Tradition & Discovery
The Polanyi Society Periodical

Michael Polanyi and Charles Sanders Peirce

Preface

This issue is being put together at the same time that Marty Moleski, S.J. and I are making the final preparations for the June 8-10 Loyola Conference. There is a paragraph about the conference in "News and Notes." In a word, this conference looks much like the 2001 and 2008 Loyola conferences—it promises two and a half days of stimulating interaction for the projected 45 people interested in Michael Polanyi's thought who are attending. Undoubtedly, some of the papers and presentations from the conference will eventually find their way into *TAD*. The conference program, which includes abstracts, will, until the fall, be available on the Polanyi Society web site (polanyisociety.org).

Also in "News and Notes" are several bibliographic items and following this section there is an interesting Letter to the Editor (p. 5) prompted by last issue's discussion of Mary Jo Nye's book, *Michael Polanyi and His Generation, Origins of the Social Construction of Science*, a book that is now being widely reviewed. The writer, Paul Craig Roberts, was perhaps Polanyi's last graduate student and has written about Polanyi's views on economics.

The fall 2012 annual meeting program (November 17, 2012 in Chicago) of the Polanyi Society is in this issue. There are papers by Andrew Grosso and David Stone. François Euvé, S.J., Professor of Theology, Center Sèvres (Paris), a physicist and theologian, who is visiting at Georgetown University, will provide another presentation. Finally, Dale Cannon's paper, with Jake Sherman as respondent, will apply ideas discussed in last year's treatment of Polanyi and the "Participatory Turn" to specific issues of religious practice (Sherman provided the paper in 2011 and Cannon responded). In sum, the fall annual meeting should be very interesting.

This issue is a special topical issue focused on intersections in the thought of Polanyi and Charles Sanders Peirce. Since I provide a short introduction to the issue, I won't say more here other than that I am pleased to have pulled together extraordinarily thoughtful essays by David Agler, Robert Innis and Vincent Colapietro, three first-rate scholars. Finally, there are more reviews than normal in this issue of *TAD*, five, and all treat books likely of interest to those to whom Polanyi's ideas are important.

Phil Mullins

NEWS AND NOTES

A Note on Dues Payment

The Oct. and Feb. but not the July issue of *TAD* include a membership flyer and an addressed envelope to be used to mail annual academic year dues and/or to make donations to the Polanyi Society. US postage regulations require that **EVERY** copy of *TAD* mailed in the postage class used must weigh exactly the same. Thus, even if you pay your annual dues in October, you will, nevertheless, receive these membership materials in your February copy of *TAD*. Dues remain $35 ($25 for libraries and $15 students), a bargain in the academic journal world. Except for those residing outside the US, members should pay dues with a check. **The Society can no longer easily and inexpensively process credit cards.** There is a Pay Pal payment option on the Polanyi Society web page. But since Pay Pal charges the Society for its services, if you can write a check in dollars, this is preferred. Note that dues and donations are handled by the Polanyi Society Treasurer, Charles Lowney, whose address is on page 2 of *TAD* as well as on payment envelopes normally included with the October and February issues. Phil Mullins should be contacted directly for *TAD* address changes (contact information is also on page 2 of *TAD*).

Travel Assistance Available For Younger Scholars Attending Polanyi Society Meetings

For students and other young scholars planning to attend the November 2012 Annual Meeting in Chicago, limited travel funding is available. Society members are urged to inform worthy candidates about this assistance. Those interested in this funding, as well as those who know of potential candidates, should contact Walter Mead (wbmead@ilstu.edu). Contributions to the travel fund are always welcome; those interested in contributing should e-mail Walter Mead. Related information about travel funds can also be found on the Polanyi Society web site (polanyisociety.org).

Polanyi Society Speakers Bureau

The Polanyi Society's Speakers Bureau helps organize talks to groups by Polanyi scholars. Marty Moleski, S. J. and Richard Gelwick gave talks in 2010 at universities; Richard Moodey and Phil Mullins gave talks in summer of 2011 at a meeting in Gummersbach, Germany. If you know anyone who might be interested in a speaker, send the name and e-mail address to Phil Mullins (mullins@missouriwestern.edu). There is now a link on the Polanyi Society web page with general information about the Speakers Bureau. You will find there a précis of the talks given by Moleski and Gelwick. Several Society members have indicated interest in speaking on different aspects of Polanyi's thought. It is likely that the Society can arrange for someone nearby to provide a talk on a topic of interest.

June 2012 Loyola Conference

The Polanyi Society-sponsored conference ("Connections/Disconnections: Polanyi and Contemporary Concerns and Domains of Inquiry") advertised in recent issues of *TAD* takes place June 8-1, 2011, at the Water Tower campus of Loyola University, Chicago. At the time this issue of *TAD* went to press in mid May, all indications are that this Loyola conference, like those in 2001 and 2008, will be an interesting event involving about 45 people from the United States as well as Israel, Portugal, Hungary, Poland, the Netherlands and Australia. There will be 24 individual papers presented and two panel discussions, each with 4 discussants. One panel discussion will focus on Polanyi and politics/political philosophy and the other on Polanyi and mysticism. In addition to the opening plenary talk on June 8 at 8 p.m. by Mary Jo Nye and the June 9 evening banquet plenary by Walter Gulick, there will be a plenary session showing of Polanyi's 1940 film *Unemployment and Money* (with a discussion following). If you are interested in additional information about the conference, the schedule as well as abstracts of papers and panel presentations will be

on the Polanyi Society web site (polanyisociety.org) during the summer.

Carlo Vinti (University of Perugia) published in February, 2012 an Italian collection of Polanyi essays titled *Fede e ragione* (faith and reason). In addition to the ten essays, Vinti provides a 51 page introduction, "Fede E Ragione Nella Riflessione Epistemologica Di Michael Polanyi (faith and reason in the epistemological reflection of Michael Polanyi). For more information, go to the publisher's web site (www.morcelliana.com).

Philip A. Rolnick and (molecular biologist) **Jayna L. Ditty** published "Keeping Faith: Evolution and Theology" in *Logos* 13:2 (Winter, 2010): 132-152.

Philip A. Rolnick published "Persons at Home in the Universe: Openness, Purpose, and Transcendence" in *In Search of Self: Interdisciplinary Perspectives on Personhood* (J. Wentzel van Huyssteen and Erik Wiebe, eds. [Grand Rapids: Eerdmans, 2011], 357-374).

Paul Lewis has had an article published in the UK-based *Journal of Moral Education*. "In Defense of Aristotle on Character: Toward a Synthesis of Recent Psychology, Neuroscience, and the Thought of Michael Polanyi" has already appeared in electronic form and will appear in the next print edition of the journal.

Eduardo Beira, a professor in the School of Engineering, University of Minho and EDAM Professor of MIT Portugal Program, is in the middle of a large project which translates into Portuguese (and publishes in small academic editions) a number of works by Michael Polanyi. The translations of *The Study of Man* and *The Tacit Dimension* were released early in 2012. Later in the year, there will be *The Contempt of Freedom* and *Full Employment and Free Trade* and then *Science and Technology* (a collection of Polanyi essays about science and technology) and *Discovery and Knowing* (a collection of essays about tacit knowing and the discovery process). Beira has also done a citation analysis of Polanyi's writings which was intended to evaluate how well a Polanyi bibliography can be reconstructed from Web of Science and Google Scholar. The analysis shows an interesting increase over time of the influence of Polanyi's writings. Beira recently digitized Polanyi's 1940 economics film titled *Unemployment and Money* and he kindly offered to bring this little-known film to the upcoming Loyola conference; a showing and discussion is scheduled for June 9, 2012.

Submissions for Publication

Articles, meeting notices and notes likely to be of interest to persons interested in the thought of Michael Polanyi are welcomed. Review suggestions and book reviews should be sent to Walter Gulick (see addresses listed below). Manuscripts, notices and notes should be sent to Phil Mullins. Manuscripts should be double-spaced type with notes at the end; writers are encouraged to employ simple citations within the text when possible. MLA or APA style is preferred. Because the journal serves English writers across the world, we do not require anybody's "standard English." Abbreviate frequently cited book titles, particularly books by Polanyi (e.g., *Personal Knowledge* becomes PK). Shorter articles (10-15 pages) are preferred, although longer manuscripts (20-24 pages) will be considered. Consistency and clear writing are expected. Manuscripts normally will be sent out for blind review. Authors are expected to provide an electronic copy as an e-mail attachment.

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Letter to the Editor

Dear Editor,

I am a bit too rusty on Polanyi's writing to participate in debates and have not followed the discussions over the past 30 years. However, having spent so much time with Polanyi, I do sense from time to time certain misinterpretations of Polanyi.

Many come at Polanyi from the standpoint of their own discipline. For example, something strikes me as not quite right about the Mary Jo Nye discussion in the 38: 2 issue of *TAD*. Michael did not set out to fashion a social epistemology of science. Michael set out to save Western civilization from dangerous inconsistencies in its intellectual foundations. To understand his motives, one must understand his essays, "Beyond Nihilism," "On the Modern Mind," and "Why Did We Destroy Europe." Michael believed that Western civilization was in danger of destroying itself because an incorrect understanding of science prevented legitimate expression of moral motives. Unable to speak in their own terms, moral motives became inverted and erupted in the French and the Bolshevik revolutions.

Michael's opposition to planned science and planned economy were responses to claims, such as those expressed to him by Bukharin in Moscow in 1935. Michael understood that the creative act of discovery could not be planned. He concluded that planning science would destroy it.

Unlike almost everyone else, Michael understood that communists meant by economic planning the replacement of "commodity production," that is a market economy, with an economy organized like a medieval manor in which output was organized for direct use and there was no "products exchange" or buying and selling in markets. He understood that this was an impossibility for a modern industrial economy in which there are many combinations of inputs and outputs and rapidly emerging technological discoveries. He concluded that such an effort at economic planning would completely disorganize the economy, which is exactly what happened when Lenin tried it during the "war communism" period.

What I mean to say is that Michael's motives were not the normal professional academic motives to create a new theory or a new explanation, but to save Western civilization from threats emanating from intellectual failures at the core of its thought. He set out to save us from these failures by providing a more truthful understanding of knowing and being. He did not leave science because he became more interested in theories of social science and philosophy. His mission was different from that of academics and scholars. His contributions were the product of his pursuit of his mission.

<div align="right">Paul Craig Roberts</div>

Editor's note: Roberts, one of Polanyi's last graduate students, had careers as a scholar, public policy maker, and journalist. He had several academic appointments, including Senior Research Fellow, Hoover Institution, Stanford University, and William E. Simon Chair in Political Economy, Center for Strategic and International Studies, Georgetown University. He was Associate Editor and columnist for the *Wall Street Journal* and *Business Week's* first outside columnist. He served in the Congressional staff and as Assistant Secretary of the Treasury in the Reagan administration. His essays in *TAD* 25:3 and 32:3 are in the online *TAD* archives.

2012 Polanyi Society Annual Meeting Program

The annual meeting for the Polanyi Society for 2012 is projected to be November 17, 2012 in Chicago in conjunction with the American Academy of Religion annual meeting. There will be a morning and evening session with two papers apiece. Additional information about locations will be posted on the Polanyi Society web site (polanyisociety.org) when it is available in the summer or early fall.. The papers will also be posted on the web site by early November.

Session I : Saturday morning, Nov. 17th, 9 – 11:30 a.m.

9:00
Andrew Grosso, Trinity Episcopal Church, Atchison, KS
"Michael Polanyi Meets Abba Moses: Embodiment, Indwelling, and Interdisciplinarity"

10:00-10:15 Break

10:15
David Stone, Northern Illinois University
"Realigning the Tacit and Indwelling"

11:15 - Business Meeting

Session II: Saturday evening, Nov. 17th, 7 – 9:30 p.m.

7:00 p.m.
François Euvé, S.J., Professor of Theology, Center Sèvres (Paris)
"Polanyi and the Renewed Dialogue between Religion and the Natural Sciences" [tentative]

8:00-8:15 Break

8:15 p.m.
Dale Cannon, Western Oregon University
"A Polanyian-Participatory Approach to Comparative Study of Religion: *The Questions of King Melinda* and Anselm's *Proslogion* as Two Traditions of Religious Practice"

Response: Jake Sherman, California Institute of Integral Studies

Michael Polanyi and Charles Sanders Peirce: An Introduction and an Historiographical Note

Phil Mullins

ABSTRACT Key Words: Michael Polanyi, Charles Sanders Peirce, Harry Prosch, David Agler, Vincent Colapietro, Robert Innis.

This brief essay introduces David Agler, Vincent Colapietro, and Robert Innis, who provide the major essays in this special issue of Tradition and Discovery *devoted to putting together Michael Polanyi and Charles Sanders Peirce. It also provides an historiographical comment, suggesting that the two references to Peirce in Polanyi's writing are quite puzzling and likely imply that Polanyi's collaborators, rather than Polanyi, took an interest in similarities between the thought of Peirce and Polanyi.*

I. An Introduction to the Topic and the Contributors

For some time, I have thought it would be interesting to have a thematic issue of *TAD* that focused on intersections in the thought of Michael Polanyi and Charles Sanders Peirce. Not many scholars, other than the three writers included in this issue, have brought together Peirce and Polanyi.[1] Polanyians have frequently suggested to me that Peirce is an odd and difficult thinker, a charge to which I have more than once responded that the same is levied against Polanyi. I am delighted that David Agler, Vincent Colapietro and Robert Innis, all figures extraordinarily well prepared for the topic, agreed to contribute to this issue's discussion.

Vincent Colapietro and Robert Innis are seasoned scholars, some of whose writing has earlier been included in *TAD*. There was a provocative review, published more than 15 years ago in *TAD* 22:3, written by the late Robin Hodgkin, treating Innis' book *Consciousness and the Play of Signs*. Hodgkin suggested that Innis interestingly linked Peirce, Polanyi, Cassirer, Langer and several other thinkers. In 2008, Jim Tiles wrote a review article focused around Innis' 2002 book *Pragmatism and the Forms of Sense: Language, Perception, Technics* and Innis responded to Tiles in *TAD* 34:2. More recently, Innis' essay "Between Articulation and Symbolization: Framing Polanyi and Langer" appeared in *TAD* 36:1. This was an essay that grew out of a paper given at a Polanyi Society gathering held in conjunction with the December 2008 American Philosophical Association's meeting in Philadelphia. In last summer's *TAD* 37:3, Walter Gulick reviewed Innis' 2009 book *Susanne Langer in Focus: The Symbolic Mind*. Innis' creative essay in this issue uses resources in Peirce and Polanyi to reflect upon the problem of the aesthetic intelligibility of the world in connection with an aesthetic approach to religious naturalism.

On November 17, 1990, Vincent Colapietro gave a paper at a Polanyi Society meeting in New Orleans titled "Lonergan and Polanyi: The Critical Appropriation of Intellectual Traditions." The essay was, in 1991, included in *TAD* 17:1 & 2, the first issue of *TAD* that I edited. The *TAD* 17:1 & 2 write-up about the essay says, "Colapietro examined the 'delicate' way that Polanyi and Lonergan treat 'the precarious authority of any particular tradition' as it plays its role in critical human inquiry," noting that the original paper evoked a lively discussion in New Orleans as the author "explored the problem of critical openness in 'the dialectic of fidelity and truth'" (4). Some years later in 2002, Colapietro also was a respondent for another Polanyi Society annual meeting paper by Richard W. Moodey titled "Moral Passion and Moral Judgment: Polanyi and Lonergan on Ethics." In 2008, Colapietro responded to the APA papers of Innis and Walter Gulick on Polanyi and Langer,

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and that response was later in the 2009 *TAD* 36: 1 which included the Innis and Gulick essays. Colapietro's insightful essay in this issue argues that a primary preoccupation of both Peirce and Polanyi was to undertake (in the words of Peirce) an inquiry into inquiry; their accounts emphasize heuristic practices and show how theoretical pursuits are intimately bound to other shared practices.

David Agler, the author of "Peirce and Polanyi on Critical Method," is a promising young scholar. The first draft of his paper was presented at the Atlanta Polanyi Society meeting in 2009. This was a meeting devoted to papers by graduate students; the society issued a call for papers by graduate students interested in Polanyi, and Agler's proposal was one of six chosen. He subsequently revised and expanded his paper in light of discussions in Atlanta and comments from several readers, including Innis and Colapietro. Although he is young, David Agler is a seasoned Peirce reader who has become very interested in Polanyi. Before beginning his doctoral work, he worked at the Peirce Project and he has published an article in *Transaction of the Peirce Society*. Since presenting in Atlanta, Agler has finished his Ph.D (Colapietro was one of his mentors), and he will be teaching logic next year at Pennsylvania State University. As the title of his article in this issue suggests, this is a very careful and thorough essay which documents the parallel criticisms made by Charles Peirce and Polanyi against the "method of doubt" or "critical method" celebrated in much modern philosophy.

II. An Historiographical Note

At the same time that I became curious about possible links between Peirce and Polanyi's philosophical ideas, I became curious about whether Michael Polanyi might ever have taken any serious interest in Peirce. Peirce was another scientist philosopher about two generations older than Polanyi and an American, but certainly a figure deeply influenced by scientific practice and committed to the prosperity of science. I have read the archival correspondence between Polanyi and Marjorie Grene who is perhaps the figure Polanyi most relied upon for suggestions about what to study more carefully in Western philosophy. There is ample, forthrightly expressed direction from Grene—and some blunt Grene criticisms, if Polanyi resisted her advice—about many interesting thinkers, including Descartes, Merleau-Ponty, and Langer, but Peirce is never mentioned. There was a collection of Peirce essays and a book on Peirce and pragmatism among Polanyi's library books.[2]   However, I have found only two places in Polanyi's writing where Peirce is cited, one in the important late essay "Sense-Giving and Sense-Reading" and the other in *Meaning*. As I briefly note below, looking closely at these references only made me more puzzled. I suspect that these references imply that not Polanyi but his collaborators had some interest and knowledge of Peirce.

A. The Reference in "Sense-Giving and Sense Reading"

At the beginning of the section titled "The Triad of Tacit Knowledge" which immediately follows the introduction in Polanyi's "Sense-Giving and Sense-Reading," there follows this paragraph:

> Tacit knowing joins together three co-efficients. This triad is akin to the triad of Peirce: 'A stands for B to C'. But I shall prefer to write instead: A person A may make the word B mean the object C. Or else: The person A can integrate the word B into bearing on C.

This at least is what is in the version of this essay published in *Philosophy: The Journal of the Royal Institute of Philosophy* (vol. XLII, no. 162 [October 1967]: 301). But "Sense-Giving and "Sense-Reading" is actually published several times in different places in this period. The essay appears in Grene's 1969 collection of

Polanyi essays titled *Knowing and Being* (hereafter KB) and it has the same paragraph quoted above; the copy included in KB is identified as the 1967 essay first published in *Philosophy*.

This Polanyi essay was also published at some point in 1967 in German as "Sinngebung und Sinndeu-tung" in *Das Problem Der Sprach,* Herausgeber Hans-Georg Gadamer (Munchen: Wilhelm Fink Verlag, 1967: 249-260). There is no indication that this German version is a translation of an English version. The German version does not cite Peirce at all in this paragraph but links the three coefficients of tacit knowing to Stoic logic:

> Unausdrückliche Erkenntnis verknüpft drei Koeffizienten: eine Trias. Diese Trias ist der Trias der stoischen Logik verwandt: Für die Person A bedeutet das Ding B ein Object C. Anders gesagt: Eine person A gibt dem Wort B die Bedeutung des objektes C, oder auch: Die person A vermag das Wort B in einen Zussammenhang mit Beziehung auf C zu integrieren (249).

The essay is also included in Thomas A. Langford and William H. Poteat's 1968 *Intellect and Hope: Essays in the Thought of Michael Polanyi* (Durham, NC: Duke University Press, 1968: 402-431) but this English version follows the German version:

> Tacit knowing joins together three coefficients. This triad is akin to the triad of Stoic logic: "A means B to C." But I shall prefer to write instead: A person A may make the word B mean the object C. Or else: The person A can integrate the word B into a bearing on C (402).

Despite following the German publication, the Acknowledgements of *Intellect and Hope* thank *Philosophy* for permission to reprint "Sense-Giving and Sense-Reading" which it identifies as first having "appeared in the pages of this journal"(v). The early Gelwick Polanyi bibliography is also included in *Intellect and Hope* ("A Bibliography of Michael Polanyi's Social and Philosophical Writings," 432-446) and Gelwick identifies "Sense-Giving and Sense-Reading" as an essay published in *Philosophy* (443). Finally, there is also a later German publication in *Seminar: Die Hermeneutic und die Wissenschaften,* Herausgegeben von Hans-Georg Gadamer und Gottfried Boehm (Frankfurt: Suhrkamp Taschenbuch Wissenschaft 238, 1978) and the sec-tion in question follows the earlier Geman text and the essay is identified as a reprint of the earlier German publication (486).

Scott and Moleski (265-266) report that "Sense-Giving and Sense-Reading" was originally a presen-tation prepared for the October, 1966 Eighth German Congress for Philosophy at Heidelberg which focused on language. Polanyi's presentation was an effort to extend his ideas about human use of language treated in *Personal Knowledge* and to address some questions raised by Chomsky.[3] Polanyi's presentation was later given again in English in the spring of 1967 at Cornell University and was used as a radio broadcast (presum-ably in German) by Hessian Radio in August, 1967.

In sum, in one version of "Sense-Giving and Sense-Reading," Polanyi's triad of tacit knowing is linked to Peirce's semiotic triad (object, sign, interpretant) but in another version which is published in the same year in German (not to mention a later American version) the link is with what is identified as the triad of Stoic logic. Perhaps Polanyi, given late stage advice by someone like Marjorie Grene (who frequently did edit Polanyi materials), changed the reference in the English publication, presumably because the comparison with Peirce seemed more appropriate. But this only raises the large question about how familiar whoever made the change was with Peirce and Peircean semiotics.

That is, one might question how "akin" Polanyi's triad of tacit knowing is to the semiotic triad of Peirce. I suspect that Peirceans might identify Polanyi's triad as describing what is sometimes called anthroposemiosis but is too narrow to describe the broader sort of semiosis (or sign process) that Peirce believed was at work in the cosmos.[4] Peirce certainly regarded human beings as knowers or interpreters—he even identified a person as a sign—but he saw human beings as in thought because they were immersed in the broader ongoing sign process of nature. Although I suspect Polanyi (or perhaps a well-intentioned editor) was not thoroughly familiar with Peirce's semiotics, if he/she had been, he/she might have been intrigued by Peirce's effort to situate human knowing in a larger, changing cosmic context with his semiotic framework; Polanyi's own broader philosophical vision—as seen, for example, in Part IV of PK or the end of TD—moves in just this direction.

B. The Reference to Peirce in *Meaning*

The second reference to Peirce comes in the eleventh chapter of *Meaning* whose title is "Order." At the beginning of "Order," Polanyi and Prosch point out that human beings today generally think the world is orderly but pointless. There is no meaning in the world except subjective meanings that human beings import into the world. Such subjective meaning-making is regarded as like building sand castles at the edge of the sea. Polanyi and Prosch conclude that "Intellectual assent to the reduction of the world to its atomic elements acting blindly in terms of equilibrations of forces, an assent that has gradually come to prevail since the birth of modern science, has made any sort of teleological view of the cosmos seem unscientific and woolgathering to us" (M 162). They note the abhorrence of teleology in even non-scientific existentialist thought and assert that particularly strong today is the rejection of any sort of tightly deterministic account of the universe in terms of structuring by an overriding cosmic purpose. But then Polanyi and Prosch turn briefly to some thinkers who they suggest successfully argue for a "looser view of teleology":

> However, since at least the time of Charles Saunders Peirce and William James a looser view of teleology has been offered to us—one that would make it possible for us to suppose that some sort of intelligible directional tendencies may be operative in the world without our having to suppose that they *determine* things (M 162).

There is a footnote following this sentence and it cites four specific sets of paragraphs in the eight volume *Collected Papers* edition of Peirce materials (the standard definitive texts at the time) as well as three different specific sections from James' *A Pluralistic Universe*![5] I have looked at the cited paragraphs in Peirce's *Collected Papers* and it is easy enough to see why these passages were construed as suggesting a "looser view of teleology." This is rich set of references sketching Peirce's ideas about habit, the evolution of the laws of nature, the nature and importance of chance (or spontaneity) and continuity in the universe, Peirce's analysis of Darwian, Lamarckian, and Spencerian views, (as well as what we today would call punctuated evolution), and Peirce's metaphysical categories and the way they can be used to fashion a cosmogonic philosophy. I conclude that the content of this footnote to Peirce implies a rather sophisticated understanding of Peirce's thought and the recognition that Peirce's effort to recover teleology is akin to some of the ideas developed in Polanyi's thought and particularly in *Meaning*. But I also think that this footnote does not reflect that Polanyi deeply appreciated Peirce but that Harry Prosch did and saw connections with ideas Polanyi was struggling to articulate.[6]

According to Prosch (see the Bibliographical Note, 288), Chapter 11, "Order," is based upon Polanyi's unpublished lecture "Expanding the Range" given at the University of Texas in 1971 (Box 41, Folder 9). Clearly, some of the material in this chapter does come from this Polanyi lecture (I have traced it, paragraph by paragraph) but the majority of what is in the chapter does not.[7] The first seven paragraphs (a bit over 3 pages) is material I regard as what Prosch classifies (see his comments in both Preface, ix-xi and Acknowledgements, xiii-xiv) as text that he is "largely responsible for" in order to provide for "the development of its [the book's] continuity through the writing of various summary, supplementary and bridging sections. . ." (Preface x). The reference to Peirce appears here in this bridging section of the chapter.

Endnotes

[1]Scott and Moleski (271, note 71) point out that an early review of PK in *Philosophy of Science* by Edward C. Moore, an early Peirce scholar, connected Polanyi and Peirce. As the final section of this introduction suggests, I think references in *Meaning* suggest that Harry Prosch very likely was familiar with Peirce's ideas and saw similarities between Polanyi and Peirce. Andy Sanders some years ago in his *Michael Polanyi's Post-Critical Epistemology: A Reconstruction of Some Aspects of Tacit Knowing* (Amsterdam: Rodopi, 1988) makes some suggestions about similarities between Polanyi and Peirce (see especially 16-18); I wrote a more recent article that makes some comparisons between these figures ("Peirce's Abduction and Polanyi's Tacit Knowing," *Journal of Speculative Philosophy*, Vol. 16, No. 3, 2002: 198-224).

[2]The title pages of Polanyi's library are in volumes in Boxes 57 and 58 in the Polanyi Papers in the Special Collections Research Center of the University of Chicago Library (cited hereafter only by box and folder). The two books possibly indicating Polanyi's interest in Peirce are *Charles S. Peirce. Essays in the Philosophy of Science*, edited and with an introduction by Vincent Thomas (New York: The Liberal Arts Press, 1957) and W. B. Gallie, *Peirce and Pragmatism* (Harmondsworth: Penguin Books, 1952).

[3]There is a three-page German document dated 1966 and titled "Sinngebung und Verständnis (Sinndeutung)" in Bill Scott's files about this meeting. This appears to be an early draft and diagram for the 1966 presentation. There is no mention of either Stoic logic or Peirce's semiotic triad in connection with Polanyi's triad in this document. I am indebted to Marty Moleski for digging out this material and discussing it with me (Mullins and Moleski e-mail exchanges of 4/17/12).

[4]See Cornelis de Waal's lucid and brief discussion of Peirce's "semeiotic" (Peirce's spelling) in *On Peirce* (Belmont, CA: Wadsworth, 2001): 67-84 as well as Vincent Colapietro's discussion of the scope of Peirce's account of the sign process in *Peirce's Approach to the Self: A Semiotic Perspective on Human Subjectivity* (Albany, NY: SUNY, 1989): 1-27.

[5]See footnote 1 in "Notes to Chapter Eleven" on M 223. The note, unfortunately, seems to be scrambled, although it uses the standard way of referencing the *Collected Papers* by volume and paragraph (e.g., 6.13-24). There is a specifically cited Peirce paragraph and then a longer passage cited following in parentheses and these double citations (there are four pairs) are separated by commas. In some cases, the first citation in a pair is simply a subsection of the longer passage cited in the parenthesis. But in two cases the first citation is not a subsection of the section cited in parenthesis. It is also almost certainly the case that there is a typographical error in the first citation—which cites the volume—of a specific passage because the reference is to the seventh rather than the sixth volume of the *Collected Papers*. Tracking what is going on in the footnote is very challenging. On the assumption that this might not be a typographical error, I have looked at the passages in the seventh volume (as well as those in the sixth, if the citation should have been to the sixth) and the sections in the seventh volume treat topics like Peirce's pendulum research and a psychological experiment. It does not make much sense to me to cite these numbered paragraphs in volume 7 and thus

I assume (correcting the typographical error) that all citations should be to the sixth volume and that they are paired to identify very specific paragraphs and larger relevant sections. With my corrections (i.e., assuming the citation should have been to volume 6), the relevance of the material in the footnote makes good sense insofar as it provides a set of references that shows Peircean thought incorporates teleology. It also is clear that whoever provided these citations was a serious enough Peirce student to have understood both Peirce's criticisms of a purely materialistic and mechanistic, non-teleological philosophy and Peirce's alternative constructive philosophical vision emphasizing chance, continuity and habit.

