served to identify her face, attention to additional details would be attempted: one might examine the person's hair color, clothing, general body shape, manner of moving, etc., for the distinctive characteristics or anomalies that provide the clue to her identity.

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Often the person's name will come to awareness at virtually the same time I recognize her, but not necessarily. As a professor who has taught many years, frequently I may recognize a person I have known (quite possibly a student), but out of context, I cannot come up with that person's name at that moment. This example supports our intuitive sense that the process of recognition is a tacit skill in which language has no essential place.

A crucial notion for understanding tacit knowing is the schema. Humans and animals alike depend upon schemas to instantiate lessons learned. Once mentally implanted, they facilitate purposeful responses to the changing demands of the environment and order actions, perceptions, and conceptions. It was mentioned that in order to identify a face, I needed to compare the gestalt I was viewing with similar gestalts I have known. These remembered gestalts are examples of schemas. The notion of a schema was used by Kant and has been used in different loosely connected ways ever since. Ann Brown states, "The use of the term *schema* is widespread, vague, and not always overladen with meaning" (1979, 231). It is therefore incumbent on me to be as clear as possible about what I mean by the term and to indicate why I find schemas to be so important for understanding tacit processes (for further elaboration, see Gulick, 1992-93, 17-20).

Kant introduced the notion of a schema as an embodied rule that would allow one to generate an imagined representation (say, of one's home) to fit and illustrate a concept or word ("house"). "Images can be connected with the concept only by means of the schema to which they belong" (Kant 1933 [1787], A 142, B 181). The Kantian categories need to be schematized before they can be applied to empirical data. Thus schemas are utilized by our imagination to connect the abstractness of concepts with (real or imagined) instances in the empirical world to which they refer. The term "house" functions as a general gestalt under which many different real or imagined examples of houses can fit. While Kant restricts schemas to being rules for going from concepts to percepts, I see no reason that one couldn't do the reverse and go from empirical example to the general concept under which it fits. In fact, I find the notion of a schema to be highly useful for explaining a wide range of learned processes that require commerce between language and imagery, our muscles and their performance, or consciousness and empirical reality.

The influential work of Frederick Bartlett on imagination has proven most helpful as a starting point for elaborating on the notion of a schema. Bartlett is famous for arguing that remembering is more a matter of reconstruction than of retrieving stored information. He suggests that stories are remembered originally through a combination of structuring schemas and specific content, but that with the passing of time specific details are forgotten and the schemas take on a greater role in creating a memory. Different people hearing the same story would recall it according to the lessons about life they had internalized and under which they had categorized the story. Thus increasingly over time their recounting of the story is interpreted through their experiences and prejudices so that it deviates more and more from the original content.

For Bartlett, schemas are unconscious and linked to perception, imagination, and constructive thought (13) as well as to long-term memory. I would extend Bartlett's understanding of schemas to suggest that all lessons learned (as well as specifics retained) are encoded in schemas. On such a conception, schemas exist as the organizing components of all the systems of long-term memory and are relied upon insofar as what has been learned is applied to new (or even remembered) situations. Schacter identifies four different primary systems of long-term memory: episodic, semantic, perceptual representation (PRS), and procedural (1996 – see especially chapter six). Episodic memory enables us to recall specific details from the past; procedural memory "allows us to acquire various kinds of skills" (292); and semantic memory includes "the general

network of concepts, associations, and facts that constitutes our general knowledge of the world" (169). The schemas of long-term memory are thus implicated in sensed connections (via <u>PRS</u>) and skills as well as the perception, imagination, and thought that Bartlett indicated. If so, then those involved in all types of education must take these tacit schemas very seriously.

I see schemas as functioning like maps or codes or models in the mind that provide persons with expectations about what might occur, based on their previous experience. They also provide the frameworks within which new experiences must be assimilated. There is thus a connection between this view of schemas and Piaget's theory of assimilation and accommodation and Langer's account of abstraction in her three volume *Mind: An Essay on Human Feeling*, but it is with Polanyi's understanding of inarticulate learning that I resonate the most. In a section of *Personal Knowledge* entitled "Inarticulate Intelligence," he set forth three types of tacit knowing in animals, three ways of learning that humans also participate in.

The first type is called "trick-learning." This type is based on the motility of an animal and arises from the animal stumbling upon useful actions in the course of moving about. In some classic animal psychology experiments, it was observed that rats in a cage sniff and paw at their cage and in that way accidentally trip a food releasing lever. The site of feeding will become a site of more active investigation, and the rat will soon learn to trip the lever to secure food. "We may say the rat has learned to *contrive* an effect that is useful to it, or else it has discovered a useful *means-end* relationship" (1964, 72). It has internalized a schema for hunger satisfaction – a pattern in procedural memory.

The second type is called by Polanyi "sign-learning," but consistent with the general tendency to consider all units of meaning (including symbols) as signs, I will substitute the more specific term "signal" when Polanyi uses the term "sign." In signal-learning experiments, an animal "is taught to expect an event by recognizing a signal foretelling the event" (1964, 72). Animals learn when impelled by desire or fear, so environmental signals foretelling sexual pleasure (the odor of a bitch in heat) or danger (the smell of a predator) serve as good examples of meaningful patterns that are perceived and schematized. This type of learning exemplifies perceptual representation memory.

"Latent-learning" is the title of the third type of tacit knowing. This occurs when an animal constructs a mental map of a situation that allows for problem solving if normal avenues of desire satisfaction (or escapes from danger, etc.) are blocked. It has achieved that basic form of understanding encoded in semantic memory. Polanyi contrasts the heuristic act of learning in any of the three inarticulate forms just discussed with the routine, reversible performances made possible by learning, operations occurring within an existing framework of knowledge that functions as the basis for understanding. The existing framework is the schema of that learned behavior. If utilized on a regular enough basis, it can be called upon again and again to solve problems.

