

Tradition & Discovery

The Polanyi Society Periodical

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The Polanyi Society

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Preface

TAD 37:2 is the issue following the Society's annual meeting in Atlanta so you will find several important business matters in News and Notes and succeeding pages. The Minutes of the meeting are included as well as the Treasurer's Report. Note in the Minutes that the Society has established an endowment program about which more will be said in the future. Establishing an endowment is an effort taken by the Board to provide more long-term financial stability for the Polanyi Society, allowing us more predictably to support projects such as travel for graduate student to the recent Atlanta meeting featuring graduate student papers. Please also notice that this issue includes a self-addressed envelope for academic year 2010-2011 dues payment. Anyone still puzzled about why the first two issues of each year include envelopes should see the note on the opposite page about mailing regulations. On page 7 of this issue, you will find the first announcement concerning a June 2012 Polanyi Society conference, "Connections/Disconnections: Polanyi and Contemporary Concerns and Domains of Inquiry." This event will likely be held at Loyola University, Chicago and will be organized in a way similar to the 2008 conference at Loyola. Hopefully, proposals for presentations at this conference will begin to come in this spring. Also, on page 8, there is a announcement and call for papers for the fall 2011 annual meeting of the Society in San Francisco.

David Nikkel has written a provocative new book, *Radical Embodiment*, that David Rutledge covers in his review article; there follows a response from Nikkel. There are two article on Marjorie Grene here. My essay traces Grene's changing response to *Personal Knowledge* and Polanyi's ideas as well as Harry Prosch's criticisms of Grene. Walter Gulick's essay is a clear and balanced response to the several criticisms of Polanyi that Grene made over the course of her long life. Finally, there is Dale Cannon's review of two books by David Noe, an interesting philosopher of mind, plus James Okapal's review of Marjorie Grene and David Depew *The Philosophy of Biology: An Episodic History*.

Phil Mullins

Tradition & Discovery is indexed selectively in *The Philosopher's Index* and *Religious and Theological Abstracts* and is included in the EBSCO online database of academic and research journals.

NEWS AND NOTES

A Note on Dues Payment

Please notice that this issue of *TAD* includes a self-addressed return envelope to be used to pay 2010-2011 academic year membership dues. The Polanyi Society is a registered non-profit organization that operates on a fiscal cycle that roughly coincides with the academic year so dues are collected each fall. The October and February issues of *TAD* normally include a self-addressed return envelope. US postage regulations, require that EVERY copy of *TAD* mailed in the postage class used must weigh exactly the same. Thus, even if you promptly paid your dues with the October issue's return envelope, this *TAD* will also include an envelope. If you cannot recall if you have already paid for 2010-2011, e-mail an inquiry to Phil Mullins. Dues remain \$35 (\$25 for libraries and \$15 for students), a bargain in the academic journal world. You can (1) send credit card information and authorization to debit from your account the amount of your dues (mullins@missouriwestern.edu or fax 816-271-5680) or (2) send a check to Phil Mullins (HPG, MWSU, St. Joseph, MO 64507 USA). Sorry but we cannot handle American Express cards.

Polanyi Society Speakers Bureau

The Polanyi Society's Speakers Bureau is available to anyone interested. Marty Moleski, S. J. and Richard Gelwick gave talks in 2010 at Loyola University of Maryland and Yale University respectively. If you know anyone who might be interested in sponsoring a talk, 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 precis of the talks given last spring by Moleski and Gelwick.

Minutes of the October 31, 2010 Meeting of the Polanyi Society Board of Directors

Present: Voting members: Paul Lewis, Charles Lowney, Dale Cannon, Jere Moorman, David Rutledge, Phil Rolnick, Wally Mead and Esther Meek (arrived late). Non-voting members Walt Gulick, Phil Mullins, Andrew Grosso and Gus Breyspraak. Guests: Mary Speckhard (student of Esther Meek).

1. President David Rutledge called the meeting to order at Mary Mac's Restaurant in Atlanta at approximately 8:25 PM.
2. The Minutes from the Board meeting in Montreal of November 6, 2009, were approved.
3. Jere Moorman, Treasurer, gave the Annual Treasurer's Report. He first covered the Scott Fund, which recently closed out a CD at \$8167.66. Phil visited with Ann Scott in the summer of 2010 and discussed with her plans for setting up an endowment account. David and Phil will write Ann Scott a letter following establishment of this account, explaining its operational procedures and our plans to add her donation to the endowment. There should be opportunity to honor Bill Scott and support scholarship on Polanyi in projects that the new Endowment Committee proposes. Jere went quickly over the rest of the Treasurer's Report. Currently there is a balance of \$4641.52. The Report was approved.
4. Walt Gulick gave the Nominating Committee Report (Committee Members: Phil Mullins, Wally Mead, and Walt Gulick): Two people are "term limited" and will need to move off of Board membership: Jere Moorman and Paul Lewis. This will necessitate election of a new Treasurer. Two people have been nominated to the Board and have accepted: Gus Breyspraak and Andrew Grosso. David Rutledge has agreed to serve a

second 3-year term. Charles Lowney has been nominated to become Treasurer and has accepted. Diane Yeager has been nominated to become Vice President (to replace Paul Lewis) and has accepted. These nominations were formally approved.

5. Phil Mullins presented the *TAD* Report.

6. Wally Mead presented the Travel Fund Report. This year we assisted attendance for 8 new young scholars, with an average subsidy of \$300.00. Jere moved that \$500 from the General Fund be transferred to the Travel Fund to replenish the account. The Board approved the motion. In the future, Travel Fund money will still need to go to Wally (who for the time being will remain in charge of the Travel Fund) but via the Treasurer.

7. Phil Mullins presented the Speakers Bureau Report. He identified a few possibilities that will be explored further at Duke University and the GTU. Jere would like to see us get better at public relations, say about what we are doing this weekend to enlist a new generation of scholars. He requested permission to pursue this possibility. This generated some discussion, even as to whether a Speakers Bureau was necessary. A couple of Board members said that personal contact is the most effective way to set up a presentation. Jere suggested that we invite members of the Society to be speakers. Someone else suggested that the web page advertising the Speakers Bureau be filled out with topical areas. The suggestion was made to continue the discussion online on our Board email list.

8. Paul Lewis presented the Meeting Report (the *ad hoc* Program Committee included Phil Mullins, Walt Gulick, David Rutledge, and Paul Lewis). Phil Rolnick and Neil Arner organized this year's meeting. Our schedule in past years was changed in order to separate the first presentations from the Board Meeting (all in one evening was too much for many folks). Paul requested feedback on this year's schedule. Next year the SBL will be back with the AAR in San Francisco. We will need to decide about schedule by March or April. Paul expressed gratitude and pleasure at the quality of papers that were submitted this year. 8 proposals were submitted; 6 were

chosen. The younger scholars making presentations on Saturday can submit a longer version to be peer reviewed for publication in *TAD*. David explained that the young scholars present will be taken to lunch tomorrow, with Board Members hosting. Next year one of the sessions will feature Darcia Narvaez of Notre Dame in Psychology. We promised some help with her travel costs. We will try to coordinate with the Religion and Psychology AAR Group. Phil Rolnick suggested that we try to have the session be in their slot, if they are willing. If anyone has further comments, send them to Paul. The question was raised: Do we want to create a formal (and not just *ad hoc*) Program Committee?

9. David Rutledge gave a Fund Raising Report. He mentioned several exploratory forays with no practical result yet. Wally suggested that it was more likely that a donor would give money for a unique experience, such as a conference, than to ongoing activities. Wally said that he and Mark Mitchell met with representatives of The Liberty Fund. It is possible that we could get them interested if we could tie our interests into their conservative intent. Someone suggested that we approach the Templeton Foundation. Walt suggested that personal contacts seem to be more important to explore than general fund raising efforts. Esther said maybe we are going about it in the wrong direction; maybe we should offer mentor services to bring scholars to us. Someone suggested we pursue funding for a Polanyi Studies Center and/or offer seminars on Polanyi. Phil Mullins mentioned Diane Yeager's recommendation that we apply for an NEH Program (Polanyi would likely need to be a focus along with other figures). This is something that she successfully organized in the past.

10. Publications: Walt reported on the state of the Polanyi reader: *Michael Polanyi, Recovering Truths: A Comprehensive Anthology*. He has investigated several publishers. He tried the reader out in a course he taught last year in Estonia, receiving praise from the students. One editor seems currently excited about it, Rowman and Littlefield. Walt is optimistic about the prospects. Wally next brought up an agreement with the *Bulletin of Science, Technology, and Society*

(published in Toronto), edited by Bill Vanderburg, to bring out an issue devoted to Polanyi's thought, like we did with the *Political Science Reviewer*. 11 persons have volunteered to write an article for what is anticipated to be a "thick volume." The expected publication date is Spring 2012. This will be a "new" audience for Polanyi. Wally also reported a conversation with the University of Chicago Press telling him that so far they have sold 2673 copies of *The Tacit Dimension*. The editor also mentioned that John Polanyi gave permission for Penguin Books to publish *The Tacit Dimension* in India.

11. Wally reported on the growing Poteat Archives at Yale Divinity School. David expressed thanks on behalf of the Board to Wally and suggested that we might have a meeting in New Haven to celebrate the opening of the Poteat Archives.

At this point (10:05 pm) we recessed, as the restaurant was closing, and decided to continue the Board Meeting at the Hyatt, once we found an appropriate space.

12. Reconvening at 10:40 pm, Wally presented the proposed change to our Bylaws for the purpose of creating the framework for an Endowment Fund to handle larger contributions (should the Polanyi Society be so fortunate). Phil Mullins' lawyer friend, who for many years has given *pro bono* legal advice to the Polanyi Society, gave some expert advice in drafting the proposal, which had been circulated in advance. There was considerable discussion around whether we should add a clause to ask a fiscal management firm to oversee endowment funds. Phil Mullins said his lawyer friend had not indicated a further explicit clause beyond what was in the proposed Bylaw changes was necessary in order to hire a professional manager; the lawyer also specifically recommended that the Board, until the endowment had a significant number of dollars, should not seek professional management. Phil brought out that the constitution of the Endowment Committee, according to the proposal, is such that someone from a management firm could be made a member of the Committee without her or him being a member of the Board. A call for the vote was made, and it was

approved as proposed by voice vote. Phil Mullins' lawyer-friend will be re-consulted about the proposed additional clause. If further revision is necessary, it can be done next year.

13. A Possible Polanyi Conference in 2012: One possibility is to return to Loyola University. The price, accommodations, proximity to the Polanyi Papers Archives, and our having experienced two successful conferences there count in its favor. (Rates and availability are not yet available.) But otherwise there is nothing special attached to this location. Marty Moleski has made a suggestion for a theme: "Redeeming Reason: Michael Polanyi's Vision." Phil Rolnick suggested that it might be broader, for the issues encompass our whole civilization. Walt suggested that we invite historian of science (acquainted with Polanyi) Mary Jo Nye as one of the principal speakers. Dale suggested that if the Polanyi Reader is being published, we might use it as a theme. Another possibility is a meeting at Yale in celebration of the Poteat Archives. Esther suggested that we call attention to Polanyi's role as a "Public Intellectual." Phil Rolnick raised the possibility of locating the conference at the University of St. Thomas in St. Paul, with its connections to 4 other seminaries in the area and the resources of the Twin Cities. This would help significantly to promote the Conference to a new audience. And if the Theology Department should co-sponsor it, we might be able to get rooms for free. It was proposed that President David appoint a small committee to explore the possibilities.

14. The Future Disposition of *TAD*, given Phil Mullins' retirement. Four things need to be addressed: (1) set up a "mirror" of the website; (2) set up an alternative financial channel (other than Missouri Western); (3) locate a future editor of *TAD*; (4) make a clear decision about whether in the future to do a print journal in addition to having *TAD* online. David, passing on the recommendation of Holmes Rolston, said that it is important to get an institution that wants to gain recognition through sponsorship of *TAD*. Phil explained that his duties could be divided up as follows: (a) collecting dues/maintaining mailing list; (b) produc-

tion of the *TAD* issues in digital form and general maintenance and expansion of the Polanyi Society web site ; and (c) production of *TAD* issues in printed form. President David urged us to keep all this in the back of our minds. If any of us can think of someone who might possibly serve as editor, that person should pass that information on to Phil and/or David.

15. Polanyi Sessions at the American Philosophical Association Convention(s – for there are 3 conventions per year): Walt is doing something at the Eastern Division APA Convention this December with the “Field Being Group.” Also Stephania Jha is presenting a paper.

16. Wally thanked Phil Mullins for doing much for the Society; at that everyone clapped and we adjourned the meeting.

Respectfully submitted,
Dale Cannon, Secretary

Polanyi Society: Treasurer’s Report 9/01/09-8/31/10

The Scott Fund CD was cashed out at \$ 8,167.66, which includes interest of \$159.30 (2009) and \$282.07 (2010). These dollars were delivered to the new Treasurer, Charles Lowney to be re-invested.

Statement Balance (9/01/09): 4,641.52

Income:

Membership and contributions: 4,480.00
Total Income: 4,480.00

Expenses:

TAD (printing) 1,413.10
TAD (supplies) 106.77
TAD (postage) 1,089.81
Total *TAD*: 2,609.68

Travel Fund: 500.00
Travel Fund: 825.00
Total Travel: 1,325.00

Total Expenses: 3,934.68

Balance at MWSU: *545.32

Statement Balance (8/31/10) 4,641.52

*MWSU amount may change as dues come in, etc.

Jere Moorman, Treasurer

Donations to the Polanyi Society

In past years, many have generously included with dues payment a US tax deductible contribution to the Society, which is a registered IRS 501C3 non profit organization. These dollars go to promote things such as the Travel Fund which supported student travel to the October 2010 annual meeting featuring graduate student papers. In this issue (pp. 8-9), is the first announcement about a June 2012 Society-sponsored conference which likely will be in Chicago. Like the last two Chicago conferences, we expect that this conference will strain the spartan Polanyi Society budget (see the annual Treasurer’s report on p.6), since the conference will include some plenary speakers and some scholarships to help support younger scholars. Donors may earmark contributions; those who donate to the support of the upcoming 2012 conference will be listed in the program.

At the recent Polanyi Society Board meeting, a Society endowment fund was established. A Bylaw change describes the objectives and operation of this fund. Generally stated, the long term objective of setting up an endowment is to put the Society’s programs on a sounder financial basis. A future issue of *TAD* will describe the endowment program. Donations to the endowment are welcome.

2012 Polanyi Society Conference

Connections/Disconnections: Polanyi and Contemporary Concerns and Domains of Inquiry

Call For Papers

The Polanyi Society will sponsor a conference in early June of 2012. Negotiations for the exact dates and place are still pending, although, like the 2008 Polanyi Conference, this will likely be a three-day conference at Loyola University, Chicago held the week of June 10, 2012. Conference participants will have the opportunity to spend an afternoon at the Regenstein Library of the University of Chicago reviewing the archival Polanyi materials held there. The conference will include several plenary speakers or panels as well as parallel sessions in which conference participants present and discuss papers with others interested in the session's particular topic. This will be a conference that builds in many opportunities for discussion and, like recent Polanyi Society-sponsored conferences, is open to persons using Polanyi-related ideas in a number of fields.

Proposals are invited for papers that examine the themes of post-critical thought in the context of the new century. The following are some suggested general categories within which specific papers might be grouped. [Please do not think of these categories as a limit for submissions but as a springboard for your own reflections. The final program will reflect groupings adjusted in light of proposals submitted.]

- Polanyi As Public Intellectual: Cultural Criticism and Reorientation in the New Global Order
- Redeeming Reason: Does “Personal Knowledge” Have a Future in a Partisan World?
- Polanyi in the Light of Developments in Psychology (and vice versa)
- Polanyi’s Work in Relation to Current Accounts of Organizations, Institutions and Authority
- Doubt and Commitment in the Postmodern Environment
- Religion and Science: Polanyi and Current Discussions
- History and Philosophy of Science: Polanyi and Current Discussions
- Contemporary Politics and Economics in Polanyian Perspective (and vice versa)
- Polanyi and the Rediscovery of Embodiment
- Language, Learning and Logic—Polanyi and Current Discussions
- Trust, Truth and Conscience: Polanyian Communal Values and Contemporary Culture
- The Good Society: Polanyi and Current Challenges
- Pluralism: Does Polanyi Help Us Address Current Interest in and Problems Associated with Diversity?
- Can Polanyi Speak to a Digital Age?
- Resources in Polanyi for Theological Reconstruction in the Face of Fanaticism and Secularism
- Skills, Practice and Virtue—Polanyian Links
- Polanyi on the Importance of the Beautiful
- Polanyi’s Antireductionism and the Logic of Emergence
- Proposals for panel presentations are invited

Proposals should be 250-300 words and will be reviewed by a panel of jurors. Send an electronic copy of the proposal without your name on it as an attachment to Phil Mullins at mullins@missouriwestern.edu. In the body of the e-mail, provide a preferred mailing address (or fax number) as well a phone number of the author. The initial deadline for receipt of proposals is October 1, 2011. If there is space on the program, those who do not meet the October 1 initial deadline can submit proposals before the final deadline of March 30, 2012. Priority consideration will be given to proposals meeting the October 1 deadline. If the proposal is for a panel, the full panel needs to be identified and one member designated as the primary contact. The panel proposal should outline why a discussion of this topic is important. Future issues of *TAD* and a posting on the Polanyi Society web site (<http://www.missouriwestern.edu/orgs/polanyi/>) will include additional conference information.

2011 Polanyi Society Annual Meeting Call for Papers

The annual meeting for the Polanyi Society for 2011 will be held in San Francisco in conjunction with the American Academy of Religion annual meeting. We are projecting that the AAR will provide two meeting slots, one on the morning of Saturday, November 19, and the second in the evening of the same day.

The overall theme for the meeting is “Persons in Society.” The Saturday morning session will feature a presentation by Professor Darcia Narvaez (a psychologist from Notre Dame who has used Polanyi’s ideas in her research on the nature of persons) with two or three formal responses. This session, may be jointly sponsored with another AAR group, Persons, Culture and Society. Proposals that connect Polanyi’s ideas to current understandings/dimensions of society are invited for the evening session.

Saturday morning session: The Moral Person: Psychology and Neuroscience and Polanyi

Saturday evening session: Open--Papers may address (but are not limited to):

- Polanyi and Ecological Psychology
- Organizations, Institutions and Authority
- Contemporary Politics and Economics
- Truth, Trust, and Conscience: Polanyian Communal Virtues and Contemporary Culture
- The Good Society: A Modest Polanyian Vision
- Polanyi and Pluralism

Proposals (250-300 words) should be sent as an attachment to Paul Lewis (LEWIS_PA@mercer.edu) by April 1, 2011. Inquiries are invited.