[6]See the discussion of Prosch's role in putting together *Meaning* in the essay Marty Moleski, S. J. and I put together just after Prosch's death ("Harry Prosch: A Memorial Re-Appraisal of the *Meaning* Controversy," *TAD* 32:2 (2005-06): 8-24. In a word, I think Michael Polanyi was far too fragile by the time the final manuscript of *Meaning* was shown to him to have had much to say about such interesting matters as the ambience of Chapter 11. As David Agler pointed out in a recent e-mail (Agler to Mullins 4/11/12), the *Meaning,* 162 mention of Peirce uses a deviant spelling of his middle name ("Saunders" rather than the more common "Sanders") and that Prosch uses this deviant spelling in a comment on Peirce in *Michael Polanyi: A Critical Exposition* (Albany SUNY, 1986)—see p. 29. Prosch makes but two comments about Peirce in this book (see p. 29 and p. 32) but these two also suggest that he knows something about Peirce's thought. Thanks also go to Agler for reviewing my analysis of the very odd and I think scrambled references to the *Collected Papers* on M 162 which appear in the Notes section on M 223.

[7]The material after about the fifth page of "Order" (i.e., the next approximately fourteen pages) does not appear to be drawn from Polanyi's 1971 lecture "Expanding the Range." It may be adapted from other sections of some of the several series of Polanyi's Meaning lectures or other places; some of the material in these pages bears close resemblance to essays from the late sixties such as "Life's Irreducible Structure" (first published in *Science* 160 [1968]: 1308-12) and "Life Transcending Physics and Chemistry" (first published in *Chemical and Engineering News*, August 21, 1967: 54-66).

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 (Douglas.Masini@armstrong.edu) and someone will see that you are added to the list.

WWW Polanyi Resources

The Polanyi Society web site (http://www.missouriwestern.edu/orgs/polanyi or polanyisociety.org/ or polanyisociety.com/) provides information about Polanyi Society membership and meetings. The site also contains the following: (1) digital archives containing all issues of *Tradition and Discovery* and its predecessor publications of the Polanyi Society going back to 1972; (2) indices listing *Tradition and Discovery* authors, reviews and reviewers; (3) the history of Polanyi Society publications; (4) information on *Appraisal* and *Polanyiana*, two sister journals with special interest in Michael Polanyi's thought; (5) a link to the "Guide to the Papers of Michael Polanyi," which provides an orientation to archival material housed in the Special Collections Research Center of the University of Chicago Library, Chicago, IL 60637; (6) photographs of Polanyi; (7) links to a number of Polanyi essays (available on the Polanyi Society web site and other sites), Polanyi's Duke Lectures (1964), as well as audio files for Polanyi's McEnerney Lectures (1962), and Polanyi's conversation with Carl Rogers (1966).

Polanyi and Peirce on the Critical Method

David W. Agler

ABSTRACT Key Words: Charles S. Peirce, Michael Polanyi, Descartes, method of doubt, skepticism.
This essay points to parallel criticisms made by Charles Peirce and Polanyi against the "critical method" or "method of doubt." In an early set of essays (1868–1869) and in later work, Peirce claimed that the Cartesian method of doubt is both philosophically bankrupt and useless because practitioners do not apply the method upon the criteria of doubting itself. Likewise, in his 1952 essay "The Stability of Beliefs" and in Personal Knowledge*, Polanyi charges practitioners of the critical method with a failure to apply the method rigorously enough. Polanyi contends that "critical" philosophers apply the method of doubt only to beliefs they find distasteful and rarely ever to the tacit beliefs that make doubt possible.*

1. Introduction[1]

There has been valuable work done toward teasing out the philosophical affinities between Michael Polanyi and Charles Peirce (e.g. Innis 1999; Mullins 2002; Sanders 1988:16-18, 1999:5). In connecting Polanyi's theory of tacit knowing with Peirce's theory of abduction, Mullins (2002:211) suggests that both Peirce and Polanyi held similar views about the philosophical value of doubt. The aim of this paper is to pursue this suggestion by clarifying two parallel criticisms of the critical method (or "the method of doubt') put forward by Peirce and Polanyi. The first criticism is that if the critical method is rigorously pursued as a starting point for philosophy, then its consequence is pure skepticism and not positive philosophy. Peirce and Polanyi both argue that if positive philosophy is to be the goal, then its primary method cannot be one that makes doubt its primary tool. The second criticism is that if the critical method is separated from previous cognition or acritical personal beliefs, then it has absolutely no use for inquiry. Traction in inquiry is often made possible by the development of one's personal beliefs and not by robust skepticism. Thus, in the stead of the critical method, Polanyi and Peirce suggest that the role doubt plays in inquiry ought to be significantly diminished (although not eliminated), and the upshot of limiting its role involves a commitment to post-critical philosophies that incorporate personal beliefs, fallibility, and a notion of truth and objectivity in scientific inquiry while avoiding naïve dogmatism and mere subjectivism.[2]

The structure of this essay is as follows. In section 2, I articulate the key components of the critical method by pointing to one particular instantiation in Descartes. I contend that the critical method is a philosophical method that starts philosophical inquiry by subjecting all beliefs to a severe test: any proposition for which there is a reason to doubt ought to (at least temporarily) be expelled from one's set of beliefs until it can be shown that that proposition is somehow indubitable. In section 3, I present Peirce's argument (and then Polanyi's) that the critical method has not been pursued rigorously, and if it were, the result would be pure skepticism. Finally, in section 4, I present Peirce's argument (and then Polanyi's) that the critical method is not particularly useful when divorced from acritically-held beliefs.

2. The Critical Method

In the Synopsis to the *Meditations*, Descartes says that the first Meditation provides reasons which "give us possible grounds for doubt about all things" but that these reasons are invoked for a particular purpose: the usefulness of such doubt is in "freeing us from all our preconceived opinions" so that any propositions we find to be true are ones that it will be "impossible for us to have any further doubts about" (CSM2:9). This gives the impression that the key feature of the critical method is to engage in a procedure of extreme and systematic doubting to determine which beliefs are not capable of being doubted and so can be regarded as certain. In fact, Descartes sometimes casts his whole project in this way. For example, in the *Discourse*, he writes that "my whole aim was to reach certainty—to cast aside the loose earth and sand so as to come upon rock or clay" (CSM1:125; AT6:29).[3] But, the explicit aim of the *Meditations* is more circumscribed. He writes that the importance of the arguments in the *Meditations* is not that they "prove what they establish" since no one seriously (practically) doubts the existence of the world, the self, or that human beings have bodies (CSM2:11).[4] Instead, Descartes writes,

> The point is that in considering these arguments [for the existence of material things], we come to realize that they are not as solid or as transparent as the arguments which lead us to knowledge of our own minds and of God, so that the latter are the most certain and evident of all possible objects of knowledge for the human intellect. Indeed, this is the one thing that I set myself to prove in these Meditations (CSM2:11).

Thus, Descartes' primary aim is to show that knowledge of our minds and of God are more certain and less open to doubt than knowledge of the existence of the material world. In order to achieve this end, Descartes sets out to subject his beliefs to a rigorous test and he does this with a multi-stage deployment of skeptical scenarios that provide reasons why certain beliefs that had been acritically-held are susceptible to doubt and therefore not certain. For those which there is some reason to doubt, Descartes contends we should suspend our judgment rather than believe them willy-nilly. Descartes writes, "Reason now leads me to think that I should hold back my assent from opinions which are not completely certain and indubitable just as carefully as I do from those which are patently false" (CSM2:12; AT VII:17). After this negative phase has passed, only those beliefs for which there is no reason to doubt (i.e., those that we cannot suspend our judgment concerning) should we not withhold our judgment concerning (i.e., those that indubitable).

One key feature of the critical method is that we ought to engage in a systematic investigation of our beliefs, withhold judgment concerning any view for which we either lack evidence or for which there is room to doubt, and build our positive philosophy upon those beliefs for which there is adequate evidence or which are indubitable. Such a view is, no doubt, not unique to Descartes. William Clifford, for example, writes "It is wrong, always, everywhere, and for anyone to believe anything upon insufficient evidence" (Clifford 1877:295). Bertrand Russell agreeing with Descartes' use of doubt writes, "Descartes (1596–1650), the founder of modern philosophy, invented a method which may still be used with profit—the method of systematic doubt" (Russell 1912:18). Kant, in the first *Critique*, insists upon subjecting pure reason to the utmost criticism when he writes, "[r]eason must in all its undertakings subject itself to criticism; should it limit freedom of criticism by any prohibitions, it must harm itself, drawing upon itself a damaging suspicion. Nothing is so important through its usefulness, nothing so sacred, that it may be exempted from this searching examination, which knows no respect for persons" (A738/B766). Finally, even certain rigid forms of contemporary evidentialism demand that we ought not to believe a proposition if we lack evidence for that position. Richard Feldman

(2000:679), for example, writes "if a person is going to adopt any attitude toward a proposition, then that person ought to believe it if his current evidence supports it, disbelieve it if his current evidence is against it, and suspend judgment about it if his evidence is neutral (or close to neutral)." [5] Each privileges the method of doubt for doing positive philosophy, and the result of each project is a normative position on doxastic attitudes. Namely, we ought not to believe any proposition if there is a possible reason to doubt it or if we lack adequate evidence for it being true.

3. The Method of Doubt as an Impossible Starting Point for Philosophy

I think that the critical method is faced with a serious dilemma: either the critical method *is* used rigorously, in which case it leads to absolute skepticism, or the critical method *is not* used rigorously, in which case it leads to admitting uncertain or unjustified beliefs. The consequence of the second horn of this dilemma is certainly undesirable, for the stated purpose of the critical method is to filter out those beliefs that are potentially dubitable so as to make our beliefs objective.[6] Practitioners of the critical method are thus more likely to reject the first horn of the dilemma by arguing that we can reap positive philosophical results by subjecting our beliefs to a severe skeptical test. In this section, however, I argue that Peirce and Polanyi both argued that no such positive benefits can be salvaged when the critical method is used rigorously.

3.1 Peirce

For Peirce, the positive results of Descartes' use of the critical method come about for two reasons. First, Descartes does not employ his critical method (method of doubt) in a rigorous fashion and so he leaves unscathed a variety of beliefs about the contents and powers of his own mind. Despite claiming to subject all of his beliefs to scrutiny, Descartes has no reservations about saying that he is a thing that "doubts, understands, affirms, denies, is willing, is unwilling, and also imagines and has sensory perceptions" (CSM2:19). Second, Descartes makes use of a faculty of intellectual intuition (and introspection) which allows him to intuit a variety of additional propositions about God, the possibility of error, the material world.

In 1868 and 1869, Peirce vehemently argued against the view that we have a special faculty of intuition and introspection. Instead, Peirce argued that there is no necessary reason to suppose the existence of a faculty of intuition or introspection for any fact that the former faculties seemed necessary to explain could be explained by a faculty of inference. Peirce's argument for this position took a case-by-case examination of a number of facts concerning our knowledge of space, our ability to distinguish being awake from being in a dream, our knowledge of self, the appearance of blind spots in vision, etc. In each case, Peirce argued that each cognition could be explained by the mode of inference (mediate cognition) rather than intuition (direct cognition).

Along with criticisms of intellectual intuition, introspection, and any type of direct cognition of objects, Peirce also argued that Descartes' method of doubt cannot be the starting point for any successful positive philosophy. Peirce writes,

> We cannot *begin* with complete doubt. We must begin with all the prejudices which we actually have when we enter upon the study of philosophy. These prejudices are not to be dispelled by a maxim for they are things which it does not occur to us *can* be questioned" (W2:212 [1868], emphasis added).

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This remark by Peirce has generated a lot of criticism by Peirce scholars toward Peirce. Some Peirce scholars object that Peirce fails to interpret Descartes correctly, for Peirce, in claiming that we cannot simply dispel our beliefs with a variety of skeptical scenarios conflates *what someone does doubt* with *what someone can doubt*. What Peirce seems to be saying is that the method of doubt is impossible because we cannot muster the *psychological power* needed to actually doubt certain propositions or that, at the end of the day, we just *won't* doubt everything the critical method tells us we can doubt. If this is the case, his critics argue, then Peirce's objection fails for two different reasons. Either Peirce is *misinformed* for he does not recognize that Descartes thinks that such skeptical worries are *theoretical* (metaphysical) in nature rather than *practical* (moral) in nature *or* Peirce's objection is merely a *linguistic dispute* for Peirce's notion of what counts as a genuine doubt (one that involves a psychological component) is different from Descartes' notion (one which does not seem to have serious psychological aspects). For example, Meyers (1967:19), Johanson (1972), and Haack (1983:244-249) argue that Peirce misunderstands the necessary condition for Cartesian skepticism. Meyers (1967:19) claims that Peirce's objection is misplaced because a belief is dubitable only if it is possible for S to doubt *p*, not only if S does (in fact) doubt *p*. In other words, the necessary condition for Cartesian skepticism is that a belief is theoretically (logically) rather than descriptively (psychologically) dubitable. Johanson (1972:218-219) argues that Descartes is free to draw a distinction between "philosophical doubts" and "heartfelt doubts," confine the scope of the former to philosophy and not to life, and then put the onus on Peirce to show that philosophical (theoretical) doubts are not sufficient in the practice of philosophy.[7] In a similar fashion, Susan Haack (1983:246) objects by claiming that Descartes' use of methodological doubt is tied to a rational policy that aims at avoiding believing anything that is false, and so "does *not* require deliberate doubt." In each case, criticisms are directed at Peirce's claim that Cartesian skepticism is impossible because Descartes' method of doubt does not require its practitioner to muster genuine, real, practical doubt.[8]

What is additionally troubling is that given this diagnosis, it appears that Peirce's objection is not very original since Gassendi, Hobbes, and Mersenne all took Descartes to task in the *Objections* to the *Meditations* for not truly doubting what he claims to doubt.[9] And, Descartes seems to have given them the same answer that Meyers, Johanson, and Haack accuse Peirce of overlooking. For example, at the beginning of the first *Meditation*, Descartes' explicit proposal is to suspend judgment on any opinion which there is "at least some reason for doubt," not on the condition that the belief can be genuinely doubted (AT VII, 18), and in a 1643 letter to Buitendijck, Descartes claimed that the scope of *intellectual doubt* is greater than the scope of *willful doubt*.[10]

Arguing against the above strain of critical literature, Lesley Friedman (1999:729) contends that while Peirce and Descartes both agree that inquiry is a struggle to eradicate doubt, they disagree on the *nature of doubt* and what qualifies as a successful reason for doubt. For Peirce, doubting is something that is not within our will but something beyond our control, something that interferes with our action, something we feel, and something whose conclusion we care about (see R828 [1910]:1-2; R288:6; CP7.109).[11] Given this definition of doubt, Friedman (1997:733-738) argues that Peirce's objection has real merit since (i) real doubt must be an emotional experience that stimulates the mind to inquiry and not pretending to doubt, (ii) real doubt is not an act of will and so we have no choice about what we doubt, (iii) real doubt is tied to some internal or external experience that leads us to doubt and the mere possibility of error is not sufficient to cause doubt, and (iv) real doubt produces real hesitancy but Descartes' notion of doubt cuts the connection between belief-doubting and action. Unfortunately, however, this makes Peirce's complaint look more like a linguistic dispute since Descartes is free to argue that he does not use the notion of doubt in this highly naturalized way.

Let's take stock. On the one hand, we have the view that Peirce's claim that the method of doubt is impossible *is not* legitimate because Descartes does not make it a requirement that individuals *do* doubt what they claim to doubt. All that is necessary is that there is a reason for an individual to doubt a given proposition. In short, on this line of criticism, Peirce's criticisms miss their target. On the other hand, we have the view that Peirce's claim that the method of doubt is impossible *is* legitimate because (i) part of the critical method involves imagining whether it is possible to doubt a proposition (even though it is not necessary to doubt it in everyday life) and (ii) Peirce argues that in this context, no one really doubts (using Peirce's conception of doubt). In short, Peirce's criticisms hit their target but involve his particular understanding of doubt and belief, and so his disagreement with Descartes seems to be nothing more than a linguistic dispute.

In the remaining part of this section, I argue that Peirce's claim concerning the impossibility of the method of doubt is not a statement about the possibility or impossibility of the method in its own right. Peirce's claim is rather one about the viability of using the method as a starting point for positive philosophy. I claim that, for Peirce, any *rigorous* use of the method would lead to *absolute skepticism* and so we ought to begin philosophy with an alternative method that makes use of an alternative definition of doubt. On this approach, Peirce's complaint is not misinformed and not built on an alternative definition of "doubt." Instead, I argue that Peirce's primary objection pertains to Descartes' failure to use the method rigorously. Namely, Peirce argued that Descartes never applied the critical method to the *activity of doubting itself*, i.e., he never applied his method to ask "what are the conditions under which an individual truly doubts as opposed to simply claims to doubt?" Descartes, Peirce claims, just takes it for granted that if we believe we doubt *p* and then muster some reason why *p* might be false (e.g., we might be dreaming or an evil demon might be tricking us), then we have succeeded in showing that *p* is dubitable. Peirce argues that this is not sufficient for showing that one does, in fact, doubt.

Peirce voiced this objection in at least two different ways. The first way I will call the *Linguistic Criticism*. The general form of the criticism is that Descartes uses linguistic information as evidence for when an individual actually doubts. For instance, Peirce complains that just because we can take our belief that *p* and put it in the interrogative mood (*is p the case*?) or write "I doubt p" does not mean that we actually doubt *p*. This type of doubting Peirce calls "paper doubt" for there is no necessary link between the capacity to express *p* in the interrogative mood or being able to utter a set of words that literally expresses *I doubt p* to actually doubting *p*. It may well be the case that an utterance of "I doubt p" is false (see EP2:336 [1905]). So, Peirce's linguistic criticism is that Descartes' use of the critical method is not rigorous enough for we can doubt the linguistic basis that Descartes uses to claim that there is a reason to doubt some belief.

The second kind of criticism, I call the *Subjective Criticism*. The general form of the criticism is that Descartes uses subjective information as sufficient for determining whether one in fact doubts. For Peirce, this violates one of the conditions put on a rigorous use of the critical method because it makes the sole criterion for whether an individual doubts the individual's belief that she doubts. Peirce raised this objection in a variety of different forms. One way in which Peirce vocalized this objection is through a more general critique of the *a priori* method. Peirce argued that the *a priori* method (the method that settles belief on a particular issue by appealing to what seems *agreeable to reason*) tends to suffer from too greatly relying on merely subjective considerations.

Peirce writes that for Descartes,

> Self-consciousness was to furnish us with our fundamental truths, and to decide what was agreeable to reason. But since, evidently, not all ideas are true, he [Descartes] was led to note, as the first condition of infallibility, that they must be clear. The distinction between an idea *seeming* clear and really being so, never occurred to him (W3:259 [1878]).

Peirce criticizes the critical method by arguing that the subjective basis on which the critical method rests lends itself to problems since an idea may *seem* clear or distinct to an individual (there may seem to be a reason to doubt *p*) but it might not actually be so (there might not actually be a reason to doubt *p*).[12] This criticism is repeated in his 1906 review of Elizabeth Haldane's *Descartes: His Life and Times* (1905) where Peirce characterized his dissatisfaction with Descartes' use of the method by arguing that at no time in the *Meditations* does Descartes give any *objective evidence* that his skeptical scenarios are genuinely capable of producing doubt in anyone's (even Descartes') mind. Peirce writes,

> As long as this universal and absolute doubt lasted (for he apparently had no doubt at all that in a month or two, at the most, it would be over), he decided that it would certainly be best for him to continue in all respects to conduct himself as if he retained his old belief; as if it were possible for a man for days to keep up, without fail, a line of conduct about all things without the slightest belief in the advantage of such conduct—always, for example, using the tongs to stir his fire, instead of his fingers, though he had utterly dismissed all belief that fire would burn his fingers (1906).

In the above passage, Peirce criticizes Descartes' use of the critical method not simply because he does not think Descartes actually doubts the propositions he says he doubt, but also because his use of the critical method is *radically incomplete*. Proponents of the critical method do not apply the method to the conditions under which an individual actually doubts but rather takes whether an individual does doubt at face value. Peirce's linguistic and subjective criticisms of Descartes' use of the critical method support Peirce's claim that Descartes simply failed to use the method in a rigorous way. According to Peirce, it is not that we cannot doubt all of our beliefs nor is it the case that Descartes' notion of doubt is unacceptable; rather, Peirce's argument is that Descartes' choice of what he does doubt is curiously selective and unrigorously deployed.

Finally, since the criticism of Peirce as engaging in a type of linguistic dispute has been so prevalent, it is helpful to diagnose why this interpretation has caught hold. I think proponents of this view fail to recognize that Peirce's alternative definition of doubt is formed because of an effort to avoid the problems he saw with Descartes' definition that seemed to depend upon subjective and linguistic criteria. Here is one way of looking at the genesis of this notion. Consider that between 1868 and 1869, Peirce published three essays in the *Journal of Speculative Philosophy* (JSP). In the first essay, "Questions Concerning Certain Faculties Claimed for Man," one of the principal claims was that there is no evidence for the existence of a faculty of intuition (direct cognition) over and above hypothetical inference (mediate cognition). In the second essay, "Some Consequences of Four Incapacities," Peirce notes that a consequence of not having intuition as a faculty is that we cannot begin with complete doubt, suggesting that Peirce thinks the critical method is impossible. However, in the third and final essay of the series, "Grounds of Validity of the Laws of Logic," Peirce qualifies this statement by claiming "[i]t has often been argued that absolute scepticism is self-contradictory; but this is a mistake: and even if it were not so, it would be no argument against the absolute sceptic, inasmuch as he

does not admit that no contradictory propositions are true" (W2:242 [1869]).[13] What this passage signifies is that given the absence of a faculty of intuition, we are left with two options concerning the use of doubt in philosophy. The *first* is that it can be pursued as a starting point for philosophy, in which case, Peirce argues, it leads to the negative result of absolute skepticism. Since a rigorous application of the method of doubt demands that we apply the method not only to our beliefs about the external world, sensory perception, mathematics but *also* to the *criteria* that determines when an individual actually doubts, Peirce argues that the skeptical method is parasitic upon itself. The method not only eats at the familiar topics of Descartes' *Meditations*, but also those that he uses methodologically or as criteria, e.g., doubt, belief, thinking, clear, distinct, etc. The *second* is that it can be pursued in some restricted form but more severe conditions need to be put on what constitutes a genuine doubt about a proposition. Real doubt, for Peirce, cannot be one that makes language or a subjective feeling the sole arbiter of when an individual does doubt. Instead, Peirce adopts a naturalized notion of doubt, one that stimulates the mind to inquiry, is emotionally distressing, is tied to action and not merely a matter of the will, and one that Peirce suggests we ought to devise experiments to help determine whether one actually doubts.

Thus, Peirce's principal complaint with the critical method is *not with its theoretical viability* nor is he arguing that it is impossible to start one's philosophical project by using the Cartesian notion of doubt. His turn to a more naturalized notion of doubt is motivated by the fact that a rigorous use of the method of doubt leads to an absolute skepticism where we don't even know what we doubt. So, when Peirce writes that "prejudices are not to be dispelled by a maxim for they are things which it does not occur to us *can* be questioned" what he is saying, given the context of his other arguments, is that "prejudices *cannot* be questioned *at the starting point of any positive inquiry*."[14]

Despite the theoretical viability of absolute skepticism, Peirce did raise a practical consideration against a fully rigorous use of the critical method. That is, Peirce claimed that there are no intelligent beings who are absolute skeptics (W2:242 [1869]). Along this line of argument, Peirce seemed to indicate that given a definition of belief in terms of a willingness to act, a being would have to be caught in a state of perpetual hesitation, entirely uncertain about how to act. However, this line of argument is independent from his purely theoretical critique of the method of doubt, which only demands that it be comprehensive.

3.2 Polanyi

One of the major aims of *Personal Knowledge* is to characterize a post-critical philosophy. Part of what it means for a philosophy to be "post-critical" is that it makes personal belief an integral part of the epistemological program (see Polanyi 1952:230; Cannon 2008). While unpacking what this means is a complex affair, involving critiques of objectivism, reductionism, the centralized control of science and economy, metaphysical dualisms,[15] part of Polanyi's turn to post-critical philosophy involves a rejection of the unrestricted use of the method of doubt by (i) arguing that it has never been rigorously pursued and (ii) arguing that if it were to be rigorously pursued, the consequence would be absolute skepticism.

Polanyi writes that during the critical period, it is not the case that "this method has been always, or indeed ever, rigorously practised—which I believe to be impossible—but merely that its practice has been avowed and emphatic" (PK:270). Instead, Polanyi argued that the method's proponents were typically guilty of an unwillingness to pursue the method to its logical conclusion or guilty of an unwitting commitment to

dogmatism in their functional (instrumental) employment of concepts. He claimed that the wholesale use of the method of doubt is a corollary of objectivism, and its employment assumes that "uprooting of all voluntary components of belief will leave behind unassailed a residue of knowledge that is completely determined by objective evidence" (PK:269).[16] Polanyi voiced a number of reasons why a full-scale use of the method of doubt was impossible for a positive philosophy, and his criticisms extend Peirce's line of thought in a more explicit fashion.

There are at least two lines of criticism. First, proponents of the method tend to restrict the application of critical assessment to *explicit* or *focal* beliefs and not to those that play a *tacit*, *subsidiary*, *non-focal*, or *functional* role. In the use of the critical method, the latter concepts are necessary not only for a skeptical assessment of a given belief but also in the very formulation and bringing into focus of such beliefs.[17] According to Polanyi, in order for a proponent of the method to claim that a given proposition *p* is explicitly dubitable, tacit presuppositions are made concerning the skeptic's instrumental use of concepts needed for attending to *p*, e.g., the use of language, the capacity for sustained cognitive attention, and memory, etc. For example, in Polanyi's 1967 "Sense-Giving and Sense-Reading," Polanyi writes

> [w]e must realize that to use language is a performance of the same kind as our integra-
> tion of visual clues for perceiving an object, or as the viewing of a stereo picture, or our
> integration of muscular contractions in walking or driving a motor car, or as the conducting
> of a game of chess—all of which are performed by relying on our subsidiary awareness of
> some things for the purpose of attending focally to a matter on which they bear (KB: 193).

One aspect of Polanyi's critique then is that a rigorous, complete, and in-depth use of the critical method requires an application to the non-focal, subsidiary, or instrumental features that make explicit belief and doubt possible. That is, just as an account of knowing must acknowledge all the factors a person relies upon in order to bring the topic of interest into focus, so must various accounts of doubting. This criticism is closely related to Peirce's own, but is more general in nature, for while Peirce points out that Descartes uses the notion of doubt without subjecting it to critical scrutiny, Polanyi notes that a rigorous use of the method of doubt requires that we subject *even* the concepts we tacitly employ to scrutiny.