It can be seen that schemas are general patterns – gestalt-like in nature – that allow many specific manifestations to fit within their purview. Mark Johnson thinks these patterns "emerge as meaningful structures for us chiefly at the level of our bodily movements through space, our manipulation of objects, and our perceptual interactions" (1987, 29). Robert Howard is even more inclusive in his use of schemas. He says they "are used in perception, comprehension, learning, remembering and problem-solving" (1987, 176). Because we have seen that schemas instantiate so many types of long-term memory systems and are developed is so many types of inarticulate learning styles, the broad scope claimed by Howard for schemas makes sense.

I have emphasized the importance of schemas, yet they manifest themselves as, at best, shadowy presences in human experience. It may be suspected that they are merely handy explanatory tools, or useful black boxes patching over vast regions of cognitive ignorance. In fact, I think we have access to schemas in several ways that might boost our confidence in their actuality. Psychologists have trouble studying schemas experimentally because each person has a unique set of schemas representing what that person has learned. It is therefore difficult to devise empirically-based research programs into such diverse phenomena subject to so many variables. The study of persons with injuries to different sections of the brain has been of great importance in psychological research. But access to schemas can also be obtained by individuals – by study of their own feelings (of which more will be said later). It is also possible to observe schemas indirectly by observing how people organize their experience in terms of background information. Roy D'Andrade mentions that one support for schemas began developing during the late 1970's as researchers in artificial intelligence tried to create computer programs that could interpret and understand stories. To provide the computers with definitions of the vocabulary used and the grammatical rules employed was not enough to allow them to paraphrase and interpret the stories. It was also necessary to understand the background relationships and gestalts that were being presupposed and made the story coherent – the background cultural schemas (1995, 125). So while an individual may have no direct articulate access to his or her personal schemas, indirect access is provided by examining his or her behavioral patterns and the cultural patterns with which the individual identifies.

One way of looking at schemas is to see them as Kantian schematized categories no longer constrained by an ideal of pure reason but encompassing all that a person has learned and used in the structuring of that person's experience. This move represents an <u>empiricizing of philosophy, removing it from its rationalistic pretensions and placing it in the embodied world of history and experience</u>. Several works by Lakoff and Johnson represent one outworking of this experiential and empirical approach to philosophy, one emphasizing the findings of the second generation of cognitive science. They present evidence from many domains of research that strengthens confidence in three notions (the cognitive unconscious, the embodiment of mind, and metaphorical thought) that are closely related to our discussion of schemas and tacit knowing. They have argued eloquently for the significant unconscious role played by cognitive metaphors (which I see as having a schematized existence) in shaping thought and action. Experimental techniques that provide convergent evidence for the role played by cognitive metaphors include "*priming, problem solving, inferential reasoning, image analysis, classification, verbal protocol analysis*, and *discourse comprehension*" (1999, 83).

Image schemas are particularly significant cognitive metaphors. Image schemas are based on the common objects and embodied actions of human experience: containers, force, paths and goals, links, and so on (see Lakoff 1987, 271-278). They structure experience prior to and independently of any concepts. In the following passage, Lakoff and Johnson discuss how the experience of space (a Kantian primitive form of intuition) is shaped by image schemas: "We experience space as structured by image schemas (as having bounded regions, paths, centers and peripheries, objects with fronts and backs, regions above, below, and beside things). Yet we now know that space in itself has no such structure" (1999, 508).

I suspect that the abstract patterned relationships characteristic of schemas correspond to networks of neurons in the brain. After all, schemas represent idiosyncratic learned relationships just as brains develop unique networks based on and influencing experience. So in speaking of schemas, we are referring to the way individual learners understand the world in all its complexity. <u>They are the storehouse of personal truth.</u>

Schemas are not only abstract representations of environmental regularities (such as the gestalt of a remembered face in a crowd, the image that provided the impetus for this discussion of schemas), they are also "processing mechanisms; they are active in selecting evidence, in parsing the data provided by our environment, and in providing appropriate general or specific hypotheses. Most, if not all, of the activation processes occur automatically and without awareness on the part of the perceiver-comprehender" (Mandler 1984, 55-56, quoted in D'Andrade 1995, 122). That is, schemas are involved in the learning processes of tacit knowing (signal- and trick-learning), provide the content for tacit knowing (latent-learning), and influence and undergird explicit knowing.

Here is one illustration of how schemas function as <u>heuristic sources for the expression of personal authenticity</u>. When I first gain an intimation of a matter of personal significance (and am not simply describing or repeating some insight), I often find myself stumbling for adequate words. My language is not primary in such an instance; rather I am trying to match my words to my as yet vaguely understood intended meaning. That inarticulate meaning is at first largely schematized. <u>Each heuristic achievement is not simply some memorized linguistic piece of information being passed on, but is rather an emergent insight that arises through a personal process of struggle</u>. Polanyi gets at this point by distinguishing "two levels of intelligence: one achieving innovations, irreversibly, the other operating a fixed framework of knowledge, reversibly" (1964, 76). Innovations that make a difference are schematized and, when subsequently utilized, appear as subsidiaries within the structure of tacit knowing. Various sorts of schemas constitute the "from" of much tacit knowing.

Further exploration of how we move from vaguely felt schemas to public disclosure or practice is the subject of our next two examples.

2) The calculus problem is challenging; it is not solved using the procedures I have used before. So I give up for the time being, although the puzzlement lingers. Later I lie down in bed and remember the problem when suddenly the solution comes to me!