The Crucial Concept of Embodiment: David Nikkel's Account

David Rutledge

ABSTRACT Key Words: dualism, embodiment, postmodernism, radical postmodernism, moderate postmodernism, postliberalism, Poteat, Polanyi, Meek, Zhenhua Yu, tradition, neuroscience, cognitive science, emergence, panentheism, God, transcendence.

This review essay describes David Nikkel's broad conception of embodiment as a remedy for the insanity of modern mind/body dualism. He employs Polanyian themes, supplemented by the insights of cognitive scientists and neuroscientists, to show that all knowing is bodily, that tradition functions in knowing in a way similar to the body, and that thinking metaphorically of the world as God's body leads to a new appreciation of panentheism.

David H. Nikkel, *Radical Embodiment*. Princeton Theological Monograph Series (Eugene, OR: Pickwick Publications/Wipf and Stock, 2010). 173 pp. + biblio + index. ISBN: 13: 978-1-55635-578-3. \$22.00 (Web Price: \$17.60).

A hallmark of the modern period is the mind/body dualism which became a persistent feature of most philosophical and scientific perspectives in the three centuries after Rene Descartes.¹ While the separation of all entities into “thinking things” and “extended things” helped release the power of science to transform knowledge of the natural world, it also resulted in the alienation of persons from themselves and their past. David Nikkel’s ambitious goal in *Radical Embodiment* is to overcome this alienation by “advancing a picture of our meaningful, radical embodiment in our biosphere and in our social traditions, within a universe regarded as the body of God” (ix).

Nikkel’s book is sophisticated philosophical theology, using the work of Michael Polanyi as a reference point for a re-thinking of western assumptions about “mind” and “body,” and in dialogue with Polanyian scholars (Zhenhua Yu, Esther Meek, and particularly William Poteat).² It endeavors to engage not in exegesis of Polanyi, but in constructive philosophy from a perspective thoroughly grounded in Polanyian themes. Let me first sketch Nikkel’s general argument, and then focus on those sections that I think will be of most interest to *TAD* readers, before ending with questions for further consideration.

The plan of the book is clear. It affirms that our culture is “insane”: one reason for the madness is our assumption that knowledge and values are discarnate; part of the cure is to grasp that knowledge is inextricably embedded in the physical body, in social tradition, and in a divine source of all meaning. The villain of the story is “the modern spirit,” which Nikkel quickly sketches in his opening chapter and assumes throughout the book. The modern knower is an isolated individual, accepting only clear and explicit evidence as true, applying a method of skeptical doubt to all claims, and assuming that her mind has no essential relation to her body. An important feature of Nikkel’s approach is his claim that western culture is in the midst of a fundamental shift from this modern worldview to a “postmodern” perspective, and that any move to a sounder position requires conforming to the “postmodern spirit.” Though he favors Polanyi’s term “postcritical,” Nikkel nevertheless accepts the majority usage of “postmodernism,” and spends much of the first chapter

delineating differences in contemporary theology between radical postmodernists, postliberals, and moderate postmodernists, where he places himself.

Though Nikkel notes that “postmodernism” certainly “is a multivalent term used in diverse contexts,” he claims widespread agreement on “postmodern epistemological assumptions and claims” (30). His listing of these assumptions and claims (30-31) is helpful, but it is striking that he feels compelled to create categories into which every thinker can be placed, running the risk of reifying what is actually a plethora of styles of thinking, sensibilities, disciplinary habits and heuristic efforts to get beyond problems of the past. As a quick way to see what some of the differences are between thinkers, this use of discrete types of postmodernism is helpful, but the reader must always remember the lively conversation and its implications that are going on outside of these categories.

The center of the book comprises four chapters which examine “tradition” and “body”: (1) the dismissal of tradition by the modern spirit and the various efforts of contemporary postmodernists to overcome this dismissal; (2) the bodily embeddedness of all human thought; (3) the benefits of conceiving of “tradition” as standing to thought in a way parallel to the body’s relation to thought, that is, of conceiving of “tradition as body;” and (4) embodiment in relation to evolutionary biology and cognitive science, and consciousness as a “mystery” whose nature and purpose cannot be explained fully by science. These chapters are an important, indeed exciting, extension of Polanyian insights to new areas of epistemology. The concluding chapters apply some elements of “embodiment” to the theological position of “panentheism,” which Nikkel is convinced can overcome the tension between transcendence and immanence.

Having set out initially the various positions with which he is in dialogue, Nikkel begins building his real argument by turning to tradition and describing the move, in both Cartesian philosophy and the Reformation, to “enthroning the ideal of a universal reason not dependent upon particular traditions,” (28) particularly the tradition of the Church.³ Both the rationalist and empiricist schools of philosophy sided with the “mind” half of Descartes’ dualism, denigrating the concrete, lived body. This disengagement from tradition and from the body have produced the anxiety and alienation of modernity. In gradually reacting against this truncated epistemology, postmodernism has affirmed several counter assumptions: that knowledge is never the result of isolated mind grasping independent object, but is rather the interconnection, the interaction, of embodied knower with his or her environment. Thus knowledge is in part constructed by the mind from within the context of its interaction with the world through its body. The totalizing, “essentializing,” absolute dualism of the “transcendental subject” is renounced by postmodernism in favor of the complex, contextual, interdependent engagement of minded body with physical and social reality.

Here Nikkel makes a real advance in discussions of postmodernism by employing specifically Polanyian themes to recast central terms. He uses the structure of tacit knowing to elaborate an understanding of tradition as that tacit givenness, that prereflective, implicit ground of particulars on which we rely to attend to the focal meaning which they jointly comprise (41-42). We are always embedded in “tradition,” that is, the “premises, metaphors, analogies, images, pictures” (77, quoting Poteat) which give thought its power subsidiarily, but which are normally unrecognized or ignored by critical thought, which has eyes only for the explicit, “focal” pole of knowledge. Our language, assumptions, habits of mind as well as of gesture, our store of knowledge of all sorts, are indwelled by the knower, but tacitly, in the same way the muscles, bones and nerves of our bodies are relied upon in perception, in conversation, in reading and writing: “...the prereflective givenness of tradition strongly parallels the prereflective givenness of the human body” (74).

Rather than seeing “tradition” solely as a canon of classical texts or concepts that one can appropriate self-consciously, we should use Polanyi’s insight to recognize the subconscious, pre-reflective role of our lived traditions. Not only is such a concept of tradition much richer, but it allows us to see that we cannot choose to bypass this pre-reflective tradition, for it is the very condition for our saying and thinking anything at all. Even postmodernism, obsessed with the hegemonic “logocentrism” present throughout the Western tradition, has in its more radical figures imitated its modernist forebears by condemning tradition, ignoring its inevitability as the subsidiary particulars of our knowing (34).

Nikkel also describes a variety of postmodernist thinkers who, despite differences between them, do recognize that knowing is in part a constructive practice that involves judgment; that despite the lack of absolute rules in knowing, “a non-arbitrary decidability obtains” (41); and that tradition is “a prereflective or tacit givenness” as well as an explicit body of texts or practices. Not surprisingly, moderate postmodernism “stands in the best position to avoid extremes” of absolutism and relativism, and Nikkel divides the moderates into four camps: the neo-pragmatist historicists (Putnam, etc.), the hermeneuticists (Gadamer, Ricoeur, Tracy), the neo-romantics (Cavell and C. Taylor), and the bodily philosophers (Polanyi, Merleau-Ponty, Poteat). He also notes, however, that many moderates are overly reliant on linguistic models for interpreting reality, while he (like Poteat) favors the role of embodiment in generating meaning.

At this point Nikkel raises an important question of Polanyian interpretation. Since some postmodernists would question the legitimacy of any and all tradition appealed to as an authority — even tradition which operates tacitly — it is important to determine whether “some aspects of tradition may be so deeply tacit and embedded as to defy adequate explicitization” (78). Nikkel argues “some aspects of knowledge in principle defy specification,” making our reliance on tradition unavoidable and inescapable, but notes that some Polanyians hold contrary views, especially Zhenhua Yu, who claims that “tacit knowledge cannot be fully articulated by verbal means, but can be articulated in action” (quoted, 78).⁴ Here the Polanyian examples of someone learning to ride a bike, or learning to play a composition on the piano, or learning a language are relevant. Are the tacit elements of these performances in principle beyond articulation, or only beyond it because of the practical limits of being able to name all of the particulars involved? Nikkel states, “I conclude that full non-verbal articulation is impossible regarding motion, art, and language use” (79), and more fully, “I do not think Zhenhua’s distinction, of tacit knowledge subject to verbal articulation versus knowledge amenable only to articulation through action, can stand, on Polanyian terms” (80).

Though I will not attempt to settle this debate in a review, it should be noted that Nikkel has raised a basic question here that deserves careful attention, and I will try at least to lay out the issue clearly. Yu’s claim quoted above appears in his discussion of Scandinavian Wittgenstein scholars who also employ Polanyi’s tacit knowing to express Wittgenstein’s dictum that “the meaning of a word is its use in the language.”⁵ The work of Grimen, Janik, and Johannessen stresses the importance of activity in knowing, a practical process or using of terms that always accompanies the intellectual, conceptual products of knowledge. These thinkers carefully discriminate between various forms of knowing that go beyond our powers to verbally articulate them—the sound of a clarinet, say, or the smell of coffee, recognizing a friend’s face, or mastering a skill such as playing a piano or a violin.⁶ This emphasis on the practical activity of knowing strikes me as very close in spirit to what Nikkel is advocating in *Radical Embodiment*, particularly in that Yu acknowledges the “logical gap” that exists between subsidiary and focal awareness, between inarticulate and articulate forms of knowing.⁷ The significant exception, however, is that this talk of action and process includes no direct attention to the body as the locus and vehicle for all such activity. Nikkel’s charge, then, could be put as follows: the

Wittgensteinians whom Yu endorses perhaps have begun to break through modernism's discarnate model of knowing, but they have not gone far enough—they have not rooted meaning-making deeply enough in the physical body and its environmental and social context.

One last comment: it does seem that the differences between these discussions of tacit knowing hinge on the varied meanings of "articulation." Yu points out that the Scandinavians have a much broader view of "articulation" than just linguistic expressions; it may include non-verbal forms of expression as well. Confusion, however, is introduced when it is implied that an action can fully or completely articulate or express meaning, which I think Nikkel is right in judging as going beyond Polanyi's claim about tacit knowledge. Perhaps the expression which Yu quotes from Johannessen would be more appropriate: "This tacit, 'surplus' knowledge is displayed in the very acts of applying...language"—displays, rather than 'articulates.'"⁸

These references to language provide a link to his next three chapters, where Nikkel argues at length that "language depends on bodies." Here he provides that "next step" which he seems to feel Yu has not yet taken, of rooting language not only in an abstract, general "activity," but in concrete bodily activity. Though referring briefly to the work of Polanyi and Merleau-Ponty, Nikkel focuses primarily on a number of neuro- and cognitive scientists, psychologists, and philosophers who have addressed this question specifically in recent years (Head, Rosch, Spelke, Mandler, Hung, Johnson and Lakoff, Nagatomo, and particularly Edelman and Damasio, 48-60, 96-117). The scientific evidence is growing that beneath linguistic, spatial, color, and mathematical concepts are "schemas" that depend directly on our body's orientation and motile skills. Nikkel is clear that while consciousness can be better understood in evolutionary perspective, it cannot be reduced in normal neo-Darwinian fashion to a brain simply responding to environmental stimuli. The "natural drift" of "self-organizing, dynamic biological systems" means that they possess "an integrity that puts pressure on the environment, so to speak, even as the environment puts pressure on it" (93). Thus the attempt to render the human mind as a mechanistic response to its environment must be rejected, as must the equally myopic attempt to render human consciousness in terms of a computing machine model: "Such computational models represent the purest form of functionalism, where hardware, material, structure, and process matter not at all, subordinated to the final product of the software program" (96-97; see also 111).

Here the concept of emergence, which is so important for Polanyi in the final chapter of PK, is crucial: as Goodenough and Deacon put it, "emergence defines the onset of telos on this planet and, for all we know, in the universe. Creatures have a purpose, and their traits are for that purpose" (quoted, 101). Nikkel distinguishes several types or levels of emergence in an effort to acknowledge both that "consciousness always depends on its component neural correlates for its very existence" (111), and also that "consciousness as emergent property exercises a measure of independent causal effectiveness, the power of some indeterminate free will" (110). Philip Clayton's work on emergence, as illustrated in the issue of *TAD* (XXIX: 3 [2002-2003]) that examined and critiqued that work in relation to Polanyi, would helpfully extend and amplify Nikkel's treatment here.

This portion of the book will certainly be instructive to Polanyian scholars in that it is written out of a thorough immersion in the science that has occurred in the fifty years since PK, and presents perspectives normally absent from epistemology and theology. It also extends concretely Poteat's talk of the "mindbody" by connecting that concept to parallel discussions in other areas. Given Poteat's own references to Piaget, Erwin Straus, and linguistic theorists in *Polanyian Meditations*, I suspect he would appreciate Nikkel's use here of "extraterritorial" scholarship. Despite the difficulties of working with two dissimilar vocabularies and sets of

assumptions, Nikkel is largely successful, it seems to me, in navigating the fine line between acknowledging the biological, material nature of “body,” without surrendering the necessity of humanistic, spiritual language in adequately describing the person.

After discussions of “tradition” and “body,” Nikkel is ready to move to a third level and take on “the status of God,” the focus of his last two chapters. The link in these topics is perhaps most clearly seen in his recognition that the biblical tradition of the west presents human beings as a psycho-somatic unity in contrast to the dualism of Greek thought (90), and thus he is inevitably led to a panentheistic theology that unifies the transcendent and immanent dimensions of God. A strength of the book is that one learns a great deal about the intellectual landscape of postmodern theology through Nikkel’s many conversation partners, both early and late in the argument. He relates his views to reactions to modernism by poststructuralists or deconstructionists (Derrida, Mark C. Taylor and others), postliberals (G. Lindbeck, S. Hauerwas, J. Milbank, and Esther Meek), and moderates (S. McFague, P. Hodgson, D. Tracy and others). In tracing the theological response to postmodernism, he positions himself in chapter six in relation to minimalist conceptions of God (Kaufman, McFague, Wieman, Loomer and Meland), atheism and its near-cousins (where he would apparently put Mark C. Taylor), and traditionalists, which would include both postliberals and process theologians or their relatives (Berdyayev, Macquarrie, Jonas, de Chardin, Fox, Cobb, and Griffin).

Among these various perspectives, the minimalists rightly reject the absolutism of traditional theology, but they replace it with its mirror opposite, a minimalism that so embraces the *via negativa* and the limits of human speech about God that it renders real commitment virtually impossible (12-18; 123-24). The conservatives or postliberals affirm the importance of being embedded within a tradition, but employ postmodernism defensively, rejecting the possibility of real dialogue with other traditions. On this ground he criticizes Esther Meek’s “excellent book” *Longing to Know* where “in step with evangelical tradition, Meek does hold to supernatural interventionism to guarantee the historicity of the biblical witness” (21-22). This, he judges, departs from Polanyi’s acceptance of historical criticism because it allowed for modern scientific knowledge while also allowing for the mytho-poetic thinking of biblical culture. To do otherwise, Nikkel suggests, preserves the personal, existential relation to biblical truth, but at a high price: God’s “personal particularity wins out over a wider, more consistently immanent revelation” (22). While Nikkel raises good questions for Meek, I suggest that beneath the surface of this issue is another question with which I think Meek is perhaps unconsciously struggling, and to which Nikkel has not yet provided an answer, namely the possibility of “transcendence,” of the divine, of God, in a “consistently immanent revelation.” While Polanyi’s discussion of biblical theology in PK is limited, it is not clear to me that he would embrace the full immanentism of Nikkel.

Against the extremes of the radicals and the postliberals, Nikkel tries to fill a void in the discussion by articulating a “moderate” postmodernism “by developing and promoting an explicit and full-fledged panentheistic understanding of God” (127). Moderates recognize that skepticism is “parasitical upon meaning,” so that the normal human experience of meaningfulness can be accepted as a portent of a deep ontological fact (contra the minimalists and atheists), and while no foundational absolutism is possible in our truth claims (contra the postliberals), we can affirm meaning and value that are adequate to our needs. The centerpiece of Nikkel’s effort is his panentheistic concept of God’s relation to the world, for which he prepares by briefly discussing the “inevitability of metaphysics,” and why the “unknowability of God” only limits, but does not eliminate, the possibility of theology (128-33).

Here this reviewer must admit that I found this last section of the book less satisfying, not because of Nikkel's full-fledged pantheism, with which I agree, but because of what we might term his theological method, and because his pantheism stresses pan, in detriment to theos. Regarding the issue of method, one of the mantras of Radical Embodiment is that any claim to knowledge in the contemporary world, especially the theological, must conform to "the postmodern spirit" (see 21, 122, 127, 131, etc.). Though Nikkel initially shows awareness of the dangers of his schema ("I offer my understanding of the modern versus postmodern spirit not as an absolute or monolithic schema that disallows countervailing tendencies or alternative schemas, but as a general description of some contrasting tendencies involved in this cultural shift," [2]; and "the postmodern spirit calls us to guard against absolutizing our own perspective," [9]), this awareness seems to dim when he returns to theology late in the book. For example, though tradition is an essential category for Nikkel, his treatment of theological concepts pays no attention to the role of such concepts in Christianity or western tradition generally, but is thoroughly abstract, defined to meet the logical demands of postmodern philosophy. "Tradition," in other words, seems to lack any historical dimension. Though he "prefers" a personal God, Nikkel's treatment severely restricts notions of revelation and of divine action in the world when these concepts threaten certain assumptions of postmodernism: "I myself cannot accept a too sharp demarcation between a transcendent (God in God's self) and an immanent (God for us) aspect of the divine. Such dualism smacks more of the modern than the postmodern spirit" (132). The question is not about Nikkel's distinction between transcendence and immanence, but about his standard for deciding the question: it is not an examination of biblical claims about God, or the theological tradition's claims about God that must be examined, but the dictates of "the postmodern spirit." "The postmodern spirit... must discount certain traditional sources for knowledge of God... we must deny the validity of the following: 1) revelation in the sense of a supernatural or self-authenticating intentional action... from God" (141). To discuss the nature of "God" in the west through such central concepts as "transcendence," "immanence," "revelation," and "divine action," while paying little attention to what the theological tradition has said about these matters, makes one wonder just what tradition actually means for Nikkel. It would seem that one of the claims of postmodernism is that all voices - including that of theology - should be heard, not just those regnant in the academy.