A second criticism by Polanyi involves his claim that the use of the critical method toward an explicitly held belief that *p* tacitly commits us to a framework from which *p* can be evaluated. Polanyi's objection here is, however, more general than Peirce's objection against Descartes' use of *linguistic* and *subjective* evidence to determine whether someone can genuinely doubt a proposition. To see this more clearly, consider, as Polanyi does, the distinctions between the different explicit forms of disbelief and doubt.[18] There is *contradictory doubt* (or disbelief) where S believes the negation of a proposition. In addition, there is *agnostic doubt* where S believes that a proposition is not proven or that there are sufficient grounds for choosing between *p* and *not-p* (PK:272-3). Polanyi further characterizes *agnostic doubt* as being one of two forms: (1) *final agnostic doubt* where S believes that *p* cannot be proven and (2) *temporary agnostic doubt* where the possibility as to whether *p* can be proven is left open (see PK:273). Polanyi claims that even though there are cases where "the agnostic suspension of belief in respect to a particular statement says nothing about its credibility, it still has a fiduciary content. It implies the acceptance of certain beliefs concerning the possibilities of proof" (PK:273). The fiduciary content of the agnostic attitude is found in a framework which is responsible not only for assessing beliefs but also for bringing such beliefs into focus. Concerning the former, Polanyi argues that when S doubts *p*, S is making a statement concerning the future state of *p*, i.e. whether it cannot be proven (in

the form of a final agnostic doubt) or whether it may be proven (in the form of a temporary agnostic doubt). Thus, the inconclusive status of p is not equivalent to simply "S doubts p" but something closer to "p may or may not be proven in the future" or, more strongly, "p can never be demonstrated" (see PK:273). This sort of account of doubt is problematic for someone who advocates the method of doubt for in analyzing which beliefs are and are not dubitable, the user of the method of doubt appears to be making a number of unchecked assumptions about the current or future dubitability of p. In other words, the mere expression of agnosticism is already expressive of a tacit commitment to a framework about how p is to be assessed.[19]

The end result for Polanyi and Peirce is very similar. Both claim that if the critical method were applied to both instrumental concepts that either bring belief into focus or that suppose a framework of evaluation, the consequence would be a *pure skepticism* rather than a solvent for error or a positive philosophy. Polanyi writes that we can "imagine an indefinite extension of the [critical] process of abandoning hitherto accepted systems of articulation, together with the theories formulated in these terms or implied in our use of them" (PK:295). Such an extension of the critical process consists of a wiping out "all such preconceived beliefs" (PK:295), and such a theoretical position demands "[w]e must accept the virgin mind, bearing the imprint of no authority, as the model of intellectual integrity" (PK:295). However, much like Peirce, despite acknowledging pure skepticism as a theoretical alternative, Polanyi voiced a practical objection against this view. Polanyi claimed that no such creature instantiates this position. Such a being, Polanyi, notes would be "frantic and inchoate," could only be pursued by "blotting out my eyesight" and "reducing ourselves to a state of stupor" (PK:296-297; see also PK:314).[20]

4. The Method of Doubt is Useless

While the method of doubt might not be the primary method for establishing the starting point of philosophy, Polanyi and Peirce also directed arguments against its utility for philosophical, scientific, and social purposes. In particular, both argued that if the method is divorced from previous cognition and personal commitment, it was useless (see PK:269).[21]

4.1 Peirce

Peirce rejected the view that the method of doubt could be useful without the requisite prejudices and previously formed beliefs upon which to interact. In the case of Descartes, Peirce writes,

> no one who follows the Cartesian method will ever be satisfied until he has formally recovered all those beliefs which in form he has given up. It is, therefore, as useless a preliminary as going to the North Pole would be in order to get to Constantinople by coming down regularly upon a meridian. (W2:212).[22]

Peirce's general point is that if Descartes' reconstructive project is to be admitted, it will only be accepted if it validates the bulk of prejudices already accepted. In other words, Peirce claims that the results of the critical method simply won't be accepted if they stray too far afield from our commonsense beliefs and so the method is guided by beliefs that are not really criticized. The whole project then amounts to a "whitewashing" since the outcome of using the method of doubt is already determined at the outset.[23] As evidence, Peirce cites a variety of claims that Descartes claims to have positively established through the reconstructive stage after applying the method of doubt but which are actually products of Descartes' formal education. In a 22 March

1906 review of Haldane's *Descartes*, Peirce writes,

> Thus, he [Descartes] plainly regarded himself as the only philosopher worthy of that name that ever lived; and yet it seems impossible that, after eight years in perhaps the most admirable Jesuit college there ever was, he should not have been perfectly aware that his famous Je pense, donc je suis was taken entire[ly] out of St. Augustine's "De Civitate Dei,' or 'De Anima,' or 'De Quantitate Animæ,' for its substance, as the form of the 'Discours de la Méthode' and of the 'Meditationes' is imitated from the 'Confessiones'; nor that he should have been totally unconscious of how far he availed himself of the results of Galileo, of Thomas Harriotts, and others whom he ignores.[24]

Peirce's main point here is that if various uses of the critical method are tacitly, unconsciously, or antecedently determined by acritical beliefs, then the method of doubt loses any pretentions it might have to being an objective method for securing certainty. For if in the application of the method, practitioners are guided by beliefs that they had before applying the method, what positive contribution does the method make to inquiry? For Peirce, the answer is none and the method is useless.[25]

Despite this criticism, Peirce claimed that doubt could have a useful role for inquiry if used in concert with previously established beliefs. It seems that for Peirce, doubt plays an effective role only if it operates within a system of prejudices and personal commitments, and its primary function is to spur the investigator to the resolution of a problem. The idea is that doubt is a type of irritant and individuals seek to remove it in any way (some more acceptable than others) they can. As such, doubt formed an important part of his Critical Common-Sensism "provided only that it be the weighty and noble metal itself, and no counterfeit nor paper substitute" (EP2:353 [1905]). Further, he claimed that the inductive method "springs directly out of dissatisfaction with existing knowledge" and the concept is central to his account of the fixation of belief (EP2:48 [1898]; W3:242-257 [1877]).

4.2 Polanyi

Polanyi was also critical of whether the method of doubt could be recognized as the primary tool for scientific discovery. In his 1952 essay "The Stability of Beliefs" and later in *Personal Knowledge* (1962 [1958]), Polanyi writes that there is no existing heuristic maxim or defensible a priori rule that recommends doubt as the primary path to scientific discovery.[26] Polanyi cites Columbus's discovery of America, Newton's work in the *Principia*, Max von Laue's discovery of the diffraction of x-rays by crystals, and J.J. Thompson's discovery of the electron as examples where knowledge was expanded not by a methodological use of doubt but by a creative power to expand scientific beliefs into more concrete or practical form and a conviction that existing beliefs were lacking in some capacity (1952:226-7; PK:277).[27] The absence of a rule that we can apply when faced with the decision whether or not to believe *p* undermines the usefulness of the method of doubt because it suggests that (1) the method should not be applied in all circumstances (as the history of science shows), and (2) it cannot be determined in advance when the method of doubt should be applied in restricted form.

Not only did Polanyi criticize the utility of the method of doubt for scientific inquiry, but he was also critical of its utility as a safeguard to various forms of religious or cultural thinking. Instead, he regarded the method as a backhanded way of propagating personal beliefs. In criticism of Russell, Polanyi writes that

Russell's intention was "to spread certain doubts which he believes to be justified" but his claim that doubt is a safeguard for tolerance does not apply to his own beliefs (PK:297). Polanyi continues,

> Philosophic doubt is thus kept on the leash and prevented from calling in question anything that the septic [sic] believes in, or from approving of any doubt that he does not share. The Inquisition's charge against Galileo was based on doubt: they accused him of "rashness'. The Pope's Encyclical "Humani Generis', issued in 1950, continues its opposition to science on the same lines, by warning Catholics that evolution is still an unproven hypothesis. Yet no philosophic sceptic would side with the Inquisition against the Copernican system or with Pope Pius XII against Darwinism. Lenin and his successors have elaborated a form of Marxism which doubts the reality of almost everything that Bertrand Russell and other rationalists teach us to respect, but these doubts, like those of the Inquisition, are not endorsed by Western rationalists, presumably because they are not "rational doubts' (PK:297).

Polanyi thus criticizes practitioners of the method of doubt as applying a double standard by only using the method upon beliefs they find disreputable and rejecting its application on those they find rational.[28] To some extent, we can accuse Descartes of this as well since his skeptical project attacks beliefs that are obtained by the senses but never questions certain cognitive abilities like thinking or doubting. The latter undergird his project to make knowledge of the self, God, and mathematics epistemologically more certain than knowledge of the external world and material objects.

Despite these criticisms, Polanyi recognized a certain place for the method of doubt. He characterized a heuristic form as essential to Christian faith (PK:281, 285) and while not "the universal solvent of error", Polanyi appears open to a contexualized and restrained use of doubt insofar as it stirs inquirers to creative solutions (PK:266; TD:57). In addition, the role of doubt plays an important but not primary role in Polanyi's epistemological theory. Polanyi writes that "the exercise of special caution is not peculiar to the scientist. The practice of every art must be restrained by its own form of caution. […] Caution is commendable in science, but only in so far as it does not hamper the boldness on which all progress in science depends" (1952:227).

5. Conclusion

In short, Peirce and Polanyi criticized the use of the method of doubt from two different directions. First, they criticized practitioners of the method of doubt for failing to use it rigorously enough and argued that a thoroughgoing use of the method would amount to a pure skepticism, of which no creature instantiates.[29] Second, they criticized said practitioners for extolling its scientific and practical utility without considering that it only plays a limited role in scientific discovery and social arbitration.[30] Without the use of the critical method to fall back on, both Peirce and Polanyi argued for post-critical philosophies whose focus was on appropriating traditional philosophical concepts (e.g., truth, objectivity) into epistemologies that situate such terms in an already ongoing project of inquiry that is rife with acritical beliefs.

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Endnotes

[1] Abbreviations for Peirce's work follow these conventions: CP#.# = (Peirce 1960); HPPS:#: (Peirce 1985); EP1:# = (Peirce 1992a); EP2:# = (Peirce 1998); SS:# = (Peirce 1977); RLT:## = (Peirce 1992b); W#.# = (Peirce 1982-2000); R#:# = (Peirce 1963-1966, 1966-1969, 1967, 1970). In addition, rejected manuscript pages will have an 'x' after the manuscript page number. Abbreviations for Descartes's work follow these conventions: AT = (Descartes 1897-1913); CSM = (Descartes 1985); CSMK = (Descartes 1991). Abbreviations for Polanyi follow these conventions: KB: (Polanyi 1969); PK: (Polanyi 1962 [1958]); SFS: (Polanyi 1964 [1946]); TD: (Polanyi 1966).

[2] For a positive overview of Polanyi's post-critical philosophy, see (Cannon 2008). For further discussion on Polanyi's relation to post-critical philosophy, including a history of Polanyi's use of the term, see (Mullins 2001).

[3] Descartes' own narrative casting of the *Meditations* also gives this impression. At the beginning of the first Meditation, he writes that "it was necessary, once in the course of my life, to demolish everything completely and start again right from the foundations if I wanted to establish anything at all in the sciences that was stable and likely to last" (CSM2:12).

[4] It is important to point out that since Descartes' skepticism does not range over practical life, he is able to push his skepticism to the extreme. As Marjorie Grene (1999:556) puts it,

> Practical skepticism does not question of the external world; it just wonders if we have good reason to claim to have certain knowledge or even reasonable beliefs, about it. Meantime, get on with life and relax. Stop straining for a knowledge you don't know whether you can have. Descartes can go further in doubting just because it is not practice he's concerned with.

[5] This is in contrast to less rigid versions of evidentialism that do not make agnosticism the primary doxastic attitude when there is a lack of evidence. One example of this less rigid evidentialism is put forward by Chisholm (1956:449), who writes concerning W. K. Clifford that "His ethics was something more rigid than that suggested here, for he held that, for each of us, there is a large class of hypotheses concerning which we ought to withhold both assent and denial. But I have suggested in effect, that an hypothesis is innocent until proven guilty. It is only when we have adequate evidence for the contradictory of an hypothesis that it is wrong for us to accept the hypothesis."

[6] For example, see the beginning of Descartes' first *Meditation* (CSM2:12; see also CSM1:193).

[7] Further, Johanson (1972:227) claims that "Descartes has open the possibility of saying that what he is doing is subjecting his indubitable (and dubitable) beliefs to criticism and imaginary experimentation, to see which of them can withstand the test of feigned hesitancy."

[8] This interpretation of Descartes' method of doubt is supported by Oswald Hanfling (1984:504-505) who writes, "Descartes' method is a logical and not a psychological one. […] What I need to make me believe or doubt a proposition is not an incentive but reasons for thinking that the proposition *is true* or *is doubtful*."

[9] Gassendi writes, "what you claim, or rather pretend, is not something you are really in doubt about" (CSM2:219). Hobbes writes, "Further, it is not only knowing something to be true that is independent of the will, but also believing it or giving assent to it. If something is proved by valid arguments, or is reported as credible, we believe it whether we want to or not. It is true that affirmation and denial, defending and refuting propositions, are acts of will; but it does not follow that our inner assent depends on the will" (CSM2:134). Mersenne writes, "may we remind you that your vigorous rejection of the images of all bodies as delusive was not something you actually and really carried through, but was merely a fiction of the mind, enabling you to draw the conclusion that you were exclusively a thinking thing" (CSM2:87).

[10] On the other hand, throughout the *Meditations* Descartes notes that the strength of his habitual beliefs requires extraordinary resources to undermine. He writes that his habitual beliefs "capture my belief" and that without the use of the evil demon, there are some beliefs that he "shall never get out of the habit of confidently assenting to these opinions" (AT VII, 22). Another example is found in his unpublished *The Search for Truth* (c.1641). There, Descartes' Eudoxus argues that just as a painter who—having made a number of mistakes in a portrait—ought to make a fresh start with a new canvas, philosophers ought to commit fully to the method of doubt. However, Epistemon and Polayander reply that this astonishing proposal would be

possible only "by calling on the assistance of powerful reasons" (AT X, 508-9). To this challenge, Eudoxus responds with the unreliability of the senses, the lack of a distinction between a waking state and a sleeping state, and the possibility of an evil demon (AT X, 510-512). All three of these cases are claimed to produce the necessary resources to get us out of the habit of confidently assenting to our habitual beliefs. Finally, in response to Gassendi's objection that the use of methodological doubt amounts to philosophical artifice because one cannot compel himself to believe that he is not awake or that his senses are untrustworthy, Descartes responds by claiming that is no reason why such beliefs should not—or could not—be called into doubt (AT VII, 258). After the publication of the *Meditations*, Gassendi published his *Metaphysical Enquiry: Doubts and Counter-Objections* (1644), which rearticulated his original objection that the method of doubt was *descriptively impossible*; we simply lack the psychological ability to doubt certain beliefs. Descartes responded by claiming that all of the beliefs in the *Meditations* are capable of being doubted because they were directed at "opinions which we have continued to accept as a result of previous judgments that we have made" and since our making of these judgments is an act of will, and since our will is in our power, it follows that it is possible that S can doubt p, even though S does not doubt p. (AT IXA, 204

[11]Concerning the view that doubt is not within our will, Peirce writes (R828 ([1910] 'Logic'), "Inquiry, that is activity animated by a desire to know something, is a place full of admirable curiosities,—a labyrinthine palace of palaces at whose every threshold there stands one of its lackeys, called 'doubts.' Most often it is the urgency, the teazing [sic] sollicitation [sic] of this lackey doubt that forces one to enter, but if one enters of one's own volition one will be accosted by one of them before one has advanced one step, or if one powers by one of them, one will find one has to return and deal with him." In addition, Peirce (R288) writes "*Questioner:* Why does he not make a clean sweep of them [beliefs]? *Pragmaticist*: You talk as if beliefs were under the belief's immediate control. If they were, they would not be beliefs. No other habits are capable of being so instantaneously shattered by the proper means but "some others are so like many tumbler locks. They open only to a key that fits. The original beliefs are like rusty locks that do not open *even* to those proper keys without working them repeatedly and wearing down the rust. But let us return to the criticism. He, like you, shows the unfounded belief of Descartes that to change belief to doubt, all one has to do is to take a sponge and rub the belief out as if it were written with soapstone on a school slate, instead of with talc on the glassy consciousness" (cf. CP5.519). In the above passage, Peirce wrote (but crossed out) "They [original beliefs] are graven in the heart wood of the mind. They won't come out without much greater difficulty than ordinary beliefs." In addition, Peirce contends that doubt is "not the same as ignorance, nor as the consciousness of being ignorant, for if one does not care to know one cannot be said to be in doubt" and "that what we call "doubt" is an *emotion*" (R828 [1910] 'Logic'). Elsewhere (R288), Peirce writes that "[a] true doubt is an uneasy state of mind in which one wavers between two opinions. It cannot exist unless there is a reason or what is mistaken for a reason for each of the two opinions. I do not doubt whether the inhabitants of Saturn have red hair; for I do not think there is the slightest indication one way or the other."

[12] Peirce's criticism is thus similar to that of Bourdin who argues that Descartes, who counsels us to treat whatever is doubtful as if it were false, balks when it comes to doubting whether ideas are clear and distinct. Bourdin (CSM2:306) writes,

> If someone doubts whether he is awake or asleep, it is not certain that what appears clear and certain to him is in fact clear and certain. Should I therefore say and believe that if something appears clear and certain to one who doubts whether he is awake or asleep, then it is not clear and certain but obscure and false? Why do you hesitate? You cannot possibly go too far in your distrustful attitude. Has it never happened to you, as it has to many people, that things seemed clear and certain to you

while you were dreaming, but that afterwards you discovered that they were doubtful or false?

[13]Peirce makes a number of statements that support his belief in the theoretical viability of any belief being subject to doubt. For example, he writes that even "twice two is four" is not absolutely certain (see R829). "You have heard of hypnotism. You know how common it is. You know that one man in *twenty* is capable of being put into a condition in which he holds the most ridiculous nonsense for unquestionable truth. How does any individual here know but that I am a hypnotist and that when he comes out of my influence he may see that twice two is four is merely his distorted idea; that in fact everybody knows it so" (CP3.150). He writes that "no empirical proof can entirely free its conclusion from rational doubt" (R288).

[14] Susan Haack (1983) addresses two objections leveled by Peirce against the method of doubt. The first is that Peirce thinks the method of doubt is impossible. The second, argues Haack (1983:252-3), is that Peirce's objection to the method of doubt is *not* rooted in the view that Descartes is *too skeptical*. Instead, Haack (1983:252) claims that when the method of doubt is tied to Descartes' rational policy of admitting only indubitable beliefs, Descartes is *not skeptical enough* for a wholesale employment of the method of doubt should "leave no residue of indubitable beliefs to form the basis of reconstruction" (Haack 1983:253). On Haack's account, since Peirce regards theoretical skepticism as consistent, Peirce's objection to Descartes's use of methodological doubt is that its employment is a backhanded way of introducing dogmatic claims already accepted before the method of doubt was applied. My claim is that Haack's first objection is a misreading of Peirce. Further, her account of the second objection lends support to my interpretation of the first.

[15] For these other aspects of a post-critical philosophy, see Mullins (2001:83-89).

[16] Concerning the claim that the critical method is a corollary of objectivism, the idea appears to be that since objectivism requires belief in a proposition only on the condition that the proposition is demonstrated, the critical method follows since it pursues knowledge by regarding any personal (or subjective) contribution as potentially dubitable (see PK:286: see also Sanders 1988:38-39).

[17] In (SFS:85), Polanyi notes that any inquiry involves the functional use of concepts and that such concepts are manifested in the practice of inquiry (see Kane 1984:18-19).

[18] As Phil Mullins has pointed out to me, Polanyi draws a distinction between the explicit and wide (or tacit) forms of doubt and there is perhaps a connection between the tacit form of doubt—which Polanyi characterizes as a "moment of hesitancy," "present in all articulate forms of intelligence," and in the behavior of animals—and Peirce's notion of "genuine doubt" (PK:272).

[19] Polanyi seemed to even claim at times that proponents of the method were already tacitly committed to (i.e., disposed for or against) any proposition put forward in their discipline. Polanyi writes, "[i]f he ignores the claim he does in fact imply that he believes it to be unfounded. If he takes notice of it, the time and attention which he diverts to its examination and the extent to which he takes account of it in guiding his own investigations are a measure of the likelihood he ascribes to its validity" (PK:276).

[20] Polanyi immediately follows this remark by writing that "the *programme* of comprehensive doubt collapses and reveals by its failure the fiduciary rootedness of all rationality" (PK:297, my emphasis). Polanyi's critique then is that a rigorous use of the method of doubt is impossible for rational purposes since the application of the method to the subsidiary or non-focal concepts that allow for the rational use of doubt requires an abandonment of rationality altogether. In particular, Polanyi writes, "to acknowledge tacit thought as an indispensible element of all knowing and as the ultimate mental power by which all explicit knowledge is endowed with meaning, is to deny the possibility that each succeeding generation, let alone each member of it, should critically test all the teachings in which it is brought up" (TD:60-1). Thus, while pure skepticism is theoretically possible, it cannot be adopted by a rational agent. Perhaps compounding the problem for the skeptic is whether subsidiary features are even capable of undergoing critical scrutiny (see KB:139, 147; TD:15; Sanders 1988:8-9).

21 For example, in the synopsis to the *Meditations*, Descartes writes "the usefulness of such extensive doubt is not apparent at first sight, its greatest benefit lies in freeing us from all our preconceived opinions, and providing the easiest route by which the mind may be led away from the senses" (AT VII 12). In replying to Gassendi's objections to the *Meditations*, Descartes claimed that it is often "*useful* to assume falsehoods instead of truths in this way in order to shed light on the truth, e.g. when astronomers imagine the equator, the zodiac, or other circles in the sky, or when geometers add new lines to given figures" (AT VII, 349, my emphasis). In terms of the method of doubt being a safeguard for tolerance, one example is Russell who emphasized its practical usefulness in arguing that it was the solvent for dogmatism infecting political and religious life. In *Personal Knowledge*, Polanyi references at least two pieces by Russell to this extent (PK:271, 297). In the first, Russell writes, "Arians and Catholics, Crusaders, and Moslems, Protestants and adherents of the Pope, Communists and Fascists, have filled large parts of the last 1,600 years with futile strife, when a little philosophy would have shown both sides in all these disputes had any good reason to believe itself in the right. Dogmatism is an enemy to peace, and an insuperable barrier to democracy. In the present age, at least as much as in former times, it is the greatest of the mental obstacles to human happiness." (1950 [1946]:26).

22 Peirce writes "[n]othing can be gained by gratuitous and fictitious doubts" (W2:189 [c.1868]). Also, he writes, "Defense against sham doubt is but a blank-cartridge action. It is of no use. On the contrary, humbug is always harmful in philosophy" (CP2.196).

23 Peirce writes, "in cases where no real doubt exists in our minds inquiry will be an idle farce, a mere whitewashing commission which were better let alone" (CP5.376n3 [1893]).

24 See also CP6.498, where Peirce writes, "Descartes convinced himself that the safest way was to "begin" by doubting everything, and accordingly he tells us he straightway did so, except only his *je pense,* which he borrowed from St. Augustine. See also (CP4.71 [1893]). That even the "cogito ergo sum" is dubitable, see R891 [c. 1880-82].

25 To some extent, this is not fair to Descartes since he concedes that the specific propositions he claims as certain have historical antecedents. What Descartes claims is novel to the *Meditations* is that our knowledge of our self as a thinking thing and God's existence are more certain than our knowledge of the objects of the material world, which are obtained through the senses (see CSM2:11)

26 For the context of Polanyi's article "The Stability of Beliefs," see (Jacobs and Mullins 2012:74-81)

27 For a list of more examples, see Sanders (1988:121-122). For von Laue's account of the discovery of x-ray interferences, see Laue (1998 [1915]:351-2).

28 For a related discussion on the use of doubt, see Sanders's (1988:118-124) discussion of Polanyi's rejection of instrumentalism.

29 Polanyi even hints that the invitation to dogmatism is built upon our ability to take the critical method to its logical conclusion (see PK:268). For an alternative reading of this passage, see (Cannon 1999:2). Polanyi is thus characterized as accepting a form of fallibilism. However, it should be noted that Polanyi gave fallibilism a very positive ring when he claimed that scientists must remember that a particular theory is not only capable of being false but a theory is also capable of being true, even in the face of adverse evidence. He illustrated this position by noting that features of argon, potassium, tellurium, and iodine in relation to the periodic system of elements and aspects of optical diffraction for Einstein's quantum theory of light (see SFS:29-31). He summarizes this point in writing "We may conclude that just as there is no proof of a proposition in natural science which cannot conceivably turn out to be incomplete, so also there is no refutation which cannot conceivably turn out to have been unfounded" (SFS:31).

30 Quite obviously, the respective attitudes of Peirce and Polanyi is only one of many points of similarity between them for both were informed scientists, both adopted a form of fallibilism, both made hypothetical

inference (abduction) an essential feature of scientific development, both accepted a form of common-sensism (methodological believing), and both appeared to explain the possibility of knowledge along evolutionary lines. For a comparison of Peirce and Polanyi on abduction and tacit-knowing, see Mullins (2002), and for a Peirce-Polanyi connection on perception, meaning, and semiosis, see Innis (1999).

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The Reach of the Aesthetic and Religious Naturalism: Peircean and Polanyian Reflections

Robert E. Innis

ABSTRACT Key words: religious naturalism, aesthetic dimension, non-theism, religious world models, Charles Peirce, Michael Polanyi, R. W. Hepburn, Frederick Ferré, John Dewey, Susanne Langer, cosmic vision. *In this article I reflect upon the problem of the aesthetic intelligibility of the world in connection with an aesthetic approach to religious naturalism. Taking the work of R.W. Hepburn as conversation partner, I bring it into relation to the work of Charles Peirce and Michael Polanyi. Admitting the ambiguous nature of their own religious commitments, I try to sketch, with no claim to completeness, how they help to illuminate just what would be entailed in beginning the process of translating religious forms of attending into aesthetic forms and what would be gained and what would be lost in doing so.*

Posing the Issues

Charles Peirce and Michael Polanyi have been appropriated in multiple, and perhaps not quite compatible, ways for theological and religious purposes. Besides the problem of their own religious commitments, which is mainly of contested biographical relevance, there is the further issue of the heuristic fertility of their conceptual schemes to illuminate core themes of a comprehensive philosophy of religion, the starting point and upshot of which may or may not be in agreement with their own premises and substantive positions. Peirce, belonging most of all to the American tradition of pragmatic naturalism and source of a specific and powerful approach to semiotics, has been received by a rather different set of readers than Polanyi, a philosophical outsider. Peirce's and Polanyi's theological relevance is, when all is said and done, not as closely wedded to traditional theistic positions as many of their interpreters have contended. Both Peirce and Polanyi, however, share not just a deep scientific background, which informed their work at every level, but also a quite reticent, maybe even systematically ambiguous, attitude, when all is said and done, to orthodox or familiar theological positions.[1]

I do not intend to enter into the thicket of controversial claims about the personal religious positions of Peirce and Polanyi, interesting as they may be. Polanyi's and Peirce's philosophical projects clearly share many points in common that merit close examination: (a) a concern to delineate the nature of abduction and discovery, (b) a foregrounding of processes of articulation and semiosis, that is, sign-production and interpretation, (c) an assertion of the essentially social nature of human inquiry and the role of tradition(s) in forming interpretation communities or societies of explorers, (d) an insistence on the paradigmatic role of science and its epistemological lessons while maintaining an essential openness to other forms of meaning-making, (e) a nuanced vision of a stratified universe marked by process and emergent novelties, and many others. All these clearly have religious relevance, although there are manifest and significant differences or at least weightings in the philosophical projects of Peirce and Polanyi.[2] But in this paper I do not intend to schematize abstractly and in a general way the points they have in common and their points of difference.

Rather, I want to explore the bearing of intellectual tools supplied by Peirce and Polanyi to a quite specific issue: the mutual informing of the aesthetic and religious dimensions of experience and the cognate

demand for an aesthetic intelligibility of the world. I will employ what I will call the "method of interpolation," using as the focal point of my discussion a set of reflections on the "reach of the aesthetic" by R. W. Hepburn, whose philosophical orientation is not informed by either Peirce or Polanyi.[3] The main questions posed by Hepburn that I will engage are the following: How far, and in what ways, does the aesthetic "reach" into the religious dimension of life? And how far, and in what ways, does the religious "reach" into the aesthetic dimension of life? The notion of "aesthetic intelligibility" as I am using it in this paper refers not to the intelligibility of aesthetics but to the problem of the *religious import and scope* of the drive to make the world aesthetically intelligible. Hepburn rejects, for theoretical reasons, a theistic explanation of the universe, but he nevertheless holds that there is room for an aesthetically configured religious relation to it. While a theistic context has generally been presupposed for exploring the religious implications of Peirce's and Polanyi's thought, this is not the only direction their thought can be taken and shown to have religious relevance. Religious naturalism, such as that represented by Hepburn, also elicits Peircean and Polanyian reflections. How deeply do their concerns and conceptual frameworks "reach" into and help to clarify this religious orientation?

A Schema of Religious Naturalism

Religious naturalism, in the form that frames this paper and Hepburn's work, posits no reality "outside" of nature. It rejects a universe antecedently planned and centrally organized by a cosmic intelligence or will. It does not reject a universe with emergent orders and emergent systems of meaning. But this ordering does not derive from, or necessitate the inference to, any orderer who integrates, on a cosmic scale, the various orders into a superordinate order or order of orders. The meanings of these orders are embodied in ramified systems of signs or sign-processes that, in the words of Peirce, "perfuse" the universe, whose sign-constituted origins and structures it is the task of semiotics to discover and of hermeneutics to interpret.[4] The universe, for such a form of religious naturalism, is self-assembling and self-meaning, a system of systems of spontaneous ordering and meaning-originating processes, processes that while subject to law or rule are nevertheless not controlled all the way down by law or by rigid antecedent constraints, a position sustained by both Peirce and Polanyi. It manifests what Peirce thought of as the "sporting" nature of firstness, the inexhaustible domain of possibility, which along with secondness (actuality) and thirdness (mediation or synthesis) make up Peirce's triad of metaphysical categories.[5] There is, on the Peircean position, a deep spontaneity or creativity in nature, akin to Scotus Eriugena's or Spinoza's *natura naturans*, that, like Polanyi's "heuristic field," pulls it forward, luring it in fact by a kind of *nisus* informed by "evolutionary love," but without in any sense trying to push it somewhere by efficient action *ab extra* and thus break the unity of nature.[6] At the same time, religious naturalism is a *religious* naturalism. It responds with reverence and rapt attention to such a world. It explores it intellectually, acts in response to its values, and attunes itself affectively to its various forms of appearing in which its structures and orders of meaning are embodied and expressed.