The solution is not controlled by me. It does not come about as the result of logical steps arriving at a conclusion, as is true in deductive reasoning. It comes as a gift, a matter of grace, although one contributes the conditions that prepare the way for the coming of the insight. Processes of tacit knowing therefore contribute importantly to the arising and recognition of the solution, even though the solution is stated in explicit terms.

So how does one prepare the way for the solution? Again, Polanyi is helpful for understanding the dynamics of tacit knowing culminating in discovery. He speaks of the process of discovery as a heuristic achievement, and suggests it requires both active and passive stages (1964, 125). We must have an intellectual desire to solve the problem, and then our "heuristic striving evokes its own consummation" (126). Here Polanyi mentions one of the critical processes involved in tacit knowing, <u>evocation</u>.

We have noted that the recognition of a face as a gestalt occurs when facial features are integrated to form a known physiognomy. <u>An integration is a nonlinear sort of synthesis</u>. But a whole can also be analyzed into distinct parts, and that is what evocation accomplishes. Synthesis and analysis, combining and distinguishing, whole and components – like integration and evocation, these terms get at the ongoing

heartbeat of tacit knowing. If a gestalt-like schema represents some lesson learned, one may say it arises through the bringing together of contributory insights, through an integration culminating in an "aha!" But suppose one is seeking for an as yet unknown gestalt that would solve a problem. How does one know what components one should integrate to find the solution?

One approach would be to evoke these components by concentrating our attention on something we don't clearly know. Polanyi quotes from Polya's book on solving mathematical problems. "'Look at the unknown!' – says Polya – 'Look at the end. Remember your aim. Do not lose sight of what is required. Keep in mind what you are looking for. *Look at the unknown. Look at the conclusion*'" (1964, 127, quoting Polya 1945, 112). There are certain likely contributors to a solution that one can be quite confident about, so what one seeks to evoke are the missing components needed to make a coherent whole that solves the problem. This is similar to seeking a word in a crossword puzzle for which one does not know the solution, although there are clues: one knows how many letters the sought word contains, the given definition or verbal clue, any letters provided by known words at right angles to the word one is seeking, etc. "The admonition to look at the unknown really means that we should *look at the known data, but not in themselves, rather as clues to the unknown; as pointers to it and parts of it*" (Polanyi 1964, 127-128). We indwell the subsidiaries. Strictly speaking, it is the missing components that are evoked, but once the correct components are found and put in place as indwelt subsidiaries, they support an integration that is known to be a solution through the feelings of satisfaction that come with the resolution of a problem. When things finally fit coherently together, we experience feelings of relief, harmony, and success. Such feelings are marks of achievement in both tacit and explicit knowing.

Another approach to finding a solution begins in a similar way to the approach Polya advocates, but it is less goal-centered and straining. It begins with a process of priming one's mind by attending to the problem and meditating on ideas or images that seem relevant to a solution. And then one turns to other activities. Sometimes, many hours afterwards, a solution suddenly occurs to one. More commonly, when one returns to the problem one has a clear mind that sees connections and is able to make progress toward a solution. What seems to be occurring in these cases is that the perceptual representation system, in combination with semantic memory, works <u>on an indwelt problem</u> at a tacit or implicit level, making significant connections.

Still another approach to problem solving is easiest to illustrate if the problem has to do with self knowledge, although it is also more widely useful. The idea behind this approach is that direct, although muted, access to schemas is achieved through attending to one's feelings. The author I find most helpfully promoting sensitivity to feelings is Eugene Gendlin, although it must be said at once that Gendlin does not speak of schemas. Rather he offers a technique he calls "focusing," and his primary interest is therapeutic rather than explanatory.

Gendlin begins by observing that patients with personal problems in which they are stuck make progress toward the solution of what is creating the pain or stress in their life when they work with a therapist who shows them ways of listening more attentively to their own internal state. Blaming self or others, ruminating on reasons why one feels as one does, and other sorts of essentially language-based exercises do nothing toward helping the patient come to terms with internal sources of dysfunction (a point Timothy Wilson corroborates – see especially 2002, 167-176). Gendlin offers steps towards making contact with a special kind of internal body awareness he calls a felt sense. This sense is a rather fuzzy global state rather than a prominent emotion. "It is how your body carries *the whole* problem" (1981, 69). It must be accepted and gently queried.

More specific feelings arise out of the global feeling. One knows that one has heard an authentic conscious voice arising from what is otherwise tacit when one experiences a physical release. The felt sense shifts. When one can bring to expression what has been tacitly bothering one, one feels a great sense of relief and freedom.

Gendlin believes his notion of focusing relates one to an internal state that exists prior to the split between body and mind (165). Schemas underlie bodily skills and conscious thought; they have the sort of pre-conscious mind-body relationship Gendlin attributes to what is revealed through a felt sense. Neurologist Antonio Damasio provides an updated, physiological account of the sort of phenomena Gendlin describes. He sees the viscera and skeletal muscles as well as the mind as contributing to background feelings that "help define our mental state and color our lives" (1999, 286). Damasio notes that the "relation between background feelings and drives and motivations is intimate" (286), and it is this sort of schematized tacit material that Gendlin's techniques are designed to illuminate. Such felt background material forms a significant part of the "from" dimension of tacit knowing in many ordinary arenas of action.

Polanyi argues that the creativity employed in scientific discovery – or our example of solving a problem in calculus – is not different in kind from the sort of creativity used in the arts. The artist as well as the problem solver may often follow Polya's advice to look at the unknown in the process of creation. The vague notion luring the painter on evokes responses from his hand and paintbrush which then may be judged as to how well they function as subsidiaries to the focal picture. The judging of subsidiaries must be conducted by the artist at a feeling level, for if they are focused on themselves, they lose their function in support of the artist's overall intention.