The second point raised concerns the way in which Nikkel's discussion of pantheism seems to reduce God to a deist figure, by greatly attenuating the possibility of God's actual presence in the world. "Immanence" is the primary category for Nikkel's "postmodern" understanding of God, and one can certainly appreciate the tendency to 'balance the scales' by stressing this dimension of the divine. If this requires eliminating some fairly central claims of the Christian theological tradition, however, one is justified in asking for a fuller defense. At this point it seems to me Nikkel's work would benefit from that of Jerry Gill, whose *Mediated Transcendence: A Postmodern Reflection* tries to grapple with the traditional "dualism" of the west's notion of God.⁹ From a Polanyian perspective, Gill suggests ways that "transcendence" may be "encountered mediationaly, known tacitly, and expressed metaphorically," "in and through the particulars of tangible reality."¹⁰ While Gill may not solve all of the problems involved, his work would supplement Nikkel's, strengthening his case for pantheism. I do not want to suggest by these criticisms that David Nikkel's discussion of pantheism, based on his well-thought-out understanding of embodiment, is not full of helpful avenues for moving beyond some weaknesses of modern theology. Here disagreement is meant to be the sincerest form of flattery. But if a God embodied in the world, to use McFague's metaphor, does not act or cause events, is not "intentional" or "purposive," and does not communicate with humans (145, 156-160), one is left wondering to what "God" refers, other than a logical construct ("the one reservoir of all possibility") (148-49).

In the very effort to summarize Radical Embodiment in a review, I have not done justice to its richness of implication, its complexities of argument and reference. Nikkel has written a book that will engage and challenge you to think for yourself in new and exciting ways; and that is the highest standard to which a book can aspire.

Endnotes

¹As Nikkel points out on p. 90, one could argue this dualism actually begins with ancient Greek philosophy.

²Nikkel's book is dedicated to Poteat, and he received his PhD at Duke, where Poteat taught. He also refers often to Merleau-Ponty and Wittgenstein, often part of the "canon" of Polanyian scholars. His earlier work, however, was on Hartshorne and Tillich.

³It would perhaps flesh out Nikkel's discussion of tradition to cite some of the modernists who have criticized it (as he does in pointing to Descartes in speaking of mind/body dualism). One might, for example, think of figures like Condorcet, Gibbon, and Diderot as they are described by a contemporary modernist, Peter Gay, in *The Enlightenment* (1968) vol. I, chs. 1, 4-6

⁴Nikkel is referring to two articles by Zhenhua Yu in *TAD*: "Tacit Knowledge: A Wittgensteinian Approach," XXXIII:3 (2006-07), 9-25; and "Tacit Knowledge/Knowing and the Problem of Articulation," XXX:2 (2003-2004), 11-23.

⁵Ludwig Wittgenstein, *Philosophical Investigations*, 2nd ed. (NY: 1958), Pt. 1, sec. 43.

⁶Zhenhua Yu, "Tacit Knowledge: A Wittgensteinian Approach," 11-13.

⁷*Ibid.*, 13-14.

⁸*Ibid.*, 20. There are some confusing aspects of Yu's generally illuminating article. He states that Wittgensteinians distinguish various forms of tacit knowing, including "tacit knowledge as something that is not articulated by verbal means, but can be articulated linguistically" (10). 'Linguistically articulated knowledge that cannot be articulated verbally' needs clarification.

⁹Jerry H. Gill, *Mediated Transcendence: A Postmodern Reflection* (Macon, GA: Mercer University Press, 1989).

¹⁰*Ibid.*, 142-143.

WWW Polanyi Resources

The Polanyi Society has a World Wide Web site at <http://www.missouriwestern.edu/orgs/polanyi> . In addition to information about Polanyi Society membership and meetings, the site contains the following: (1) digital archives containing all issues of *Tradition and Discovery* 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) 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 essays (available on the Polanyi Society web site and other sites) by Polanyi as well as audio files for Polanyi's McEnerney Lectures (1962) and Polanyi's conversation with Carl Rogers (1966).

A Response to David Rutledge

David Nikkel

ABSTRACT: Key Words: articulation, God, determinism/predestination, embodiment, finitude, indeterminate freedom, general and special providence, panentheism, postmodernism, quantum events, tacit knowledge, tradition, Arthur Peacocke, Friedrich Schleiermacher, Mark C. Taylor, Zhenhua Yu. *This appreciative response to David Rutledge's review of my book, Radical Embodiment, deals with the nature of categorization/generalization with respect to and in light of postmodernism, with the issue of the articulation of tacit knowledge, with Mark C. Taylor's current a/theological stance regarding the concept of God, and finally with my model of divine embodiment that rejects special providence and revelation.*

I appreciate tremendously David Rutledge's attentive reading and thoughtful engagement with my book *Radical Embodiment*. I doubt that I could conjure up as felicitous a summary of my positions as he has accomplished. I can only hope that other readers make as serious an effort to indwell my text as has he. That he believes that I have succeeded in most of my goals for this project adds to my pleasure.

I now turn to particular points in his review calling for response, clarification, or elucidation. First off, I admit a certain irony in formulating generalizations and categories pertaining to postmodernism, given that one of my generalizations is suspicion of categories (at least when understood rigidly or absolutistically—see RE, 31)! Yet I would want to affirm both sides of the tension. Meaningful generalizations about groups of thinkers are indeed possible and sometimes insightful and productive. At the same time, such generalizations should never deny nor gloss over relevant differences in what Rutledge dubs “styles of thinking, sensibilities, disciplinary habits and heuristic efforts” (10). I probably should have issued a caveat that my categorizations do not intend to gainsay the great diversity among postmodern thinkers.

The second issue I will address concerns whether one can fully articulate tacit knowledge, in particular whether non-verbal tacit knowledge is amenable to complete articulation through action (even when not amenable to full verbal explicitization). At the outset, I will grant that at least some of the disagreement between myself and Yu may stem from a different understanding of “articulation” for a native Chinese versus a native English speaker (versus perhaps native Scandinavian speakers). The limited nature of all our knowledge—including our tacit knowledge—constitutes a fundamental premise for me. This premise accompanies our very embodiment in the world, so I think Rutledge is spot on in suggesting that the Scandinavian Wittgensteinians “have not gone far enough” from the perspective of radical embodiment, by failing to root “meaning-making deeply enough in the physical body and its environmental and social context.” In my book (RE, 108), I expressed doubts at Polanyi's claim that tacit knowledge may extend to “neural traces” in one's cortex (TD, 15—a somewhat vague phrase, I might add). While tacit knowledge indeed extends deep into our bodies, it always runs up against some limits. Our explicit knowledge forms only the tip of the iceberg holding our tacit knowledge—but that “iceberg” that is one's body has a base underlying our tacit knowledge. For example, I would find it absurd if someone claimed to have tacit knowledge of individual cortical neurons (each neuron does after all represent a whole composed of its own parts). To argue further, I would claim a kind of tacit knowledge of my heart beating and, in some circumstances, of the blood coursing through my arteries and veins. And I possessed such tacit knowledge even before I learned the English language or had

a science lesson. But I do not have such a tacit knowledge of the composition and structure of my heart and circulatory system. Compared to my tacit bodily knowledge, such scientific knowledge is third-person explicit knowledge. Thus, it seems to me that I cannot fully articulate my non-verbal tacit knowledge to myself through my own actions, let alone to another. As I suggested in my book, I do not believe I can make fully explicit to another my tacit knowledge involved in orienting and moving my body to ride a bike (RE, 78-79)—let alone the very tacit knowledge of my heart beating at that time. I agree with Rutledge that “displays” is a better word than “articulates” when it comes to tacit knowledge. Still I would not want to say that I can fully display my tacit knowledge in any particular act. My sense of this finally depends not only on a postmodern recognition of human finitude, but also on such recognition from my Judeo-Christian heritage. Our embodiment entails that our knowledge and control both of our external and internal environments, both of one’s world and one’s body, always has its limits.

Allow me to address a penultimate—even minor though still interesting—matter concerning the “status of God.” The earlier deconstructionist Mark C. Taylor could indeed be justly labelled an atheistic “atheologian.” In Taylor’s avowedly post-deconstructionist current phase, I do not find things so simple. The *After God* title of his latest book indicates that he certainly has not returned to a Western personalistic model of “God.” Yet he admits that the notion of divinity will not let him go. In some important respects, he develops a polar model of divinity more robust than minimalist Christian conceptions. It posits a structuring element and a destabilizing element within the divine—with the destabilizing one being more “fully divine,” I believe it is safe to say.

I will now tackle the ultimate issue of David Rutledge’s review: whether Nikkel goes too far in undermining divine intentionality and purpose relative to divine action, including revelatory action. First, let me clarify where and how I believe God is intentional and purposive. In traditional Christian theological terms, I affirm general providence (and revelation): the divine reality and purposes become manifest in and through God’s body, the world. In this connection I criticize McFague for her explicit refusal to speak of any intentionality in God’s embodiment (RE, 160-61). What I cannot affirm is special providence (or revelation), that God both intends and acts to cause particular events. By insisting that what happens in the world affects God, I do agree that God desires that certain events occur and further that some events are paradigmatic of God’s intentions for the world and human creatures. I admit that, relative to the whole of Christian tradition, my refusal to support special providence represents an aspect of “radical embodiment” that is radical indeed. However, my position has connections both with the history and logic of the concept of pantheism and with modern Christian theology.

In expounding upon the concept, which came out of German Romantic Idealism, I will draw on my entry article on “pantheism” in the *Encyclopedia of Science and Religion*. Pantheism attempted to find a middle ground between deism and pantheism, taking what its developers considered the best of both models for the God-world relationship, while avoiding their respective pitfalls. What it liked about deism was that God refrains from actions that overturn nature. What it liked about pantheism was the on-going intimate connection between the divine and the world (in contrast to the externality of God to the world in deism as well as in classical theism). Contrary to a pantheistic model, pantheism professes indeterminate creaturely freedom.

To be sure, one could have a pantheism wherein God did engage in particular violations or supercessions of the laws of nature without committing a logical contradiction. But, as above, pantheism’s historical genesis was premised precisely on avoiding such a model. Furthermore, there is something about the nature of

embodiment—a metaphor often accompanying panentheism—which makes problematic the notion of divine interventions and supercessions. A body in the normal animal sense is something in and through which we attend to a more or less external world. A difficulty in applying the metaphor to God is that no environment finally stands external to the divine. It is true that we can sometimes intentionally influence what is happening within our human bodies by our thoughts alone; still, such cases where I would want to say that I have directly caused a change within my body are rare. As we engage with the external world, we and our bodies attempt to preserve a homeostasis that permits our organism to survive and hopefully thrive. In other words, what goes on within our bodies generally has little to nothing to do with specific intentions or direct causation regarding a particular bodily part. Thus, the homeostatic processes of our bodies analogize with divine general providence, with the total processes of nature which God has ordained. Of course, a qualification of the body analogy is that God does ordain these natural processes, while we contingent creatures do not ordain the homeostatic processes of our bodies. If the whole universe is the body of God and God does not move that body to deal with an external environment, a certain presumption may exist that God does not need to move a particular part of that body for internal purposes in order to fulfill God's intentions—especially given divine respect for creaturely freedom.

Finally, let me address modern Christian precedents for my non-interventionist position. The modern world led many Christian theologians, as well as German Romantic Idealists—who sometimes overlapped—to doubt biblical or traditional supernatural events, both because of a modern scientific worldview and because modern historical methods and research cast doubts upon the reliability of the accounts of such happenings. Friedrich Schleiermacher, the father of modern theology, did uphold special revelation in Jesus Christ, who alone possessed a full God-consciousness, through natural processes—but at the cost of embracing predestination and rejecting indeterminate free will (and for this reason, some have identified his theism as a form of pantheism). In a sense, general and special providence collapse or at least become less easily distinguishable in his model. Interestingly, Arthur Peacocke, an avowed pantheist, has developed a notion of “top-down causation,” where divine action supposedly does cause specific events. This hypothesis presumes that, in setting the general laws and the initial conditions of the universe, God can guarantee certain events will happen. Given indeterminate freedom and chance interactions among creatures in their freedom (which Peacocke affirms) stretching over 13.7 billion years to this point, I find it utterly implausible on Peacocke's premises that God can guarantee certain events will happen in human history.

Liberal Protestant theologians after Schleiermacher endorsed indeterminate freedom and refrained from identifying particular events as God's acts. To my knowledge, so did the major Neo-Orthodox theologians with the notable exception of Karl Barth. It does then appear most difficult for modern Christians to identify particular events as directly caused by God—unless one either resorts to supernatural intervention or reverts to a determinism (whether directly or, as with Peacocke, implicitly). Process theology provides an alternative approach, whereby God is active in particular events or occasions—indeed in every event. God offers an initial aim to each (split-second) “unit occasion of experience” (the fundamental metaphysical reality for process thought). This initial aim is God's preference for how the creature should act on that occasion. Of course, in strongly asserting indeterminate creaturely freedom, process theology maintains that God never fully determines any occasion or event—creatures always play a part in the final outcome. But at least one could say that God is specifically involved in every event, as well as judge that God desired a particular religiously significant event to occur. The problem with the process position here is its totally speculative nature; we lack any empirical evidence for the existence of initial aims and likely always will.

Another alternative has been advanced by several figures in the science and religion dialogue (to which Peacocke has been so important), including Nancy Murphy, Robert Russell, and Thomas Tracy. Latching onto the quantum indeterminacy observed by physics, they attempt to purchase special providence and revelation by speculating that God determines the probabilistic quantum movements of subatomic particles, which in turn produce macro-effects resulting in particular events. This notion has the virtue of not contravening any natural regularities: the aggregate motions of particles fall into the invariable probabilistic distributions; however, “behind the scenes,” God manipulates which individual particles do what. Thus far, no empirical evidence exists that micro quantum events have macro effects. And if we do establish any such effects, to establish a causal connection between quantum events and a particular religiously significant event seems staggeringly improbable. Apparently, we would need to have some very sophisticated scientific instruments in place when and where we expect something revelatory to happen. Finally, even if we can prove that a particular configuration of sub-atomic activity produced a desired effect, whereas other possible configurations would not have yielded this effect, a huge problem remains. In principle, no scientific, no empirical method exists to show that God caused this particular configuration, rather than the naturalistic, random playing out of quantum mechanics. To believe that God causes particular events through quantum manipulations appears to be a form of blind faith. Moreover, this model, like supernatural interventionism and predestination, raises profound questions of theodicy and God’s control of events. In this particular model, did God manipulate certain quantum events that resulted in evil or fail to manipulate certain quantum events in a way that would have prevented evil?

I thank David Rutledge for spurring me to unpack the tacit knowledge informing my rejection of divine supernatural (or deterministic natural) causation of particular events. While I do refer to the “post-modern spirit” in support of my position, my understanding of tradition and its tacit roots is quite expansive. The postmodern spirit relies substantially upon the modern spirit and its various sub-traditions, including the tradition of modern science, even as it reacts against crucial elements of the same. In formulating my views on divine action, I have relied heavily not only on Western scientific traditions and traditions of panentheism and divine embodiment, but also on modern Christian theological traditions.

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Marjorie Grene and *Personal Knowledge*

Phil Mullins

ABSTRACT Key Words: Michael Polanyi, Marjorie Grene, Merleau-Ponty, Harry Prosch, interpreting *Personal Knowledge*, Polanyi's dualism.

This essay pulls together from myriad sources the record of Marjorie Grene's early collaboration with Michael Polanyi as well as her interesting, changing commentary on Polanyi's philosophical perspective and particularly that articulated in Personal Knowledge. It provides an account of the conflicting perspectives of Grene and Harry Prosch, who collaborated in publishing Polanyi's last work, Meaning.

These reflections are an historically-oriented review of Marjorie Grene's almost sixty year involvement with what I call the *Personal Knowledge* project.¹ In what follows, I pull together many of the important things Marjorie Grene said, during her long life as a philosopher, about *Personal Knowledge* (hereafter PK) after its June 20, 1958 publication. I cannot sensibly do that without also noting beforehand the important role that Grene played in working with Polanyi in the period leading up to the publication of PK. I also touch upon work Grene has done herself after the publication of PK, suggesting some of PK's impact upon Grene. The final section of the essay attempts to further illumine Grene's views by examining Harry Prosch's criticism of Grene's assessment of Polanyi's thought. I emphasize that this essay primarily attempts to interpret²—rather than criticize—the views and role of Marjorie Grene as Polanyi's able associate, advocate and critic, although at the end of the second section, I do briefly counter some elements of Grene's late reading of Polanyi.

I. The Collaboration on the Gifford Lecturers and *Personal Knowledge*

Grene met Polanyi in the spring term of 1950 when he came to the University of Chicago as Alexander White Visiting Professor to give several lectures, most of which were likely drawn from the material that in the next year was published as *The Logic of Liberty*.³ Grene heard at least one Polanyi lecture and apparently soon afterward became acquainted with Polanyi. What she heard in Polanyi's lecture and soon afterward read in the copy of *Science, Faith and Society* that she rounded up, she must have regarded as promising philosophical seeds that might grow (PMG, 12). She says of her earliest exposure to Polanyi that she "found his argument against positivism thoroughly convincing; in fact I thought he had found the very refutation of that movement that I had been unable to articulate twelve years earlier in Carnap's seminar."⁴ She also notes that she was (or quickly became) "deeply committed to what he [Polanyi] came to call [in his Gifford Lectures and later in PK] his 'fiduciary program': a kind of lay Augustinianism, in which we recognize that our reasoning always rests on the attempt to clarify, and to improve, something we already believe, but believe, of course, in such a way that we recognize that we might be mistaken" (PMG, 13-14). In any event, shortly after his Chicago lectures, Grene, who no longer had an academic appointment at Chicago, says she was asked by Polanyi to help him prepare his Gifford Lectures on which he already was hard at work. She reports that she was "delighted" to join in Polanyi's struggle to do what he called "'articulate the inarticulate'" and that one of her first tasks in working with Polanyi was to find for Polanyi in the literature of biology "heresies in evolutionary theory, specifically critics of the evolutionary synthesis" (PT, 91).