Donald Crosby, in his version of religious naturalism, has argued that nature is both *metaphysically* ultimate and *religiously* ultimate.[7] For Crosby, nature is the ultimate *context* of explanation, but in itself it defies and does not need an explanation, even if, as Gordon Kaufman in his theologically oriented version of religious naturalism sees it, we are then confronted with the ultimacy of mystery, indeed, an ultimate mystery, beyond which we cannot go.[8] On these views, nature understood as the union of *natura naturans* and *natura naturata* is the locus of originations and the ultimate exemplification of continuous origination. But no-thing is responsible for its origin. It is self-originating, however one ultimately interprets this theoretically or responds to it religiously. It does not depend in any way on an antecedent or concurrent "other" reality that is responsible for its origin. For religious naturalism, nature is the context as well as the object of distinctively multidi-

mensional religious forms of apprehension of this ultimacy and processes of origination.[9] It is the gathering matrix of our being-in-the-world and of our orienting ourselves in it. Of course, all forms and structures of religious consciousness, whether theistic or not, involve ultimacy, akin to, but not necessarily identical with, what Tillich, with whose work Polanyi was familiar, called being grasped by and committing oneself to an ultimate concern. The sense of the "sacred" or of the "holy," which Hepburn discusses and reconstructs, is a prime exemplification of this ultimacy as is Tillich's affirmation of "the God beyond God" or "the nothingness beyond God" proposed by Nishida Kitarō.[10] What is ultimate for us is god, though not necessarily God.[11]

The history of religions has left a trail of elaborate conceptual systems, ritual and meditative practices, moral precepts, and pregnant images, in all modalities, that are supports of what in the last analysis is an ultimate disposition of ourselves toward "ALL THAT IS."[12] A fundamental problem is whether and how a religious naturalism, and not just Hepburn's, in the non-theistic version (or even an "immanentist" theistic version), can appropriate and reconstitute in its own terms the religious lessons and permanent insights of these traditions and what is, perhaps, the best way of doing so. This would entail, of course, fundamental and thoroughgoing conceptual reconstruction and thus impose severe hermeneutical as well as existential tasks on us.[13] Some essential claims, in their traditional senses, would perhaps have to be abandoned, such as the notion of "revelation" itself, or "salvation," or "redemption," or "creation," as well as some long-standing descriptions of our existential structures, states, and predicaments, such as "sinfulness" and "disobedience to God's will." Religions are composed of multiform ways to make the ultimate context(s) of our lives intelligible and to justify forms of life. They clearly have or imply different metaphysical visions of "ALL THAT IS." The great revelatory monotheisms of Judaism, Christianity, and Islam are combustible mixtures of levels of articulation and are marked by fateful relations to philosophical categories, including attempts at rejection of philosophical categories altogether.

Revelatory theisms "start high" in their content even if they "start low" in their religious needs. They are formulated in "sacred scriptures" and they in different ways locate the sources of insight outside the realm of human powers, even if human powers are needed to receive the revelation. But the intrinsic authority of the revelation comes *ab extra*, although the revelations clearly manifest marked historical features that "date" them and require a community of interpreters to keep them alive—just as traditions based on insight do, too. The scriptures must be interpreted and, in fact, subjected to criticism, even as they in their proposals subject us to criticism and seek to inform us at all levels of our being. Peirce schematized this interpreter self in terms of his triadic schema of categories: the self is an open system of feeling, reacting, and synthesizing or mediating thought processes. It engages the world affectively in terms of feeling-qualities, dynamically in terms of real connections, and "logically" in terms of concepts. It is attuned to and is grasped by immediate qualities, it reacts to the interruptive features of experience that shatter its everydayness and conceptual schemes, and construes the world ideationally in a continual process of attempts, as Peirce put it, to "fix" beliefs in light of the constant irritation of doubt. But this interpreter self—and interpretation community—is likewise present when we start at the bottom, so to speak.[14]

The purely philosophical theisms, and non-theisms, "start low," with the world and the flux of existence, which is then subjected to deep reflection upon the conditions of its possibility.[15] While they reject the authoritative claims of the religions of revelation *ab extra*, though not religions of enlightenment, they nevertheless consider them as sources of insight and data for reflection in as much as they manifest the focal concerns of the religious orientation, however "ultimate reality" is to be understood in the end. Religious naturalism of a non-theistic sort, of which Hepburn's is only one representative position, starting "low" like

philosophical theism, also engages these focal concerns and indeed refocuses them, but without identifying the "ultimate" with the "divine." Clearly, we are wanderers in a veritable labyrinth of alternative frameworks, with different starting points and conceptual weightings. There is no avoiding, as Polanyi points out, the perils of commitment and conceptual decision.

Frederick Ferré wrote that "whatever provides the context for all other contexts is functionally religion."[16] This context is embodied in what he calls "religious world models," or RWMs. As Ferré puts it (p. 146):

> … (1) an RWM is a *model*, which indicates that it stands for or represents something else, and (2) a RWM represents the *world*, which means that it is comprehensive in its reference to the entire universe, and (3) an RWM is *religious*, which entails that it is emotionally 'hot,' engaging intense valuational affect.

It is clear that the RWM of religious naturalism *models* the *world* as a self-originating system of systems. And it is clearly "hot," in Ferré's sense—or maybe even, from some points of view, decidedly "cool."

Religious naturalism, as a RWM, aims to provide a context for other contexts. Its goal is to render the world religiously intelligible. But if there is no specifically theoretical way to support theism and its attendant religious affections oriented toward a personal, transcendent source, as religious naturalism affirms, is there perhaps another way that brings us into forms of consciousness that while not making the world theoretically intelligible in a theistic form makes it intelligible in another form and still orients us in a "hot" manner toward the world? How would the world be religiously represented then and what types of experiences would we undergo, be receptive to, and pursue? Religious naturalism, from the philosophical side, is a *theoretical* vision embodied in articulated conceptual systems. It engages us on the level of effective *action* by demanding real responses. And it elicits from us forms of genuine *attunement* on the affective level.

Ferré develops, upon the basis of what he calls a Whiteheadian personalistic organicism, a naturalistic religious position centered on kalogenesis, that is, the generation or creation of beauty, specifically, rich and coherent forms of experiencing that prehend, receptively and actively, the intrinsic values of the experiential continuum, "realizing" them in every sense of that term.[17] The live creature (John Dewey's term), or the Polanyian sense-reading and sense-giving inquirer, is inextricably bound to the flux of experiencing, dividing it at its significant joints, that is, and giving rise to coherences filled with significance, wholes saturated with meaning, both existential and representative.[18] On Ferré's conception, the experience of beauty is the beauty of experience, an experience that is attuned to the qualities of the world with their distinctive "affective tones." Hepburn argues that among these affective tones are those that are clearly "religious" or bear upon the religious, and in paradigmatic cases they are likewise "aesthetic," even if they are not necessarily "artistic," although they clearly can be when we turn to the great stream of symbolic images articulating the fundamental existential stances of the religious traditions.[19] Susanne Langer wrote in her *Philosophy in a New Key* that "meaning accrues essentially to forms."[20] And religious meaning is adherent in specific forms of experiencing oriented to distinctive features of objects and situations. Hepburn wants to foreground the affinity between the aesthetic and the religious forms of experience once the notion of a transcendent ground of the universe is given up.[21]

A religious world model, looked at from a Peircean point of view, is expressed in sets of signs of different types, each type being oriented to a specific "aspect" of the world. Following Peirce's schematization,

we could say that such a model is composed of differentially weighted sets of signs, both natural and artificial, functioning iconically, indexically, and symbolically. These sets of signs are *indwelt* as subsidiaries in Polanyi's sense. They have what Peirce calls a "material quality" or "distinctive feel." They are the embodied semiotic roots of our lives, our ultimate existential and cognitional supports or subsidiaries.[22] The basis for the signs' relationships to their objects is, according to Peirce, (a) *resemblance* in the case of images, diagrams, and metaphors, founded on a shared quality between image-sign and object, (b) e*xistential or real connection*, in the case of indexes, which are primarily pointers or vectors, and (c) *convention or agreement* in the case of symbols. Icons are signs that embody the felt qualities of the world. Indexes are signs that bind us dynamically to the world. Symbols are signs that specify the conceptual content, the "idea," of the sign-configurations. But such a view of signs also implies that there are real resemblances, real dynamic connections, and real immanent intelligible structures in experience and in cosmic process. These meaning-full dimensions give rise in us to what Peirce called "interpretants," understood as the proper significate effect of signs or the signifying powers of nature. [23]

Aesthetic Reach of Religious Naturalism

Let us now turn to the focal issue to be confronted in this paper, using as our test case the religious reach of the aesthetic as sketched by R. W. Hepburn, seen through the eyes of Peirce and Polanyi.

Hepburn's, and our, point of departure is the experienced unlimited *wonder* (*das Erstaunen*, *thaumazein*) of a finite being at the universe, a wonder that, in one of its forms, takes on a distinctively aesthetic, as well as religious, tone and configuration, not restricted by any means solely to the "sublime." On Hepburn's reckoning the "reach" of wonder, akin to Peirce's play of "musement," is unlimited in that it is a complex wondering about "the sense of it all," but, unlike Peirce, Hepburn does not think it leads to theism.[24] The core of such a wondering, according to Hepburn, is what he calls the "aestheticized sense of contingency or of numinous awe" (*Reach*, p. 98), what Friedrich Schleiermacher, in his *On Religion*, equated to "creature consciousness" or the feeling of "absolute dependency" that arises from an "intuition of the universe." This is, I think, the ground floor of any religious orientation.[25]

The goal of such wondering, and of its explication, is different from a distinctively conceptual wondering about contingency. It is "*making* sense" in many intertwined and groping modes, with emphasis on the constructive, interpretive nature of the processes, what Polanyi, as I have already noted, called sense-giving and sense-reading and the Peircean tradition unlimited semiosis or the play of signs.[26] The existential aspect of wondering concerns the ground features, following Peirce, of our orientation toward the cosmos: cognitively, action-wise, and affectively. The metaphysical aspect that haunts all of Hepburn's deepest and most pertinent reflections pertains to another dimension of the "reach" of the aesthetic, that is, how far the deep features of the universe itself display, or can be accessed by recourse to, an aesthetic intelligibility which is different from a theoretical or explanatory intelligibility, which itself, as many have argued, has an aesthetic component. But theoretical construction is not aesthetic or religious apprehension. Nevertheless, "rational religion" or a "religion of reason" is open to an aesthetic complement. Such a thematic unity is more akin to the Plotinian thematization of an intellectual beauty that is the ground of the very unity of the cosmos and the model luring the wonderer or, clearly, if we follow St. Augustine's lead, the *wanderer*, toward unity. As Hepburn says, rightly and rather laconically, "It is not easy to determine what exactly is the relation between religio-metaphysical belief and doctrine, on the one side, and aesthetic-religious 'vision,' on the other" (*Reach*, p. 97). In this he is paralleled by Schleiermacher's remark that "religion and art stand beside one another like

two friendly souls whose inner affinity, whether or not they equally surmise it, is nevertheless still unknown to them" (*On Religion*, p. 69). What is the nature of this inner affinity and not just between art and religion but between the religious and the aesthetic, a problematic affinity which has vexed the many different traditions of religious aesthetics embedded in very different conceptual frameworks?

Hepburn poses the issue we are concerned with in the following way: What is revealed, or achieved, by extending the "reach" of the aesthetic to encompass or constitute *an* irreducibly ultimate, if not *the* ultimate, religious context for orienting ourselves in the world, different from, but inextricably intertwined with, a conceptually grounded ultimate context, which it cannot duplicate, but which it presupposes and maybe even, in a certain sense, supplants? The conceptually grounded context that furnishes the philosophical background to Hepburn's reflections, clearly different from Peirce's and Polanyi's, is a nonaggressive, and non-nostalgic, form of non-theism, a metaphysical position that, along with religious naturalism in its many other manifestations, rejects all appeals to a transcendent sphere separate from cosmic process itself, but does not "lapse" into pantheism.[27] Whatever transcendence is to be found in nature or the cosmos is, for Hepburn, with a gesture toward Karl Jaspers, an "immanent transcendence," not an objectively existent "transcendent" domain outside the world that would fuse the functions of an "ultimate religious object" and an "ultimate explanatory principle" to ground a radical aesthetic unity of the cosmos. Such a unity is clearly not apparent to us, caught up as we are in the perplexing web of the problem of evil. Hepburn, however, is sensitive to religious forms of consciousness and wants to conserve them—in the aesthetic mode—to the degree that that is possible but without identifying the two modes *tout court* and also recognizing what is lost, indeed must be lost, in the process. That there are deep affinities between the aesthetic impulse and the religious impulse and the various metaphysical visions in which they are embedded does not entail that they are identical.

Hepburn traces, as many others such as Schleiermacher and the Romantics have, an arc from "nature" experienced as a not completely orderly immanent system of reciprocal relations to aesthetic experiences, both natural and artistic, marked by a distinctive felt quality of "transcendence" and sense of the "sacred," features foregrounded by Rudolf Otto as *mysterium tremendum et fascinans* and described as "sacred folds" in the ecstatic naturalism developed by Robert Corrington. These are epiphanic moments, breaks in the normal course of experience, whether induced by natural experiences or by symbolic artifacts that take us out of ourselves, as Polanyi so eloquently writes. But while, it is clear, the actual existence of nature is not in doubt, it is precisely the problematic status, both conceptually and experientially, of the transcendent or the sacred, whether attached to nature or to art, that confronts us, even as, so it seems, we find them unavoidable no matter how we name them. Nature is "beyond" us even as we are "within" it. While nature as a whole, the cosmos as a vast panorama of processes and structures, is clearly an "object" of aesthetic as well as speculative wonder, one can ask whether religious and aesthetic wondering in the case of the transcendent or the sacred have any real work to do if there is no "object" independent of our forms of apprehension.

Hepburn raises this question against the background of a personalistic theism, which he finds unacceptable on metaphysical grounds, a topic we do not need to enter into here.[28] The problem Hepburn forces us to face is, if we cannot reach, make, or ground the transcendent or sacred philosophically, in the explanatory or theoretical mode, can we perhaps do so aesthetically and in this sense make them real? Does the "reach" of the aesthetic extend to a real experience of transcendence that merits cultivation and distinctive practices of attending? And what type of transcendent dimension do we reach and what is its object? Or, if there is no transcendent dimension in the personalistic sense that Hepburn gives to this term, conditioned for him by a

repudiated metaphysically grounded theism, is there any way to salvage the aesthetically religious imagination such that it is not a mere projection of human subjectivity onto a cosmos devoid of any objective aesthetic features? While, as Hepburn puts it, "imagination speculates, with freedom and passion, but is necessarily checked and controlled by critical reason" (*Reach*, p. 90), such checking, leading to acknowledging a failure to reach a metaphysically transcendent unity of a cosmic consciousness, can nevertheless "be seen as signaling a necessary stage in religious understanding, a requirement of imaginative logic in the religious sphere. Even though it may be one that negates an 'objectified' view of the divine, it is far from negating the life of religious imagination itself" (*Reach*, p. 94). We recall how Tillich exploited, under the guise of Christianity, the "non-objectified" view of the divine and attempted to find out the place of the aesthetic within our relationship to it.[29]

Of course, the great non-theistic traditions of the East and closer to home, Emerson, among others, have already shown us how to do this and they constitute a vast reservoir of significant images and a corresponding set of hermeneutical practices. They, too, are embedded in highly diversified conceptual systems and exemplify the appropriate existential attitudes and forms of attunement proper to them. And they manifest features of a "deep" aesthetic, "deep" as in "deep ecology." Indeed, it has been claimed, in many quarters, that the universe or world process manifests a deep aesthetic *structure* or that a *demand* for such a structure is justifiable in order to compensate aesthetically for systemic and moral disorder and evil (process theology in theistic form).[30] However, as Hepburn remarks, "to take evil with full seriousness must involve setting resolute limits to treating it in aesthetic terms" (*Reach*, p.106). But this would seem to be precisely what Whitehead and Hartshorne saw as needed to handle the *ultimate integration of order and disorder* in God's consequent nature. Evil presents itself as something "ugly," a central point in Frederick Ferré's development of a kalogenic evolutionary naturalism (Ferré, *Living and Value*).[31]

There *must* be *some* way, it has been claimed, for the universe to be an aesthetic whole or to be apprehended in such a way that it is an aesthetic unity, and therefore "good" or an "intrinsic value," even if it is not apparent to us but something taken on faith. This seems to be a postulate or an ultimate premise. The problem, of course, is how one would establish the actual existence and nature of such a structure and the ontological implications of such a demand. Can it be done aesthetically, however we want to define such a term? For religious naturalism, in its multiple and culturally diverse forms, and clearly for Hepburn, the aesthetic intelligibility of nature is, for the most part, a *construction* rather than a *construal* and, in essence, it is an *event* or *process*, a constitutive habit, or set of habits, of attending that *gives rise to what it intends*, to which, as Polanyi writes, we submit and which we "serve." It is constituted by *participation through contemplation* but not by contemplation or speculative thought alone, which has already preceded it and been left behind. While it involves *recognizing* aesthetic *orders* of the world, or aesthetically apprehended orders, it accepts the radical perspectival character of all forms of apprehension and makes no attempt to totalize it or think it has to be, or even can be, grounded in an integrating and totalizing consciousness. Is, then, a cosmically oriented religiously tinged aesthetics doomed "unless the overall fabric of the world were itself an intelligible, rational structure or also the work of an infinite intelligible mind" (*Reach*, p. 103)? This is a further problem, however. In what senses does an intelligible, rational structure of the world have to be the work of an infinite intelligible mind? Is this a working hypothesis or a theorem? Or can we separate the two sides? Peirce and Polanyi would allow us to do so, even if some of their followers quite strongly argue the opposite.

In the case of the appearance of the "transcendent," of an "open beyond," the problem, as Hepburn sees it, is precisely the "revelatory" or "disclosure" power of the experience of such a beyond and what is

its status if the "transcendent," or the "sacred," is not anything separate or distinct from the very forms of experiencing in which it occurs, that is, if it comprises existential stances that do not so much reveal as *enrich* the universe, that is, *add new features to it*, features it, in light of "the God-emptiness of nature" (*Reach*, p. 104), would not have were it not for us creatures, who are ourselves inside, not outside, of nature. In short, the aesthetico-religious "taking" of nature has an undeniable object and the forms in which we experience nature clearly both reveal and enrich—and do so precisely in the aesthetic, not the explanatory, mode. But if, one could ask, the "transcendent" or the "sacred" in some ways *appear* in specific forms of experiencing, do they really have to have any reality other than their forms of appearing and the distinctive kinds of "logics" that determine them? Or are they, rather, as philosophical theism asserts, merely *primary analogues* of a type of unity that marks a unifying cosmic consciousness that can be established in another way, that is, argumentatively? What is their status if, as Hepburn proposes, they can be detached from the metaphysics of theism and from the dogmatic claims of the religions of revelation?

The prime question we are confronted with, then, is complex and, indeed, exceedingly strange. Is aesthetic intelligibility (a) *discovered* already in the universe, (b) *added* to the universe, (c) a theoretical, that is, metaphysical *demand* or *requirement*, (d) a psychological/intellectual desire … or what? Peirce and Polanyi, with their realist views of science, allow us to answer "yes" to (a) and (b), which really are not in opposition, but (c) and (d) require closer discussion.

There is clearly operative in us—at out best moments—not just a desire for intelligibility but a desire for *aesthetic* intelligibility, a desire for the cosmos, like a work of art, to display both an immanent and a transcendent sense of order, a cosmic aesthetic order, an order that is not just a projection of our desires, pushing us *a tergo*, but a *lure*, pulling us *de fronte*. Peirce explores this possibility in his "neglected argument" essay. But why do we think we *need to have* a cosmos as an intrinsically *aesthetically* ordered whole if the cosmos is to have religious relevance? Is this a reasonable demand? How would it be accessed? It is clear that from one point of view the cosmos—in order to be the universe—must be a unity, even if it is not an "object" presented to us in perception. Looked at objectively, the universe displays laws that "hold it together." But, on the religious naturalist position, no one holds it together. There is no actualized and grounding cosmic vision of the whole. Our apprehension of the world is irretrievably finite. But, faced with what Mikel Dufrenne called "the plenitude of the perceived" and "the total immanence of a meaning in the sensuous" (*In the Presence of the Sensuous* p. 83; cited in *Reach*, p. 108),[32] we have to admit that, notwithstanding the absence of such an *actualized* vision of the whole, we still intend or try to achieve a kind of cosmic vision. This is the motor of religious longing.

What is the actual object—the effective object—of this vision? Is it something, in the words of Schiller, "for which mind has no concept nor speech any name" (Schiller, *On the Aesthetic Education of Man*, p. 109; cited in *Reach*, p. 110),[33] that is, something that transcends all definite description, something that Dewey characterizes as "the mysterious totality of being the imagination calls the universe."[34] It is "no thing at all." Writing from a thoroughly naturalistic position, Dewey claims that "the idea of a whole, whether of the whole personal being or of the world, is an imaginative and not a literal idea. The limited world of our observation and reflection becomes the Universe only through imaginative extension. It cannot be apprehended in knowledge nor realized in reflection"(*Common Faith*, pp. 18-19). In his *Art as Experience*, Dewey also writes:

> We suppose that experience has the same definite limits as the things to which it is concerned.
> But any experience … has an indefinite total setting … in a whole that stretches out indefi-

> nitely…. Any experience becomes mystical in the degree to which the sense, the feeling, of the unlimited envelope becomes intense – as it may do in experience of an object of art. … This sense of the including whole … is rendered intense within the frame of a painting or a poem. … A work of art … accentuates this quality of being a whole and of belonging to the larger, all-inclusive whole which is the universe.[35]

Religious images, and experienced forms with religious import, do precisely this. They formulate experience in such a way that they are experienced as "samples from the sea" of existential attitudes. Dewey further writes, with echoes of James, of "the religious feeling that accompanies intense aesthetic perception: … however broad the field, it is still felt as not the whole; the margins shade into that indefinite expanse beyond which imagination calls the universe" (*Art as Experience*, p. 195). This applies not just to religious artworks but to our experience of nature apart from, even if informed by, our experiences of such artworks.

But, what if, without having recourse to any Kantian-type regulative principles or the Whiteheadian-Hartshornean ontological postulate of a cosmic appreciator, the desire for aesthetic unity is best seen as an *enabling device* to stabilize and preserve the intrinsic values of the universe, *emergent with us*, but without an ultimate preservation/preserver of value who would also be the object of an aesthetic regard? What if the distinction between *projection* and *lure* is not ultimate? And what if our deepest fiduciary commitment is to this?

Peirce and Polanyi would admit that a price is to be paid if the aesthetic intelligibility of the cosmos as a support of our religious orientation is a feature of our demands and not a feature of the world independent of these demands, *which are themselves objective*. There is also a price to be paid if we give up the demand for the religious context of the aesthetic intelligibility of the world: extreme impoverishment of our experience. So, we could ask what is to be gained if we *accept the demand* without any way of either accepting or being able to prove the aesthetic intelligibility of world itself *independently of our responding* to it? Would this make the aesthetic intelligibility of the cosmos any less objective? Can we *reconstitute the values* intrinsic to the demand and intrinsic to our position in the universe while discarding the metaphysical claims of a transcendent (or transcendental) grounding? Do Peirce and Polanyi really need such a grounding outside the processes of *natura naturans*? Is, indeed, a human grounding all that we need and in fact a constitutive component of our response to objective features of the world? Hepburn speaks of "aesthetic reworkings of religion" (*Reach,* p. 106) and of the need for "placing aesthetic concepts against a background of religious concepts"(108).

Religious naturalism in "displacing God" from the focal point of life and of metaphysical explanation needs, however, as Ferré says, something else to occupy "the logical space of God" as context of contexts (*Living and Value*, p. 178). Within the frame of religious naturalism it is nature as a union of process and pattern not the God of theism that functions as the metaphysical and the religious ultimate. Religious images and religious affections are not directed toward such a God and consequently religious naturalism is faced with a comprehensive re-reading, reconstruction, and filtering of the great vortex of sacred symbols. In this, of course, religious naturalism is not alone, since there are even non-theistic forms of Christianity and of Judaism which retain the "experiential logic" of the Jewish and Christian form of life and all the existential attitudes, shorn of their dogmatic context, belonging to it.[36] The fertile ambiguity of Schleiermacher is only one great and still relevant "high theological" instance of such an approach, with Spinoza lurking in the background. Tillich, and maybe even Peirce, are also put into play with their own Schellingian background.[37] The major systems of Eastern thought exemplified in the philosophical traditions of Taoism, Confucianism, Buddhism,

and Advaita Vedanta find the anthropomorphic and dualistic position on the "divine" or "ultimate" reality that permeates all Western "onto-theology" inadequate. They elicit and inform very different "spiritual exercises." The function of God in the Western metaphysical tradition is to *ground* or *integrate* the complex diversity of the cosmos, without itself being identical with it, except within a pantheistic frame such as Spinoza's, where God is identified with the laws of nature and is worshipped by a philosophical intellectual love. The ultimate premise is that the universe needs a *ground* to support it by reason of its radical contingency and that it needs an *integrator* to hold it together by reason of its centrifugal variety. While the ground is often conceived as an antecedent rational order—Plato's ideas, the logos of the Stoics, the divine ideas of Aquinas, Whitehead's eternal objects—the universe itself is seen, from our side, to be a heterogeneous and often powerfully and overwhelmingly disordered, yet creative, field, which nevertheless displays profoundly attractive features that pull us toward it (and repel us, too) in the deepest ways. Stuart Kauffman has foregrounded this side of things in his *Reinventing the Sacred*.[38] Kauffman's position is remarkably close to Polanyi's, but without a commitment to or a need for theism.

Further Considerations

The universe is, it must be admitted, a *source* of aesthetic delight and almost unspeakable sublimity purely on the level of experience. Both Peirce and Polanyi bear witness to this in their insatiable openness and interest, as does Chet Raymo in his attempt to construct a non-theistic sacramental Catholicism, developed in his *When God is Gone Everything is Holy*. Our experiences of the universe are marked by properties that are distinctively aesthetic, properties that mark our own consciousness and forms of apprehension, that constantly and permanently pull us "beyond the finite."[39] We, surface dwellers that we are, are still perplexed by systemic forms of disorder. The cosmos does not appear, and in fact is not, entirely benign and its aesthetic, that is, harmonious, order is not unproblematically apparent. We *want* by pure spontaneity of mind for there to be such an order and orderer, as Peirce opined. We want the cosmos, or at least central parts of it, to be not just intelligible on the explanatory level—the level of laws, theories, formal symmetries captured in equations and the periodic table and the statistical processes of genetic replication—but we want, on the affective level of ontological attunement, a deep intrinsic harmony that ultimately "accepts" the presence of intrinsic elements of disharmony, integrating them into a higher, even if hidden, unity. Theism, in whatever form, and the philosophical position embodied in the *Dao de Jing* share the desire for "acceptance," but divide on the meaning of "accepts." Accepting in the sense of "allowing for," as in Taoism, is quite different from accepting in the sense of the necessary consequences of a personal decision of a creator or orderer God. This latter sense is the aesthetic-metaphysical thrust of the Whiteheadian tradition in its theistic form, a form that has been challenged by Donald Sherburne in his classic examination and (de)construction of a Whiteheadian theo-aesthetic and by Frederick Ferré's development of the notion of a kalogenic universe and the appropriate practices for living and creating value in it, especially values immanent in types of experiences.

The desire for an aesthetic unity of the cosmos—for an ultimate aesthetic unity—is, then, clearly a deep *affective demand*. Such a demand is exemplified in paradigmatic occasions of experiencing marked by what Whitehead called "affective tones" of a special sort and which we have already seen Dewey gesturing toward in his notion of an open spiral of experiencing. These "aesthetico-metaphysically" tinged affective tones have, in the long term, a focal object that, depending on the theoretical context and even if intrinsically vague, is both metaphysically and religiously ultimate. But, one could ask, is there any real difference in the "quality" of the affective tones if the thematic "object" of such cosmic affective intentional structures can be

construed in radically different ways? One is once again reminded of, and challenged by, Schleiermacher's ambivalent characterization, deeply influenced by Spinoza, of the ultimate object of a religious consciousness marked by "creature consciousness" or the sense of "ultimate dependency": *God or the universe*. This ambivalence is the root of the charge of pantheism against Schleiermacher. Both—God and the universe—are totalities. The question is, What happens to our aesthetico-religious appropriation of them, if they so clearly belong to such radically different contexts?

Further, how, or in what sense, does an aesthetic attitude, rooted in a wondering sense of finitude and ontological dependency, contribute to rendering God or the cosmos intelligible and hence *worthy* of our regard, that is, a thing of value and beauty, displaying, to have recourse to Aquinas's formulation, (a) *claritas sive splendor formae*, (b) *integritas sive perfectio*, and (c) *consonantia sive debita proportio* (shining, wholeness, and harmony—*Summa Theologiae* I, 39, 8c)?

Aquinas's formulation applies clearly to finite instances of beauty, which he considers to be reflections in nature of (a) the beauty of the divine being and (b) the beauty of the cosmos as a whole as *ordered*, in spite of its recalcitrance, and *enjoyed*, in spite of its irretrievable losses and tragedies, by the divine being, the cosmic poet or dramatist, according to Hartshorne and Peirce (for Peirce the universe is "God's poem"). But neither God nor the universe is a puppet master, since the creative process is not under the rule of strict necessity. In the theistic form of process thought God is, or can be, surprised by the course of creation. Frederick Ferré, writing out of the same tradition, denies the need for a cosmic integrator. "Monotheism," he writes, "is a possible but not a compelling aspect of Whiteheadian organicism. Perhaps the universe is not centrally organized, after all" (*Living and Value*, p. 209). Neither Peirce nor Polanyi have established this on theoretical grounds. Maybe nobody has.