In judging a painting <u>or any work of art</u> as a whole, artist and critic alike ought to <u>judge its success</u> from an aesthetic standpoint <u>in which the tacit dimension is significant</u>. In mentioning an aesthetic perspective, I am alluding to Kant's influential notion (see 1951 [1790], 38) that aesthetic judgments arise as an assessment of the relationship between one's feeling (in this case, the collective "voice" of the subsidiaries) and thought (in this case, conception of the meaning and purpose of the whole work of art). One can contrast an artist's ultimate reliance on a feeling of satisfaction with a critic's need to balance feeling with explanation. Take a poem, for instance. On the one hand, the poet can assess how well the poem's subsidiary particulars contribute to a whole that expresses meanings satisfying to the poet. This subjective assessment is not available to a critic. On the other hand, a critic would judge the adequacy with which the felt import of the poem's components – words, imagery, structure – supports a coherent and meaningful overall message. In making an aesthetic judgment about a poem, a critic cannot successfully rely upon a subjective response alone, but is expected to appeal to accepted standards of adequacy to justify the critic's judgment. Much more could be said about aesthetics, but perhaps these few comments are sufficient to suggest the usefulness of the Polanyian structure of tacit knowing to the assessment of art.

3. I was given my first bicycle when I was a second-grader. I certainly felt vulnerable and precarious when I climbed onto the bike's seat and stretched my legs to the pedals – even though my father was holding the bike. He ran alongside me holding the bike upright as I attempted to gain mastery of this wonderful but scary machine. And somehow I did learn to ride the bike myself – an example of tacit knowing if ever there were one.

The riding of a bike requires the learning of subtle coordination between various muscle groups as facilitated by proprioception centered in our inner ear and monitoring information from receptors in our

muscles, joints, and tendons (Leder 1990, 39, 42). In the learning of any skill, including one as complicated as riding a bike, it is natural at first to want to direct one's focal attention to the various muscular components of the act so that one might consciously control them. In learning to play the piano (or type), the temptation is to look at where one is placing one's fingers. To be sure, it can be useful, if a performance is complex, to break it into chunks to be learned in isolation. But once mastery of the chunks is achieved and they are integrated into the artistic whole, such a shift of attention can be disastrous. For only if one's attention is focused on the overall purpose or form of the performance – the "to" dimension of consciousness – will the subsidiaries find their dynamic place in support of the whole. If one focuses on one of the subsidiary chunks, the other subsidiaries lose their place and the intended whole falls into disarray.

Skills are primitive forms of tacit knowing we share with all animals. They represent achievements of motility grafted upon yet more primitive acts shared by all living things. Most basically there is the evolutionarily-selected responsiveness provided by receptors conveying information essential to the survival of the animal, plant or other living thing. More complex than the deterministic pattern of stimulus and response is life-enhancing responsiveness to internal and environmental signals. While this responsiveness to signals attains quite a sophisticated form in human perception, in its origins it is a bare chemical response to a chemical stimulus – however, it is one of a set of coordinated responses serving a living center's purposes. That is, the responsiveness is not a meaningless chemical twitch in the vastness of cosmic determinism; it is a meaningful act because it involves selection that serves a purpose, even if that purpose is as basic as the brute ingesting of food in the service of survival.

Within cells, signals are received by receptors, bridges across cell membranes that link the cell's inside requirements with its outside environment. The inside is purposive in its processes – attuned to its own survival and self-replication. On the outside is potential resource or danger, and if the cell is to survive, it must be able to be related to the outside in order to find food and avoid threats. Particular molecules set off signal-transduction cascades that can be either responses to environmental conditions or proactive attempts to control that environment (see Goodenough 1998, 40-44). This sort of give and take between cell and environment or between cell and cell is a primitive kind of tacit processing far removed from conscious knowing.

With the evolutionary development of nerve cells, the speed and extent of communication is greatly enhanced. Harold Morowitz describes how a nerve cell "receives a chemical signal at a given locus on the surface and converts it into an electrical signal, the action potential. In the electrical form, the signal moves rapidly along the axon and triggers chemical release at contacts with receptor sites of other cells. The axon may be thousands of cell diameters in length, so that a cell-to-cell signal may be sent rapidly over long distances" (2002, 98). The brain is the site of connectivity between neurons. While the overall structure of each brain is the product of evolutionary history encoded in genes, individual brains are also dynamically shaped by the signals that are received and indwelt in learning. Those connections that are reinforced by experience allow their supporting neurons to thrive, while neurons receiving no reinforcement atrophy and die. "The logic of this process is essentially a Darwinian logic: overproduction of random variants followed by selective support of some and elimination of most. . . . Such a strategy, while appearing somewhat wasteful of material, is highly efficient in its use of information. It circumvents the difficulties of planning ahead and allows development to proceed with a minimum of design or regulatory mechanisms" (Deacon 1997, 195-196). Thus brains not only allow animals to use signals to adapt to specific environments, they are themselves shaped by signals in order that their hosts, the entire animal, might be more at home in the world.

Internal signals are the basis of an organism's self-regulation. Signals from the environment are the basis of an organism's survival. Signal responsiveness is the informational heartbeat making tacit knowing possible. Trick-learning is consolidated when essential signals are internalized, and such a process is closely related to the learning of such skills as bicycle riding. Signals are, obviously enough, the vehicles of insight incorporated into signal-learning and relied upon in latent-learning. There is yet more to be said about the significance of signals in a broader philosophical context.

4. Using a long stick as a probe, I can reach into a cavity to determine its shape insofar as its walls are within my enhanced reach. The pressure in the palm of my hand reveals the cavity's limits, and I can map in my mind the shape of the hole as I poke about. This internal map is an example of latent-learning.