Grene's role in connection with the Gifford Lectures remains somewhat unclear. I think she may have helped a bit on the First Series delivered in May and early June of 1951, but it is almost certain that she helped on the Second Series in November of 1952 (PMG, 34). But the extent and full nature of Grene's work on the Gifford Lectures is a matter about which I have found few records. This is the somewhat unsettled period in Polanyi's life when he tried to leave Manchester to take an appointment at the University of Chicago but was denied a visa and then reassumed his position in Manchester.⁵ Grene was farming in Illinois and had small children, although she apparently did come to Manchester in the spring of 1952.⁶

Later in 1952, Grene moved to Ireland to farm and began a six year period in which she worked with Polanyi to turn his Gifford Lectures into PK.⁷ Although Polanyi somewhat naively hoped quickly to turn out PK,⁸ it was a long process that Grene was very directly and importantly involved in. There is no extant copy of Polanyi's original Gifford Lectures but Grene donated to Duke in 1969 two loose-leaf binders which Polanyi had given to her in May, 1957 in appreciation for her work on PK. This material is apparently a somewhat revised version of the Gifford Lectures; it differs substantially from the published *Personal Knowledge*. Some of the material may come from as late as 1954.⁹ After she moved to Ireland, Grene apparently came to Manchester at times to work with Polanyi and may have also worked in other settings and likely regularly corresponded with him, although very little of that correspondence is still around. She gathered material for chapters, discussed it with Polanyi, and reviewed and commented on drafts as they were written. Elizabeth Sewall, who was in Manchester from 1955 to 1957 and was also involved in work on PK and knew Grene, noted what she called the "close and constant professional connection" between Grene and Polanyi. Sewall says that she watched Grene work with Polanyi "with admiration and some astonishment" and recognized that Grene "was integral to Michael's professional life." She comments that

Marjorie's whole work time was devoted to the *Personal Knowledge* enterprise. A professional philosopher and a born teacher, explicator, redacteur . . . one had the sense of her constant presence in Michael's day-to-day endeavours, checking and suggesting references, discussing the work with him, arguing, extricating as far as possible the Germanic touches in his style.¹⁰

I have found few comments from Grene herself about her work with Polanyi in this period before the publication of PK.¹¹ In her PMG autobiographical remarks, Grene says she "acted partly as Polanyi's research assistant and chiefly, I think, as editor and as advisor in the history of philosophy" (PMG, 13). In another place, she admits being somewhat puzzled in 1953 or 1954 that Polanyi took a whole year to write the Articulation chapter of PK. She says she only later came to appreciate that this chapter treating the "understanding of understanding, of rationality itself" was one that demanded "an understanding of the way in which the subsidiary supports the focal, in particular of the way in which the ineffable supports the activities of voice and pen."¹² Grene acknowledges that she did not always see clearly where Polanyi was headed, but it seems likely that Polanyi himself did not always himself see how things were to be worked out. That is, there were topics like "Two Kinds of Awareness" in the Gifford Lectures that are broached but not developed until working out chapters like "Articulation."¹³ Grene's early interest in Polanyi's work was on the justification of dubitable belief, but she has acknowledged that she did not foresee the importance of Polanyi's early interest in unspecifiability as the key to the justification of dubitable belief (PT, 168).

If later correspondence between Grene and Polanyi is in any way representative, it seems very likely that Grene's working relationship with Polanyi was one in which she was a strong-minded and often blunt

critic who sometimes convinced Polanyi that she knew best. Sewell's reflections don't capture the fiery Grene. Her later letters to Polanyi about his writing often straightforwardly say to Polanyi what she thinks he should and should not claim; frequently, she insisted that he rework his prose.¹⁴ Grene was one of the small group of people Polanyi identified as having read the whole manuscript of PK before it was published after it was completed in March 1957.¹⁵ A May 12, 1958 Grene letter to Oldham indicates she, like Oldham,¹⁶ particularly wanted further work on the draft of the last chapter. She expressed appreciation for the criticisms of Oldham which apparently were the tipping point leading Polanyi extensively to rework the final chapter:

. . . having just finished re-reading Personal Knowledge , I really must tell you how very grateful I feel to you for your criticism of the MS a year ago. I was in despair over the then extant version of the final chapter, which at that stage was by no means up to the standard of the rest of the book, but until you read the whole thing I had been quite unable to persuade Professor Polanyi that it (the concluding chapter, I mean) did need radical rewriting. But when you wrote him (though more courteously) almost what I had been saying myself, he did of course really do it over—and as you will have seen achieved absolutely the right finale, and in fact some of the most important and original conceptions in the whole work. Western philosophy owes you a great debt!¹⁷

Although the records of Grene's work with Polanyi on *Personal Knowledge* are sketchy, what is clear is that Polanyi was immensely grateful to Marjorie Grene and intended in the Acknowledgments to *Personal Knowledge* to recognize that "she has a share in anything that I may have achieved here":

This work owes much to Marjorie Grene. The moment we first talked about it in Chicago in 1950 she seemed to have guessed my whole purpose, and ever since she has never ceased to help its pursuit. Setting aside her own work as a philosopher, she has devoted herself for years to the present enquiry. Our discussions have catalysed its progress at every stage and there is hardly a page that has not benefited from her criticism (PK, xv).

I don't think Grene, or Polanyi for that matter, in 1950 grasped the whole *Personal Knowledge* project. I do, however, suspect that Grene's role in putting together *Personal Knowledge* may have been more important than it will ever be possible definitively to establish. What is perhaps more important is that this collaboration later also yielded good fruit. One only has to read the final chapter of Grene and Depew's 2004 *The Philosophy of Biology: An Episodic History* to see this. Here these authors argue that philosophy of science, long caught between the residue of logical positivist views and social constructionist views, should be reshaped by the best of the recent tradition in philosophy of biology. Although there is but one reference here to Polanyi, the tracks of the *Personal Knowledge* project and Grene's work with Polanyi thereafter can be clearly seen.¹⁸ In her 2002 intellectual autobiography (as well as in PT) Grene explains that her post-PK philosophical career developed in two directions; she pursued interests in history of philosophy and philosophy of biology, and this 2004 book, of course, brings the two interests together.¹⁹ Clearly, Grene eventually came to be regarded as one of the seminal figures from the philosophy camp (as opposed to the biology camp) in the development of philosophy of biology after 1960.

II. Marjorie Grene and the Interpretation of PK—Early and Late

A. Early Comments

Soon after, if not before, the June 20, 1958 publication of PK, Grene seems to have become actively interested in seeing that PK was understood by philosophers and other readers. Grene apparently was interested, in the period immediately before publication, in the project of getting PK reviewed. Her correspondence with J. H. Oldham in May and early June of 1958 touches some matters other than her thanks to Oldham for his criticism of the first draft of the last chapter of PK (treated above).²⁰ It seems likely that the available record of the correspondence is incomplete. However, Oldham's June 4, 1958 letter to Grene (J. H. Oldham Archives, 10.4) outlines at length his thinking about what he dubs the "delicate matter" concerning "the question of reviewing." He proposes to Grene that "one or two people take a short time to think over one by one the journals and papers that are important." He notes that "the aim is not propaganda or advertisement or anything of that kind, but merely to ensure that a book of importance is not overlooked through accident or pressure of other things." Oldham views his (and presumably Grene's activity) as not "wire pulling" but a matter of "the editor's elbow should be nudged before he has decided what he will do about this review copy."²¹

Michael Oakeshott wrote an early review of PK for *Encounter* that was published in September of 1958.²² On the whole, it is a positive review,²³ but it did not please Grene. For purposes of simplification, I parse Polanyi's philosophical perspective in PK in terms of three elements: critical philosophizing that attacks some important elements of the modern tradition of philosophy; constructive philosophizing that articulates an alternative to some but not all elements of philosophy since the Enlightenment; and the articulation of a *Lebensphilosophie*. I think these three elements are woven inextricably together in PK—particularly the last two.²⁴ Oakeshott clearly sees the critical philosophizing elements in PK, but he is rather unclear about the constructive philosophizing and he does not see how in a post-critical philosophy the *Lebensphilosophie* is fundamental (although he does briefly praise Part IV of PK). Oakeshott does not see the order of PK; he describes the book as "disordered, repetitive, digressive, and often obscure; as a work of art it leaves much to be desired."²⁵ Although Oakeshott notices Polanyi's attention to discovery and his emphasis on skill and personal judgment, he fears that Polanyi's constructive philosophizing sets forth an understanding of knowledge as subjective and does not really provide a theory of scientific knowledge. He hints that Polanyi may be philosophically innocent, noting that he hears faint "Hegelian echoes" or perhaps a Platonic resolution to the problem of rationality, and certainly Polanyi does not give skepticism its due.²⁶

Grene responded to Oakeshott's review and this was published as a long letter titled "Personal Knowledge" in the October, 1958 issue of *Encounter*.²⁷ She concedes that the argument of PK is "difficult" but she affirms that it is "luminous" and "convincing" (67). She points out that PK is the only modern work in philosophy that focuses on a theory of knowledge which "can answer and therefore fittingly transcend the epistemological problems with which critical minds, from Descartes onward, have been preoccupied" (67). She counters Oakeshott's claim that PK recognizes the personal coefficient in knowledge but does not really offer a theory of scientific knowledge by laying out the argument of PK in terms of its four sections. Parts One and Two are "primarily descriptive" (67). Part One "establishes the basic analogy between scientific knowing and skilful doing" and Part Two "elaborates and extends it to a panorama of the inarticulate aspect of intellectual life" (67). Part Three addresses the problem of how personal knowledge can be justified. This is a section in

which the argument is “turned back upon itself” (67). It points to “the paradox of self-set standards—which is the argument’s recurrent theme” (67) and this theme is “restated in a reflective assessment of the calling of man” (67):

It is through the conception of the personal, involving both the givenness and the fallibility of situation and the dignity of universal intent, that the commitment of the philosopher and the scientist is justified. . . . The scientist is a believing, seeking, fallible person and this truth is essential to the nature of his scientific knowledge: that is the fact stated in Part One and exhibited on a broader canvas in Part Two. The philosopher, as such a person likewise, now turns in explicit reflection to recognise this paradox; and that very recognition, made explicit, resolves the paradox, or at any rate confirms it and makes it bearable (67).

Greene downplays any Hegelian echoes in PK by suggesting “if *Personal Knowledge* is Hegelian, it is a Hegelianism purged by the Kierkegaardian critique . . . for the existential root of philosophical reflection is an absolute, the only intellectual absolute” (68). She says that she would prefer to see the argument of PK in a Kantian context:

. . . if we take Kant’s argument seriously, unhampered by the limits of his formalism, it leads straight to the concept of personal knowledge—for it expresses the logical dependence of order on the person who both gives the order and submits to it. And when the transcendental unity is filled in to become a living person, the transcendental object is filled in also to be more than an X behind a phenomenal world. We cannot, indeed seize upon reality with our hands, but it is reality, not its shadow, which in hope and humility, we understand, misunderstand, and seek to understand anew (68).²⁸

Finally, Greene notes that while Polanyi in Part Three “has been reflecting on the scientist’s calling, which is in its essential structure his own calling too,” in Part Four he

puts this act of reflection, this person striving to make sense of things, into the context of nature: into the stratified world of ever richer living things. . . . The epistemologist knowing his own knowing, and the biologist knowing the ongoings of other living things, here coalesce (67).²⁹

B. Late Comments

Greene occasionally commented on elements of PK and, more generally, on Polanyi’s philosophical perspective in several of her publications over the last fifty years of her life. I have not carefully studied all of Greene’s many later publications; I am not confident that I have always understood everything in publications that I have studied. With this qualification acknowledged, I, nevertheless, attempt in this section to present what seems to me the pattern in Greene’s later discussions. Greene was a fertile mind whose achievements over a long life are nearly as remarkable as those of Polanyi. As I have noted above, it is a fair summary of Greene’s philosophical career to say that after working on PK, she wrote many things usually classified as philosophy of biology, but she also wrote about figures in the history of Western philosophy. She commented in 2002 that her post-Polanyi interests are “so to speak, decidedly extra-Polanyian” (PMG, 61) but I think Greene’s approach within these areas of endeavor is deeply Polanyian.

About her early work in the history of philosophy with Polanyi, she remarks, “I did indeed try to assist him with historical information when it was needed; but he thought of history from a scientist’s point of view—as a source from which to cull tidbits, but no more” (PMG, 61). As her books and chapters treating the history of philosophy show, clearly Grene believed the “tidbit approach” is inadequate. Nevertheless, at least some of Grene’s work in the history of philosophy—that is, elements of her trenchant analysis of the problems of significant thinkers—does reflect tacit assumptions that she shares with Polanyi. Also I think that it is clear that the inception of Grene’s work in philosophy of biology goes back to work with Polanyi on PK, and I believe some of her more recent work in this area, despite her later sharply critical words about Part IV of PK, still shares ground with Polanyi. Grene at least indirectly acknowledged the importance of the *Personal Knowledge* project on her later work when she commented in 2002 that it is “probably correct . . . that my years of working with Polanyi have continued to influence my thought, and writing, more than I have recently recognized” (PMG, 61).

A little over a year after Polanyi’s death, Grene published “Tacit Knowing: Grounds for A Revolution in Philosophy” (“TK”), which I regard as the finest short analysis of Polanyi’s philosophical achievement. It is a developmental analysis of Polanyi’s thought and it draws, at least indirectly, on Grene’s own developing post-PK work in the history of philosophy. This is also an essay that in some ways interprets Polanyi to contemporary philosophers with a more Anglo-American outlook. Grene both analyzes PK and situates it in a broader context of Polanyi’s emerging thought as well as some standard assumptions of contemporary philosophers. She says Polanyi’s first philosophizing was motivated by the “problem of the administration of science” (or the problem of “the structure of a ‘society of explorers’”) which led him to “the question of the justification of dubitable beliefs”³⁰ (“TK,”165) by 1950 when he is working on his Gifford Lectures (i.e., when Grene meets him). Polanyi addresses this question by working out what he calls the “fiduciary program,” which is the key to Polanyi’s early account of personal knowledge.³¹ The “fiduciary program” is the odd name for Polanyi’s constructive argument which ultimately articulates an “epistemology of science” (“TK,”166) in *Personal Knowledge*. The argument, Grene emphasizes, is basically analogical and likely to alienate many contemporary philosophers: Polanyi’s method “consisted essentially in broadening and stabilizing the interpretive circle through a series of analogies, by showing that human activities of many kinds are structures in the same hopeful yet hazardous fashion as those of science”(“TK,”167). Polanyi links his account of commitment in science with the broader range of responsible committed human endeavor:

. . . the account of commitment, expanded to a fiduciary programme, showed us science as one instance of the way in which responsible beings do their best to make sense of what is given them and yet what they, by their active powers, have also partly already enacted (“TK,”167).

The line between perception and scientific discovery is unbroken in Polanyi’s narrative. He carefully works out his themes concerned with self-set standards and universal intent.³² He is a realist³³ who pays attention to scientific practice and the history of science. Grene thus clearly recognizes that the “Two Kinds of Awareness” lecture in the Gifford Lectures is the seed that grows, by the time of PK, into Polanyi’s richer discussions of focal and subsidiary awareness, the operation of skills, problem solving and scientific discovery. But this germinating seed then becomes the mature Polanyi account we later know as the theory of tacit knowing. That is, “two kinds of awareness” is first the key to “the justification of dubitable beliefs” (“TK,”165) but then blossoms into the full blown theory of tacit knowing that gets worked out in the decade after PK.³⁴ This, of course, was a decade in which Grene was very involved in Polanyi-related projects and she ultimately edits

Knowing and Being (published in 1969), a collection designed primarily to show the interesting ways Polanyi's philosophical ideas were developing in the decade after *Personal Knowledge*, as her remarks on the third group of essays in the collection show:³⁵

Personal Knowledge was directed not so much to tacit knowing as to the problem of intellectual commitment, the question how I can justify the holding of dubitable beliefs. The theory of tacit knowing is indeed the foundation of the doctrine of commitment, but while the latter probes deeper into the foundation of human personality, the former is more far-reaching. It reveals a pervasive substructure of all intelligent behavior (KB, xiv).³⁶

C. Grene on Part IV of PK and Other Comments

Grene has been quite clear that the theory of tacit knowing is “revolutionary,” as the subtitle of her 1977 article on Polanyi's thought (i.e., “Tacit Knowing: Grounds for a Revolution in Philosophy”) indicates. What Polanyi offered is “a major break with the tradition and a possible foundation for a new turn in the theory of knowledge and a fortiori in philosophy as such” (“TK,” 164).³⁷ In “TK,” Grene, of course, not only outlines Polanyi's philosophical development and its importance, but she also sharply criticizes elements of his thought. She makes clear that she thinks some of Polanyi's late articles, particularly those attacking behaviorism, suggest that he has forgotten his own best insights about the “from-to” structure of knowing. He slips into a body-mind dualism that in fact his earlier work in PK and TD shows is a philosophical *cul-de-sac* to be avoided. He seems, Grene says, sometimes not to recognize “the incarnate nature of mind” which is “part and parcel of the theory of tacit knowing” (“TK,” 171).³⁸ Grene also suggests that some of Polanyi's very late writing is “tragically misguided” (“TK,” 168) since it manages to separate art and science, reversing the ways in which Polanyi had put art and science together in PK and *The Study of Man*. Polanyi's effort to extend his analysis of meaning by analyzing art, myth, and religion using an expanded version of the theory of tacit knowing is too grand and relies on sources that she thinks are not truly consistent with Polanyi's own revolution in philosophy.³⁹

A late criticism more directly aimed at PK is in Grene's 1991 Kent State address where she carefully goes through PK to show that “the contrast between the personal and the subjective forms is one of several basic theses carefully woven into the texture of Polanyi's argument in *Personal Knowledge*. . .”⁴⁰ Grene has long been vigilant to point out that philosophers who think Polanyi is a subjectivist simply have it wrong. She identifies this as one of two common misreadings in her 1977 article on Polanyi (“TK,” 165). Thus her 1991 Kent State address in which she carefully went through PK to contrast the personal and the subjective was in some ways nothing new. In her address, Grene shows that PK both sharply separates the personal and “subjectivity,” understood in one sense, but also links the personal, objectivity, and “subjectivity,” understood in another sense: “The subjective as just my passive experience, is other than the personal, but the personal contains an aspect of subjectivity, of mineness, in fusion with objectivity, the thrust toward something other than myself” (“PS,” 13). However, what Grene finds in 1991 in a footnote in Part IV of PK (PK, 374) suggests to her that Polanyi has not been consistent and may have introduced another notion of subjectivity (“commitments made to a mistaken system” [“PS,” 14]). In 1995 in PT, she dubs this a “treacherous footnote” (PT, 171). She thinks that any new notion of subjectivity which the footnote implies means Polanyi really may not have grasped the full implications of the “fiduciary program” that he sets forth in PK.⁴¹

Grene's 1991 question about Polanyi's account of subjectivity in PK is really part of a larger general dissatisfaction, made clear in several publications since 1977, with the fourth section of PK, and particularly the last chapter of the book.⁴² I have noted above that Grene's correspondence with Oldham indicates that she, like Oldham, was unhappy with the first draft of the last chapter of PK even before it was published. But much of what she says early in the response to Oakeshott (discussed above) and in KK imply support for Polanyi's views. But by her 1977 "TK," she notes Polanyi's

notion of a 'stratified universe' was always less than convincing; indeed, the final chapter of *Personal Knowledge* has only been saved from total disaster by the criticisms of his friend J. H. Oldham. And as I have learned a little more about evolutionary theory, both its subtleties and its limitations, I have grown more sceptical about cosmologies of emergence in any form ("TK," 168).