One could ask, further, in what sense(s) can one really say then that God takes, and so should we, *aesthetic* satisfaction in the course of creation, that God finds the cosmos beautiful, that God *integrates* the cosmos *aesthetically* and weaves it into the prehensive field of his consequent nature so that it makes up a "divine order"? This is, of course, not the infinite act of understanding of the classical theistic tradition, God's eternal act of omniscient understanding, an ecstatic vision marked by "delight." The delight, from the classical theistic point of view, seems to be a purely intellectual one, marked by a transparency and lack of opaqueness, which are the exact opposites of our forms of consciousness. Process thought, in its theistic form, of course, attacks this, transforming the delight into an aesthetic delight, an unsurpassable or maximal aesthetic delight, in that everything can be brought into a felt unity, with maximal contrast, and has been done so in all its felt particularities. But what we finite beings actually have in experience are fragmented and perspectival harmonies that we both uncover and create. The universe, from the experiential side, as the pragmatists have shown, is made up of local integrated systems that follow their own trajectories within the creative womb of time and the boundaries of cosmic law, which binds order and chaos together. Novalis's remark that "chaos, in a work of art, should shimmer through the veil of order" has real resonance in this context, especially if we think of chaos as not merely disorder but dynamic and serendipitous creativity, the perpetual shimmering of cosmic process itself. The veil of order, Polanyi establishes, is an achievement, on both the ontological and the experiential levels. It marks nature and it marks our efforts to apprehend it adequately.

The veil of order arises and is grasped in what Hepburn calls "visionary glimpses" which characterize imagination's "stammering after transcendence" (*Reach*, p. 82). This stammering never stops or reaches full and total articulation, in accordance with Polanyi's notion that articulation always remains incomplete.

This stammering after transcendence is composed of the "attitudes and evaluations that now constitute the religious orientation" (*Reach*, p. 87). Hepburn agrees with George Steiner's claim in his book, *Real Presences*,[40] that "the aesthetic is the making formal of an epiphany," (p. 226; cited in *Reach*, p. 100), but gives it a substantially different interpretation. Steiner was enamored of the fact that the meaning of an artwork, whether poem, painting, a piece of music, emerged out of its underlying carriers: words, brush strokes, tones. This emergence of a novel quality out of an antecedent set of conditions is meant to show that meaning "transcends" its supports, that the supports have no meaning in themselves but need a generative consciousness that animates them, which is precisely Polanyi's point. Steiner wants to say that this model of emergent meaning grounds the transition from the emergence of meaning on the experiential plane to the emergence of meaning on the cosmic plane. While not claiming that God is emergent from the world, Steiner still claims that God is the guarantor and ground of the emergent higher order meanings of the world. The seems to be an experientially unwarranted conclusion. Of course, the question is whether higher order meanings either need God, as guarantor, conservator, and condition of possibility, or even point to such a higher meaning. Meaning is the "soul," or animating principle, of a set of particulars, but this does not entail that God, as world soul, is needed to inform the materials and endow them with meaning. It is not evident that either Peirce or Polanyi think so. It is clearly quite foreign to Polanyi's own conceptual framework.

But I think, with a gesture toward Polanyi, that we can go in another direction here with a differently weighted distinction between *emergence* and *embodiment*: the emergence of novel forms of feeling and their embodiment in pregnant symbols. Hepburn speaks of "religiously toned aesthetic experiences" (*Reach*, p. 110) wherein the "extrapolatory, transcending movement of the mind may have no actual terminus" (*Reach*, p. 110). Such a movement culminates in what seem to be "time-transcending moments," Polanyi's ecstatic vision, of aesthetic integration where "everything comes together" and there is a sense of primal unity and of being caught up in an ecstatic moment. The screen of concepts falls away, as Polanyi says, and we are poured directly into experience. Paradigmatic examples of this, as charted by Hepburn, are experiences of music (think of Bach's B-Minor Mass or St. Matthew Passion, Mozart's great Mass in C Minor, Beethoven's late quartets, Mahler's 9th Symphony, and so forth) or peak experiences such as those charted in Wordsworth's account of the ascent of Mount Snowdon. But they are also clearly shown, with startling and overwhelming power, in such images as Bellini's *St. Francis in the Wilderness* in the Frick Museum in New York and Ma Yuan's *Mountain Path in Spring*.[41] These two paintings, from radically different traditions, present images of being "placed" in the cosmos. But are their "affective tones" or "defining qualities" really inseparable from either their implicit or explicit metaphysical contexts, the one of theism and the other of a Taoist religious naturalism? Do they not have something deeply in common? Both St. Francis and the walker are in and out of the landscape, are *embodied*, just as the images of their embodiment are themselves embodiments. These images arise and are not just "about" or thematize philosophical and theological positions but express, or present, the "morphology" of ecstatic vision, of being caught up in what Karl Jaspers called "the encompassing." Every particular in each image is a vector pointing toward a focus, which is the "import" of the total configuration. These images belong to both the aesthetic and the religious dimensions of experience and of meaning-making and show their deep affinity. In both these cases we see the validity of Dufrenne's comment that "Art's task is to bring the spiritual before our eyes in a sensuous manner" (*Presence of the Sensuous*, p.83; cited in *Reach*, p. 74), witnessed to by the powerful vortices of symbolic images spiraling out of religious traditions that are haunted by the irresolvable tension between absence and presence on both the semiotic and metaphysical levels.

Symbols, according to Dewey, "afford the only way of escape from submergence in existence."[42] This is, in the present context, the role of aesthetic and religiously toned symbols, which always contain an

interpretation, or are themselves interpretations in the presentational (Langer) or exhibitive (Buchler) mode. They lift us out of immediate existence as they orient us toward participation in a novel dimension of reality. But it is not their explicit subject matter that is at issue, which is subject to bitter dispute; it is the felt qualities of the encounters that are engendered by a subject matter that remains discursively beyond our grasp or at least beyond universal agreement. When Hepburn speaks of "the way in which aesthetic experience approaches experience delineated in theistic language" (*Reach*, p. 104), he is trying to find "an aesthetic home for the sacred … neither demonizing nature nor divinizing it, but concerned to contemplate and celebrate nature as it is, so far as that is a coherent objective" (*Reach*, p. 158). *Contemplation* and *celebration*: are these not the paradigmatic acts that spread the aesthetic lattice over the experienced world, independently of whether there is a cosmic contemplator celebrating creation?[43]

What do the acts of contemplation encounter? First and foremost, the unsettling realization that there is a world, the *es gibt* of a massive presence, the experience of the world as *gift* and as bearing physiognomic features of mysteriousness, hiddenness, and sublimity that elicit respect, reverence, wonder. The sacred and the transcendent on a naturalistic view must be, as Hepburn puts it, connected with fragility, with cosmic insecurity (*Reach*, p. 118) manifested in our recognition of the "dysteleological side of the world" (*Wonder*, p. 152). This leads to the wonderment that we began with, a wonderment that arises spontaneously in the receptive mind, but not in the mind which is closed and hardened. Hepburn writes: "Wonder may well become the core of the component of "strangeness and mystery," in place of the dumbfounded response to the supposedly supernatural" (*Reach*, p. 125). As Hepburn says, "to be evocative of wonder, an object need not be seen as filtering the perfections of deity" (*Wonder*, p. 144). What Dewey points out in the case of our perception of a painting, that "there is an impact that precedes all definite recognition of what it is about" (*Art as Experience*, p. 150), is also the mark of our encounter with the *fact* of nature and its combination of processes and patterns including the affect-drenched images which, arising out of the symbolic world of human creativity and forms of apprehension, hold the whole world before us in a kind of sacramental vision. Do they not show the aptness of Schleiermacher's remark that "to be one with the infinite in the midst of the finite and to be eternal in a moment, that is the immortality of religion" (*On Religion*, p. 54)? And of Goethe's remark from his poem, *Gott, Gemüt und Welt*: "If you want to reach the infinite, stride in the finite in all directions." In this sense infinite wondering, but not wondering about an ontologically transcendent infinite, becomes "*life-enhancing*" (*Wonder*, p. 144) and takes on an ethical tone that complements the existential tone arising from the sense of radical contingency.

Wondering and its modes, and its distillation in intense experiences, cause nature in all its modes, Hepburn writes, to "burgeon forth in the light of our consciousness" (*Reach*, p. 161) in all its "freshness and radiance" (*Wonder*, p. 143). In the process we summon objects and ourselves "out from the everlasting darkness in which they had been interred" (*Reach*, p. 111). It is this summoning, and the sense of this summoning, that gives rise to the "feeling qualities of the sacred" (*Reach*, p. 127) that are embodied in our "sacred signs."[44] Iris Murdoch alludes to Plato's suggestion in the *Timaeus* that man "saves or cherishes creation by lending a consciousness to nature."[45] But if religious naturalism is right in at least one thing, it is that the saving and cherishing is something that we do and ought to do, and it is manifested in a creative symbolic consciousness that has left not just a rich heritage of symbolic images for us to explore, reconstruct, and live by, but capacities to read the great cipher-script of nature itself in terms of its symbolic pregnance and its magnetic power to pull us toward it in rapt acts of attention. The power of symbolic transformation turns the objects of experience themselves into symbols, as Susanne Langer saw and exploited in her great semiotic project.

Polanyi writes that "the universe of every great articulate system is constructed by elaborating and transmuting one particular aspect of anterior experience … in terms of its own internal experience" (*PK* 283). Religious naturalism takes the *es gibt* of nature as both the starting point and the end point, elaborating and transmuting it in terms of sought for forms of participation. This internal experience is marked by a distinctive "quality" in the Deweyan sense, in this case at hand, the *quality of wondering*, of existential perplexity and of contemplative participation in *natura naturans*. In the words of John Dewey, "the gist of the matter is that the immediate existence of quality, and of dominant and pervasive quality, is the background, the point of departure, and the regulative principle of all thinking."[46] Polanyi writes that "a valid articulate framework may be a theory, or a mathematical discovery, or a symphony. Whatever it is, it will be used by dwelling in it, and this *indwelling can be consciously experienced*" (*PK* 195, my emphasis). The construction in images, image-schemas, and metaphorical networks of a religiously toned aesthetic frame may be in service of a theory, exemplifying it, but it is not itself a theory and indeed may even supplant or dispense with theory. Dwelling in the flux of experience in a self-focusing manner in participatory contemplation, Polanyi says, "dissolves the screen (of theory), stops our movement through experience and pours us straight into experience; we cease to handle things and become immersed in them … As we lose ourselves in contemplation, we take on an impersonal life in the objects of our contemplation" (*PK* 197). Is this not what is exhibited in the Bellini and Ma Yuan? These images *frame* a paradigmatic cosmic experience, exhibiting a form of feeling immanent not just in the relational configuration of the frame, but in the circle of our own experience. They are to be validated and not verified, if we can follow Polanyi's critical distinction here.

Polanyi speaks of our being *carried away* by the sets of subsidiary particulars, functioning as vectors, which support our processes of sense-making. It is precisely this process of being carried away that marks the kind of aesthetic intelligibility I have been grappling with, one that admits its radically constructive nature without having to commit itself to the metaphysical conclusions of an objective integration of the cosmos as opposed to an integration of the self over against and in relation to the cosmos and its emergent features and values. Climbing Mount Snowdon "framed" a nature-oriented perceptual occasion for Wordsworth just as his poem frames a perceptual occasion, an event of meaning, for us, and just as Bach's B-Minor Mass does or any work of art with religious resonance, independent of its factual claims or dogmatic commitments. Such frames are reservoirs of authentic religious feeling. While the experience of climbing Mount Snowdon is the experiencing of a natural object, that is, Mount Snowdon itself as a symbol of ascent, the second experience, of Wordsworth's poem, is clearly, in the most literal sense, of an "unnatural object," a symbolically pregnant form in which we see embodied the deepest forms of response to the mystery of life and of the world. This is the case of all those frames that we use as instruments of self-integration and orientation. They manifest specific morphologies of feeling, in Langer's sense, wherein each element of the frame has a role in the configuration, functioning as gradients informing our subjectivity at all levels.[47]

They are, in Polanyi's terminology, symbols. Consider the following passage from *Meaning*:

The symbol, as an object of our focal awareness, is not merely established by an integration of subsidiary clues directed *from* the self to the focal object; it is also established by surrendering the diffuse memories and experiences of the self *into* this object, thus giving them a visible embodiment. This visible embodiment serves as a focal point for the integration of these diffuse aspects of the self into a felt unity, a tacit grasp of ourselves as a whole person in spite of the manifold incompatibles existing in our lives as lived. Instead of being a self-*centered* integration, a symbol becomes a self-*giving* one, an integration in which not only

the symbol becomes integrated but the self also becomes integrated as it is carried away by the symbol—or given to it.[48]

The theme of the religious dimension of aesthetic intelligibility, as I have been posing it, is precisely what symbols and what features of experience, what symbolically pregnant experiences, we are to give ourselves to and what their proper significate effects are and their ontological reach. Polanyi's foregrounding of self-giving and participation is complemented by Peirce's account of the multileveled self that is given to the play of meanings and that strives to integrate itself in linkage to the world.

Looked at in Peircean terms this self-integration occurs by means of iconic, indexical, symbolic (in Peirce's sense) elements that make up the constitutive factors of the symbolic configuration, in Polanyi's sense of that term. The self-integration takes place on the affective, actional, and "logical" levels, corresponding to the schematization of Peircean interpretants, what Peirce, as we have seen, called the "proper significate effects" of signs and of the sign-functioning dimensions of experience.

First of all, looked at iconically, the cosmic vision, as expressed, is composed of a set or field of images or rather affect-laden images in the semiotic mode or features of experience. What image-field or perceptual-field informs the cosmic vision? One source is clearly the "scientific imagination," the best possible imaginative vision of the universe, as Polanyi pointed out, upon which an appropriate religious imagination is built. Religious naturalism, in the discursive mode, supplies this. Another source is the religious imagination, with its various background conditions and conceptual commitments. This imagination is clearly not always theistic and its imaginal supports have what Nelson Goodman referred to as a split or double reference: "down" to the thematic contents they are denoting and "up" to the existential attitudes they are expressing and which are embodied in them. The world as a field of pregnant objects and images, joined in and grounded in the deep play of resemblances, gives rise to Peircean emotional/affective interpretants.

Secondly, from the indexical side, the cosmic vision has a vectorial power to direct both perception and action. It gives rise to Peircean energetic interpretants. The elements of the cosmic vision, its affect-laden particulars, interrupt us in our everydayness and pulls us out of ourselves, ecstatically, and directs us, in stipulated ways, to the object of our cosmic focus. It forces us to "pay attention" to the world, in Simone Weil's conception of the task. The indexical side makes up the vectorial particulars, directed perceptual lines of force, that point to a focus, just as Polanyi schematized. Polanyi would call them subsidiary particulars separated by a logical gap from what they "mean." The distinctiveness of these particulars, however, to follow Polanyi's lead, is that they are "parts" of ourselves. The prime religious symbol, or symbolic image, is something we are forced to give ourselves to, something that we pour ourselves into, something that we find ourselves in—or refuse.

Thirdly, continuing the Peircean schematization, from the symbolic side, there is an intelligible core, an integrating unity, that is, a *content* (albeit a qualitatively defined content) that holds the elements of the cosmic vision together and that "refers" to something "objective." The cosmic vision, on the symbolic side, is a semiotic lattice, a conceptual frame. It is a grid through which, or a system within which, we apprehend the cosmos itself as a content. The cosmos is apprehended in a global fashion and other objects in it are apprehended in more specific, focused fashion, with its individual properties and expressive features proper to the links and linkages of the religious vision. The religious vision, rooted in attending to the world, points up

to and exemplifies existential attitudes and points down to and denotes some scientific, historical, or dogmatic claim. It is the very nature of these claims that a religious naturalism puts into play. Religious naturalism is established on the symbolic level of argumentation, but it is practiced on all three levels.

Conclusion

At the end of his *Human Nature and Conduct,* John Dewey wrote that "to be grasped and held … consciousness needs … objects, symbols." The objects and symbols induce, in his words, "reverences, affections, and loyalties which are communal." Religion, he goes on to say, "as a sense of the whole is the most individualized of all things, the most spontaneous, undefinable and varied. For individuality signifies unique connections in the whole."[49] The challenge set to us by religious naturalism is to develop habits of attending that open us up to the sense of the whole and show us how to engage the web of unique connections. Peirce and Polanyi supply powerful and complementary tools for clarifying just what these habits of attending consist of and what attending to the world in this manner does to us.

Endnotes

[1]On Peirce's undeveloped, fragmentary, and ambiguous theological positions see for fundamental orientation and extension Donna M. Orange, *Peirce's Conception of God: A Developmental Study* (Bloomington: Indiana University Press, 1984), Michael Raposa, *Peirce's Philosophy of Religion* (Bloomington: Indiana University Press, 1993) and his "Peirce's Theological Semiotic," *The Journal of Religion* 67/4 (October 1987): 493-509, Vincent Potter, *Peirce's Philosophical Perspectives* (New York: Fordham University Press, 1996), Robert S. Corrington, *An Introduction to C.S. Peirce: Philosopher, Semiotician, and Ecstatic Naturalist* (Lanham, MD: Rowman and Littlefield, 1993) and *A Semiotic Theory of Theology and Philosophy* (New York: Cambridge University Press, 2000), Robert Neville, *Realism in Religion: A Pragmatist's Perspective* (Albany: SUNY Press, 2009), and most recently Leon Niemoczynski, *Charles Sanders Peirce and a Religious Metaphysics of Nature* (Lanham, MD: Lexington Books, 2011). They give a taste for the variety of conclusions to be drawn from Peirce's scattered remarks. Joseph Brent, *Charles S. Peirce: A Life,* Revised and Enlarged Edition (Bloomington: Indiana University Press, 1998) puts us on ground level of Peirce's religious experiences.

Polanyi's religious positions have been explored and debated in many places, as readers of *Tradition and Discovery* are clearly aware. Ground level for discussion of Polanyi's religious affiliations and implications is William Scott and Martin Moleski, S.J., *Michael Polanyi: Scientist and Philosopher* (New York: Oxford University Press, 2005). Thomas Torrance explored the implications of Polanyi's work in his *Belief in Science and in Christian Life: The Relevance of Michael Polanyi's Thought for Christian Faith and Life* (Edinburgh: Handel Press, 1980) and *Reality and Scientific Theology* (Edinburgh: Scottish Academic Press, 1985). See the references to "God" in Drusilla Scott, *Everyman Revisited: The Common Sense of Michael Polanyi* (Grand Rapids, Michigan: Eerdmans, 1985). Harry Prosch, *Michael Polanyi: A Critical Exposition* (Albany: SUNY Press, 1986) confronts more orthodox appropriators of Polanyi's work in a critical manner. See also William Poteat's *Polanyian Meditations: In Search of a Post-Critical Logic* (Durham: Duke University Press, 1985) and his *A Philosophical Daybook: Post-Critical Investigations* (Columbia: University of Missouri Press, 1990). Tony Clark writes: "The debate about Polanyi's views on religion reflects a substantial uncertainty about whether the God of whom Polanyi speaks has an existence which is independent of human imagination. The secondary literature only serves to show that Polanyi's position on this question is far from clear" [*Tradition and Discovery* 32/3 (2005-2006): 28].

[2]I have discussed Peirce and Polanyi together in a number of formats: in relation to models of consciousness in my *Consciousness and the Play of Signs* (Bloomington: Indiana University Press, 1994), in relation to the perceptual roots of linguistic meaning in my *Pragmatism and the Forms of Sense* (University Park: Penn State University Press, 2002), in relation to ritual in my "The Tacit Logic of Ritual Embodiments," in *Ritual in its own Right*, edited by Don Handelman and Galina Lindquist (New York: Berghahn Books, 2005), pp. 197-212, in an aesthetic context in my "Dimensions of an Aesthetic Encounter," in *Semiotic Rotations* (Charlotte, NC: Information Age Publishing, 2007), pp. 113-134, and in the context of an exploration of the cultural matrices of meaning-making in my "Meaningful Connections: Semiotics, Cultural Psychology, and the Forms of Sense," in Jaan Valsiner (ed.), *The Oxford Handbook of Culture and Psychology* (New York: Oxford University Press, 2012), pp. 255-276. I have treated the nature of religious naturalism in another context in my 'Royce and Religious Naturalism,' forthcoming in *Cognitio* 12/2 (2012).

[3]The two works that constitute the foil to these comments are *"Wonder" and other Essays: Eight Studies in Aesthetics and Neighboring Fields* (Edinburgh: at the University Press, 1984) and *The Reach of the Aesthetic: Collected Essays on Art and Nature* (Aldershot: Ashgate, 2001).

[4]See for the general background of these comments Jesper Hoffmeyer, *Signs of Meaning in the Universe*, translated by Barbara J. Haveland (Bloomington: Indiana University Press, 1996) and *Biosemiotics: An Examination into the Signs of Life and the Life of Signs*, translated by Jesper Hoffmeyer and Donald Favareau (Scranton: University of Scranton Press, 2008).

[5]As we will see, Peirce's love of triads will illuminate a number of issues: metaphysical, psychological, and semiotic. But any detailed discussion of these triads is not needed in the present discussion. See, however, the compact and accessible account in John K. Sheriff, *Charles Peirce's Guess at the Riddle: Grounds of Human Significance* (Bloomington: Indiana University Press, 1994) and James Jakób Liszka, *A General Introduction to the Semeiotic of Charles Sanders Peirce* (Bloomington: Indiana University Press, 1996).

[6]The reference to lure is to a central feature of Whitehead's account of how God influences the world.

[7]Donald Crosby, *A Religion of Nature* (Albany: SUNY Press, 2002) and *Living with Ambiguity: Religious Naturalism and the Menace of Evil* (Albany: SUNY Press, 2008).

[8]See especially Gordon Kaufman, *In the beginning … Creativity* (Minneapolis: Fortress Press, 2004) and *In Face of Mystery: A Constructive Theology* (Cambridge, Mass: Harvard University Press, 1993).

[9]Crosby in his *A Religion of Nature* (p. 118) writes that "any basic object of religious concern … can be characterized by six 'role-functional' categories and their interrelations": uniqueness, primacy, pervasiveness, rightness, permanence, and hiddenness. He shows quite clearly that nature as process and pattern can fulfill these roles. That nature is the only object to fulfill these roles is certainly not the case: God, the Tao, Brahman, and so forth can likewise. But, we are faced with making a conceptual decision as to what characterization of the ultimate we are to choose. No matter which terminus we propose, Crosby points out, it will still have to fulfill these functional roles in the religious life. The question we will be facing is how these role functions are accessible in the aesthetic mode, without claiming, of course, that that is the only way.

[10]Robert E. Carter, *The Nothingness Beyond God* (St. Paul, Minnesota: Paragon House, 1997).

[11]This is an important point that lies at the base of Frederick Ferré's proposals in his profoundly stimulating *Living and Value* (Albany: SUNY Press, 2001).

[12]See Joseph Grange, *Soul: A Cosmology* (Albany: SUNY Press, 2011) where this term functions in a central way, against the background of rather unorthodox use of Spinoza.

[13]Robert Neville has charted in accessible form the scope of such a reconstruction in his *Realism in Religion: A Pragmatist's Perspective* (Albany: SUNY Press, 2009) fundamentally under the rubric of a philosophy or theology of symbolic engagement, using pragmatist conceptual and semiotic tools, primarily derived from Peirce. This is not the place to examine his defence of a theistic naturalism as opposed to Crosby's

non-theistic naturalism. A powerful exemplification of oscillation between frameworks is Paul F. Knitter, *Without Buddha I Could not be a Christian* (Oxford: One World, 2009), with the dedication "For my atheist brother, Don, who did his best to keep me honest." See also the moving work of Richard Holloway, *Looking in the Distance: The Human Search for Meaning* (Edinburgh: Canongate, 2004), devoted to reflecting upon Vasilii Rozanov's aphorism: "All religions will pass, but this will remain: simply sitting in a chair and looking in the distance." How we look is the crux of the matter.

[14]See Vincent Colapietro, *Peirce's Approach to the Self: A Semiotic Perspective on Human Subjectivity* (Albany: SUNY Press, 1989) and chapter one of my *Consciousness and the Play of Signs*.

[15]This is a constant theme in Neville's *Realism in Religion*.

[16]*Living and Value*, p. 146.

[17]It should be mentioned that Ferré was well acquainted with Polanyi's work and used it to great advantage in his *Knowing and Value* (Albany: SUNY Press, 1998). It is interesting that he made no use of Polanyi's work in his discussion of religious world models.

[18]"The distinction between two kinds of awareness allows us readily to acknowledge these two kinds of wholes and two kinds of meaning. Remembering the various uses of a stick, for pointing, exploring or for hitting, we can easily see that anything that functions effectively within an accredited context has a meaning in that context and that any such context will itself be appreciated as meaningful. We may describe the kind of meaning which a context possesses in itself as existential, to distinguish it especially from denotative or, more generally, representative meaning. In this sense mathematics has an existential meaning, while a mathematical theory in physics has a denotative meaning. The meaning of music is mainly existential, that of a portrait more or less representative, and so on. All kinds of order, whether contrived or natural, have existential meaning; but contrived order usually also conveys a message," Michael Polanyi, *Personal Knowledge* (Chicago: University of Chicago Press, 1958), p. 58; cited hereafter in text as PK .

[19]A general methodology for "translating" into religious naturalist terms the religious import of this stream of images is beyond the scope of this paper. Different traditions embody very different thematic contents and configure very different existential orientations that express our ultimate concern. Religious naturalism, in the form examined in the present essay, obviously has a greater affinity to the "high" non-theistic traditions than to the theistic. But, of course, even the type of theism engaged will also impact how the paradigmatic symbols of any tradition are interpreted. The liberal theology of the Chicago School still presents a challenge of a high order. More immediately, see Barbara Dee Bennett Baumgarten, *Visual Art as Theology* (New York: Peter Lang, 1994), where Tillich and Polanyi are examined together. I plan to return to the general hermeneutical and methodological problems on another occasion where the analytic framework will be broadened to encompass other conceptual resources.

[20](Cambridge, Mass: Harvard University Press, 1957; third edition), p. 90.

[21]This is also the practice exemplified in Chet Raymo, *Natural Prayers* (Saint Paul, Minnesota: Hungry Mind Press, 1999), *Honey from Stone: A Naturalist's Search for God* (Saint Paul, Minnesota: Hungry Mind Press, 1987), and *Once God is Gone Everything is Holy: The Making of a Religious Naturalist* (Notre Dame, Indiana: Sorin Books, 2008). Ursula Goodenough's classic book, *The Sacred Depths of Nature* (New York: Oxford University Press, 1998) explores the same issues in depth from a slightly different angle and in a most accessible and moving manner.

[22]I am referring to Polanyi's comment in *The Tacit Dimension* (Chicago: University of Chicago Press, 2009; originally published 1966) that all our thinking, and *eo ipso* our lives, "are necessarily fraught with the roots" that they embody (p. xviii).

[23]Peirce distinguishes multiple triads of interpretants. For our purposes, I restrict reference to what we can call the affective, energetic, and logical interpretants. The "interpretant" of a sign can be a feeling or

affect, a mode of reaction or existential connection, or a "thought" or "idea." These are the significate effects of the iconic, indexical, and symbolic dimensions of a sign or sign-configuration.

[24]See Potter, pp. 169-194, on Peirce's neglected argument as rooted in the play of musement.

[25]Friedrich Schleiermacher, *On Religion: Speeches to its Cultured Despisers*, translated and edited by Richard Crouter (Cambridge, England: Cambridge University Press, 1996; originally published 1799).

[26]See my *Consciousness and the Play of Signs* for an extended treatment of this theme.

[27]John Dewey's *A Common Faith* is also marked by such a non-nostalgic position.

[28]See especially chapters 9 and 10 on "God and Cosmos" of his *Christianity and Paradox* (New York: Pegasus, 1996).

[29]See Baumgarten and Paul Tillich, *On Art and Architecture*, edited by John Dillenberger and Jane Dillenberger (New York: Crossroads, 1989). Tillich's reflections have to be brought into dialogue with others, with rather different theological visions, in order to be fully evaluated. The same comment applies to other reflections on the theological implications of aesthetics such as Jacques Maritain on the one hand and Ananda Coomaraswamy on the other, who represents one strand of the *philosophia perennis*, itself a problematic notion.

[30]See John Barrow, *The Artful Universe Expanded* (Oxford: Oxford University Press, 2005).

[31]Donald Crosby has explored the problem of evil extensively in his *Living with Ambiguity*.

[32]Mikel Dufrenne, *In the Presence of the Sensuous: Essays in Aesthetics*, edited and translated by Mark S. Roberts and Dennis Gallagher (Atlantic Highlands, NJ: Humanities Press, 1987).

[33]Friedrich Schiller, *On the Aesthetic Education of Man: In a Series of Letters*, edited and translated with an introduction, commentary, and glossary of terms by Elizabeth M. Wilkinson and L.A. Willoughby (Oxford: At the Clarendon Press, 1967).