Here's what may seem to be a strange rhetorical question: do I really know the shape of the cavity, or do I only know certain pressures on my hand (which is only as far as my body extends)? Those pressures function as subsidiaries that are relayed by the affected nerves to my brain. But my attention is focused at the tip of the probe, not on the feeling in my palm. Thus, as Polanyi notes, the probe functions as an indwelt extension of my body (1964, 59). The subsidiary feelings and the processes of mediation and transduction are tacitly involved in this experience. The stick, felt pressures in my palm, and brain processes all restrict what I can know about the cavity, confining it to a certain perspective, but they are not a source of skepticism about the quality of the perspectival information I can obtain in this way. I truly gain information about the shape of the cavity if the pressures on my hand function as subsidiaries.

Now let us turn to human perception. Do we have reasons to be skeptical of what we perceive visually? My eyes function as highly complex receptors capturing the reflected light from objects in my surroundings. My mind goes through complex activities and caps the spatio-temporal organization of the sensed signals with descriptive language. Suppose we are observing some pine trees. Does the mediating intrusion of words shield me from what I perceive, or are the words agents of revelation without which my visual experience would be much poorer? Consistent with the example of the probe, one might reasonably think words are indwelt as subsidiaries to my focal attention on the pine trees as objects. It would follow that my linguistically-enhanced focusing gives me a certain perspective on the trees as objects. If I conceive of the objects as pine trees, the connotations of "pine" and "tree" allow me to make mental connections between this perceptual experience and many other experiences with trees and what I associate with "pine tree." And in making such connections, we are experiencing the typical human form of consciousness, one expressed in linguistic symbols. Language intrudes itself into almost all human consciousness with unrelenting insistence. So fundamental to human consciousness are linguistic symbols that I have argued that Polanyi's from-to structure of experience ought to be expanded for typical human consciousness into a from-via-to structure, where the "via" represents the mediating influence of language (see Gulick 1992-93, 32-40). We humans think from schematized lessons and schematized information provided by receptors via words structured by grammar to meaningful understanding of subject matter or objects.

To be sure, the from-via-to structure houses a process that moves beyond the tacit dimension into the focal dimension of perception and thought. The brute sensation provided by receptors is scanned for what may be of interest, that is, what forms match the schemas attuned to danger, food sources, etc. What is of interest is lifted via schemas into intelligibility and then by conception (language) it may be brought into more narrow and sharply defined focus as perception. That is, from an encompassing but amorphous background – sensation of which we are momentarily aware, but which slips away if we do not focus upon it – the focal

clarity of perception may arise in a rapid two step process. This background sensation has duration in the half-life of working (not long-term) memory, and at any time during its fading existence it may be seized by schemas and then shaped by concepts that render it into explicit perception.

There is more to be said about this background sensation, but first it is important to distinguish between two ways that what is made focal may be used. These ways are made paradigmatically clear in Susanne Langer's distinction between signals and symbols. Because Langer has masterfully showed how important this distinction is, I will quote extensively from her, substituting "signal" for "sign" in her text as per her wish in the second edition of her work being quoted, *Philosophy in a New Key.*

> A signal indicates the existence – past, present, or future – of a thing, event, or condition.
> Wet streets are a signal that it has rained. A patter on the roof is a signal that it is raining.
> A fall of the barometer or a ring around the moon is a signal that it is going to rain. . . .
> The interpretation of signals . . . is the most elemental and most tangible sort of intellection;
> it is the kind of knowledge we share with the animals, that we acquire entirely by experience,
> that has obvious biological uses, and equally obvious criteria of truth and falsehood. . . .
> A term which is used symbolically and not signally does *not* evoke action appropriate to the
> presence of it object. . . .
> Symbols are not proxy for their objects, but are *vehicles for the conception of objects.* To
> conceive a thing or a situation is not the same thing as to 'react toward it' overtly, or to be
> aware of its presence. In talking *about* things we have conceptions of them, not the things
> themselves; and *it is the conceptions, not the things, that symbols directly 'mean.'* Behavior
> toward conceptions is what words normally evoke; this is the typical process of thinking. . . .
> The fundamental difference between signals and symbols is this difference of association
> and consequently of their *use* by the third party to the meaning function, the subject; signals
> *announce* their objects to him, whereas symbols *lead him to conceive* their objects. (57, 59-
> 61)

It is convenient to use the term "signal" in a broader and more substantial sense than the narrower sense Langer indicates in the passage just quoted (but which broader sense she refers to on page x). A signal in the broad sense is some environmental information of interest furnished by one or more of a living being's receptors. Signals in this broad sense are not so much functional responses as qualities involved in autonomic (stimulus-response) processes – sunlight as it impacts plants, for instance. In animals, an example of an autonomic response would be the regulation of the rate of breathing, which is dependent on signaled information about the oxygen and carbon dioxide levels in the blood (Deacon, 232). Instinctual responses to signals from the external environment are fairly rigidly coded by genes in individuals but may shift in a species' evolutionary development when mutant patterns of response are selected .

The narrower notion of signals Langer discusses in the passage above arises in evolutionary development concomitantly with the development of mental ability. Signals in the narrower sense are learned patterns announcing <u>in consciousness</u> the presence of environmental factors of interest to an animal. They are tokens involved in tacit knowing, as we saw in describing signal-learning. Michael Tye suggests that the learning associated with phenomenal consciousness is not restricted to vertebrates. Even simpler organisms display responses to environmental signals in the narrower sense. "Honey bees and fish behave intelligently and they are the subject of phenomenally conscious experiences, but they have no higher-order consciousness.

In the higher-order sense, they are unconscious automata – they have no *cognitive* awareness of their sensory states. They do not bring their own *experiences* under concepts" (2000, 181-182). They schematize what they learn, but their learning is restricted to signal (in both the narrower and broader sense) sensitivity; they are bereft of the ability to move beyond from-to consciousness to from-via-to consciousness.