In her 2002 intellectual autobiography, she acknowledges that when she re-read PK to prepare her 1991 Kent State address, she found "Polanyi's argument (in Part IV of *Personal Knowledge*) even more shocking than I had originally thought it." (PMG, 61). She says looking more closely at the literature of evolutionary biology—whose important developing course she has carefully followed for more than forty years—enhanced her discontent with Part IV of PK. She proclaims in her intellectual autobiography that Polanyi's "understanding of Darwinian theory was minimal, or worse, and I'm afraid mine at the time was not much better" (PMG, 16).

Although she still appreciates what she in 2002 calls Polanyi's/PK's "lay Augustinianism,"⁴³ Grene also became increasingly unhappy with the theistic hints and Christian overtones in PK and other Polanyi writings; as I have noted, she complained about such religious language in her Kent State address. She recognized these elements as sure to prevent philosophers of science from seriously reading Polanyi and recognizing his philosophical importance ("PS," 14). Grene discovers Merleau-Ponty shortly after the publication of *PK*⁴⁴ and somewhat later the writings of the Gibsons which develop an "ecological account" of perception and animal behavior.⁴⁵ She tends to fit these thinkers seamlessly with Polanyi in her later writing,⁴⁶ but she certainly recognizes that Merleau-Ponty and the Gibsons are likely not to be rejected out of hand by many professional philosophers quite so quickly as Polanyi. Grene also, even while Polanyi was alive, worked hard to bring into discussions of philosophy of science (and particularly philosophy of biology) connections with philosophical European scientists influenced by what once was called modern continental philosophy.⁴⁷ Clearly she tried to make Polanyi aware of this literature and of the importance of claims about "being-in-the-world" in figures like Merleau-Ponty.⁴⁸ She was very insightful about the links between this literature and Polanyi's own developing theory of tacit knowing.⁴⁹ There are, of course, some general references in Polanyi's writing after 1958 to some of this literature, but Grene is likely correct that Polanyi did not explore connections very much and likely did not want to explore them because of his inability to think historically about himself as a philosophical thinker.⁵⁰

Perhaps more important than Grene's complaints about the alienating (to philosophers of science) religious rhetoric in PK (and other Polanyi writing) are her substantial criticisms of philosophical ideas important in Part IV of PK. These criticisms unfortunately are often rather cryptic and are not, at least to this author, always clear. Although some of these I have sketched above, I want to try to develop them further. In her 1991 Kent State address, Grene claimed that she by now suspected that Polanyi slipped into "ontological dogmatism" and she found "the hopelessly anthropocentric evolutionism of the final chapter, as well as its closing

Christian apologetic, must be discouraging . . . to supporters of the model of commitment for epistemology and the philosophy of science”(“PS,” 15). Grene does allow that “Polanyi’s late work on tacit knowledge, being cosmologically less ambitious, may help to correct this imbalance” (“PS,” 15). About Polanyi’s discussion of evolution and emergence in his last section of PK, Grene says:

. . . while these chapters raise some important points against reduction in biology, the effort to locate homo sapiens as the apex of evolution is hopelessly mistaken. The ontological aspect of tacit knowing, proposed in *The Tacit Dimension*, being more limited in its import, is much more convincing. Commitment, however, has, I should think, to retain its precarious ontological position as the stance of a given embodied person, cast ephemerally into the flow of history, and pre- and posthistory, self-obliged to obey a calling that takes him (her) beyond the confines of subjective preference (“PS” 14).

While Grene’s several criticisms should be taken very seriously, the way they are interwoven makes it difficult to pull the elements apart and examine each carefully. In 1991, Grene said that she still stood behind the commitment chapter of PK, the last of Part III, as one that provides “an appropriate foundation for a philosophy of science, a theory of knowledge, and a perspective on the nature of responsible personhood.” This is a “precarious foothold” but “the best we can do.” However, in Part IV of PK, Polanyi wrongly thought he had “provided a more sweeping ontological location for the act of commitment”(“PS,” 14). The end of PK is cosmologically overly ambitious and focuses on human beings in evolution in a way that is very anthropocentric and simply wrong, in terms of modern evolutionary biology. Clearly, Grene thinks Polanyi’s field theory approach to emergence, using Driesch’s biology and to some degree models from physics, is not tenable. She seems, by 2002, however, to think any account of emergence is dubious, although it is rather unclear what she now means by “emergence.” Surely Grene is right that Driesch’s ideas are not viable in today’s biology. Yet Grene seems to accept the epistemological point, Polanyi’s antireductionism, which is deeply embedded in all of the discussion of Part IV and even in his account of evolution. She accepts what in TD (51) is called the “critical” and “convivial” nature of biology⁵¹ (i.e., knowing living forms necessarily involves recognizing their achievements) which is basically Polanyi’s claim that the study of life requires recognizing two levels of control. Lower levels bear on higher levels insofar as they “*define the conditions of their success and account for their failures, but they cannot account for their success, for they cannot even define it*” (PK, 382). Grene seems to me insightfully on target in recognizing that the critical and convivial nature of biology and the claims for two levels of control are what Polanyi after PK discusses (e.g., in TD) as the “ontological aspect” of tacit knowing. She seems to believe that working out the ontological aspect of tacit knowing in the years after PK tempers the element of Part IV of PK that she dubs “a more sweeping ontological location for the act of commitment” (“PS,” 14).⁵²

What should one make of all of this? Clearly, Grene does not like the grand cosmological vision at the end of PK. Perhaps she is correct in suggesting that the end of TD employs a less grand rhetoric, but the message is nevertheless in important respects much the same as that of Part IV of PK.⁵³ Polanyi says clearly in the Preface to the Torchbook Edition of PK (written in 1964) that “it is from the logic of indwelling that I have derived in Part IV of this book the conception of a stratified universe and the evolutionary panorama, leading to the rise of man equipped with the logic of comprehension” (x-xi). In TD, Polanyi affirms a “universe filled with strata of realities, joined together meaningfully in pairs of higher and lower strata” (TD, 35). What Grene still seems most to value in Polanyi is what in PK was called the fiduciary program with its emphasis upon commitment and fallibility (the “precarious foothold” she finds in the Commitment chapter),

although she understands that Polanyi's later theory of tacit knowing underlies and in some ways supersedes his early account of the fiduciary program.⁵⁴ At the least, she seems to find a tension between the emphasis upon commitment and fallibility and the vision of human beings articulated in Part IV of PK. Here Polanyi tries to deflect attention from mutation and natural selection and he does this in part by suggesting a parallel between epistemological emergence and the evolutionary emergence of more complex living forms. He portrays evolutionary history as a succession of achievements in which the complexity of life emerges as new levels of control come to be part of history. Polanyi argues that such an understanding of evolutionary history (focused on achievements) allows human beings better to know their natural heritage, their kinship with the non-human and what their opportunities and responsibilities are. All of this is concerned with the emergence of meaning in the natural and ultrabiological world. Polanyi's anthropomorphism so far as I can see does not suggest that evolutionary history ends with or culminates in the human, but it is a claim that evolutionary theory must ultimately recognize the intricate powers of human beings as creatures gifted with the complex skills to study and understand evolution.⁵⁵ This is an opportunity (an affordance, to use Grene's term appropriated from J. J. Gibson) in the human world. Polanyi situates biological study (or at least the biologist) in an ecological context. It is, to use another of Grene's terms, a manifestation of the minding of a human being with the specialized skills of a biological scientist.

III. The Contested Legacy of PK: Notes on Grene and Prosch

One of the most interesting discussions in Harry Prosch's 1986 *Michael Polanyi, A Critical Exposition* is his chapter attempting to refute Grene's late criticisms (i.e., those overt in "TK" plus possibly some interpretative comments in KK) of Polanyi (MPCE, 220-247). Prosch's chapter is extraordinarily dense and his argument is, to this reader, not always clear, but it is worth examining briefly because it illumines both Prosch's and Grene's philosophical convictions. In the final analysis, Prosch seems to understand Polanyi's "ontological aspect" of tacit knowing rather differently than Grene; he also likely misreads some of Grene's philosophical convictions. So far as I know, Grene never responded directly to the discussion in MPCE.⁵⁶

The chapter where the discussion appears is titled "Is Epistemological Antireductionism Sufficient?" and this query Prosch intends to respond to with a resounding "no." He thinks that Grene's late criticisms of Polanyi imply that she holds the contrary position, namely that "epistemological antireductionism is sufficient" but this phrase is hardly transparent. Prosch says,

It would appear that Grene thinks our recognition of the from-to structure of knowing alone is sufficient to preserve us from reductionism. Since it shows us that reductionism is not possible on epistemological grounds, she thinks there is no reason to try to refute reductionism on ontological grounds as well. Trying also to do the latter endangers the notion that mind must be embodied; and opens the door to dualism, which she thinks, philosophers today will not accept as a means of avoiding reductionism. (MPCE, 222-223)

Clearly, Grene appreciated the non-reductionist ambience of Polanyi philosophical perspective. In her own post-PK work in philosophy of biology, she became something of a champion of non-reductionism. Prosch is raising a question about the grounds for opposing reductionism. What Prosch seems ultimately to think is at stake is what Prosch dubs Grene's "rejection of his [Polanyi's] ontological hierarchies" (MPCE, 221). That

is, Prosch thinks Grene does not accept what he takes to be the full implications of Polanyi's ontology which Prosch sees as a very important foundation of Polanyi's critique of reductionism.

What is a bit curious in all of this is that Grene in KK (published in 1966, although written earlier) discusses and affirms what she holds to be Polanyi's ontology and its importance as a counter to reductionism. Her position can be summarized in a sentence: "To break the stranglehold of reductionism, we must acknowledge once more *the multiplicity of forms of being*" (KK, 219). Perhaps it is not entirely fair to criticize Prosch for making no use of Grene's discussion in KK, which was published before he even began his work on Polanyi. But Prosch was a careful thinker and it seems most likely that in his first year working with Polanyi in Oxford (1968) when he was studying all of Polanyi's writings that Polanyi's respect for Grene (and perhaps even this book dedicated to Polanyi) would have come up. Prosch may, of course, have believed that Grene changed her mind about views in KK between the writing of KK and the writing of "TK" (1976). Grene frequently did change her mind and she readily acknowledged it and she was eventually very critical of KK. Nevertheless, Prosch's limited familiarity with KK is a puzzle since there are ideas in KK that are important which might have helped Prosch better understand Grene's views. Grene does in KK take care to distinguish what she identifies as "three aspects of the situation [regarding ontology]: "(1) the double determinateness of comprehensive entities,⁵⁷ including living things and the achievements of living things, (2) the multiplicity of kinds of such doubly determinate entities, [and] (3) the question of their stratification relative to one another" (KK, 219). Prosch's criticisms of Grene do not distinguish these three aspects and he seems primarily to attack Grene for not supporting the third aspect, which indeed, her discussions in "TK" suggest she is wary of, at least as that appears in Part IV of PK.⁵⁸

It is also of interest that almost 25 years after the publication of Prosch's book (and more than 30 years after Grene's critical remarks in "TK," as well as 15 years after her remarks in PT and almost a decade after her "IA" in PMG), Tihamér Margitay's essay "From Epistemology to Ontology, Polanyi's Arguments for the Layered Ontology" in the new 2010 collection *Knowing and Being, Perspectives on the Philosophy of Michael Polanyi*⁵⁹ again raises some of the same kinds of questions that Prosch thinks Grene raised. For that matter, Edward Pol's 1968 essay "Polanyi and the Problem of Metaphysical Knowledge" in *Intellect and Hope*⁶⁰ and some of the more recent discussions in *TAD* and *Polanyiana* of "Polanyi's realism"⁶¹ also treat metaphysical issues akin to those that Prosch and now Margitay discuss. So matters related to Polanyi's ontology have for many years stirred—and continue to stir—scholarly discussion.

Prosch thinks that Grene regarded the "ontological aspect" of tacit knowing "as simply meaning that the two levels in entities we find in our world are only analogues to the two levels we find in our knowing processes" (MPCE, 230). This position, Prosch suggests, is a weak account that is "simply epistemological" and fails to make "the leap out of them [i.e., such analogues] into a 'real' world structured by them" (MPCE, 232). Prosch certainly found an emphasis on analogues in Grene's careful writing about "comprehensive entities" going back to *The Knower and the Known*.⁶² He claims that Polanyi's "intention" was "to project the comprehensive entities into what exists beyond his own grasp of them" and this "is a most important part of his thought, without which all things have only the reality of the meanings or focal integrations we happen to achieve" (MPCE, 233). Prosch contends that he sees "no sufficient reason why the ontological projections of an epistemology should not be respected as much as the epistemology itself is" and he concludes "I think Polanyi's basic ontological foundations are as sound as his epistemology" (MPCE, 233). He suggests that in his view it is "reasonable to assume that there is a marvelous coincidence between the way we know things and the way they are, in and of themselves, in the universe" (MPCE, 235). Nevertheless, Prosch acknowledges

a “logical gap” exists “between our own accepted ontology and the belief that it does in fact accurately state the way things are”(MPCE, 233). He concedes “there is no way to demonstrate with logical rigor that we must believe that any given ontology is true of the world. There is no way to match the two”(MPCE, 233).

At least in part Prosch arrives at his criticism of Grene by drawing certain conclusions from the fact that Grene suggested (as I outlined above) some late Polanyi articles (in his eagerness to attack behaviorism) seem to re-institute a mind-body dualism. In his best writing, Polanyi offers a consistently incarnate or embodied perspective, Grene argues, but he seems late in life at times to have forgotten the implications of this. Positively stated, Grene contends that the “concept of from-to knowledge” opens a subtle perspective that “should certainly prevent, not support a return to a notion of a ‘separate’ consciousness or thinking thing” (“TK,” 170). But she says Polanyi either “never realized, or ceased to realize, the subtlety of his own anti-reductionist position”; because he was too much preoccupied with the matter of refuting “the ‘denial of consciousness’ by behaviourists . . . he failed to recognize how essential to his own philosophical position was the insistence on embodiment as the framework of mentality” (“TK,” 170).⁶³

Prosch contends that Polanyi held that it was not possible to have a mind without a body so “he [Polanyi] did not hold to anything like a Cartesian dualism. The mind was nothing and nowhere without the body. Mind was indeed incarnate” (MPCE, 227). Prosch seems to think the central issue is “whether or not the mind does possess powers that its parts (its body and so its brain) do not possess” (MPCE, 227). He seems to believe that Grene’s views merely conflate mind and body and mean she does not recognize how “consciousness or sentience became so important to Polanyi”(MPCE, 227). Prosch likely is correct that by the time of “TK” and certainly by the final years of her life, Grene thinks most philosophical talk about “consciousness” is misguided; “consciousness” is a reification that has misled philosophy by diverting attention from the ways in which humans and other animals are always actors deeply and inextricably embedded in a particular historical-social and natural niche. Whatever perceptions or reflections—responses—that even language-using human animals have are profoundly contextual (and grounded in the pre-reflective embodiment of a context). Grene likely would prefer to call such responses “minding”⁶⁴ rather than positing some sort of inner state identified as “consciousness.”⁶⁵

It is important to remember that by 1977, when Grene published “TK,” she had long ago linked Merleau-Ponty (discovered in 1960) to Polanyi and he is a figure who for her has a profound understanding of embodiment in terms of being-in-the-world. This absorption is in fact also reflected somewhat in KK. Grene thinks Merleau-Ponty, unlike Heidegger, gets being-in-the-world right because he unpacks perception in terms of the embodied person. Grene effectively integrates many of Polanyi and Merleau-Ponty’s views. She held that Merleau-Ponty’s account of embodiment complemented and strengthened Polanyi’s account of indwelling and, more generally, tacit knowing and the person. It is this connection between embodiment, being-in-the-world and Polanyi’s post-PK “strengthening and extension of his [Polanyi’s] conception of the tacit foundation of knowledge” (“TK,” 168) that is the context for Grene’s suggestion (in “TK”) that Polanyi’s “notion of a ‘stratified universe’ was always less than convincing: indeed the final chapter of *Personal Knowledge* had only been saved from total disaster by criticisms of his friend J. H. Oldham” (“TK,” 168). It seems likely that this comment significantly shapes Prosch’s reading of Grene’s account of Polanyi.⁶⁶ Prosch, of course, knows nothing about the controversy (noted above) over the final chapter of the draft of PK (he does not meet Polanyi or seriously study his writings until about a decade after the publication of PK). Perhaps more important is the fact that he seems to have little knowledge or interest in Merleau-Ponty and Merleau-Ponty’s ideas about being-in-the world. At the least, there is little evidence that Prosch, unlike Grene, was impressed

with the way that Polanyi's account of a person and tacit knowing could be linked to Merleau-Ponty's account of perception, embodiment and being-in-the-world.

There is but one reference in MPCE to Merleau-Ponty. Prosch notes that Polanyi was not even aware when working out the views in PK that

some continental phenomenologists were bringing forth considerations similar in many respects to his. He discovered Merleau-Ponty later and realized that an affinity existed and yet he correctly rejected the notion that their views were identical. His position therefore, turned out to be a fresh one even when compared with the current phenomenologists. It lacked the peculiar style and framework of assumptions within which they work. And so also it incorporated certain features altogether lacking in them (MPCE, 52).

There is a footnote in Prosch's discussion that cites the last section of Polanyi's essay "The Structure of Consciousness" (KB, 221-222) which comments very briefly on Merleau-Ponty, the body-mind problem and being-in-the-world. Polanyi's concluding comment on Merleau-Ponty is a critical comment that Prosch likely took to be very important:

These remarks [i.e., quotations from Merleau-Ponty] foreshadow my analysis, but I find among them neither the logic of tacit knowing nor the theory of ontological stratification, which I regard as indispensable for the understanding of the phenomena described by Merleau-Ponty (KB, 222).

Polanyi's discussion ends by suggesting that Merleau-Ponty's views, shorn of "their existentialist perspective" (KB, 222) cannot be distinguished from the views of Ryle, a contemporary offering an anti-Cartesian view that is nevertheless fallacious.