[34]John Dewey, *A Common Faith* (New Haven: Yale University Press, 1934), p. 85.

[35](New York: Perigee, 1980; originally published 1934), pp. 193-195.

[36]I am thinking of the work of Don Cupitt, Lloyd Geering , John Shelby Spong, and Mordecai Kaplan.

[37]I am referring to Niemoczynski's book. See note 1.

[38](New York: Basic Books, 2008). Kauffman says that "if we are members of a universe in which emergence and ceaseless creativity abound, if we take that creativity as a sense of God we can share" there results a "sense of the sacredness of all life and the planet" that functions as both base and goal of our fundamental religious orientation (p. 9).

[39]See Roald Hoffmann and Iain Boyd Whyte, *Beyond the Finite: The Sublime in Art and Science* (New York: Oxford University Press, 2011).

[40](Chicago: University of Chicago Press, 1989).

[41]Hepburn speaks of Bellini's painting on p. 143 of *Wonder*.

[42]*The Quest for Certainty* (Carbondale: Southern Illinois University Press, 1988; originally published 1929), p. 129.

[43]Simone Weil in *Waiting on God,* translated by Emma Craufurd (London: Collins, 1951): "Attention consists of suspending our thought, leaving it detached, empty and ready to be penetrated by the object, it means holding in our minds, within reach of this thought, but on a lower level and not in contact with it, the diverse knowledge we have acquired which we are forced to make use of. Our thought should be in relation to all particular and already formulated thoughts, as a man on a mountain who, as he looks forward, sees also below him, without actually looking at them, a great many forests and plains. Above all our thought should be empty, waiting, not seeking anything, but ready to receive in its naked truth the object which is to penetrate it" (p. 72). Weil, speaking of school exercises, thinks of paying attention as an "image of something precious,"

which certainly applies to the cases we are discussing here. She writes: "Every school exercise, thought of in this way, is like a sacrament" (*Waiting*, p. 73). So much more so is attending to nature, the context of contexts. This is also the message of Chet Raymo's wonderful books.

[44]Ori Z. Soltes, *Our Sacred Signs: How Jewish, Christian, and Muslim Art Draw from the Same Source* (Cambridge, Mass: Westview, 2005).

[45]*Metaphysics as a Guide to Morals* (London: Penguin, 1992), p. 252.

[46]"Qualitative Thought," in John Dewey, *Philosophy and Civilization* (New York: Putnam, 1931), p. 116.

[47]On Langer's model of mind see my *Susanne Langer in Focus: The Symbolic Mind* (Bloomington: Indiana University Press, 2009). On Langer and Polanyi see my essay, "Between Articulation and Symbolization: Framing Polanyi and Langer," *Tradition and Discovery* 36/1 (2009), pp. 8-20.

[48](Chicago: University of Chicago Press, 1975), pp. 74-75.

[49](Carbondale: Southern Illinois University Press, 1983), p. 226.

Intellectual Passions, Heuristic Virtues, and Shared Practices: Charles Peirce and Michael Polanyi on Experimental Inquiry

Vincent Colapietro

ABSTRACT Key Words: Critique, responsibility, inquiry, science, doubt, heuristic virtues, intellectual passions, the comparative essay as a philosophical genre.

The central preoccupation of Peirce and Polanyi was to undertake (in the words of the former) an inquiry into inquiry, one in which the defining features of our heuristic practices stood out in bold relief. But both thinkers were also concerned to bring into sharp focus the deep affinities between our theoretical pursuits and other shared practices. They were in effect sketching a portrait of the responsible inquirer and, by implication, that of the responsible agent more generally. This essay is, in structure, a series of études *for how we might reconstruct that portrait, since there is no extended treatment in the writings of either author of these central figures (the agent and, in particular, the responsible inquirer). It is accordingly a preliminary study, though in some particulars a detailed one. Its ultimate aim is to join—and thereby to invite others to join—Peirce and Polanyi* as inquirer*s into the very nature of inquiry itself.*

Introduction

The thought of Charles Peirce and that of Michael Polanyi intersect at numerous points. These points of multiple intersections are sources of mutual illumination. This has hardly escaped the notice of scholars conversant with both thinkers. Indeed, Phil Mullins, Robert Innis, Andy Sanders, and David Agler have written exemplary comparisons of these two complex thinkers.[1] Even so, more (arguably much more) needs to be done in this regard. What these scholars have already so compellingly shown is that Peirce and Polanyi drew many of the same conclusions, were preoccupied with many of the same questions, and possessed strikingly similar sensibilities regarding fundamental matters. In brief, Peirce and Polanyi invite comparison as much as any two thinkers with whom I am familiar.

In general, comparative studies are a distinctive genre of philosophical discourse. It is far from surprising to encounter an essay on (say) Martin Heidegger and Ludwig Wittgenstein or one on Charles Peirce and Jacques Derrida or, finally, even a volume of essays on Emmanuel Levinas and Jacques Lacan. We have become accustomed to such juxtapositions. Though sometimes such ventures can be little more than (if indeed that) tedious exercises in hermeneutic cleverness serving no commendable purpose, they are often sources of illumination and insight. But perhaps too little attention has been paid to the pragmatics of such comparisons. Studies animated by a spirit of *rapprochement* are indeed among the most commonplace forms of philosophical discourse, though not all comparative studies are necessarily animated by this spirit. In any event, reflection on what we are doing when we are engaged in the work of *rapprochement* or simply comparison is surprisingly slight and sporadic. The obvious answer (bringing together disparate thinkers, traditions, or texts for the sake of calling attention to unsuspected affinities and differences) is neither mistaken nor adequate. This *is*, in truth, what we are doing or, at least, aspire to accomplish in such studies. Hence, the obvious answer is far from an inadequate one. Matters are, however, hardly so simple. The purposes being served by such comparisons call for our scrutiny. Pointing out similarities and dissimilarities

is one thing; doing so in such a manner as to advance inquiry or to aid whatever endeavor it is—the very inquiry or undertaking in which the authors being compared were passionately engaged—is quite another.

This is especially true if we take seriously Peirce's views regarding similarity. From a Peircean perspective, nothing could be easier than identifying similarities between even the most apparently disparate things. No two things are completely dissimilar in all respects. Yet, from a pragmatist perspective (at least regarding the fruitful comparison of different *thinkers*), matters are, as I have just noted, much more difficult.[2] Accordingly, the task of *showing* in detail, for some important purpose, how two thinkers are alike is not itself sufficient. In executing this task, one would have to contribute to the fuller realization of such a purpose—a truly philosophical (and not merely a hermeneutic) purpose.

In comparing what Peirce and Polanyi claim regarding inquiry, for example, one should aim at enhancing our understanding of this process itself. The comparison should be itself a step in the inquiry into the nature of inquiry. In general, both philosophical authors demand the *personal* participation of their readers in the elaboration of the meaning of their texts.[3] Beyond the role of the reader as an agent[4] assisting the text in realizing itself, that of the co-inquirer is, in the case of these authors, equally indispensable. Indeed, if we have not joined Peirce or Polanyi as co-inquirers—if we are not as seriously and passionately engaged in the process of investigation as they are (cf. Burchill)—we are failing precisely as readers, readers in the sense they explicitly call upon us to be. It would not be enough to show how two sticks are alike in this, that, and the other respect; it would be necessary to rub them together in such a way as to generate an illuminating flame and, then, ideally to use that flame to light the path of inquiry.

Even apart from this, however, to attend in detail to what both thinkers have to say, for example, about tradition is to have one's understanding of Polanyi enhanced by Peirce's insights and, in turn, one's understanding of Peirce deepened by Polanyi's points of emphasis. My appreciation and understanding of Peirce is inevitably enhanced by my study of Polanyi; but so too is my estimation and comprehension of Polanyi increased by my engagement with Peirce. One reason for this is that certain trajectories in Peirce's thought are traced out more fully in Polanyi's writings, while certain themes in Polanyi's thought are sounded not only more emphatically but also more delicately in Peirce's texts. Accordingly, a careful study of Polanyi can contribute to a nuanced understanding of Peirce and vice versa. But, in itself, mutual illumination is (to repeat) ultimately inadequate: fruitful suggestions for advancing inquiry, suggestions flowing from such comparisons, alone justify such a comparative study, at least if we are true to the spirit of these thinkers.

My aim in this paper is, consequently, to explore what is arguably at the center of each author's vision,[5] an attempt to offer a compelling portrait of the responsible inquirer and, inseparably connected to this, a *creditable*[6] account of experimental inquiry from the perspective of both the committed inquirer and the actual history of scientific investigation. More accurately, my goal is much more modest than this suggests, since it is merely to offer several closely related *études*, undertaken simply as preliminary studies for a more comprehensive, developed work. Inflected personally, these *études* are for a portrait of the responsible inquirer; understood processually (i.e., envisioned principally in terms of a process in which individuals participate), they are for an account of responsible inquiry. Whether or not I ever manage to turn to the task of executing this work is far less important than whether these *études* assist others in coming to terms with Peirce and Polanyi.

In taking up this task, we cannot avoid beginning *in medias res*, especially when our imperative desire is to begin at the beginning. Indeed, this desire only arises because our projects and, indeed, we ourselves are

located *in medias res*. Practically, beginning *in medias res* means beginning with our ineluctable engagement in a wide range of shared practices. We are first and foremost practitioners, implicated participants in an interwoven set of human practices (Colapietro 2006). This is not so much a consequence of thought as the result of life and the exigencies of action imposed by the business of living (cf. Whitehead 187). As infants, we are held and nurtured. In being held, fed, and otherwise nurtured, we have our first touch and taste of ethics, of how we are to comport ourselves toward others, toward nothing less than the world itself in all its promise and allurement, its imperative demands and subtle seductions as well as its abrupt reversals and unanticipated rebukes. Human agents are to a remarkable degree recognizable participants in an overlapping set of shared practices, the most important of these being arguably the linguistic practices constitutive of an identifiable language.

The very acquisition of a language, however, requires that we have already been initiated into trick learning, sign learning, and latent learning (see, e.g., *PK* 75). That is, our very ability to attain the capacity for linguistic articulation is a function of our inarticulate intelligence (see, e.g., *PK* 71ff.). Accordingly, human agency in its most rudimentary forms is the irrepressible exercise of instinctual ingenuity, an ingenuity observable in our capacity to learn how to perform tricks, use signs, and reconfigure the context of our engagements (*PK* 74). The reconfiguration of context and, therein, that of the form of action are at the heart of pragmatism.[7] Far from being a doctrine preoccupied with the most efficient realization of antecedently established ends—far from being an uncritical celebration of purely instrumental reason (cf. Horkheimer)—pragmatism is, above all, devoted to the projection of barely imaginable ends (e.g., a world in which experimental intelligence rather than brute force or the exclusive interests of an insular group shapes the course of events). Pragmatism is attentive to how both in the interstices of institutions and outside of control by institutions some genre of activity (e.g., the rearing of children or the pursuit of truth, the administration of justice or the rituals of worship) becomes reconfigured.[8]

What is utterly remarkable here is that, at a quite rudimentary level, the instinctual exercise of our inarticulate intelligence already encompasses what Polanyi calls "latent learning," that is, an ability to reorganize the very form of our own engagements with the world. While human action is always situated, the salient situations are never absolutely or inalterably given: they are inherently open to modification. They are modified by the very exercise of our agency. The human animal is, Peirce stresses, "so continually getting himself into novel situations that he needs, and is supplied with, a subsidiary faculty of *reasoning*" (*CP* 497). The dramatic result of being thrown back upon our *rational* agency in unprecedented circumstances is that what counts as (say) religious sacrifice or legal justice or commendable conduct is transformed, often quite radically. Both in reference to established modes of activity and the noteworthy modifications of those modes, however, improvisation and ingenuity are integral to intelligence, at least as this word is understood by Peirce no less than Polanyi. The most fully conditioned response tends not to be an utterly mechanical reaction, just as the most stunningly improvisational response is not an anarchical one.

Creativity, at least in the form of improvisation and innovation, is a hallmark of our agency (cf. Joas). But another feature is equally noteworthy. Our agency tends to evolve in the direction of reflexivity.[9] In the normal development of human beings, at least, we cannot but act, if only in the form of inhibition or restraint,[10] upon our tendencies to act; we cannot help but have emotional responses to our immediate feelings regarding our direct involvement in experiential affairs; and we inevitably form more or less integrated habits having a fateful bearing upon the acquisition and alteration of future habits. This implies that we cannot help but think about thinking, cannot help but inquire into the very process of inquiring, though this hardly entails that we undertake these tasks in a conscientious, careful, or effective manner. "Few persons care," Peirce observes, "to study logic, because everybody conceives himself to be proficient enough

in the art of reasoning already" (*CP* 5.358). We tend to think about thinking in a haphazard, sporadic, and fleeting manner, to inquiry into inquiry itself in a similar way. Logic in Peirce's sense is, however, a normative theory of objective inquiry (the only form of inquiry deserving this name). At the very least, then, this means that logic is a painstaking, sustained, and self-critical undertaking. In these (and other) respects, it stands in marked contrast to the *logica utens* with which we tend to be unduly contented. In Peirce's sense, Polanyi was also a logician, for Polanyi was devoted to offering a normative account of those heuristic practices instituted for the sake of facilitating genuine discoveries or disclosures. Like Peirce, he was preoccupied, *as an inquirer*, to understand more deeply and fully the task to which he devoted his life.

First *Étude*: An Inquiry into Inquiry Itself

The obvious is often easy to overlook. Peirce and Polanyi were trained scientists and, beyond this, committed inquirers whose animating concern was, over and above specific, substantive investigations, to offer a tenable theory of human inquiry in its broadest outline and (in no small measure) its most salient details. Peirce identified this as his quest of quests, his "Inquiry into the conditions of the Success of Inquiry (beyond the collection and observation of facts)" (5.568, note). In turn, Polanyi identified the task undertaken in *Personal Knowledge* to be "an enquiry into the nature and justification of scientific knowledge" (in brief, an enquiry into enquiry[11]). But he was quick to point out: "[M]y reconsideration of scientific knowledge leads to a wide range of questions outside science" (vii). In other words, they were practitioners reflecting upon their practice, in light of their participation and the relevant history of human practices, *for the sake of the refinement of that practice*. They were acutely mindful of what other practitioners had to say in this regard and often sharply critical of the pronouncements of these others. They possessed wide-ranging historical knowledge and a deep-cutting critical sensibility.

For both Peirce and Polanyi, the emphasis falls on learning and discovery, not knowing. Self-corrective processes and practices replace self-warranting cognitions or truths (Sellars; Delaney), so much so that everything is, in principle, open to revision and reappraisal. Universal doubt of a Cartesian cast is rejected, but the potentially universal scope of specific forms of genuine doubt, in the sense that *any* truth at some point might be rendered dubious by the course of inquiry itself (not in the sense that *every* truth can be rendered dubious, especially all at once, by methodological fiat[12]), is integral to Peirce's fallibilism (see Agler).

Insofar as either Peirce or Polanyi turns his attention to questions of justification,[13] the focus of concern tends to be, "How can a deliberate agent, entangled in some problematic situation, most intelligently proceed?" Their objective is not the refutation of skepticism; it is rather an account of inquiry, an account wherein the appropriate and indeed necessary idealizations of the shared practices of experimental inquiry are not allowed to eclipse the irreducibly personal dimensions of these communal endeavors. Moreover, both were devoted to crafting an account in which the immense value of formalization was given its due, but not allowed to eradicate the possibility of *acknowledging* even more basic values (such as an inherently unformalizable sense of beauty or an irreducibly personal sense of obligation). Finally, both were committed to an exacting ideal of ongoing critique, but equally sensitive to the ineliminable distinction between acritical and critical judgments.

There is a sense in which our practices are ungrounded or groundless. They themselves provide the grounds for how *to go on* (cf. Wittgenstein, I, #179). To imagine that there is something more fundamental than these practices *and* the world in which they have evolved (but a world accessible to us only in and through our participation in these practices) is to fall prey to an illusion. The insistence upon the necessity to ground our historical practices upon an ahistoric foundation—to jump outside of history as a

means of validating our endeavors—has been a defining fixation of traditional thought. Both Peirce and Polanyi have rendered themselves immune to the siren songs of an immutable order upon which our historically and evolved undertakings allegedly need to rest. They however do so without jettisoning entirely the temporally or historically invariant. Yet both of them appreciate that the transcendence of time is and can only be a partial, provisional, and precarious achievement in the very flux of time itself, that a critical distance from the densely sedimented histories in which we are ineluctably and indeed fatefully implicated is a singular achievement of historical actors. Our locus in the present is far less a prison than a point of departure from which precincts of the past can be reached and possibilities for the future can be projected.

The inquiry into the forms, functions, and conditions enabling as well as stultifying inquiry cannot be responsibly undertaken without envisioning a vast field of human practices in which our predominantly heuristic practices can be located. In just this sense as well as other senses, Peirce and Polanyi undertook this inquiry responsibly. For our purpose, however, several points are especially worthy of emphasis. First, *theory is* for both theorists *a form of practice*. Second, there is in the hands of these philosophers nothing in the least reductivistic about this characterization. Indeed, it is one thing to assert that theory is for the sake of practice, quite another to claim that theory itself is a form of practice having a status, authority, and integrity of its own. Third, there is a complex relationship between predominantly heuristic practices such as the experimental sciences (e.g., physics, chemistry, astronomy, and biology) and ones organized about goals other than the discovery of truth (e.g., the goal of insuring justice or that of satisfying the myriad desires of human organisms). Heuristic practices have been the beneficiaries of support provided by other forms of human endeavor (e.g., royal patronage, government funding, and the cultural prestige accorded these practices by ordinary laypersons) but also the victims of the intolerance, misunderstanding, and much else tracing their origin to these other endeavors. Given the vulnerability of inquiry to disfigurement or worse (corruption at its very heart), there is an abiding need for heuristic practices to protect themselves from the corrupting influences of other culturally sanctioned forms of human endeavor. In a later *étude*, I will return to this point, so for the moment I will content myself with noting that the integrity of a practice, especially such a practice as physics of chemistry, is ubiquitously vulnerable to internal corruption and external influence of a deleterious character. In brief, practices are by their very nature corruptible. Their maintenance as noble and ennobling endeavors is dependent upon the abiding commitment of conscientious practitioners to preserve the integrity of these practices. The very act of undertaking an inquiry into inquiry, in the manner exemplified by Peirce and Polanyi, can be seen as a dramatic instance of a deliberate effort on the part of these responsible practitioners to protect the integrity of the practices to which they devoted their lives.

This effort is a bid for self-understanding, albeit one inextricably linked to a commitment to self-accountability (cf. Larmore). Both Peirce and Polanyi, however, were acutely aware of the degree to which the human animal is susceptible to grossest deceptions, perhaps especially self-deceit and self-obfuscation. What they write about self-understanding is indeed informed by a finely attuned sensitivity to our persistently operative tendency to misunderstand our selves and various aspects of the experiential world. That self-misunderstanding especially is more often than not rooted in our ideals, without which our idealizations would be impossible. What exposes our practices most to corruption, disfigurement, and implosion are not so much our venal failings but our most honorable impulses, our most exalted commitments. What James Baldwin wrote about artists is true more generally of humans. We are looking for not only occasions for action but also opportunities for the cultivation of our talents. When the world affords such occasions and opportunities, we encounter "the most dangerous point": "For … not only in the wilderness of the soul, but also in the real world which accompanies its seductions not by offering you opportunities to be wicked but by offering

opportunities to be good, to be active and effective, to be admired and central and apparently loved" (294).

In a curious way, this brings us to our second *étude*. The historically credited portrait of the responsible inquirer has been one in which methodic doubt has played *the* central role. But, from the perspective of Peirce and Polanyi, this discredits too much of what responsible investigators cannot and ought not to eschew, most of all, the acritical inferences upon which finite agents must inevitably rely and the conscientious acknowledgement of the constitutive ideals of our heuristic practices. That is, both theorists have their doubts about the role accorded to doubt by the founding figures of the modern epoch: they are deeply skeptical about the salutary effects of a methodic skepticism, especially when the champions of the method of doubt betray the spirit of dogmatism in their very insistence on doubt.

Second *Étude*: Doubts about Skepticism

As Peirce and Polanyi conceive the topics of belief, doubt, and inquiry, the most pressing concern is not to refute skepticism, once and for all. It is to affirm, time and again, what alone would unblock the road of inquiry and thereby open new paths for experimental investigation. It is one thing to advise one's co-inquirers not to block the road of inquiry (as though this is merely a mistake into which they might fall), quite another to point out the specific ways in which historical developments have actually obstructed the heuristic road—and then to show how such obstructions can be removed. Peirce and Polanyi certainly were animated by the desire to warn their contemporaries and successors to avoid putting obstacles in the path of inquiry; however, they were even more desirous to remove the historical impediments frustrating the ongoing work of experimental investigators. One of the ironies here, arguably the most crucial irony, is that the road of inquiry has been as often as not blocked in the name of science itself. All too frequently, the self-appointed champions of science (one might think here of Mach, Pearson, or Snow) have unwittingly contributed to a self-stultifying understanding of their own endeavor. Polanyi goes so far as to underscore "the immense power of self-deception" on display in so many formal attempts at self-understanding on the part of scientists (*PK* 169).

When one has lost one's keys, one tries to find them—not to debate the possibility of whether this endeavor is, in principle, rational or justifiable. There of course might be circumstances in which the very possibility of ever finding one's keys is a matter to be taken up with the utmost seriousness; but such circumstances would be specific, not global. If every time a person who lost a set of keys took up seriously the skeptical challenge, rather than looking in a careful and (possibly) systematic manner, we would hardly be justified in judging such a person to be duly *critical*; rather we would properly suspect some psychological problem (cf. Wittgenstein's *On Certainty*). That is, their concern is to justify not knowledge presumed to be in their possession, but the procedures by which what is not yet known can most effectively be discovered.

The radical skeptic and mainstream epistemologists who allow skepticism to be the pivot around which their entire enterprise turns are too credulous regarding the coherence and legitimacy of such doubt. The dogmatic skeptic is, indeed, the hidden figure in the official portrait of the responsible inquirer painted by those who at the outset defined the modern epoch (most influentially by Descartes). To be *post-critical* does not mean being blind to the need for critique or even for the role of doubt in the course of inquiry; rather it means being delicately sensitive to the forms and loci of effective doubt (see Agler in this issue). But it also means acknowledging the conditions and commitments required for effective doubt to take root. Even so, Peirce goes so far as to assert that "skepticism about the reality of things,—provided that it is genuine and sincere, and not a sham,—is a healthful and growing stage of mental development" (*CP* 8.43).

> Many and many a philosopher seems to think that taking a piece of paper and writing down 'I doubt that' is doubting it, or that it is a thing he can do in a minute as soon as he decides what he wants to doubt. Descartes convinced himself that the safest way was to 'begin' by doubting everything, and accordingly he tells us he straightway did so, except only his *je pense*, which he borrowed from Augustine. Well I guess not; for genuine doubt does not talk of *beginning* with doubting. The pragmatist knows that doubt is an art which has to be acquired with difficulty; and his genuine doubts will go much further than those of any Cartesian (*CP* 6.498).

Practically, this means that the art of doubting is derived from and applicable to experience: "genuine doubt cannot be created by a mere effort of the will, but must be compassed through experience" (*CP* 5.498; cf. Friedman).

The art of inquiry is, in no small measure, the art of doubting. No experimentally trained inquirer, such as Peirce and Polanyi were, has any doubt about this. But the role of doubt is, in the context of inquiry, not originary (more precisely, it is not absolutely or unqualifiedly originary). Intelligible doubt only arises against a vast, vague background of largely tacit, intricately interwoven beliefs (or habits). It concerns not so much a propositional attitude as an agential orientation toward the experiential world, an orientation that is in truth a disorientation. Doubt marks those occasions when an agent is truly at a loss regarding what to say or do, how to go on or even in extreme cases how to get back to the point from which that agent set out.

Human agency is, at the very least, a more or less integrated set of somatically rooted habits making possible (at the very least) the competent execution of an indefinite range of human activities.[14] Such habits are, in certain contexts (i.e., for certain purposes), identifiable with skills or abilities to perform certain tasks, especially when the performance of these tasks is (or can be seen as) integral to participation in some other practice. The capacity to draw inferences in accord with the rules of inference, or to construct sentences in conformity to the rules of grammar, or to conduct a juridical inquiry in accord with the strict procedures of the promulgated laws in a given culture, or even to act within the recognizable bounds defined by the tacit rules of acceptable behavior seems to suggest that habits and skills are best conceived in terms of rules. In turn, rules in the relevant sense are taken to be formalizable. Pragmatism is—or entered upon the scene—as the explicit formulation of a heuristic maxim, a rule articulated by an inquirer for the sake of guiding the activity of himself and others passionately yet responsibly engaged in the task of inquiry. Rules, codes, and formalizations however play a subordinate role in the pragmatist account of our heuristic practices and, thus, also in the self-portrait of the responsible inquirer, at least as sketched by Peirce and Polanyi. To stress that the role of rules in particular is subordinate is not to imply that rules are dispensable or even unimportant. Far from it. But both Polanyi and even Peirce, who spent so much time explicating the formal rules of valid inference, were acutely sensitive to the limits of codification and formalization. In a crucial respect, both were anti-formalists. Both were, in effect, attuned to the full force of pronouncing any instance of human conduct "Bad form." That is, they were deeply appreciative of form, formality, strict protocols, and the conscientious adherence to established procedures and traditional maxims. But this deep appreciation was tempered and informed by an even deeper appreciation of the irreducibly vague and tacit dimensions of human experience and conduct. Habits are not so much implicit rules as rules are codified habits. That is, inherently vague habits, skills, and abilities are primary, while formally explicable rules, procedures, and codes are derivative and thus secondary. Such codifications stand to habits, skills, and abilities in a manner somewhat analogous to the way maps stand to the terrain mapped. They can help us find our way about, but they can never replace experiential acquaintance with actual conditions (the tacit familiarity underlying not only formal definition but also even pragmatic clarification). To alter the metaphor, formal rules are the shadows cast by those concrete realities known as habits and

dispositions.[15] We can trace the contours of these shadows and, in doing so, we can obtain a sense of the shape of the realities to which they bear witness. But the realities themselves are the discoverable tendencies and dispositions of things, ranging from inanimate beings at the lowest level to responsible agents at the highest.

Third *Étude*: Habits, Skills, and Rules

In the interest of space, this *étude* will be hardly more than a doodle (to which I will add another doodle in the penultimate section). The main point to make here is, at once, simple to state yet difficult to comprehend in its deep-cutting and far-reaching implications. It is indeed one I have already made: habits and by implication virtues[16] are primary, rules and maxims derivative. "Rules of art can be useful, but they do not determine the practice of an art; they are maxims, which can serve as a guide to an art only if they can be integrated into the practical knowledge of the art. They cannot replace this knowledge" (*PK* 50). Rules and maxims are not to be disparaged; rather they are in many instances to be emphatically recalled and even deliberately cherished. Deliberative agents tend to know just how useful formal procedures and explicit rules, especially in proverbial form, can be. But they know even better how "practical knowledge" takes the form of an expansive range of unspecifiable skills exercised by improvisational agents caught up in novel circumstances. Theoretical inquirers as such possess such "practical" knowledge, since they know how to comport themselves in the context of inquiry. This is truly a species of *know how*, so that knowing *that* is inconceivable apart from knowing *how*.

"Established rules of inference offer," as Polanyi notes, "public paths for drawing intelligent conclusions from existing knowledge" (*PK* 123). But the art of inquiry is more than anything else a game of guessing. For this maxims are certainly helpful. Such established rules are, for the growth of knowledge, necessary but not sufficient: responsible inquirers must be responsive thinkers, ones capable of responding in novel ways to novel situations.[17] It obviously means being able to frame imaginative hypotheses that go beyond the secure precincts of existing knowledge. "The process of logical inference is," in Polanyi's judgment, "the strictest form of human thought, and it can be subjected to severe criticism by going over it stepwise any number of times" (*PK* 264). The principal function of the diagrammatic symbolization of inferential processes is, of course, to facilitate the activity of inquirers in their efforts to go over an inference 'stepwise any number of times." "But systematic forms of criticism can be applied only to articulate forms" (*PK* 264). Some steps in an investigation are, however, inherently uncontrollable and, accordingly, uncriticizable. "Tacit acts are judged by other standards [than articulate forms of human thought and especially formal processes of deductive inference]"; they "are to be regarded accordingly as *a-critical*" (ibid.).

At the most primordial level, then, we cannot but go on acritical inferences. At the most exalted level, however, we are thrust back upon self-set standards and self-imposed discipline. At the highest level, indeed, the logic of affirmation becomes the logic of self-affirmation. "An intelligence which dwells wholly within an articulate structure of its own creation accentuates by doing so a paradox that is inherent in the exercise of all intellectual passions" (*PK* 195). This paradox concerns the necessity of dwelling in some interpretive framework and, equally, the necessity of breaking out of such structures.

"There is [in science no less than art or religion] present a personal component, inarticulate and passionate, which declares our standards of values, drives us to fulfill them and judges our performance by these self-set standards" (*PK* 195). This makes intellectual passions and heuristic virtues, rather than logical rules or formal procedures, the heart of the matter.