Now let us return to the issue of the reliability of perception. We have distinguished several layers of responsiveness in our sensing. At the lowest level there is the constant information provided by our sense receptors but not attended to. Receptors sensitive to signals in the broader sense automatically provide such input when we are awake and even some information when we are asleep. While I am typing this paper I am subject to all sorts of background noises, pressures on my body, visual information I do not attend to, etc. This is mere background sensation that if not attended to within a few seconds fades away to be replaced by new sensation. When I stop to look out the window, my visual perception becomes more focused as I scan the scene for interesting information that may be responded to either as signals eliciting action – "I unthinkingly respond to seeing unexpected dark clouds overhead by quickly glancing to see if I left windows open" – or as symbols evoking reflection – "how pretty those crocuses are; I wonder if other flowers are blooming?" Both heightened levels of response to sensation involve me in reacting to my enveloping environment, but in one case I am alerted to a state of affairs – material reality – that may require action and in the other case I am enticed to reflect – become immersed in the reality of intangible meaning – about the presented scene. Error may enter into either response to received information.

At this point I believe some slight modification of Langer's functional understanding of signals and symbols is needed. When humans scan sensations for items of interest, if signals of interesting affairs are found, Langer states that actions are evoked. I would add to her analysis that when such signals arise, symbols as well as actions are typically evoked. As I sit in my living room, suddenly I smell smoke. Quite likely I am impelled to get up and investigate the source of the smoke, but all the while I am also thinking about the situation. Perhaps some yogis can easily exclude language from consciousness, but for most of us signals in the narrow sense are quickly clothed in symbols, in language-saturated thought.

We usually ignore almost all the sensation originating in signals (in the broad sense) and furnished by our internal and external receptors. But this sensation retains great philosophical significance. Our sensation offers us information about the real world that – while limited by the particularities of context, the scope of the electro-magnetic spectrum and longitudinal waves utilized, etc. – is veridical within its natural parameters. The reliability of sensation is a product of its evolutionary heritage. If our sensations were consistently illusory or inaccurate with respect to the environment in which we exist, we would not have survived as a species.

Now in order to gain access to and make fullest use of sensation, I must first schematize it (done tacitly) and then subject it to linguistically-shaped consciousness. Left as background sensation, it will just fade away. Thus its veridical nature is something of a tease. To be made the subject of public interest or usefulness, sensation must be thought about (the "via") with the attendant possibility of error. When I focally attend to the world and consequently dress sensation up in words, then I may judge wrongly or be misunderstood. Thus we might say that receptor-mediated sensation, virtually inaccessible to human focal consciousness, is veridical within narrow limits, but that fully clothed perception is fallible. Full-blown skepticism about human perception is not warranted, but neither is unquestioning confidence.

Hence all our perception and systematic thought is fallible even when it is based on empirical evidence. But by being expressed in language, the scope and power of what we sense can be expanded immensely. The achievements of science and technology demonstrate that careful, empirically-based constructive thought, while fallible, is capable of amazing insights. The knowledge gained by a simple probe barely suggests the wealth of information that can be gathered by sophisticated technological probes.

*   *   *

But our exploration of tacit knowing has now spilled beyond signal-based knowing into the articulate realm of explicit knowing. Two important points remain to be made. First, the intelligent response to signals in the narrow sense of the term constitutes the core process of tacit knowing. Autonomic and instinctual responses to signals in the broad sense are matters of great significance in terms of evolutionary advance from the beginnings of life, and they continue to underlie and support all functions in life today. Many sorts of unconscious or <u>tacit processes</u> have been selected for in evolutionary history. However, it is only appropriate to speak of <u>tacit knowing</u> after conscious awareness and the possibility of learning have arisen. At some point in evolutionary development the threshold of learning was passed and a primitive form of tacit knowing came into being. The great apes live within the boundaries of a sophisticated variety of tacit knowledge.

Second, human consciousness passed another significant threshold. Many skillful feats achieved by humans are pure manifestations of tacit knowing, but in everyday human consciousness, the tacit is obscured by symbol-soaked focal awareness. The necessary presence of language in human thought has misled many philosophers into ignoring the tacit roots of thought and action. A fully adequate philosophical worldview cannot be constructed with such an omission. Comprehensive exploration of all the symbol-generated worlds of culture and knowledge is of vast significance in the scheme of things, but the great temptation has been to conduct such exploration only at the level of explicit, articulate knowledge. In his old age, Polanyi collaborated with Harry Prosch in a brave but flawed attempt to explore the many worlds that the creative use of symbols opens up (see Polanyi and Prosch 1975). To his credit, Polanyi never ignored the tacit roots that contribute a personal dimension to all the cultural worlds. But the work that I think best captures so far the sort of vision Polanyi was aiming for was written by an individual who, so far as I know, has never made use of Polanyi's thought.

In *Considered Judgment*, Catherine Z. Elgin argues that philosophy should change its epistemic target from the pursuit of knowledge to an increase in understanding. By tradition, knowledge is regarded as a permanent achievement grounded in warranted judgments about facts. "Not being restricted to facts, understanding is more comprehensive than knowledge ever hoped to be. We understand rules and reasons, actions and passions, objectives and obstacles, techniques and tools, forms, functions, and fictions, as well as facts" (1996, 123). In encompassing actions, passions, techniques, and functions within the scope of her philosophical vision, Elgin endorses tacit processes in their diversity. A philosophy of understanding illuminates how the inarticulate and the articulate each contribute to the complexity of human existence. Not just the clear and distinct, not just language and logic, but also signals, schemas, subsidiaries and skills – all the dimensions of existence must be embraced if the possibility of comprehensive (although still skeletal) philosophical understanding is to be brought closer to realization.