Interestingly, Prosch does suggest Grene's reading of Polanyi emphasizing the epistemic (or embodied) is an account that construes Polanyi as "only a phenomenologist" (MPCE, 232) which he thinks is inadequate.⁶⁷ It seems likely that Prosch was generally dismissive of what he took to be "phenomenology."⁶⁸ Prosch argues that Polanyi was not "only a phenomenologist" because he was a scientist who thought discovery uncovered the nature of external reality. Polanyi was a fallibilist; this essentially posed the question of how mistakes could be recognized if "there were no touchstone of reality against which to measure them?" (MPCE, 232). Also Prosch argues that Polanyi was striving to articulate a rich post-positivist vision of science, one that went beyond the phenomenal orientation of positivism.⁶⁹

What seems clear in Prosch's discussion is that he holds Polanyi was not a "phenomenologist," but he thinks Grene makes Polanyi into a "phenomenologist." It seems very likely Prosch and Grene, although they both seem critical of "phenomenology," have quite different readings of what a "phenomenological" approach is and what its problems are. More important is the fact that Prosch gives no indication that he thinks it important to link Polanyi's ideas about tacit knowing and embodied "being-in-the-world." On this point, Prosch's account of Polanyi's metaphysics and Grene's metaphysics are indeed sharply at odds. As Grene put metaphysical matters in KK (written at the time of or shortly after her discovery of Merleau-Ponty), the kind of central philosophical reform called for in the twentieth century "would make *time* the fundamental category of metaphysics" (KK, 243). I think she believes that is what Merleau-Ponty does in his account

of embodied being-in-the-world and what Polanyi does in a parallel fashion in his theory of tacit knowing. Both approaches are a temporal re-orientation of fundamental philosophical thinking about the person. This is one of the themes in Polanyi that William Poteat's work picks up and develops.⁷⁰ In terms of Polanyi's tacit knowing, Grene speaks about the "tension of the act of tacit knowing in which we attend from the clues which we know only subsidiarily to the object of our focal attention":

This directedness, from the proximal to the distal pole of tacit knowing, is a reaching out from ourselves to the world—and by the same token a reaching out from past to future, a reaching drawn by the focal point of attention, temporal activity, drawn by the future pull of what we seek to understand" (KK, 244).

The structure of temporality for Grene provides the key to a "tenable theory of action as responsible and free" (KK, 252). A person engaging the world in terms of his or her unfolding attention reliant upon ongoing tacit integrations operates under "the protensive pull of our transcendence" (KK, 252). The last sentence in KK puts matters very directly: "The structure of tacit knowing is mirrored in the structure of comprehensive entities because they both mirror the metaphysical structure of time" (KK, 252).

Grene holds that the restoration of the temporal in our account of knowing will help

to articulate an analytical pluralism, a metaphysic which will allow us to acknowledge the existence of a rich variety of realities, not all of which need exist in identifiable, spatio-temporal separateness. Minds are not separate from bodies, yet persons capable of 'minding' are richer and more highly endowed than persons, or individuals, not so capable (KK, 242).

A richer appreciation for the temporal will dislodge philosophy from "the alternative 'separate mind' or 'no mind', two reals or one real only" which "has been too long dominant over western thought" (KK, 242). She says we "need to recognize the richness of reality, including the achievements of human persons and human traditions" (KK, 242). So Grene's "analytical pluralism" recognizes a variety of types of realities. I suspect that she believed that Polanyi had prepared the way for such a metaphysic but she eventually came to fear that that Polanyi's sketch of a hierarchical cosmos at the end of PK (if not also his comments on dualism) could displace his own central insights about the temporal. She believed that the theory of tacit knowing as it was developed after PK and as it could be further articulated in terms of Merleau-Ponty's account of embodiment and being-in-the-world made clearer the centrality of the temporal.⁷¹

Harry Prosch did not appreciate—and perhaps simply did not grasp—the subtlety of Grene's metaphysical orientation. His metaphysical account of Polanyi was preoccupied with, first, Polanyi's from-to structure as it operates for the scientist interested in the discovery of external reality and, second, with how that from-to structure operates to legitimate what Prosch took to be Polanyi's vision of the distinctly different realities of the noosphere. Defending his position on this latter topic, Prosch provided chapters immediately following his criticism of Grene. Prosch treats what he calls "the problem of Polanyi's divarication" (MPCE, 235). Here Prosch lays out and defends against criticism the position he had previously articulated in the Gelwick-Prosch debate played out earlier in Polanyi Society papers and in publications in *Ethics*, *TAD* and *Zygon*.⁷² He argues (and the *Meaning* material suggests this) for a distinction between how the from-to structure of knowing operates "in our perception and our knowledge of nature and the way in which we make use of it in the arts and religion (and possibly in our moral life)" (MPCE, 235). Prosch contends that the ontological

status of the realities of the noosphere differ in an important way from the realities known in perception and science.⁷³ Grene's few critical comments about *Meaning* do come up (MPCE, 237-238) and Prosch addresses them in the context of his larger argument. Grene's comments on *Meaning*, although general and not focused directly on metaphysical matters, could certainly be linked to her metaphysical orientation.

Although I have in these reflections tried primarily to interpret Grene, I acknowledged at the end of the last section my perplexity about some elements of Grene's account of Polanyi. I also acknowledge, in concluding this discussion of Grene and Prosch, that I find what seems to be the presupposed framework underlying Prosch's account of Polanyi's metaphysical views, as well as Prosch's criticism of Grene, to be problematic. Prosch lapses into an idiom (and a presupposed picture of the nature of things) that I believe too sharply separates knowing and being. Prosch seems to defend, to paraphrase Grene's criticism of Polanyi, a view that the from-to processes that constitutes minding is dissectable into two "things," the corporeal and the mental. In his criticisms of Grene, Prosch underplays the way that Polanyi strongly emphasized how indwelling reshapes a person's being.⁷⁴ Grene is ever mindful that the knowing person who integrates subsidiaries to attend to a focus is a real "comprehensive entity" but this seems not to be something central in Prosch's account. Even in scientific study,⁷⁵ a knowing subject is not simply an independent thinking being wholly separated from and different in kind from a comprehensive entity existing in some external sphere. The "knowing subject" and the "world" are profoundly and almost inextricably woven together for Polanyi and for Grene (and especially for Grene after she digests Merleau-Ponty). As Grene put it, "This interpenetration of 'self' and 'world' is not only a central characteristic of mind; it is what mind is" (KK, 56). Despite the fact that at his best, he recognizes there is no mind without a body, Prosch seems often to be seeking some type of external, impersonal ontological realm to serve as a trump card to ground human knowing. He was not always keenly attuned to the reach of the personal, a topic that Grene, of course, emphasizes in her 1991 Kent State address and in other writing, as I have noted in my discussion. A little known comment of Polanyi on the personal, made in response to a question from William Poteat, is a remark Grene would likely have approved and a remark that seems in sharp tension with some of Prosch's account of Polanyi:

... I think that "personal" is the effort of this integration and the sustaining of this integration; they are all important. It is conceptually misleading, I think, to believe that such an integration can exist without somebody being there to sustain it, because only in ourselves can two levels of awareness exist. They can't exist outside somebody, and therefore there is an ineluctable presence of the person in knowledge, so far as it is knowledge with that structure (and of course all knowledge has that structure); this ineluctable presence is logically necessary in view of the two levels of awareness which can be present only in a person.⁷⁶

Endnotes

¹This essay is a revised version of a paper delivered at the "*Personal Knowledge at Fifty*" conference at Loyola University, Chicago in June of 2008. I appreciate the helpful comments of three reviewers which led to further revisions.

²Interpreting Grene, I emphasize, is a complex matter and I acknowledge that I am not always confident that I have seen through to the heart of things. Although she writes very clearly, there are many interesting points that I wish she had said more about. As I later note, some of her criticisms of Polanyi are rather cryptic. She acknowledges that her own ideas have changed over her long life. Reconciling early and later comments is guesswork.

³See Marjorie Grene's "Intellectual Autobiography" (hereafter occasionally abbreviated to "IA" in notes) in *The Philosophy of Marjorie Grene*, Library of Living Philosophers, Vol. 29. eds. Randall E. Auxier and Lewis Edwin Hahn (Chicago and LaSalle, IL: Open Court, 2002), 12. *The Philosophy of Marjorie Grene* is hereafter cited as PMG. "IA" is PMG, 3-28 and I draw extensively on "IA" here as well as my essay "On Persons and Knowledge: Marjorie Grene and Michael Polanyi" (PMG, 32-60), which treats a number of the things discussed early in this essay (see especially 32-36). See also Marjorie Grene, *A Philosophical Testament* (Chicago and LaSalle, IL: Open Court, 1995), 91. *A Philosophical Testament* is hereafter cited as PT. There are many comments on Grene and her work with Polanyi in the Polanyi biography (William Scott and Martin Moleski, SJ, *Michael Polanyi, Scientist and Philosopher* [Oxford: 2005] cited hereafter as Scott and Moleski). See Scott and Moleski, 216 for comments on meeting Grene and 216-231 for various comments on her role with the Gifford Lectures and *Personal Knowledge*. My debts in this paper to the biography are many and I suspect sometimes that I am no longer clearly distinguishing these debts to the biography (or early drafts of the biography material) from archival material and the many scattered comments Grene makes in her own writing. Most of the citations here are to sources other than the biography (although the biography may have comments similar and may be relying upon the same archival sources).

⁴PT, 91. See also PMG, 257.

⁵This is discussed a bit in the biography. See Scott and Moleski, 217ff. The letters in the not-yet-public Shils archives at the University of Chicago, however, make clear that stress of this encounter with the US immigration authorities in the era of McCarthy was much more traumatic than the biography indicates.

⁶PT, 5 and PMG, 32-33.

⁷Scott and Moleski, 216-236, in the discussion of Polanyi's visits to Chicago, his preparation of the Gifford Lectures and the years of work on *Personal Knowledge*, mention several details about Grene's work with Polanyi. For my attempt to summarize some of this and link it with things Grene has said and archival tidbits, see PMG, 34-36.

⁸Polanyi letter to Oldham, 5 March 1953, Box 15, Folder 5, Michael Polanyi Papers, Special Collections Research Center, University of Chicago Library. Citations to Polanyi archival materials are used with permission and are hereafter foreshortened to the box and folder number.

⁹Gerald Smith's "Introduction" to the Duke microfilm of this material suggests this dating. I agree with Smith that the sometimes ambiguous penciled notes on this typescript likely imply that this material is a very early (some of it perhaps as late as 1954) step toward PK—in other words this material is likely close to the original Gifford texts. Polanyi probably had some of the lectures carefully typed up for the original delivery but may have had only handwritten texts for some. A handwritten note included with Gifford Series 1, Lecture 1 indicates this material was given to Grene in May, 1957.

¹⁰The block quotation and quotations in the preceding sentences are from Elizabeth Sewell, "Memoir of Michael Polanyi," Box 46, Folder 12, typescript p. 20 and pp. 14-15.

¹¹Grene's statement in "IA" (PMG, 13) says much of her work with Polanyi was in correspondence; very little of this, however, is in the Michael Polanyi Papers.

¹²Marjorie Grene, "Tacit Knowing: Grounds For A Revolution in Philosophy," *Journal of the British Society for Phenomenology*, Vol. 8, No. 3, October 1977, 168. Hereafter this article is cited as "TK."

¹³Grene implies this in "TK," 165 when she says "these puzzles of the organization of science might have culminated in a philosophical ethic, or theory of natural law, and at one time, I believe about 1952, that is the direction in which Polanyi hoped the second series of Gifford lectures would take him."

¹⁴Some of the archival correspondence related to the work on *Knowing and Being: Essays by Michael Polanyi* (Chicago: University of Chicago Press, 1969) [hereafter KB] make Grene's approach plain. She refused to include some essays Polanyi wanted that she thought inferior and she refused to allow Polanyi to do some revisions on ones she did include. It seems very likely that she did some revisions in articles that she did want herself rather than trust Polanyi to make the changes. Grene made rather clear that she sometimes thought Polanyi's continual revisions marred the quality of his writing and she seems to have thought his writing often had Germanic elements that should be eliminated.

¹⁵See PK, xv. Although he is not listed as one of the readers of the full or even part of the manuscript, Joseph Agassi notes in *A Philosopher's Apprentice: In Karl Popper's Workshop*, (revised, extended and annotated edition [Amsterdam and New York: Rodopi, 2008], 179) that he read the manuscript and declined Polanyi's invitation to come to Manchester and help Polanyi put PK in its final form.

¹⁶Oldham's earlier letter to Polanyi specified his criticisms and Grene apparently had seen the letter: Oldham letter to Polanyi, May 11, 1957, Box 15, Folder 5. This careful 6.5 page letter criticizing the manuscript of PK was certainly an important response to Polanyi. See my discussion of the concerns in this letter and Oldham's influence more generally in "Michael Polanyi and J. H. Oldham: In Praise of Friendship," *Appraisal*, vol. 1, no. 4 (Oct. 1997): 179-189.

¹⁷Grene letter to Oldham, May 12, 1958. (J. H. Oldham Archives, 10.4.), Edinburgh University Library, Edinburgh University, Edinburgh, Scotland (hereafter cited in shortened form).

¹⁸Marjorie Grene and David Depew, *The Philosophy of Biology: An Episodic History* (Cambridge: Cambridge University Press, 2004): 348-361. This final chapter much resembles the argument in Grene's 1985 article, "Perception, Interpretation, and the Sciences: Toward a New Philosophy of Science" (*Evolution at a Crossroads: The New Biology and the New Philosophy of Science*, ed. David J. Depew and Bruce H. Weber [Cambridge: MIT Press]: 1-20). As I note below, I argued in 2002 that Grene's 1995 PT, which reflects on her work in several areas of philosophy over her long career, shows philosophical convictions that are generally consistent with Polanyi's perspective (PMG, 47-54). Grene's brief response to my case suggests I was "also probably correct in believing that my years of working with Polanyi have continued to influence my thought and writing, more than I have recently recognized" (PMG, 61). She does go on to say she later developed interests "decidedly extra-Polanyian" (PMG, 61), which certainly is the case, but my point is that the way in which she pursues these interests bears the mark of her collaboration with Polanyi.

¹⁹See her discussion in "IA," especially PMG, 14-26.

²⁰Grene's May 29, 1958 letter to Oldham (J. H. Oldham Archives, 10.4) responds to an earlier Oldham letter recommending that she and Polanyi read John Macmurray. She reports that she has run down some Macmurray literature, read some of it and turned it over to Polanyi.

²¹All quotations are from Oldham letter to Grene, June 4, 1958 (J. H. Oldham Archives, 10.4).

²²Michael Oakeshott, "The Human Coefficient," *Encounter* vol. 11, no. 3 (1958): 77-80. This review is hereafter noted by page number and the author's name.

²³Scott and Moleski, 231, note that there were more than twenty reviews between 1958 and 1960 and they were decidedly mixed.

²⁴I have elaborated in several places this admittedly artificial but nevertheless useful, three-pronged approach to PK and, more generally, to Polanyi's thought. See "The Spectrum of Meaning: Polanyian Perspectives on Science and Religion," *Zygon: Journal of Religion and Science* (vol. 17, no. 1), March, 1982: 3-8, and the first section of "On Reading Polanyi and Reading About Polanyi's Philosophical Perspective: Notes on Secondary Sources," *The Political Science Reviewer* (Vol. XXXVII) 2008: 158-240.

²⁵Oakeshott, 77.

²⁶Oakeshott, 79.

²⁷Marjorie Grene, "Personal Knowledge," *Encounter* vol. 11, no. 4 (1958): 67-68. Since Grene's response is printed on only two pages, citations hereafter are in the text in parenthesis following the quotation. Grene apparently sent the draft of this letter to Oldham since a typescript is in the J. H. Oldham Archives, 10.4.

²⁸See also Grene's discussion of Kant (especially 140-156) in her chapter on Kant in *The Knower and the Known* (Berkeley: University of CA Press, 1966): 120-156. *The Knower and the Known* is hereafter foreshortened to KK. There are also many comments about Kant in PT. See especially her chapter "Rereading Kant"(PT, 29-46).

²⁹Many scholars interested in Polanyi know Grene's KK which was published in 1966 but she says was mostly written from 1961-1963 (KK, "Preface to the Paper-bound Edition of 1974"). The book draws on articles written in the late fifties and early sixties and is an example of both Grene's developing interest in his-

tory of philosophy and philosophy of biology. KK has chapters on important figures in the history of philosophy as well the interesting chapter “The Faith of Darwinism,” which by 2002 Grene regarded as misguided (PMG, 16-17). There are many references in KK to Polanyi and/or Polanyi’s writing, including PK. In many ways, this book reflects that Grene has digested PK, and other Polanyi writing from just after PK. Certainly one could argue that this book deserves attention in this section of the discussion as an early Grene response to PK but space does not permit such a discussion here. Also, unless I have overlooked it, there is no section in KK that is a sustained reflection on PK as a whole. More typical are discussions like that in “The Faith of Darwinism,” a chapter discussing the assumptions of Neo-Darwinism. The references to Polanyi and PK are scattered but it is easy enough to see that Grene’s questions and responses are very akin to things that are developed in discussions in PK. KK is dedicated to Polanyi. Grene’s letter to Polanyi of January 19, 1963 (Box 16, Folder 1) provided an early outline of the book and advised him that this book should be dedicated to him; she also suggested that the book’s title “reflects its Hungarian origins.”

³⁰Grene makes clear that Polanyi’s interest (as well as her own) in “dubitable belief” is quite different than the standard discussion in philosophy of justified true belief. She suggests that Polanyi is generally not attuned to all the philosophers’ talk about justification but he wrestles with the problem coming from a background in science. See her discussion in “TK,” 166-167.

³¹Polanyi notes in the 1964 Torchbook edition of PK that there are forty declarations of belief listed under “fiduciary program” in the index (PK, ix). Grene and her children did the index so she is certainly mindful of the importance of this key term (see “TK,” 167), which however goes back earlier than PK. In the syllabus of the Gifford Lectures, First Series, similar language (“fiduciary mode” and “fiduciary philosophy”) is used in the précis of Lecture 6 (Box 33, Folder 1). There are indications Polanyi was already discussing “the fiduciary mode” in 1948 before he met Grene. See my discussion of Polanyi’s correspondence with J. H. Oldham about his paper “Forms of Atheism” prepared for a December, 1948 Oldham gathering (“Michael Polanyi and J. H. Oldham: In Praise of Friendship,” *Appraisal*, vol. 1, no. 4 [Oct. 1997], p. 184). Polanyi’s comment in *The Logic of Liberty* (1952—as well as comments in the syllabus for the First Series Gifford Lectures of May and June 1951) make clear that Polanyi understood “post-critical” in terms of the fiduciary program: “We have thus begun to live in a new intellectual period, which I would call the post-critical age of Western civilization. Liberalism to-day is becoming conscious of its own fiduciary foundations and is forming an alliance with other beliefs kindred to its own” (LL, 109).

³²Grene emphasizes Polanyi’s notion of the human obligation “to fulfill demands made on us by something that both defines and transcends our particular selves;” she identifies it as “what Polanyi called the paradox of self-set standards. We accept with universal intent principles or patterns of behavior that we have at one and the same time both happened to develop and enacted as responsibly our own” (PT, 169-170).