The actual history of scientific discovery makes this incontrovertible. Such discovery "is overwhelmed by its our own passionate activity" (*PK* 196).[18] But this entails for Peirce no less than Polanyi being overwhelmed by some salient feature of "the circumambient All" (CP 6.429) in which the human animal is implicated.[19] "Scientific discovery, which leads from one such framework [of interpretation] to another, bursts the bounds of disciplined thought in an intense if transient moment of heuristic vision." As the result of breaking out of some hitherto unquestioned framework, "the mind is for the moment directly experiencing its content rather than controlling it by the use of any pre-established modes of interpretation." It is thereby (as we noted above) "overwhelmed by its own passionate activity" (*PK* 196).

In the concluding chapter of *Personal Knowledge* ("The Rise of Man"), Polanyi asserts:

> Comprehension is an unformalizable process striving toward an unspecifiable achievement, and is accordingly attributed to the agency of a centre seeking satisfaction in light of its own standards. For it cannot be defined without accrediting the intellectual satisfaction of the comprehending centre. The unspecifiability of a conscious act of comprehension implies the impossibility of accounting for it [this act] in terms of a fixed neurological mechanism, etc.(*PK* 398).

What Polanyi asserts here regarding comprehension might with equal justice be claimed regarding inquiry or science. They are unformalizable processes with unspecifiable achievements. To some extent, the procedures by which inquiry or science are effectively undertaken *can be* formalized and, moreover, the achievements of the practitioners *can be* specified. What cannot be accomplished however is the reduction of the art of inquiry to a set of rules, in particular, a finite set of explicit rules insuring an antecedently definable success. What we are doing, even when we are engaged in a historically recognizable and culturally sanctioned form of human activity, is not transparently, certainly not infallibly or completely, clear to the participants in any practice. Our conscientious engagement in any human practice demands, time and again, a Socratic confession—a contrite acknowledgment that we do not know fully, and thus we do not know adequately, what we are doing. Only out of such an acknowledgment can the impulse to reform us and reconfigure our activities effectively assert itself.

The virtues of the inquirer encompass conscientious adherence to the formal rules of valid inference. They are hardly exhausted by such rules. Indeed, the very nature of virtue is that it transcends complete formalization, codification, or even explication. The invincibly tacit knowledge of the virtuous person is, in the end no less than the beginning, a surer guide to the practical meaning (or pragmatic clarification) of the various virtues than any abstract definition or formal codification.

Scientific inquiry cannot be reduced to a set of rules. It is indeed nothing less than a form of life, a distinctive form of human life bearing a complex relationship to other human practices (none of which is reducible to a set of rules). "We owe our mental existence predominantly to works of art, morality, religious worship, scientific theory and other articulate systems which we accept as our dwelling place and as the soil of our mental development" (*PK* 286). While science is but one practice among others (more accurately, while our heuristic practices constitute an extended family of shared practices having its matrix in a far wider range of human undertakings), it possesses (as we have already noted) an integrity of its own; but it constitutes a world unto itself (in other words, a form of life in and through which distinctive ideals of intellectual excellence are formed and reformed).

Fourth *Étude*: Science as a Form of Life

Science is, at once, itself a form of life and an integral part of a human life, including far more than experimental investigation in its historically demarcated forms. That is, science is simultaneously autonomous as well as derivative from, and dependent on, a historically evolved form of human existence in which certain intellectual passions (along with much else) are, to some extent, provided cultural support. Without the cultivation of these intellectual passions, the emergence and growth of experimental inquiry would be impossible. Put yet otherwise, science is a world unto itself and part of a world larger than itself. The integrity of science demands an acknowledgment of both the autonomous character of experimental inquiry and its deep rootedness in animal life. It is indeed rooted in the plasticity so characteristic of certain zoological species, hence also the capacity of such organisms to learn from experience (ultimately in the case of *Homo sapiens*, to learn from experience in a self-directed and self-critical manner). It grows in the soil of a millennial acquaintance with what eventually become identified as the focal concern of specific sciences: "The existence of animals was not discovered by zoologists, nor that of plants by botanists, etc." (*PK* 139). But it flowers into an endeavor far removed from the instinctual gropings of even the most intelligent species (*PK* 123-24).

This makes the justification of science itself, at bottom, the justification of a form of life and, hence, one in which there is something inescapably circular about the manner of justification (*PK* 195). On the one hand, this justification cannot but appeal to the very criteria and ideals by which this form of life is defined. In this sense, it must be an *internal* justification and, as such, it cannot avoid appearing to be question begging. On the other hand, it cannot limit itself to such an appeal and, in this way, it cannot avoid seeming to be a violation of the integrity of this very form of life. To justify the life of the experimentalist ultimately by an appeal to something other than a devotion of truth would be a paradigm of such violation. How, then, is this dilemma to be resolved?

The most basic skills (the somatic, social skills and capacities by which experimental inquirers are able to accomplish the myriad tasks requisite for carrying forward any intellectual endeavor, including the one with which they so completely identify) are not so many bottom rungs on a dispensable ladder (a ladder they are in the position to kick away once they have ascended by its assistance). The formalist dream is that all the indispensable acts of the responsible inquirer might be reduced to a finite set of formalized rules. Peirce and Polanyi however see this not as a dream to be fulfilled, but a nightmare to be avoided. Idealizations, codifications, and formalizations play an indispensable (though variable) role in all forms of inquiry; but intellectual passions, a wide range of seemingly rudimentary skills, a more or less integrated set of heuristic virtues, and much else which cannot be completely formalized, codified, or even articulated play an even more *vital* role.

These habits are formed and skills acquired in the interpersonal contexts to which our shared practices trace their deepest roots. The personal is inseparable from the interpersonal, the effective from the exemplary and thus from the authoritative, while codes are distillations from processes of codification and formal procedures are idealizations of the efficacious forms of some practical expertise (say, the expertise of the inquirer, the manifestly skillful participant in some historically established or contemporaneously promising practice). The exemplar in effect functions as an authority, however provisionally.

Rejecting the method of authority does not entail denying the provisional authority of our actual traditions.[19] Indeed, in the case of both Peirce and Polanyi, there is a robust recognition of the indispensable part played by heuristic traditions in the ongoing work of experimental investigation. There is, in their writings, a corresponding suspicion of those forms of originality based upon an adolescent

devaluation of these intergenerational communities. In an especially important passage, Polanyi asserts:

> Wherever connoisseurship is found operating in science or technology we may assume that it persists only because it has not been possible to replace in by a measurable grading [or gradient] … The large amount of time spent by students of chemistry, biology, and medicine in their practical courses shows how greatly these sciences rely on the transmission of skills and connoisseurship from master to apprentice. It offers an impressive demonstration of the extent to which the art of knowing has remained unspecifiable at the very heart of science (*PK* 55).

In turn, rejecting the method of apriority does not require jettisoning a keen appreciation of the critical role played by human conversations (face-to-face and otherwise) in what itself might be envisioned to be a different form of dialogical exchange—the experimentalist's conversation with Nature (CP 6.568; also 5.168). Werner Heisenberg goes so far as to assert: "science is rooted in conversations" (1971, vii). As long as conversation is taken in a copious sense, one encompassing enough to include the exchanges between inquisitive, ingenious animals, on the one hand, and some more or less determinate range of identifiable phenomena, on the other, Peirce would heartily agree with this.

In any event, the life of experimental inquiry is one with the life of evolving symbols (see, e.g., CP 5.594, 2.220, 2.222 and especially 3.301). There is no paradox, at least no contradiction, in tracing the most exalted forms of human articulation to their subterranean roots in inarticulate intelligence. The radical responsibility of conscientious inquirers indeed requires such inquirers tracing their autonomy to their gifts and inheritances.

An Irrepressible Doodle: Responsible Inquirers as Passionate—and Playful—Participants in Historically Evolving Practices

Given my own interests and preoccupations, I cannot repress the urge to offer a doodle—so severely abridged as to be little more than a caricature—of the human face of any experimental inquirer. Peirce's manuscripts are a repository for a large number of pictorial doodles, often ones of a humorous composition (Viola; Leja). They are, of course, also such a place for textual doodles, though to an even greater extent a series of sketches in various stages of completion.

One of my favorite pictorial doodles to be found in Peirce's unpublished manuscripts is the portrait of a figure (in fact, only of a face) named *Epistémy*. It is the depiction of an irritable and perhaps irascible character. It stands in sharp contrast to the more welcoming visages typically adorning the pages of these unpublished writings. I am disposed to go so far as to suggest that, in a puppet show of stock characters, at least one imagined by Peirce, *Epistémy* would play the role of the villain while Inquiry would assume that of the hero.[20] In any event, here is *Epistémy*.

Why would Peirce portray a figure so named in such an unflattering light? Allow me to appeal to a poet, although to a letter rather than poem by him, to shed light on Peirce's doodle. In a letter to his brothers, dated December 21st, 1817, John Keats defines *negative capability* as a remarkable capability of the human animal (one observable in Shakespeare though not in Coleridge); it is present "when a man is capable of being in uncertainties, mysteries, doubts, without any irritable reaching after fact and reason." While Keats seems to be disposed to ascribe this capability primarily to artists, its range of applicability might be much wider than this.[21] There is nothing inherently objectionable about reaching after fact or reason in the face of uncertainty or doubt. There is, however, something potentially self-stultifying in the irritable (and, thus, by implication the premature and presumptuous) reaching after these. The art of inquiry, no less than the work of the artists, requires the capacity to remain in doubt—to explore a range of possibilities without dismissing too abruptly, as almost always tends to be the result of irritability, seemingly implausible or even in some respects fantastic possibilities. The work of experimental inquiry encompasses the play of the theoretical imagination. The portrait of the inquirer given to such play is hardly that of *Epistêmy*, as sketched by Peirce in MS 1528. The humility, patience, and hope animating such an inquirer would hardly allow for a countenance frozen into a portrait of irritability. Such seemingly insignificant and irrelevant dispositions as humility, patience, and hope are, in the judgment of Peirce no less than that of Polanyi, truly intellectual virtues, ones indispensable for carrying out experimental investigations in a responsible manner. So, as a quickly improvised doodle portraying the responsible inquirer, I am strongly disposed to sketch the face of a passionate yet playful person who possesses the capability of living in uncertainty and doubt for an indefinite time. It is also the portrait of the virtuous person, wherein virtue reclaims its original meaning of strength. Though not nearly as arresting or intriguing as Peirce's various forms of doodling, I hope this one is at least suggestive and not without its own fascination. Though this doodle might fittingly serve as a conclusion to this essay, a more traditional conclusion is almost certainly a more appropriate one.

Conclusion

First of all, the inquiry into the nature of inquiry invites a consideration of an encompassing field of human practices in which the defining features of our heuristic practices alone stand out in bold relief. Second, the dogmatic character of modern skepticism no less than the unacknowledged doubts shaping various forms of scientific dogmatism are effectively exposed by Peirce and Polanyi. There are, to be sure, reasonable doubts regarding the corrosive forms of modern skepticism, just as there are such doubts regarding the alleged certainties to which modern thinkers have appealed in their attempt to dispel (or defang) the seemingly intractable forms of modern skepticism. These doubts about skepticism suggest that traditional forms of the skeptical stance betray an unperceived dogmatism, while the characteristic assurances of those so vociferously combating modern skepticism betray anxious inflections. These inflections themselves betray an obsessive preoccupation with merely theoretical "doubts." What is needed is, as much as anything, a post-critical philosophy, one marking a decisive break with not only Descartes but also Kant.

Of even more fundamental importance, the ineradicably personal character of experimental inquiry and the precariously experiential nature of even the most praiseworthy forms of personal agency are arrestingly illuminated by Peirce and Polanyi: their efforts to throw light on these aspects of our practices and our very agency truly throws these facets into bold relief, especially against the background of traditional theories.

Finally, the emergence of self-critical intelligence is, paradoxically, only explicable in terms of a post-critical philosophy. The modern ideals of critique need to be supplanted by what (albeit misleadingly) might be

called a postmodern acknowledgment of responsibility. Theoretical undecidability does not preclude practical decisiveness. As it turns out, theoretical decisions (specific decisions made by theoretical inquirers at some historical juncture in the actual unfolding of some actual inquiry) are, at bottom, a species of practical decision. Such at least is the counsel of Peirce and Polanyi. What conclusion to draw, method to deploy, topic to research, and a host of other considerations are matters confronting historical actors in the evolving circumstances in which such improvisational agents are ineluctably entangled. In a sense, then, they are historical judgments, since they require taking into account what has been done, what one is doing, and how to go on precisely as a participant in some practice.

The thought of Peirce intersects with that of Polanyi around such themes and topics. Because of this, they prove themselves to be mutually illuminating philosophers. Of far greater significance, they prove themselves (especially in their mutual illumination) to be indispensable resources for attaining a deeper understanding of the central questions to which their theoretical imaginations were, time and again, drawn. "To read Peirce is," as John E. Smith long ago noted, "to philosophize, for to follow his arguments it is necessary for the reader himself to be wrestling with the very problems Peirce envisaged" (xxv; cf. Short)": above all else, it is to philosophize about such topics as inquiry, doubt, practice, rationality, and indeed much else. The same must be said about reading Polanyi. We have squandered the opportunities provided by their texts if we have not followed out the trajectories of their thought beyond what they themselves were in a position to accomplish.[22] The possibility of doing so, however, presupposes a passionate identification with an interwoven set of shared practices, above all else, those of responsible utterance and truly experimental inquiry. It is only by so identifying ourselves with Charles Peirce and Michael Polanyi that we can hope to begin to fathom their meaning. Identifying ourselves with these thinkers in the appropriate manner does not preclude critical distance from their substantive claims and methodological decisions. Quite the contrary, it alone secures the humane bases for effective critique, in the service of adjudicating these claims and assessing these decisions—that is, in the service of traveling down the road of inquiry.

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Endnotes

[1]I have benefitted greatly from not only David Agler's essay in this issue of *Tradition and Discovery* but also his response to an earlier draft of this paper. Thanks also go to Robert Innis and Phil Mullins for help in producing the final copy of these remarks.

[2]When I wrote that Innis, Mullins, and Agler have written exemplary essays, I intended to assert that they did so in just this pragmatic sense.

[3]On the first page of the Preface to *Personal Knowledge*, Polanyi stresses "the *personal participation* of the knower in all acts of understanding" (vii). He explicitly links this theme to the reading of a text (see, e.g., 92).

[4]As a sign, a text possesses an agency of its own. Even if the author is "dead" in the sense intended by Roland Barthes and (by implication) Michel Foucault, the author is almost always a ghost haunting the habitation of the text (cf. Glass).

[5]In *A Pluralistic Universe*, William James suggests that "Any author is easy if you can catch the center of his vision."

[6]My use of this word in this context is intended to allude to the task of accrediting highlighted by Polanyi in *Personal Knowledge* and elsewhere.

[7]As Jonathan Culler notes in a very different context (!), "meaning is context bound, but context is boundless" (2002, 67). The prefixes *re-* and *trans-* are especially critical in the lexicon of pragmatists. Recontextualization is no less important than reconstruction, renewal, or reappraisal; indeed, the latter are always in effect, at least, instances of recontextualization.

[8]"From a humane standpoint our study of history," John Dewey noted, "is still too primitive. It is possible to study a multitude of histories, and yet permit history, the record of the transitions and transformations of activities, to escape us" (*MW* 14, 78-79).

[9]"Now the theory of Pragmaticism was," Peirce observed in 1905, "originally based … upon a study of that experience of the phenomena of self-control which is common to all grown men and women; and it seems evident that to some extent, at least, it must always be so based. For it is to the conceptions of deliberate conduct that Pragmaticism would trace the intellectual purport of symbols; and deliberate conduct is self-controlled conduct. Now conduct may itself be controlled, criticism itself subjected to criticism; and ideally there is no obvious limit to the sequence" (*CP* 5.442).

[10]For Peirce, the ideal of self-control is largely realized through deliberate self-restraint and self-inhibition. This important facet of his overarching moral psychology has hardly received the attention it deserves.

[11]Enquiry versus inquiry: in *Descartes: The Project of Pure Enquiry*, Bernard Williams stresses that the pure enquiry in which Descartes was engaged differs from other forms of enquiry (or, to help render this distinction clear, simply from inquiries, as though enquiry and inquiry are fundamentally different activities). For Peirce and Polanyi, however, the inquiry into inquiry is, in most critical respects, continuous with the first-order inquiries constituting the subject-matter being explored. Whereas the project of pure enquiry is "to be done, if at all, once in a lifetime" (Williams 33-34), the task confronting the responsible inquirer, as envisioned by Peirce and Polanyi, is to be taken up, time and again, in the ongoing course of a historical practice susceptible to immanent crises (crises generated by its very successes).

[12]Despite her deep sympathy to Peirce's pragmatist approach to human inquiry, Susan Haack points

out a respect in which Peirce is not fair to Descartes regarding his predecessor's methodological construal of universal doubt.

[13]Both unquestionably *do* attend to questions of justification in various contexts, but what precisely they are doing when they become preoccupied by such questions is all too easily misunderstood. The main reason for this is that their engagement with such questions seems to be one more modernist (or critical) attempt to secure the foundations for knowledge, rather than a post-critical (thus, perhaps—to use a likely misleading term—postmodern) endeavor to offer a thoroughgoing fallibilist account of experimental inquiry in which a personal commitment to self-corrective procedures in effect replaces a completely impersonal appeal to self-certifying cognitions.

[14]This characterization of our agency fails to do justice to our struggle with our own incompetencies and, inseparably connected to this, the critical role such frequently disconcerting struggles rule in the effective mastery of some recognizable competency.

[15]From Peirce's perspective, there are likely no more straightforward examples of concrete *realities* than the embodied habits observable not only in certain species of animals but also in virtually every observable form encountered in the natural world.

[16]One of the many ways in which Peirce is an Aristotelian is that he takes habit to be the genus of virtue (i.e., a virtue is a species of habit).

[17]"The interpretative framework of the educated mind is," Polanyi insists, "ever ready to meet somewhat novel experiences, and to deal with them in a somewhat novel manner. In this sense all life is endowed with originality and originality of a higher order is but a magnified form of a universal biological adaptivity" (*PK* 124).

[18]This carries implications for the relationship between science and art. "The arts appear then no longer as contrasted but as immediately continuous with science, only that in them the thinker participates more deeply in the object of his thought" than does the scientist (*PK* 194).

[19] Peirce defines religion, in reference to an individual, as "a sort of sentiment, or obscure perception, a deep recognition of a something in the circumambient All, if he [the individual] strives to express it, will clothe itself in forms more or less extravagant, more or less accidental, but ever acknowledging the first and last ... as well as a relation to the Absolute of the individual's self, as a relative being" (*CP* 6.429)

[20]"To learn by example is," Polanyi notes, "to submit to authority. You follow your master because you trust his manner of doing things even when you cannot analyse and account in detail for its effectiveness. … These hidden rules can be assimilated only by a person who surrenders himself to that extent uncritically to the imitation of another. A Society which wants to preserve a fund of personal knowledge must submit to tradition" (*PK* 53). If anything, Peirce is even more of a traditionalist in this regard than Polanyi.

[21]"Science and philosophy seem to have been changed in their cradles. For it is not knowing, but the love of learning, that characterizes the scientific man; while the 'philosopher' is a man with a system which he thinks embodies everything worth knowing. If a man burns to learn and sets himself to comparing his ideas with experimental results in order that he may correct those ideas, every scientific man will recognize him as a brother, no matter how small his knowledge may be" (*CP* 1.44).

[22]Indeed, John Dewey in *Art as Experience* characterizes philosophies in terms of this trait. At the conclusion of Chapter 2 ("The Live Creature and 'Ethereal Things'"), part of the title of which is also derived from Keats (*LW* 10, 27, note #1), he suggests: "Ultimately there are but two philosophies. One of them accepts life and experience in all its uncertainty, mystery, doubt, and half-knowledge and turns that experience upon itself to deepen and intensify its own qualities—in imagination and art. This is the philosophy of Shakespeare and Keats" (*LW* 10, 41).

[23]We have the advantage of our time⸺the time since each one of these thinkers has died—but we have this advantage because of the insights with which they have equipped us for the ongoing task of critically appropriating our historical moment.

REVIEWS

Esther Lightcap Meek, *Loving to Know: Introducing Covenant Epistemology*. Eugene, OR: Cascade Books, 2011. Pp. xviii+518. ISBN 13: 978-1-60899-928-6. $49.

This book represents the harvest of years of critical and constructive engagement with many of the questions and problems at the heart of contemporary epistemological studies. It also represents the fruit of years of teaching and guiding others in convivial discussions about the correspondence between intellectual formation and human flourishing.

At the heart of this book is an argument intended to demonstrate "how some features of human knowing make startlingly profound sense when construed personally, and to suggest, in light of this, that being intentional about the personal and covenantal aspects of knowing will prove profitable and healing" (179) at not only the individual level but the social and cultural levels as well. To construe knowledge in personal terms involves recognizing that all acts of knowing are situated within the context of "unfolding, covenantally constituted, interpersonal relationship" (xiv).

Meek intends her work to provide a kind of intellectual "therapy" (6), and hopes that the result of her efforts will include the "existential transformation" of the reader and not just the "receipt of information" (469). She intersperses her account of "covenant epistemology" with various "textures," excurses designed to flesh out her arguments and encourage a kind of dialogical engagement on the part of the reader; one is left with the feeling of having taken part in a seminar rather than simply having read a book. This is very much in keeping with her desire to inspire the kind of renewal that will overcome the "philosophical and cultural fallout that continues to deaden the outlook of ordinary people" (17; cf. 50-51).

The book unfolds over the course of five distinct sections, the first of which is devoted largely to an exposition of what Meek sees as the dangerously distorted account of knowledge that is regnant in late modern Western thought and culture. She argues that our preoccupation with "*information, facts, statements, and proofs*" (7, emphasis in the original) reflects an impersonal and unsustainable account of knowledge that is responsible for a variety of problematic dichotomies the likes of which inhibit human flourishing (e.g., objective/subjective, facts/values, theory/practice, reason/faith, mind/body, etc.). She thus introduces her own efforts not only as a philosophical alternative to academic studies of the nature of knowledge but as a modest contribution to the task of cultural renewal.

Many of the chapters that follow are presented as "conversations" with various scholars whose efforts contribute in some way to Meek's own; in part two, her conversation partners include Michael Polanyi and James Loder. Meek is compelled by Polanyi's account of subsidiary-tacit integration, and follows him in holding that such acts of integration (and the acts of indwelling and interiorization they imply) are evident in all acts of knowing. She is also convinced (again, following Polanyi) that such acts of integration and indwelling are what enable us to make "contact with reality" (97) and thus to pursue reliable knowledge of the world. In the first of two "conversations" she pursues with Loder, she highlights Loder's account of knowing as an experience of transformation, and also adopts his strategy to proceed in a manner that not only describes transformative knowing but "evokes it" (123-124).

In part three, Meek moves decisively in a direction that takes her to the heart of her argument: by engaging the work of John Frame and Mike Williams, she shifts to an explicitly personalistic mode of inquiry. Frame provides her with a means of articulating the covenantal nature of all knowledge; in particular, his description of the "situational," "existential," and

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"normative" dimensions of knowledge help tease apart the dimensions of covenantal relations (158-164), and also introduces the necessarily theological tenor or ground of all covenantal accounts of knowing (i.e., human knowing and being is covenantal in nature because of the covenantal character and actions of God). Williams, on the other hand, helps advance Frame's work by highlighting the distinctly personal character of all covenantal relations. In other words, Williams helps Meek put Frame's account of covenant squarely within an interpersonal, relational context.

The fourth section is the longest, chiefly because it is here that Meek develops her arguments in ways that go considerably beyond her earlier work: here she sets forth her understanding of "interpersonhood," which she proposes as a way of describing the ontological ground of covenant epistemology. She draws in this section on John Macmurray, Martin Buber, James Loder (again), David Schnarch, Colin Gunton, and Philip Rolnick and their insights into the personal shape of both knowing and being. Following Macmurray, she argues that not only is knowing personal in nature but so too is existence itself; she also highlights the way Macmurray's emphasis on agency helps expound the relational character of both knowing and being. Following Buber, she contends that knowing and being are better understood in terms of "encounter" than "experience" (250-252), and that knowing is chiefly a matter of learning how to be known; this also helps her further elucidate the theological dimension of knowing and being. Her second "conversation" with Loder and his account of the four-dimensional context wherein transformational knowing takes place (i.e., the intersection of the self, the world, the void, and the holy) helps round out her exposition of the covenantal shape of knowledge. Schnarch contributes a psychological model for understanding covenant relations, namely, the "psychotherapeutic concept of differentiation," which Meek suggests "doubles as a key to effective knowing" (310) inasmuch as it affords an image of relationality that fosters true mutuality (i.e., one that accommodates independence and interdependence while avoiding autonomy and absorption). Gunton's trinitarian theology provides a means of thinking about the ultimate ground of personal knowing and being, especially his account of the perichoretic relations of the three divine persons. In particular, the doctrine of *perichoresis* helps make the point that personal relations are "asymmetrical" in nature: their "logic" is that of "gift and reception" rather than absolute mutuality (339). The concept of giftedness takes Meek to Rolnick's recent work and his description of the way that mutual donation offers an account of relations that recognizes both dependence and independence, and one that identifies the goal of all personal relations as friendship or communion.

In the fifth and final section of the book, Meek outlines "etiquette" for practicing and pursuing the kind of knowing she commends. She first draws together the threads of the various "conversations" pursued in earlier sections and weaves them into an integrated summary of her thesis: covenant epistemology is a more truthful account of human knowing because acknowledging the personal, relational nature of knowledge results in a "deeper objectivity than impersonal objectivity" (400). She then identifies five key practices or disciplines necessary for pursuing covenantal knowing: these include desire (both active and passive, i.e., love and longing), composure (fidelity to the integrity of oneself and that of others), comportment (humility before and obedience to that which is true and real), strategy (placing oneself attentively "in the path of knowing," 454), and consummation (cultivation of relationships marked by intimacy and on-going mutual discovery). Any account of knowing, she suggests, will imply an account of being, and she offers covenant epistemology as a way of understanding knowing that encourages a way of being marked by *shalom* ("health, safety, rest, completeness, wholeness, welfare, perfection, blessing, harmony," 473-475) and friendship with the world, with others, and with God.

Specialists may want to quibble about Meek's reading of the scholars whose work she engages, but her clear and consistent focus has more to do with her own constructive proposals than with attempting anything like a definitive reading of her sources; she is forthright about concerns she herself has about certain

elements of their work (including Polanyi's). In other words, serious criticism of Meek's arguments would need to be grounded in analysis of her overall efforts, and her achievement in this regard is considerable.

One thing that Meek might have explored more thoroughly has to do with the necessarily multi-model or interdisciplinary nature of knowledge and knowing. She is more than aware of the dangers of epistemological reductionism and should by no means be read as suggesting that all knowing can be circumscribed in a uniform manner; the excurses scattered throughout the book tend in quite the opposite direction, as does her suggestion that the celebration of the Eucharist is a paradigmatic way of describing the enactment of interpersonhood (467). But in order truly to break out of contemporary epistemology's preoccupation with the "objects, source, nature, and justification of knowledge" (396), what one needs is an account of both the continuity and discontinuity between various modes of knowledge (e.g., physical, chemical, biological, ecological, sociological, philosophical, etc.). Given her concern with cultural renewal and the accreditation of the knowledge of "ordinary" knowers, focused attention to this question would have helped demonstrate the very real value her efforts have beyond academic philosophy.

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Robert B. Brandom, *Perspectives on Pragmatism: Classical, Recent, and Contemporary*. Cambridge, MA and London, England: Harvard University Press, 2011. Pp. 248. ISBN: 978-0-674-05808-8. $35.00 hb.

Perspectives on Pragmatism is a collection of essays by Robert Brandom (2000, 2002, 2004, 2008:1-30, 2009a, 2009b) that forge his rationalist pragmatism from the pragmatic side rather than from the rationalist side as in his *Reason in Philosophy* (2009c). While the volume *feels* like a collection of essays rather than a cohesive volume (the volume somewhat lacks a unifying thread), there are certainly enough topical fibers that knit chapters together and

make the book worth reading if you are familiar with Brandom's previous work, and especially if you are keen on seeing the relation betweem pragmatism and analytic philosophy of language or wish to see how Polanyi's thought has elements in common with an important contemporary philosopher's ideas.

The story begins with Kant, who introduces two "master ideas": (i) a *normative conception of judgment*, the claim that we undertake a commitment when applying concepts and (ii) a *methodological pragmatism*, the understanding of discursive content in terms of what individuals are doing when they apply concepts (1-4). To these two master ideas a third is added, which is in germinal form in Hegel but completed by the classical American pragmatists: (iii) the *naturalization* of experience (and the world), not as the passive reception of raw data about the world, but as the result of a historically-developed (and evolving) learning activity (see 5-13). The latter of these three ideas is important for Brandom because it reverses the traditional order of explanation of the world and human activity. Rather than the *representationalist* view where we begin with the notion of representational content and then use this content to make sense of the world and the activity of subjects, the fundamental pragmatist begins with the activity of subjects (what subjects do) and uses this to explain representational content and the world (11).