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Phil Mullins has been the Editor of *TAD* since 1991 and with the emergence of WWW, he also became the person responsible for the Polanyi Society web pages. He has written a variety of Polanyi-related articles published in *TAD* and elsewhere.

Electronic Discussion List

The Polanyi Society supports an electronic discussion group that explores implications of the thought of Michael Polanyi. Anyone interested can join. To join yourself, go to the following address: http://groups.yahoo.com/group/polanyi_list/join. If you have difficulty, send an e-mail to Doug Masini (masini@etsu.edu) and someone will see that you are added to the list.

REVIEWS

R. Melvin Keiser and Rosemary Moore, eds. and commentators. *Knowing the Mystery of Life Within: Selected Writings of Isaac Penington in their Historical and Theological Context*. London: Quaker Books, 2005. Pp. 322 + xiv. ISBN 0 85245 378 7. £18.00 pb (available through bookshop @quaker.org.uk or in US at www.quakerbooks.org).

What of interest might a book about the life and writings of a seventeenth century Quaker have for students of the thought of Michael Polanyi? Quite a bit, it turns out. The Quaker in question is Isaac Penington (1616-1679), who focused his later writings on the life within. The dynamics of that life turns out to have much in common with the workings of the tacit dimension.

After a brief General Introduction, the book is divided into two parts. Part I features Penington's correspondence as commented upon by the English historian of the early Quaker movement, Rosemary Moore. It sets the historical context, during the Puritan revolution and the Restoration, for Penington's spiritual development, attending to family relationships as well as Quaker thought and practice. Penington interacted with George Fox and other leaders who helped shape the Society of Friends, and his daughter married William Penn. The contrast between Isaac's practical wife and his own rather otherworldly concentration is revealed in these letters. Part II is entitled "The Spirituality and Thought of Isaac Penington." In the Introduction to and twelve sections of this part, Mel Keiser provides a philosophically and theologically informed commentary on extracts from Penington's publications. The book includes helpful bibliographic material and a full general index.

The editors do an excellent job of interpreting a person whose mode of discourse is not that inviting on initial impression. The first edition of his collected works (1681) was entitled *The Works of the Long Mournful and Sorely-Distressed Isaac Penington*, which would not exactly attract the average reader today. That original title does accurately suggest that Penington probably inwardly suffered from depression and certainly outwardly was subjected to loss of property and freedom, as he was jailed on a number of occasions for his belief and practice. Moreover, the editors note that "Isaac Penington was,

beyond question, a wordy writer" (ix), one whose language is replete with metaphor and unconcerned with formal consistency. Ah, but Keiser shows how there is a spiritual consistency to his Quaker writings, which began in 1659.

Penington's faith is rooted in an internal uprising based on the givenness of sense and feeling – not on reason. Embodied experience provides the data for relating to the orienting but mysterious phenomenon (not an object) he calls God. Penington contrasts two ways of relating to God: an intellectual way that makes scripture and theology basic for the life of faith, and the inward way of waiting upon and discerning God's presence in a process of continuing revelation. In his pre-Quaker days, Penington was attracted to the former, Puritan-influenced way of living. Then he came to believe that he was deceived, that he was, in Keiser's words, "captive not only to his own thoughts but to the way thinking dominated his life, obstructing the springs of life" (196). Many would-be Christians, Penington claims, rely upon Christian theology and ritual but without a transformed heart rooted in discernment. They exhibit a veiled self that advocates dominating structures serving self-interest. Similarly, the historical church became trapped in apostasy: it "lost the mutuality of people drawn together under the leadership of the Spirit, and set up a hierarchical structure" (Keiser, 158).

What then is the true way of life Penington champions? His ruling metaphor, according to Keiser, is Life, which signifies attunement to the Spirit within. Such Life transforms us so we become committed "to live harmoniously with diversity in community; to work for justice and an end to oppression in the nation; and to participate in the wisdom of the Spirit that originates, orders, and fills nature" (Keiser, 275). Thus thinking and doing are both articulations of the embodied spirit. Ethical action flows out of discernment, not out of abstract principles applied with discriminating rationality. Sin is defined not as disobedience to the commandments of God, which have taken on rational form, but as "not living in the life, not being transformed, filled and led by the divine life" (Keiser, 245).

Keiser mentions Polanyi only once (215): "Locating true religion in feeling and a changed life confronts us with mystery, in which we must wait for clarity to emerge

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from this 'tacit dimension' (as Michael Polanyi has named it in *The Tacit Dimension*; see ch. 1)." But Polanyi's influence is more pervasive than a single reference would indicate. For instance, Keiser states, "For Friends the self is an experiential being, whose knowing, even scientific reasoning, is personal" (178). Similarly, "Discernment is discovery, not applying known principles" (184). Penington, then, emerges as a nascent postcritical thinker very much in opposition to the modernist spirit of his time as exemplified by Cartesian dualism. If one wants to explore how the tacit realm lying "underneath" subject and object might be interpreted in theological terms, Penington, as interpreted by Moore and Keiser, offers much that is suggestive and useful.

It might have seemed from my comments that Penington is an anti-rational mystery monger. That is not so. Rather his concern is to place reason in its proper epistemological (he would say "spiritual") context. Let the last words then be Penington's.

> Is not sense an excellent thing in man, if it be guided by reason? And is not reason a much more excellent thing if it be guided by an inward principle of life? But sense left to itself, without the guidance of reason, how brutish it is! And reason left to itself, without the guidance of a principle of life, falls below sense. (*Concerning the Sum or Substance of our Religion,* 455, quoted on 191-2)

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Richard Dawkins. *The God Delusion*. New York: Houghton Mifflin, 2006. Pp. 416. ISBN 13: 978-0-618-68000-9. $27.00 hardback.