³³Grene to my mind is very insightful about the character of Polanyi’s realism (a realism to which she herself subscribed and explained in terms of orientation and ecology, which draws on the language of the Gibsons. See KK, x where she first uses “orientation”; see also PT, 108, and more generally PT, 113-191, as well as her response (PMG, 61-62) to my essay on her links to Polanyi. She notes that recognition of the from-to structure of knowing is “indispensable if we are to escape the to-and-fro of realism-anti-realism arguments” (PT, 123) which are found in contemporary philosophy of science (PT, 169-170). Grene offers an interesting analysis of contemporary discussions of realism in PT, 113-126. She suggests that much contemporary discussion in philosophy of science has formalistic suppositions about knowledge and misguided notions about perception going back to empiricism. It is really an in-house debate about “scientific realism” and it is a debate into which neither Polanyi nor Grene fit. I have recently argued (“Comprehension and the ‘Comprehensive Entity,’” *TAD* 33: 3 [2006-2007], 26-43) that Polanyi is closer to a medieval realist (a position that opposed nominalism) than a modern realist.

³⁴“Polanyi was not only right to call the distinction between two kinds of awareness the most important feature of *Personal Knowledge*; he was righter than he knew. For in the development of his thought that followed *Personal Knowledge*, it was the strengthening and extension of his conception of the tacit foundation of knowledge that, in my view at least, proved most fruitful” (“TK,” 168).

³⁵As Grene notes, the analogical reasoning of PK with its focus on commitment is in some ways superseded by the stronger general affirmation of unspecifiability in the theory of tacit knowing: “The point is, I now see, that the fiduciary programme is supported, not so much by its expansion through analogical reasoning, as by the foundation common to all its instances, the foundation of tacit knowing” (“TK,” 168).

³⁶Polanyi makes this interesting comment about Grene’s “Introduction” to *Knowing and Being* in a Nov. 22, 1968 letter to Grene (Box 16, Folder 3): “I thank you also for your introduction, which I read with great interest. You do make me gradually familiar with a number of toes on which I have trodden. It is fascinating.” Polanyi, however, says much the same thing as Grene about the development of his ideas in his April 1966 Introduction to *The Tacit Dimension*: “Viewing the content of these pages from the position reached in *Personal Knowledge* and *The Study of Man* eight years ago, I see that my reliance on the necessity of commitment has been reduced by working out the structure of tacit knowing. This structure shows that all thought contains components of which we are subsidiarily aware in the focal content of our thinking, and that all thought dwells in its subsidiaries as if they were parts of our body” (TD, x).

³⁷Against common misreadings of Polanyi, Grene insists “what is essential is not the existence of the tacit, but the relation of the tacit to the explicit”:

The tacit component is not a residuum, but an indispensable foundation. What matters is not that there is something unspecifiable, for example, in science, but how unspecifiability works and what it accomplishes. It is the function of the tacit in all knowledge, however exact and “objective”, that the tradition had neglected or denied, and that Polanyi’s epistemology allows us to accept and articulate (“TK,” 165).

³⁸Harry Prosch (*Michael Polanyi: A Critical Exposition* [Albany: SUNY, 1986]: 220-234—hereafter MPCE) spends much time trying to refute Grene’s criticisms of Polanyi; the final section of this essay discusses Prosch’s views of Grene which I argue helpfully illumines Grene’s position but also make clear Prosch’s agenda. It is worth laying out Grene’s position carefully. Grene does, in some of her letters to Polanyi, vigorously object to the way Polanyi frames matters regarding body and mind in some late essays. Her October 28, 1967 letter to Polanyi (Box 16, Folder 1), commenting on a draft of Polanyi’s essay “Logic and Psychology” (*American Psychologist*, 23 [January 1968]: pp. 27-43), sets forth her case succinctly. She tells Polanyi “there is surely something radically wrong with the distinction [between body and mind] as you make it. When I see an external object, I rely on subsidiaries in my body to see the object out there—this is my mind at work, but not, as such, known by me. My brain, on the other hand, as observed by a neurologist, is known by him.” She later emphasizes that “mind is not known in either case. You are not contrasting either mind & brain or knowledge of mind & knowledge of brain, but mind working & brain known. Besides, how can there be any knowledge that isn’t somebody’s from-to knowledge?” She concedes that knowing a mind is somewhat different from perceiving: “. . . perception is, I suppose, a primordial case of understanding; knowing minds, like knowing Shakespeare or relativity theory, entails attention to higher levels of integration.” But she insists Polanyi’s terms of comparison are mismatched: “. . . a mind on the other hand exists only in the process of from-to knowing, whether perceptually or any other way. Then, indeed, the mind is imperceptible but not a different ‘thing’ from the brain as you say it is—it’s not an object, but how a certain organized being deals with its world.” Interestingly, in Grene’s subsequent letter of Nov. 1, 1967 (Box 16, Folder 1), she notes that, having tried to formulate what is wrong about Polanyi’s formulations, she does understand what Polanyi was struggling to distinguish, although he is wrong in assuming this is Cartesian two substance dualism. In Polanyi’s November 6, 1967 reply to Grene’s two previous letters, Polanyi comments (and seems to acknowledge Grene’s point) “referring to my formulation of dualism. You seem to have satisfied yourself about it, while I myself was induced by your first letter (October 28th) to pursue your criticism and suggest a slight amendment. I still think that an amendment would be useful.” This leads in subsequent letters to further discussion and a Grene attack on Polanyi’s discussion of “from-at” as something apparently different than “from-to” knowledge: “. . . if all knowledge is from-to knowledge, how do we suddenly turn up something that isn’t?” (Grene to Polanyi, November 7, 1967, Box 16, Folder 1). Finally, when the galleys of the article under discussion come to her, Grene makes a few changes which she thinks mandatory. In “TK,” Grene says Polanyi “believed that he was reviving dualism, when in fact he was helping to refute it”

because “the theory of mind mediated by the doctrine of tacit knowing is a theory of mind as fundamentally and irrevocably incarnate” (“TK,” 169). She praises Polanyi (and points out Charles Taylor also praises him) as one of the few twentieth century thinkers to develop concepts that “overcome Cartesian dualism” and philosophize “outside the impoverished traditions of empiricism” (“TK,” 169). She says she was sad to discovery in Polanyi’s essay “The Structure of Consciousness” (KB, 211-224) that when Polanyi refers to “the problem of Cartesian dualism,” he did not “mean the problem of overcoming the conception of mind as separate from body. . . in a fashion adequate to account for our intellectual powers, rather than behaviouristically” but, instead, he meant “the problem of defending mind’s separateness from body” (“TK,” 169). She concludes, “surely the from-to processes that constitute ‘mind’ (or ‘minding’) are precisely not dissectable into two ‘things’, the corporeal ‘from’ and the mental ‘to.’ Their integral, indeed, internal, relation is just what Polanyi had been concerned to defend, and what he had succeeded in defending” (“TK,” 169).

³⁹Such criticisms appear in Grene’s letters to Polanyi in the period in which he was delivering some of the lectures and writing some of the articles (most of which Grene read) that Prosch eventually synthesized and were published as *Meaning* in 1975.

⁴⁰“The Personal and the Subjective,” *TAD* 22:3 (1995-1996): 6. This Kent State address is hereafter cited by page as “PS.”

⁴¹What Grene finds objectionable is Polanyi’s introduction of “subjective validity” as one of the “four grades” for classifying “reasonable action and perception, as well as animal inference” (PK, 374). Subjective validity is “the correct use of a fallacious system” which is an “incompetent mode of reasoning” (PK, 374). The PK footnote to “subjective validity” refers back to the Zande discussion in PK, 286-288. Thus it appears that Polanyi regards Zande practices as not truly personal knowledge and thus, in Grene’s heavily sarcastic words: “We, the heirs of a modern European liberal tradition, turn out to be the only human beings who make commitments with universal intent. Everybody else is following a mere subjectively valid impulse” (PT, 170). Grene does seem to make a good point in suggesting that this classification does not fit with Polanyi’s primary notions of the subjective outlined in the fiduciary program which presumably applies to all human persons, Zande and non- Zande. However, I think she may be overestimating the importance of this inconsistency as she herself seems to hint when she points out that at the end of Part IV Polanyi refers to the “social lore” which includes the traditions of all societies, “and that includes science, religion, the arts —as ‘everything in which we may be totally mistaken’” (PT, 170). Polanyi should, however, have avoided the term “subjective validity.” I think the Zande, Marxists, Freudians and trout mistakenly consuming the angler’s fly can be said to have made competent but erroneous judgments (advanced with universal intent); much that is embedded in the frameworks brought to bear in such judgments is fallacious from the perspective of a judgment informed by a scientific framework. Perhaps one must claim that any “contact with reality” for these interpretative systems will not stand the test of time in the long run. I acknowledge that this is a Peircean metaphysical solution to an epistemological problem. Grene seems to think Polanyi’s claim for “subjective validity” makes clear what she dubs a Western scientific species of “ontological dogmatism” (“PS,” 15) which has ceased to be properly mindful of commitment and its universal aspiration which can only occur in a changing historical-cultural context. Grene does not mention that Polanyi’s earlier section titled “Existential Aspects of Commitment” (PK, 318-320) does articulate a scheme in which he speaks of rising “to the level of the personal by reaching out to reality” (PK, 318). He raises a question regarding “an active mental process, aiming at universality” (PK, 318) which turns out to have been fundamentally mistaken: if such an error is possible, can one still hold that the knowing subject “has risen to the level of the personal by reaching out to reality?” (PK, 318). Following this question, Polanyi then claims the Zande witch doctor is a rational person but his rationality is deluded. Polanyi concedes that the witch doctor’s “intellectual system” can serve, within his society, to provide a “form of leadership” and “the means for deciding disputes, however unjustly” (PK, 318). Polanyi allows (in what seems the weakest of affirmations) that the witch doctor’s intellectual system acquires a “limited justification” (PK, 318). Next, however, Polanyi ends his discussion by denying that the Zande intellectual system is a true account of nature: “But as an interpretation of natural experience it is false” (PK, 318). Immediately following, in a new paragraph, he “replies” to the above account by “distinguishing between [A] a competent line of thought, which may be erroneous, and [B] mental processes

that are altogether illusory and incompetent” (PK, 318). Polanyi links those processes that are [B] “altogether illusory and incompetent” with [C] “passive mental states, as purely subjective” (PK, 318). A footnote indicates that in Part IV of PK, he will separate this combined class of [C] passive mental states and [B] illusory and incompetent processes into elements that are merely incoherent and elements that are “systematically pursued misinterpretations.” This apparently looks forward to PK 374. Further, Polanyi acknowledges that the line for judgment between competent mental activity and superstition, madness and twaddle is “determined by my own interpretative framework” (PK, 319). He ends his discussion by acknowledging also that “different systems of acknowledged competences are separated by a logical gap, across which they threaten each other by their persuasive passions. They are contesting each other’s mental existence” (PK, 319). In sum, the discussion on PK, 318-319 does not resolve all the issues Grene raises, but it suggests that Polanyi was struggling with them. It does appear that Polanyi thinks that the Zande have “risen to the level of the personal by reaching out to reality.” Polanyi holds, however, the Zande happen to be fundamentally wrong about the true nature of reality. This commitment (tacit or explicit) about Zande error reflects Polanyi’s acceptance of the intellectual framework we call a scientific point of view. Polanyi thus seems to be, once again, simply affirming that you cannot make claims or commitments except from within a framework of belief that is largely subsidiary.

⁴²Clearly, Grene’s writing in the years soon after the publication of PK show that she does share Polanyi’s interests in attacking what was then called “reductionism” in biology and even in her 2002 intellectual autobiography she affirms that she “still appreciates his [Polanyi’s] dubbing epistemology, or philosophy of science, “ultrabiology” (PMG, 61, see also PT, 25 where she approving uses Polanyi’s term “ultrabiology” to link Polanyi’s philosophy and Merleau-Ponty). See also Grene’s discussions from the early sixties in KK in Part Three, “The Complexity of Things” where her views seem reasonably well aligned with Polanyi. As I have noted, she, by 2002, in her intellectual autobiography, says she regards the chapter “The Faith of Darwinism” (in this section) as “a really bad chapter” (PMG, 17) which, like much of her writing on evolution in most of the sixties and perhaps the seventies, is “in large part indefensible” (PMG, 16). However she identifies an early publication (1963) in philosophy of biology, “Two Evolutionary Theories” (I and II), *The British Journal for the Philosophy of Science*, IX: 34 and 35: 152-54, 349-51) as still a reasonable piece of “conceptual analysis” (PMG, 16). In this article, she applies the insight in PK about two kinds of awareness to debates among then contemporary evolution theorists and argues for more attention to structure in evolutionary theory.

⁴³PMG, 13-14. In 2002, she says she does still have some sympathy with “Polanyi’s Augustinianism. I do believe that faith is prior to reason—only I don’t believe it has to be faith held dogmatically, let alone faith in the supernatural. It’s the difficult position described in the chapter on the critique of doubt that we ought to try to maintain” (PMG, 62).

⁴⁴In “IA,” she dates her first reading as 1960 (PMG, 14-15, 20). See also PT, 69.

⁴⁵She says that she read J. J. Gibson’s 1979 book *Ecological Approaches to Visual Perception* and by late 1980 began to grasp its implications “for my problems: the nature of persons, of knowledge, of the practices of the sciences” (PMG, 21-22). See her extended discussion of the Gibsons’ work and “the ecological approach” in PT, 129-151.

⁴⁶See her discussion throughout PT as well as her discussion in her intellectual autobiography (PMG, 20-23): “. . . looking back. . . it is successively Polanyi, Merleau-Ponty, and Gibson who mark the significant stages on my (intellectual) life’s way” (PMG, 81). See my effort to show how she fits these figures together in “In Memoriam: Marjorie Grene” (*TAD* 36:1[2009-2010]: 50-63).

⁴⁷See her discussion in “IA” (PMG, 18-19) as well as Grene’s 1965 book *Approaches to a Philosophy of Biology* (New York: Basic Books) which treats some of this literature. Her correspondence with Polanyi in the sixties reflects her interest in some of these philosophical European scientists and she encouraged Polanyi to read them. Polanyi wrote a favorable review of *Approaches to a Philosophy of Biology* in *British Journal for Philosophy of Science* 22 [1971]: 307-308.

⁴⁸The incomplete Grene-Polanyi correspondence record from the early sixties does include letters in which Merleau-Ponty is mentioned. Grene links him with other European scientists doing philosophy that she thinks is akin to Polanyi’s views. She encourages Polanyi to read Merleau-Ponty and they apparently discuss

his work in some letters that are referenced but were not preserved. I believe that Polanyi begins to see the connection between his theory of tacit knowing and Merleau-Ponty's account of embodiment, a connection however that he, unlike Grene, never seems overly enthusiastic about exploring. See my comments in the final section. Perhaps the most interesting comment about Merleau-Ponty is in Polanyi's January 27, 1963 letter (Box 16, Folder 1) to Grene:

Got your SOS about Merleau-Ponty. I have a theory about what went awry with these people. They discovered an epistemology, or at least sighted it on a distant horizon, which represented knowledge as shaped by the knower, and instead of worrying about the jeopardy of truth, turned a blind eye on this, while fascinated by the jeopardy of man as shaper of his own knowledge. Our business is to restrain this extravagance by a theory of knowledge which implies a limited responsibility of the knower and thereby restricts the range of his self determination. This will enrich the conception of P.K. by feeding it with the more violent existential passions discovered by our age. You know that I always felt that my ideas are lacking in vital concern. I think they can be given a deeper foundation by grafting them on outcroppings of existentialism.

⁴⁹See, for example, KK, 202-225. I have tried to lay out Grene's work here in "Comprehension and the 'Comprehensive Entity': Polanyi's Theory of Tacit Knowing and Its Metaphysical Implications" cited above.

⁵⁰See the footnote discussion on "TK," 164.

⁵¹See my discussion of this element in Polanyi in "Polanyian Footnotes To 'From Biology To Consciousness To Morality'" (*TAD* 30:3 [2004-2005]: 23-25). Here I also try to show the way in which in the early sixties in KK, Grene, perhaps even more clearly than Polanyi, shows what acceptance of the critical and convivial nature of biology involves philosophically: "To know life is to comprehend comprehensive entities; to know knowing is to comprehend those particular achievements of living things which consist in their acts of comprehension. Mind is once more a natural reality, and nature once more both the medium and the object of mind's activity" (KK, 224). As I have noted above, Grene says in 2002 that she "still appreciates his [Polanyi's] dubbing epistemology, or philosophy of science, "ultrabiology" (PMG, 61). Although she does not say much, I think Grene very illuminatingly comments (in 2002) on one of her 1990 articles criticizing extreme "population thinking" as "pure nominalist" (PMG, 17); as noted above, she insists that she is a realist of the sort that her mentors Polanyi, Merleau-Ponty and the Gibsons are and the discussions of realism and anti-realism in contemporary philosophy of science are artificial debates that really are only about scientific realism.

⁵²This is an ambiguous but apparently important element of Grene's critique of Part IV of PK. She never says this but I speculate that late in her life (after spending forty years deeply immersed in philosophy of biology), she found many of the Part IV discussions of matters related to evolution to be overly "cluttered." That is, Polanyi's persistent attempts to show a parallelism between epistemological emergence and ontological emergence I suspect she came to believe were simply untenable. Because it is a motor driving much of the Part IV discussion, the discussion does not do justice to evolution, not to mention the fact that developments in science simply make this sort of account excessively mindful of parallels something most contemporary scientists cannot fathom. Because TD is a more circumspect book, I think Grene found it less "cluttered."

⁵³Andy Sanders interestingly argues ("On Reading Part IV of *Personal Knowledge: A Finalistic or a Simple Vision?*" *TAD* 30:1: 24-34) for a reading of the end of PK as "a modest speculative attempt to fulfill the requirements of a Gifford Lecturer" (24). He emphasizes Polanyi's emphasis on religious practice in other writings rather than metaphysical theorizing.

⁵⁴I speculate that Grene's early work on Kierkegaard and Heidegger (not to mention other writing on so-called existentialists) has influenced her on these points, although she has little good to say about either Kierkegaard or Heidegger.

⁵⁵This is rather close to what Grene herself said about Part IV in her 1958 response to Oakeshott's review. See the discussion of this response above.

⁵⁶Greene did make comments in 1977 in “TK” (168) (i.e., before the publication of Prosch’s MPCE) suggesting that the orientation of *Meaning* was a betrayal of the best of PK and other Polanyi philosophical writing. Her letters to Polanyi (written in the period in which the material that became *Meaning* was first drafted as articles and lectures) raise many questions with Polanyi about what seem to be his emerging ideas. One can link these early Greene comments to her reading of Polanyi’s ontological account.