Chapter 1 situates classical American philosophy in relation to other philosophical traditions, points to certain historical factors that shaped its genesis (specifically the Civil War), and offers a characterization of pragmatism as a type of non-reductive empiricism. Brandom's picture of classical American pragmatism is of a philosophy shaped by advances in the biological sciences and a strong rejection of certitude because of the horrors of the Civil War, yet unwilling to abandon the quest for truth for a dogmatic romanticism or bleak post-modernism.

Chapter 2 analyzes a number of different kinds of pragmatism and argues against one quite forcefully. The key to Brandom's analysis is a distinction between

two basic types of pragmatism: a *narrow* variety that focuses on evaluating beliefs in terms of their ability to satisfy desires (a true belief is one that satisfies my desires), while a broader variety is tied to a theory of language that prioritizes the *practice of using language* over the merely literal (formally-generated) content (56-58). His pragmatist insight is that any account of the word-world relation must be sensitive to how agents *use* words and this will involve paying attention to norms implicit in discursive practice (see 76).

Chapters 3–5 turn the clock forward to the pragmatism of Wilfried Sellars and Richard Rorty. The aim of chapter 3 is to show how Sellars's arguments against empiricism in "Empiricism and the Philosophy of Mind" is situated in the larger context of his work, specifically the part which argues that various forms of empiricism cannot account for modal vocabulary. Chapter 4 is an exegesis on how Rorty's antagonism to an impersonal, objective reality does not amount to a dangerous irrationalism or norm-empty subjectivism but is compatible with there being both *truth* and *knowledge*. Chapter 5 is a critical appraisal of Rorty's pragmatic stance concerning epistemic norms: the view that any privileging of certain representations (e.g. first-person reports about perceptual givens or inferences undergirded by some meaning-analytic connection) "is ultimately intelligible only in terms of social practices that involve implicitly recognizing or acknowledging such authority" (120, see 123). Brandom argues that Rorty's extreme form of pragmatism about norms leads Rorty to the radical conclusion that there were no truths (or facts) before vocabularies (or representations) to express them. But, Brandom convincingly argues that once we distinguish *acts of claiming* from *what is claimed*, Rorty's conclusion simply does not follow since there may be no true *acts of claiming* about electrons before the introduction of the term "electron," but this does not mean that what could be claimed about electrons fails to be true.

Finally, chapters 6 and 7 situate rationalist pragmatism within the contemporary versions of analytic pragmatism. Chapter 6 lays out the traditional project of classical semantic analysis where one vocabulary (or set of locutions) is made sense of in terms of another, e.g., number theory in first-order logic or mental states in physical states. After articulating a Wittgensteinian version of the pragmatist challenge to this project—that our focus should shift from *meaning* to *use*—Brandom argues that the formalist, semanticist programs can be made complementary to a natural-historical, pragmatic program (158-165). The way to this end is not by a divide-and-conquer approach where the *semantic program* is concerned with features like systematicity and the literal meaning of expressions while the *pragmatic program* is concerned with features like implicature and what a speaker means in using an expression (à la Grice). Instead, Brandom proposes that "we can deepen our semantics by the addition of pragmatics" and this involves a detailed and somewhat abstract account of how our vocabulary means what it does in virtue of how it is used (165; see 165-189). Chapter 7 considers the current state of anti-representationalism—a rejection of the view that the concept of *representation* plays the fundamental explanatory role in semantic theory—post Rorty's rejection of it in *Philosophy and the Mirror of Nature*. While Brandom sides with the Rorty-Sellars rejection of a workable notion of "experience" that might fall into the Myth of the Given, Brandom parts with Rorty in the latter's wholesale rejection of the concept (see 197).

All in all, there appear to be two points to take home. First, the semantic-phenomenalist-empiricist way of looking at the meaning of linguistic expressions in terms of its merely referential, descriptive, or representational content opens itself up to serious problems. A representationalist perspective either collapses into an epistemological skepticism due to a gulf between word and world or bottoms out as a foundationalism employing a sensory given or cognitively transparent meaning. But Brandom, drawing from exegeses of Rorty, Sellars, and Quine, concludes that both of these options are untenable. Second, given the dead-ends of a representationalist perspective, we need not fall into the gloom of a *global anti-representationalism* where the notion of representation should be cut out of philosophy altogether. Instead, Brandom proposes a pragmatic shift

in perspective that focuses on the roles that practice, action, and linguistic doings play in determining what a linguistic expression means.

I have some minor complaints. First, while Brandom's command of figures is certainly synoptic, the book lacks certain bibliographic information that is important from a forensic point of view. Also, providing greater clarification by way of exegesis or engagement with the scholarly literature would have offered a sharper, more textured, and smoother perspective on the detailed landscape (e.g., a quote from Rorty on p.6; a reference to Perry and Lewis on p.192; a reference to Ruth Millikan's "selectional teleosemantics" on p. 194). I do not mean to suggest that any of Brandom's references or exegetical work is inaccurate—precisely the opposite—but this type of apparatus is necessary for facilitating critical engagement. Second, I would have liked to see more engagement with, and reference to, contemporary figures (especially pragmatists) who argue against traditional strains of representational semantics for a pragmatic semantics (e.g. David Boersema, Francois Recanati, Robyn Carston, relevance theorists, *et alia*).

Although Brandom makes no mention of Polanyi throughout the book, there are a number of reasons for Polanyians to be interested in his work and for Brandom to include Polanyi in his multi-lensed view of pragmatism. Brandom works with the implicit/explicit distinction throughout the book (e.g., 47), rejects a spectator view of knowledge (40-41), rejects non-personal knowledge without collapsing into mere subjectivism (chapter 4), is sensitive to the fact that experience is an active process that is conditioned by the evolution of the species, and pursues a vision that is in the spirit of a "post-critical" philosophy rather than one that is distinctly modern or post-modern. All of these points of connection make the book worth reading and open up a question for both Polanyians and Brandom to consider: what are the principal points of connection (and disconnection) between Michael Polanyi and the pragmatist tradition (both old and new)?[1]

Brandom, Robert B. 2000. Vocabularies of Pragmatism: Synthesizing Naturalism and Historicism. In *Rorty and His Critics*, edited by Robert B. Brandom. Malden, MA: Blackwell, pp.156-183.
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Clark Moustakas, *Heuristic Research: Design, Methodology, and Applications*. Thousand Oaks, California: SAGE, 1990. Pp.129. ISBN-0-8039-3882-9. $73.00, pb.

I have never read a book devoted to the process of discovery which was more imbued with the epistemological insights of Michael Polanyi than *Heuristic Research: Design*, *Methodology and Applications*. Literally from the first page to the last paragraph, and fourteen times in between in this brief volume, Moustakas refers to Polanyi's works. Rejecting the dispassionate, objectivist model of much scientific research, Mousta-

kas plunges deep into the implications of Polanyi's concepts of personal knowledge, tacit knowing and indwelling to find a creative path to discovery in the human sciences, humanities and psychotherapy. These concepts are not mere add-ons to buttress Moustakas' arguments. They are the bedrock of his work.

Moustakas is a graduate of Columbia University (Ed.D, PhD in Educational and Clinical Psychology) and Union Institute (philosophy). He is the author of numerous books and articles published in over fourteen languages including the work under review, only now being reviewed in *Tradition and Discovery* 22 years after it was published. In 1981, he co-founded the Center for Humanistic Studies, now the Michigan School for Professional Psychology in Detroit, where he is emeritus professor. He is a Core Faculty member in psychology at the Union Institute in Cincinnati. In 1956, with Carl Rogers and Abraham Maslow, Moustakas forged the humanistic psychology movement. He was instrumental in establishing the Association for Humanistic Psychology and the *Journal of Humanistic Psychology*.

Moustakas' central concerns have to do with the emotional lives of children and adults. Throughout his career, which began in the early 1950s, Moustakas has clearly operated outside the mainstream of positivist orthodoxy in psychology. He has been instrumental in establishing successful educational institutions which embody his and his cohorts' alternative views!

Moustakas' approach to "human research" is totally in keeping with Polanyi's understanding that on the "inter-human level" … "[m]utuality prevails to such an extent here that the logical category of an observer facing an object placed on a lower logical level becomes altogether inapplicable. The I-It situation has been gradually transformed into an I-Thou relation" (*PK* 346). And further, "the knowledge of another person" will become "a critical reflection on our own knowledge" and involve the one in an exchange with the other in which they "mutually question, inform, criticize and persuade each other"(*PK* 373f). Everything Moustakas sets forth in this book reflects this Polanyian frame of reference regarding mutuality. Therefore it comes as no surprise that Moustakas' favorite way of collecting data is the "conversational interview" or "dialogue." "Dialogue is the preferred approach in that it aims toward encouraging expression, elucidation, and disclosure of the experience being investigated" (47). Expanding on this approach, Moustakas quotes Martin Buber (*The Knowledge of Man*, 86): "The interhuman opens out what would otherwise remain unopened" and Weber (*Phenomenology and Pedagogy,* 68): "... it is only in relating to the other person as a human being that interviewing is really possible... when the interviewer and the participant are both caught up in the phenomenon being discussed" (48).

In the introduction, Moustakas cites Polanyi as a "resource and inspiration"(9). In Chapter 2, he moves to an explication of the conceptual basis of heuristic research. He begins by saying that "Underlying all other concepts in heuristic research, at the base of all heuristic discovery, is the power of revelation in tacit knowing" (21). He cites Polanyi's famous statement: "*we can know more than we can tell*" (*TD* 4).

Using the concept of *intuition* as the bridge between the tacit and the explicit, Moustakas says that intuition makes immediate knowledge possible. Like Polanyi (*KB* 118), Moustakas sees intuition as a skill related to the recognition of patterns." Without the intuitive capacity to form patterns, relationships and references, essential material for scientific knowledge is denied or lost" (23f).

Moustakas next elaborates his understanding of *indwelling* in a manner that is clearly in essential agreement with Polanyi. Moustakas says that to understand something fully, "one dwells inside the subsidiary and focal factors to draw from them every nuance, texture, fact and meaning" (24). Later, discussing psychotherapy, he says that: "I dwell inside my experience with a person to understand the essential parameters of my knowledge" (110). Furthermore, "in my interaction with this person I must check out my knowledge. In doing this I employ an *internal frame of reference*" (111, italics in the original). The "internal frame of reference" refers to his knowledge of the "parameters,

structures, themes and horizons" which he indwells and from which he explores the different facets of the person's world, "coming to know them in the context of the person's way of being" (110). This understanding of indwelling as relying on a "framework" is consonant with Polany's definition of indwelling as "a utilization of a *framework* for unfolding our understanding in accordance with the indications and standards imposed by the *framework*" (*KB* 134, italics mine).

To the foregoing concepts Moustakas adds *focusing*, which he defines as "the clearing of an inward space to enable one to tap into thoughts and feelings that are essential to clarifying a question[;] elucidating its constituents; making contact with core themes; and explicating the themes." Focusing enables the researcher to "identify qualities of an experience that have remained out of conscious reach primarily because the individual has not paused long enough to examine his or her experience of the phenomenon" (25).

Ending Chapter 2, Moustakas introduces what he calls the six "phases" of heuristic research: "initial engagement, immersion, incubation, illumination, explication and creative synthesis" (27). He explains each phase by relating it explicitly to one or more of Polanyi's concepts, including "passionate concern" for a question, tacit awareness, intuition, indwelling, internal frames of reference and universal intent (27-32). He closes this section with a discussion of the validation of heuristic research stating that "...validity in heuristic research is not a quantitative measurement that can be determined by correlations or statistics. The question of validity is one of meaning" (32). Referring to Polanyi (*KB* 120), Moustakas agrees that there can be no rules to guide verification that can be relied on in the last resort." What is presented as truth...can be accredited only on the grounds of personal knowledge..." (33).

Chapter 3 is devoted to research design and methodology. Moustakas begins by discussing in more depth the critical importance of formulating the question to be researched. He quotes Polanyi (*KB* 118): "All true scientific research starts with hitting on a deep and promising problem, and this is half the discovery"

(40). In the spirit of Polanyi, Moustakas says that the heuristic researcher "learns to love the question. It becomes a kind of song into which the researcher breathes life not only because the question leads to an answer, but also because the question itself is infused in the researcher's being. It creates a thirst to discover..." (43).

The heart of Chapter 3 is contained in the "Outline Guide of Procedures for Analysis of Data" (51). Here Moustakas gives concrete form to the conceptual framework which he has elucidated earlier. He envisions a team of researchers led by a primary researcher who deals directly with "participants," who are the subjects of a research project. The primary researcher incorporates (indwells) the findings and critiques of his co-researchers *and participants* as he moves through the various steps of the analysis. Variations on this format may include studies done by only one researcher working with several participants.

Moustakas suggests eight critical steps in the process of analyzing the data collected by the primary researcher and his co-researchers. 1) Gathering all the data from one participant. 2) Immersion in the material until it is understood. 3) Constructing an "individual depiction" of the experience. 4,5) In the light of his own research, absorbing, analyzing and revising the individual depictions formulated by his co-workers and *sharing the results with individual participants to determine accuracy of understanding*. 6) Developing a "composite depiction," based on "immersion" in the material "until the universal qualities and themes of the experience are thoroughly internalized and understood" (52). 7) Based on the raw material and individual depictions of all co-researchers, the primary researcher selects two or three participants who exemplify the group as a whole and constructs "individual portraits" of these persons which best exemplify the dominant themes of the phenomenon investigated. 8) A "creative synthesis" of the experience is developed which is "a recognition of tacit-intuitive awarenesses of the researcher, knowledge that has been incubating over months ..." (52).

Chapter 4 presents examples of heuristic research in verbatim form under the headings of

"the initial interview," "individual depictions," "composite depictions," "exemplary portraits," and "the creative synthesis." These examples make for fascinating reading. They cover 21 research topics, including "The Experience of Touch in Blindness," "Growing up in a Fatherless Home," "Interaction Rhythms" and "The Experience of Writing Poetry."

In Chapter 5, the final section of the book, titled "Applications of Heuristic Research," Moustakas illustrates the insightful discoveries to be made by applying his heuristic approach to the study of loneliness, "the symbolic growth experience" and psychotherapy. Verbatim data from participants illustrate these applications of heuristic research in a vivid and engaging way.

Moustakas' treatment of psychotherapy has exciting implications for applying Polanyian concepts to current theoretical developments in psychoanalysis and psychotherapy, especially as articulated by the "intersubjective" theorists in self psychology. The book is also laden with anticipatory possibilities for exploring in the social sciences and humanities. The place of metaphor in heuristic research, which is so evident in this work, warrants further attention for its crucial role in the process of discovery. In sum, *Heuristic Research* is a veritable manual for sailing uncharted seas in search of "known" but unthought new lands. I recommend it highly to readers of *TAD*.

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Terrence W. Deacon, *Incomplete Nature: How Mind Emerged from Matter*. New York and London: W. W. Norton, 2012. Pp. xv+602. ISNB 978-0393-04991-6. USA $29.95; Can. $34.50, hb.

A key chapter of this book is on the concept of *work*, and this concept figures prominently in its other parts. The book itself requires considerable work from the engaged reader, principally because of four outstanding features: its stunning originality, its demanding technical character, its comprehensive scope, and its impressive interdisciplinary approach. The required effort or work is well worthwhile, however, because the book provides a promising way of at least beginning to account for and understand the daunting and to-date frustrating problems relating to the emergence of life from nonlife and the emergence of mental functionings and capacities from less complex forms of life. It does so while bringing to light the pitfalls and inadequacies of reductionism, dualism, computational models of mind, and existing supervenience theories.

Deacon points out that many of the current approaches to the matter-life and matter-mind problems tacitly presuppose the implicit dualism of an external homunculus required to interpret the reference, significance, and value of physico-chemical processes such as those in the brain or in computer processes and programs. Epiphenomenalism or eliminative materialism seeks to avoid this problem of interpretation and meaning by basically dismissing its importance, but in doing so creates intractable problems of its own. Computer programs and processes, however elaborate, have no inherent meaning, only the meanings assigned or imputed to them by their external creators and users. In this way they differ radically from the nervous systems and brains of organisms, with their internal, self-directed, self-actualizing modes of interpretation and meaning. In many other ways, which Deacon is careful to indicate, these approaches fail to explain or even adequately begin to explain, the distinctive functions and powers of life and mind. What is needed, he contends, is a radically different approach or strikingly new paradigm, the lineaments of which he seeks to lay out in his book.

This approach requires, among other things, bringing back Aristotle's formal and final causes, giving them a prominent role in both life and mind, and showing how they relate to Aristotle's material and efficient causes. The formal causes are such things as the "geometry" of complexly entwined, hierarchical levels of organization and the "generals" or universals to which exceedingly complex life forms such as humans are capable of responding. These, in turn, give rise to powers of self-definition and self-awareness, as well as to capacities of creativity and self-agency.

The multiple lower levels of organization that make life possible support and underlie newer and higher levels of organization that make possible, in their turn, ever more sophisticated mental processes in more developed forms of life. But "support and underlie" do not mean "reducible to," because the higher levels of organization have their own distinctive properties and powers that are unique to them and that cannot be reduced to the properties and powers of lower levels.

Moreover, these higher levels of organization do not simply *add to* the lower levels. To a significant extent, they subtract from, inhibit, or constrain many of the lower-level properties and processes that, if left intact, would make the emergence of the higher levels impossible. Relatively simple efficient causes and effects, and their "thermodynamic" traits give way to the kinds of work that can be facilitated and performed by the organizational and consequent cognitive capabilities introduced at higher levels. "Morphodynamic" (spontaneous order generating and sustaining) processes build on but also reverse thermodynamic ones that tend relentlessly toward disorder, and the two together provide a basis for emergence of the "teleodynamic" (end-seeking, consequence-oriented, final-causal) processes of life and mind. At some point of emergent evolution, an organism such as a human being becomes capable not only of the agential and self-sustaining behavior characteristic of all forms of life in differing degrees but to have a model of itself that pervades its actions. And it acquires the semiotic capability of envisioning and responding to universals, giving to them causal significance in their own right.

The key to these powers is not so much what is present as what is *absent*, Deacon argues. In both cases, nothing—like zero in the number series—is paradoxically something, and something of great significance. The living world and the human self are, in this reckoning, incomplete because of their orientations toward that which is not—not functioning as simple thermodynamics (i.e., ordinary physics and chemistry), not simple self-ordering systems, not mere material particulars, not something already attained but only intended, and not a substantial, separate self.

That which is not is thus paradoxically able to have multiple effects in the world.

Emergence of all types requires for Deacon the introduction of genuine novelty, and not just more of the same thing or type of thing that goes on at lower levels of organization or functioning. The lower levels make possible the higher ones, but the higher ones are not just the lower ones in different guises or manifestations. There is something genuinely new under the sun. The old is not left behind, but it is also not merely manifested or reproduced in slightly different form.

This summary does not do justice to the subtlety, sophistication, and originality with which Deacon develops his ideas. His book is highly suggestive and points the way to new ways of thinking and conceiving of research programs. But I have two criticisms to make of it. His "absentialism" (as he terms it) is a useful foil to reductive materialism, which seeks to view life and mind entirely in mechanical and thermodynamic terms and to dissolve complex wholes and organizational systems into the traits and capabilities of their separate parts. While it is true that some, though not all, old properties need to be left behind in order for new ones to emerge, this is hardly the whole story. The new ones are positive capacities in their own right. They do not merely constrain or cordon off some old properties. Much more accentuation, development, and clarification of the positive aspect are needed in Deacon's analysis.

My second criticism is that Deacon more often than not is content simply to indicate or describe processes and developments involved in the origins of life and mind without venturing to explain how they can do so. By indicating what these processes and developments are, and how they relate to one another, he makes an important contribution. But precisely in what specific ways they are able to function as they do to produce life and mind is left mostly unanalyzed and unaccounted for. The hard problem of consciousness, in particular, still remains, generally as hard as before.

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Thomas Jay Oord (ed.). *The Polkinghorne Reader: Science, Faith and the Search for Meaning,* (ed.) . West Conschohocken, PA: Templeton Press, 2010. Pp. 246. $15.96, pb. ISBN 978-1-59947-315-4. London: SPCK. £14.99. ISBN 978-0-281-06053-5.

In our scientific and technological era, John Polkinghorne says that for many persons being a physicist and theologian seems like being "a vegetarian butcher." Science and theology do not digest well together. Correcting this presumption, Thomas Jay Oord has presented, with the advice and cooperation of John Polkinghorne, a full menu of Polkinghorne's views on The World (Part I), God (Part II), and Christianity (Part III). The rich three course fare selected from the publications of a distinguished scientist and theologian combine well to serve a lively, lucid, and learned treatment of some of the most basic issues between science and theology today. More importantly, Polkinghorne's work is a demonstration of how a very competent mathematical physicist finds not just compatibility between science and Christian theology but also a way of life lived with openness, Christian faith, and advanced scientific knowledge.

Polkinghorne was for over twenty years a scientist and professor in mathematical physics at Cambridge University before deciding in 1979 to become a priest and theologian in the Anglican Church. He has published over 35 books (including his most popular *The Quantum World* [1984]), lectured widely in America and Europe, was knighted by Queen Elizabeth, and received the 2002 Templeton Prize for expanding our views of human purpose and ultimate reality. Oord has deftly selected from the many books of Polkinghorne a coherent and comprehensive overview of how Polkinghorne finds science and Christian theology to be "cousins" complementing each other and forming a progressive understanding of human being in the world today. Were it not for Oord's helpful citations of the sources and dates of Polkinghorne's publications from which *The Polkinghorne Reader* is composed, one might think that the book's fluency is a synthesis by Polkinghorne himself.

In each of its three parts, Polkinghorne faces some of the toughest issues between science and theology. Through them we see both a way science and theology can complement each other yet maintain their independence and fidelity to their disciplinary field. In the following, brief selections from each of the three main parts, I show Polkinghorne's main approach to science and theology, and where he stands on basic issues that for many seem irreconcilable.

Polkinghorne begins in Part I with the popular and dominating view in both the public and much of the academic world that science is a type of expert study that finds immutable facts. Drawing on current studies in the philosophy of science, he undermines this view by introducing the role of "the spectacles behind the eyes" that guide and shape our knowing. Next he refutes the idea of scientific reasoning as leading to a "totally specifiable verification" by showing how scientific reasoning is progressive, not the whole truth, but a "verisimilitude." Verisimilitudinous knowledge is reliable without being exhaustive (31). This open outlook toward what we now know and have yet to know comes from Polkinghorne's understanding of the physical world from particle physics to its relation to current evolutionary biology and the continuing development of Christian theology. Interpreting quantum mechanics and the origins of the cosmos, considering both bottom up and top down causation in physics and biology, Polkinghorne suggests that for science the "resulting worldview is certainly not that of a dull mechanical regularity… has more than a touch of the organismic about it… (27) and if subatomic particles are not 'more real' than cells or persons, they are not more fundamental either" (26). Reductionism based on a materialist view of reality is denied by another look at what science is finding in both physics and biology. Science shares with theology the continuing challenge of understanding reality in ways that may be surprising or even revolutionary.

Polkinghorne describes his approach to both science and theology as "critical realism." Critical realism takes seriously the physical reality of the world but it entails at least three things. First, "it has to recognize

that at any particular moment verisimilitude is all that can be claimed as science's achievement…" (21). "Second, our everyday notions of objectivity may prove insufficient as we move into regimes ever more remote from our experience" (22). "Third, a critical realism is not blind to the role of judgment in the pursuit of science" because "there are always unspecifiable discretionary elements involved" (22). By seeing this wider range of human knowledge and experience, Polkinghorne suggests that both science and theology share through critical realism an epistemological common ground in their search for and in the understanding of truth. Inherent in this open and verisimilitudinous approach is also the challenge of possible revision, and here Polkinghorne puts an emphasis on a closer look at the history of science and the history of theology. This outlook is shown consistently throughout the next two parts of the book. While Polkinghorne often uses "religion" and "theology" interchangeably, his primary concern is for the relationship of science and Christian theology today. However, he holds the same principle of openness toward other world faiths that he does for the verisimilitude that he finds in the pursuit of truth in science and theology. "No one can pretend to attain some magisterial vantage point from which neutral adjudication could be given. We can listen to each other, but we cannot presume to speak for each other" (231).

In Part II, Polkinghorne turns to the meaning of God in our world of science. Here he perpetuates the exclusive reference to God as "he" which is a clue to how traditional, though progressive in relation to science, his theology is. God is not a part of reality as in metaphysical monism, nor the final or first member of a series of beings (88). God's reality is necessary to answer why there is something and not nothing. Every chain of explanation has to have a starting point (91). In theology, we have to talk about God analogically. Here we face the paradox that "the most real" is "He" who is most elusive. If God is personal, "he" will manifest himself in ways unlike "the dreary uniformity of the action of a force" and will reveal God's self in ways appropriate to the divine nature. The philosophical criterion of coherence is not the measure of everything, and philosophical clarity may have to yield to empirical

reality as quantum physics has shown us (90). This approach opens the way for understanding elements in religious experience and in complex issues such as the Christian doctrine of the incarnation, the Trinity, and the resurrection. Again verisimilitude plays an important role in understanding what we believe to be true.

Since both science and theology seek the truest understanding of reality through their distinctive fields, the arena for their interaction is natural theology which is searching for knowledge of God by reason and inspection of the world (94). Each inquiry has something important to say. What natural theology finds may be limited to only a "supreme being," but then there is more to understanding the world than its physical elements. Natural theology can help treat whether the world has significance and purpose. Polkinghorne sees the rationality and beauty of the cosmos expanded by science's achievements as reflective of "the Mind" that holds it in being. While this view, he admits, is not a logical demonstration, it is an intellectually satisfying one (98).

Turning to Christianity in Part III, Polkinghorne begins with scripture because natural theology is not enough for the fundamental foundations of his religious beliefs. That foundation lies in his "encounter with God in Christ, mediated through the Church, the sacraments, and of course the reading of scripture" (147). Discussion of science and religion is a second order task of trying to harmonize and integrate his experience and beliefs as a Christian and a scientist. Because of its foundational function, scripture is important. It is not to be read literally but with understanding of its nature and context. The Bible is not a "divinely guaranteed textbook but a prime means by which we come to know God's dealings with humankind and particularly his self-utterance in Jesus Christ" (149). This view also means that scripture is evidential, a means by which we know what Jesus was like and what that tells us about God. Here Polkinghorne notes a distinction between science and religion. He does not need to read Clerk Maxwell's *Treatise on Electricity and Magnetism* in order to use his equations, but he does need to read the gospels to reckon with Christ (151).

Polkinghorne discusses many of the traditional conflicts between science and religion in Christianity such as prayer, miracles, the resurrection, and the Trinity. His ability to find complementarity between science and religion reveals how his career has thoughtfully related them both. One example is his discussion of the resurrection as a scientist and theologian. First, he uses his critical realist approach like a scientist looking at the evidence reported in the New Testament, especially the gospels and the apostle Paul. Looking at critical biblical and theological scholarship since the nineteenth century and debating whether the resurrection was a post-Easter faith arising from the reflection of Jesus' followers or an actual event, Polkinghorne concludes that it is an actual event. "The resurrection of Jesus is a great act of God, but its singularity is its timing, not its nature, for it is a historical anticipation of the eschatological destiny of the whole of humankind" (187). Here Polkinghorne speaks as both physicist and as theologian suggesting that like the moment of the big bang at the origin of the universe, the resurrection is a "foretaste and guarantee of what will await all of us beyond history" (187).

These brief glimpses into this book are only appetizers for a rare combination of a gifted person in both physics and theology. The scope and complexity of argument is inviting to further inquiry into the general subject of science and theology. In many ways it is a confessional presentation, a physicist who was also nurtured from childhood in the Christian faith and learned to find positive relations between physics and theology that extend generally into the larger concern over the questions about science and theology today.

For readers of *Tradition and Discovery: The Polanyi Society Periodical*, they will notice a strong kinship between Polkinghorne's philosophy of science and Michael Polanyi's thought. Polanyi is mentioned supportively several times, and I noticed there are at least twenty-one places where Polanyi's concepts of tacit knowing and personal knowledge in scientific tradition, authority, skills, discovery, verification, and beliefs are related. Polanyi did not explicitly develop a theology as Polkinghorne does, but I think he would

have appreciated his work without endorsing it because of Polkinghorne's view that our knowledge of reality is not exhaustive and Polanyi's concern for overcoming the gulf between science and religion based on the false ideal of scientific detachment and objectivity.

As mentioned above, Polkinghorne brings science and theology into constructive relationship through critical realism and verisimilitude. Critical realism calls for an examination of evidence and cautions against finality in judgment. Verisimilitude settles for truth in terms of approximation, not absolute correspondence or completeness. These standards of judgment entail an openness to modification. Thinking of the opposition to theology current in the public forum, such standards may not work well with them because verisimilitude lacks their absoluteness. On the other hand, Polkinghorne's work in this book and his others can help a sincere seeker to find ways of taking both science and theology seriously, not as a disjunctive choice but as a continuing and creative interchange and a choice of personal faith.

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