In this review I will discuss what I take to be four of the most prominent problematic claims (which I'll call fallacies) made in this new book. While, in my opinion, Dawkins performs a needed service for atheism by calling attention to the oppressive and discriminatory milieu in which American atheists now live (esp. pp. 43-45), as one of atheism's current elites, his intellectual contribution offers little for atheists to be proud of.

The first fallacy is that of the need for "science" to completely displace "religion." He cannot see how the natural and the supernatural can ever co-exist. Dawkins regards all supernatural points of view as "viruses of the mind" (186 ff) which must be eradicated for the betterment of humanity.

Unbeknownst to Dawkins, Michael Polanyi wrote, "Theological accounts of God must, of course, appear meaningless and often blatantly self-contradictory if taken to claim validity within the universe of observable experience. Such a result is inevitable, wherever a language that is apposite to one subject matter is used with reference to another altogether different matter" (PK 282).

Dawkins was made aware of this basic point by other writers. Dawkins quotes Steven Jay Gould's sage advice: "'To say it for all my colleagues and for the umpteenth millionth time … science simply cannot (by its legitimate methods) adjudicate the issue of God's possible superintendence of nature. We neither affirm nor deny it; we simply can't comment on it as scientists'" (Dawkins, 55). "'These two magisteria do not overlap,'" writes Gould, just as "'the magisteria of art and the meaning of beauty'" (55) are distinct frameworks of meaning.

Of course, the key word here is "meaning." Dawkins's "theologian friends" told him that there are other sources of meaning besides the scientific, and that he was "brutally foisting a scientific epistemology upon an unwilling theology" (153). But Dawkins simply refuses to acknowledge that frameworks other than natural science can be legitimate sources of meaning for those who are committed to them. He doubts that theology can truly "be said to have a province" (56). He sees no "good reason to suppose that theology (as opposed to biblical history, literature, etc.) is a subject at all" (57).

Others besides Gould have cautioned him against his crusade of intolerance. For example, Cambridge astronomer Martin Rees gave the same advice in a book Dawkins quotes. Another astronomer at Oxford made the point to him directly. But, in plain denial, Dawkins writes, "I suspect that neither the Cambridge nor the Oxford astronomer really believed [what they had said to him, or written]" (57). Furthermore, "I simply do not believe that Gould could possibly have meant much of [the advice] he wrote" (57).

Secondly, writes Dawkins, the position of Gould and the others also "implies that science cannot even make *probability* judgments on the question." Dawkins, of course, thinks such judgments are possible (cf. 58). Dawkins notes that T.H. Huxley wrote that the existence of God is a matter of faith, and not of proof. "Contrary to Huxley," Dawkins writes, "I shall suggest that the existence of God is a scientific hypothesis like any other" (50). He then attempts to disprove the hypothesis by his own fallacious brand of statistical probability.

Dawkins does not consider that probability estimates generally require some recurring experience from which the estimates can be fashioned. One example is the predictions of rainfall made in the Farmer's Almanac. Instead, he asserts that since God either does or does not exist, both hypotheses have an "exactly equal probability of being right" (48). After a long discussion of his "statistical science," he concludes that God's existence is equal to the possibility of a hurricane sweeping through a junkyard and producing a perfect Boeing 747. Therefore, he announces triumphantly, "the god hypothesis … is untenable. God almost certainly does not exist" (158).

The logical confusion here is like judging the beauty of a painting by taking a bite to taste it. But for Dawkins, those who disagree with his "science" are among the "many people [who] have not had their consciousness raised" (143, 146).

The third fallacy is his topsy-turvy notion of "child abuse." Dawkins reveals that he was "the victim" of abuse while a child in one of England's "boarding schools." But then he adds, as a mere parenthetic aside, that it was "(an embarrassing but otherwise harmless experience)" (316). Instead, "what is really pernicious is the practice of teaching children that faith itself is a virtue" (308).

In reference to some sensational stories about Catholic priests in Ireland, he comments "horrible as sexual abuse no doubt was, the damage was arguably less than the long-term psychological damage inflicted by bringing up the child Catholic in the first place" (317). Dawkins expresses his outrage that society allows such abuse all in the name of "maintaining cultural diversity" (329).

What would Dawkins do about this "pernicious … practice of teaching children … faith"? Dawkins engages in a bad cop, good cop routine on this point. He quotes his "colleague the psychologist Nicholas Humphrey," who said that children "'have a human right not to have their minds crippled by [the] dogma and superstition [of their parents'] faith … and we as a society have a duty to protect them from it'" (326).

However, Dawkins does not advocate making this novel notion of "child abuse" a crime. Instead, he writes, "Please, please raise your consciousness about this, and raise the roof whenever you hear it happening" (339). Thus, Dawkins gives us a chance to redeem ourselves before the likes of Humphrey have their way.

For his fourth fallacy, Dawkins begins by declaring, "I shall end this book by arguing … that one can lead a happy and fulfilled life without supernatural religion" (353). He prescribes "a good dose of science" (361). For him, "our life is as meaningful, as full and wonderful as we choose to make it" (360). All the knowledge made available by natural science cannot only give "consolation," but just thinking of the new knowledge awaiting discovery can give "inspiration" (360, 374). Thus, he concludes, society has no need for "the god delusion."

Dawkins's zeal causes him "framework blindness." Not only is his intellectual capacity to make clear distinctions diminished by his ardor, but more pathetically, his capacity for human empathy is overridden. He cannot understand that other people may not find his brand of natural science a satisfying source of meaning.

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