⁵⁷This term she borrows from R. O. Kapp (another philosopher): “. . . the whole depending on the parts as conditions of its existence, but the parts existing as parts only as so constituted by the unifying principle of the whole. Thus in themselves, at least in living nature, all entities exist on a least two levels at once” (KK, 218).

⁵⁸As I hinted in a note above, I suspect that as Greene studied biology and understood evolution more deeply, she came to believe that the picture of things projected by Part IV of PK was one that paid too much attention to human beings in the larger family of nature; because of its focus on human beings, I suspect that Greene came to believe this was a picture that emphasized hierarchical stratification at the expense of dynamics.

⁵⁹Tihamér Margitay, ed. (Newcastle upon Tyne: Cambridge Scholars Press): 128-140.

⁶⁰Thomas A. Langford and William H. Poteat, eds. (Durham, NC: Duke University Press, 1968): 58-90.

⁶¹See *TAD* 26:3, 33:3, and *Polanyiana* 6:2.

⁶²See, for example, discussion on KK, 241 concerning operative principles in entities: “Comprehensive entities if they mirror our tacit knowing of them should display an analog of both of these properties. . . .”

⁶³See note 38 above for further discussion of Greene’s critique.

⁶⁴See her use of this term in “TK,” 170 and PMG, 221, but note that she is careful to distinguish her position in “TK” from what she regards as a degenerate version of “minding” in “Rylean behaviourism, let alone . . . some kind of ‘central-state materialism’” (“TK,” 170). “Minding” also emphasizes Greene’s emphasis upon the temporal, which she emphasizes in KK, as I discuss below.

⁶⁵In her recent responses to Anthony Perovich (PMG, 194-197) and David Rosenthal (PMG, 221-224), Greene very directly takes on the criticism that she neglects consciousness as a central feature of the human. She concedes that many organisms are “conscious” insofar as they are not asleep or dead, but she argues that “consciousness tells us nothing about a unique human condition, if such there be” (PMG, 194). Further, if one posits some special form of human consciousness like self-consciousness, she suggests that she does not “see how anything purely subjective or inward can tell me who I am, what kind of life it is that marks mine out as human” (PMG, 194). Her response also points out that in her view her opposition to the “consciousmongers” (PMG, 194) seems to be a lone voice in the wilderness but her views are grounded in her concept of the person which she draws primarily from Polanyi and Merleau-Ponty.

⁶⁶Especially is this the case given Polanyi’s own comment in the 1964 Torchbook Preface to PK: “Indwelling is also the instrument by which comprehensive entities are known throughout the world. It is from the logic of indwelling that I have derived in Part IV of this book, the conception of a stratified universe and the evolutionary panorama leading to the rise of man equipped with the logic of comprehension” (PK, x-xi).

⁶⁷Greene would agree Polanyi is not a phenomenologist but she certainly has a much richer understanding of this tradition than Prosch. Greene, it should be noted, argued (though perhaps not before the publication of MPCE) that Merleau-Ponty was not a phenomenologist; she distinguishes his views from Heidegger who she contends has nothing to say about embodiment. She had little positive to say about some other so-called phenomenologists (e.g., Husserl and Brentano). See her discussion in PT (67-85) of Merleau-Ponty’s being-in-the-world, his realistic account of perception and particularly his distance from “phenomenology” (85-87).

⁶⁸I am indebted to an reviewer of this essay for pointing out that Prosch’s views of phenomenology (as his *Genesis of Twentieth Century Philosophy* reflects) are likely strongly shaped by his teacher Richard

McKeon's typology describing four types of metaphysical paradigms. The diversity of phenomenology and the richness of Merleau-Ponty are poorly represented in McKeon's typology. More generally, I suspect that the reviewer is correct in suggesting that a more careful study of Prosch's *Genesis of Twentieth Century Philosophy* and McKeon's influence might better illumine Prosch's perspective on Polanyi.

⁶⁹A reviewer pointed out, Prosch perhaps confused or conflated phenomenology and phenomenalism.

⁷⁰See David Rutledge's excellent recent orientation to Poteat ("Willaim Poteat: The Primacy of the Person," *Appraisal* 7:2 [October 2008]: 31-37) for a discussion of Poteat's treatment of this theme.

⁷¹Kyle Takati's recent discussion in "Embodied Knowing: The Tacit Dimension in Johnson and Lakoff, and Merleau-Ponty" (*TAD* 36:2 [2009-2010]: 26-39 [see especially 35-37]) is a rich and fascinating one that treats some issues related to Polanyi's ontology and its connection with Merleau-Ponty's perspective. Takati argues for "Polanyi's 'enactive realism'" which is "a fusion of being-in-the-world with consequential commitments and that aim at levels of achievement—levels that include emergent comprehensions of the world, and their related commitments to emergent realities yet to be discovered" (36). He is certainly right that Grene picks up and emphasizes the achievements that living comprehensive entities make and that this is deeply connected to Polanyi's claim that some existents are "more real" than others and Polanyi's emphasis upon discovering richly real entities that must be recognized as having an emergent nature. Takati argues that Merleau-Ponty's realism "goes back to revealing the tacit modes of being-in-the-world" (36) but that in a certain sense Polanyi's realism does not simply reach "back" to the primacy of perception, but also look[s] forward to what our commitments demand as we expand tacit knowing's hermeneutic circle" (37). Perhaps Grene's last chapter in *KK* ("Time and Teleology") recognizes this futural emphasis in Polanyi's metaphysics, although I am not sure that she would see this a move "beyond" Merleau-Ponty. Takati intriguingly suggests "a new philosophy of embodiment may want to seriously consider the metaphysical status of embodied, enactive constructs and Polanyi's insights" (37). The yet unpublished paper "Of One Mind? Merleau-Ponty and Polanyi on the Reduction of Mind to Body" (given at the 2009 Polanyi Society annual meeting) by Charles Lowney (with Florentien Verhage), although not focused directly on Grene and Prosch is an outstanding essay that tries to tease out the similarities and differences between Polanyi and Merleau-Ponty. The essay does examine some of Polanyi's criticisms of Merleau-Ponty which Prosch apparently relies upon. The discussion is attentive to subtle matters linking and distinguishing epistemology and ontology, matters that I don't think Prosch clearly saw.

⁷²For a full discussion of the *Meaning* controversy and Prosch's MPCE see the discussion of MPCE in my *Political Science Reviewer* article "On Reading Polanyi and Reading About Polanyi's Philosophical Perspective: Notes on Secondary Sources" (203-233) cited above.

⁷³Briefly stated, Prosch argued that Polanyi intended to emphasize the ontological discontinuity between natural realities and what in Polanyi's later writing were referred to as the "transnatural" realities of art and religion. The latter classes of realities do not exist independent of the articulate system of a particular community of inquiry as do natural realities known in science and perception.

⁷⁴In the essay "Knowing and Being," Polanyi points out that "there is a close analogy between the elucidation of a comprehensive object and the mastering of a skill" (KB, 125). For Polanyi, the arts of knowing and doing are structurally akin and always are blended. This leads Polanyi to say, "it is apposite therefore to include skilful feats among comprehensive entities" (KB, 126). He acknowledges that most frequently we speak of "understanding a comprehensive object or situation and of mastering a skill," but he points out that we also are comfortable speaking of "grasping a subject or an art" (KB, 126). The way in which comprehension is always a skillful integration of elements Polanyi often treats by discussing knowing in connection with indwelling. He claims that "the structure of knowing, revealed by the limits of specifiability, thus fuses our subsidiary awareness of the particulars belonging to our subject matter with the cultural background of our knowing" (KB, 134). The knower's physical and mental habits or skills must coalesce in an achievement or performance and this performance makes possible—and indeed is—what a "comprehensive entity" is: "our subsidiary awareness of the particulars of a comprehensive entity is fused,

in our knowing of the entity, with our subsidiary awareness of our own bodily and cultural being” (KB, 134). Polanyi thus describes knowing as an indwelling—an activity of distributing our intentionality across a range of different particulars which must then be coordinated. He acknowledges that when the indwelt structure changes, the knower’s being changes. Knowing involves “a utilization of a framework for unfolding our understanding in accordance with the indications and standards imposed by the framework. But any particular indwelling is a particular form of mental existence. If an act of knowing affects our choice between alternative frameworks, or modifies the framework in which we dwell, it involves a change in our way of being” (KB, 134). In the 1964 “Preface to the Torchbook Edition” of PK, Polanyi says “Indwelling is being-in-the-world. Every act of tacit knowing shifts our existence, re-directing, contracting our participation in the world. Existentialism and phenomenology have studied such processes under other names. We must re-interpret such observations now in terms of the more concrete structure of tacit knowing” (PK, xi). These discussions clearly show that Polanyi did not think of a “comprehensive entity” as merely an external thing or a focal object to be sharply distinguished ontologically from the knowing subject. The theory of tacit knowing rejects the simple internal-external framework as adequate to represent human participation in the world. Edward Pols (“The Problem of Metaphysical Knowledge, *Intellect and Hope*, 58-90) suggests Polanyi has an embedded “metaphysical claim” in his contention that when the knower makes a commitment, the knower “too is a comprehensive entity and his cognitive act can therefore be understood as a level of reality making use of subsidiary levels.” (73). See also my extended discussion in “Comprehension and the ‘Comprehensive Entity’: Polanyi’s Theory of Tacit Knowing and Its Metaphysical Implications” (*TAD*, 33:3: 26-43).

⁷⁵Polanyi does suggest that all knowing involves participation, although the kind or degree of participation in scientific study differs from that found in knowing historical figures or works of art. Nevertheless, different kinds of participation do not warrant the conclusion that any knowing is unmediated. Prosch’s sharp distinction between the ontological status of realities known in perception and science and those known in the noosphere seems to me a distinction that comes close to affirming that perceptual and scientific knowledge are unmediated or less mediated than knowledge of other realities. Prosch slips into a preoccupation with the nature or character of what exists, and forgets or does not properly emphasize that even affirmations about this nature or character (i.e., existence) are themselves inferences held tacitly and with conviction by persons in a community.

⁷⁶This is a response to a question posed by William Poteat in a discussion of “The Creative Imagination” after presentation in the 1965 meeting of the Study Group on Foundations of Cultural Unity. See *Toward a Unity of Thought*, ed. Marjorie Grene, *Psychological Issues*, vol. vi, no. 2, monograph 22 (NY: International Universities Press, Inc., 1969): 77. Grene perhaps did in fact approve of this comment since she edited the material here!

That “Treacherous Footnote”: Assessing Grene’s Critique of Polanyi

Walter Gulick

ABSTRACT Key Words: Michael Polanyi, Marjorie Grene, science and religion, evolution, teleology, dualism, frameworks, subjectivity, fallibility, commitment.

While acknowledging her appreciation of and dependence upon the philosophy of Michael Polanyi, Marjorie Grene in developing her own philosophical vision distanced herself from some aspects of Polanyi’s thought. This essay examines her critique of a) Polanyi’s incorporation of religious themes in his writing, b) the teleology present in Polanyi’s understanding of evolution, c) his alleged return to dualistic thought, and d) his confusing use of “subjectivity” in Personal Knowledge. The essay points out ways in which her remarks are sometimes trenchant and sometimes miss the mark.

Nobody understands the genesis of Michael Polanyi’s philosophical aims and insights more deeply than his co-worker in giving birth to *Personal Knowledge*: Marjorie Grene. Thus one must pay attention with special respect to Grene’s critique of Polanyi’s *magnum opus* in particular, and to all his philosophical positions in general. Perhaps her most extended critical engagement with *Personal Knowledge* (PK) is found in her Kent State keynote address, “The Personal and the Subjective.”¹ There she notes with dismay Polanyi’s description of “subjective validity” (on PK 374, with a footnoted reference to the beliefs of the Azande). She refers to this material as “the treacherous footnote, whose existence, however, I cannot in all honesty deny” (PT 171).²

What is so treacherous about this description and footnote, and to what extent is Polanyi’s achievement compromised by them? How else does she criticize Polanyi’s *published* work, and how well founded are her criticisms?³ In seeking to answer these questions, I will, then, be assessing Grene’s critique of Polanyi, and consequently assessing some aspects of her own considerable philosophical accomplishments.

It must be said, however, that the extent of Grene’s criticism of Polanyi should not be exaggerated. Her public criticism of his philosophy is relatively limited and is most appropriately seen in the context of her overwhelmingly positive appreciation of Polanyi’s accomplishment. The fact that her criticisms are limited is itself a compliment to Polanyi, for there are few thinkers she seriously engages that escape without being subjected to devastating assessments (even though she still sometimes makes use of their views). Polanyi, Merleau-Ponty and J.J. Gibson (along with his wife Eleanor) form the holy trinity among Grene’s contemporary influences.⁴ Still, Grene never pulls back diplomatically from blunt judgments when she feels they are warranted—her judgments are devastatingly dismissive of academically entrenched analytical philosophers, but she is also critical of her threefold contemporary philosophical influences and her own earlier views. Her frankness is part of her charm.

Before turning to the interesting issues raised by the treacherous footnote, however, I will briefly note three broad criticisms Grene eventually makes of Polanyi’s philosophy in general. Examination of these criti-

cisms will help differentiate Grene's philosophical orientation from Polanyi's and thus provide some context for the investigation of the treacherous footnote. The first two criticisms primarily are reactions against aspects of PK, while the third criticism is targeted more toward later developments in Polanyi's thought.

Three General Criticisms

1. Mixing Religion with Science and Philosophy

First, she is made uncomfortable by the theistic themes woven into PK. Of course these are included almost by necessity of its being based on the Gifford Lectures, which are endowed to deal with natural theology.⁵ Most fundamentally, her reaction is because "I believe by now (and this is now my commitment) that religion does so much more harm than good in the world that it is differences from it rather than similarities that need stressing in practices we wish to accredit" (PS 14). She supports Hume's view that on the whole organized religion encourages "superstition and enthusiasm" ("Reply to Kathleen Blamey," PMG 511). She is also concerned that introducing God into the discussion will alienate philosophers of science.

More specifically, she objects to the way Polanyi makes use of "the Christian scheme of Fall and Redemption" (PK 324). With good reason she claims that regarding the person groping for knowledge as analogous with the state of original sin is "utterly misguided" (PS 14). The Fall refers to a condition of alienation from God that is to be overcome, on one common reading, through the grace of God in providing Christ as expiation for our bondage to sin. The amoral "historically given and subjective condition of our mind" Polanyi refers to does indeed seem categorically far distant from the morally deficient condition of sin. Polanyi's analogy rests on the similarity between gifts of God freely given without being merited and gifts of discovery that are not produced or controlled by us but arrive as an Aha! surprise. When discoveries are separated from any linkage with the concept of sin, Grene affirms Polanyi's Pauline or Augustinian account of how we come to know:

Polanyi used to say that he was adopting the Pauline view that the proper attitude for human beings was neither arrogance nor despair, but hope. This seemed to me an illuminating view, and I took its religious connotations sufficiently seriously to agree that scientists seek only through faith, and find only through grace. Even then, I meant this in a very broad and metaphorical way that would satisfy few true believers. . . . Can one be an atheistic Augustinian? ("Reply to Kathleen Blamey," PMG 511).

It could be observed that, although Grene does not make this point, Polanyi goes on to speak of a "technique of our redemption," which sounds like a manifestation of works inconsistent with the Pauline model of grace to which Polanyi claims he is committed. But does Polanyi really think there is a technique by which persons can ensure their redemption? His statement about a technique is as follows: "The technique of our redemption is to lose ourselves in the performance of an obligation which we accept, in spite of its appearing on reflection impossible of achievement" (PK 324). In context, it seems evident that the "technique" to which Polanyi refers is more similar to faith than it is to works or manipulative control. That he is supporting a posture of faith becomes obvious when he goes on to say that "we hope to be visited by powers for which we cannot account in terms of our specifiable capabilities" (PK 324).

Grene's rejection of Polanyi's interest in theism is consistent with her naturalistic understanding of the world and its processes. However, to others not sharing her commitment to thoroughgoing naturalism, her criticism of Polanyi's forays into religion would be seen as more a matter of her personal discretion than it would likely be considered a damaging criticism of Polanyi's accomplishments. That is, her rejection of religion can be viewed as an expression of the limits of her basic frame of reference. Indeed, perhaps Grene's dissatisfaction with her own articulation of personhood⁶ would be alleviated were she open to the way such religious concepts as the Christian notion of sin, the Buddhist notion of emptiness, or the Hindu notion of *lila* might enrich her rather existentially thin naturalistic notion of the person.

2. Polanyi's Understanding of Evolutionary Theory

Second, Grene also finds serious problems with Polanyi's understanding of evolution as presented in Part IV of PK. In discussing "Polanyi's gross misunderstanding of evolutionary theory" (PT 171), she rejects what she claims is his notion that humanity is "the apex of evolution" (PS 14), with its unacceptable implications of a teleological, progressive thrust inherent in the evolutionary process. Grene would certainly acknowledge that individual animals exhibit purposive behavior, but in concert with most contemporary theorists of evolution, she rejects the notion that the evolutionary process *itself* exhibits teleology in any form.

Thus Grene (and David Depew) affirm Robert Cummins' rejection of what they term "neo-teleology," the view that explains the existence of a trait by a process of selection that enables a useful function to come into being. "The neo-teleologist asks, for example, of a bird's wing, why it is there, and answers, because it enables flight—and therefore selection produced it."⁷ Neo-teleology is problematic because it surreptitiously slips in mind-like purpose or aim to a mindless process. Grene's Chapter 5 in PT, "Darwinian Nature," contains much that is thoughtful concerning teleology versus causality in evolution—see particularly pp. 102-107. There she discusses neo-teleology as problematic examples of "hyperadaptationism" and "ultradarwinism" (105).

Were she to have considered it, Grene would likely also reject as superfluous Polanyi's attempt to establish an "ordering principle of evolution" (PK 382), an active process of emergence that he thinks is necessary to account for the qualitative leaps in the earth's history of evolution. Polanyi thinks the sort of processes postulated in the neo-Darwinian synthesis result in "entirely accidental advantages" that can never "add up to the evolution of a new set of operational principles, as it is not in their nature to do so" (PK 385). He holds that an ordering principle of incipient stability is needed to explain the emergence of new operating principles. That this principle is teleologically tinged can be seen in Polanyi's claim that evolution is itself an achievement that "must have been directed by *an orderly innovating principle . . .*" (PK 386). He asserts that his conception of the generalized biological field he postulates as producing achievements is "of course finalistic" (PK 399).

Grene affirms Polanyi's vision of reality as hierarchical, but would not accept that evolutionary theory needs some additional principle to explain how emergence produces more complex biotic levels. Elsewhere I have suggested that complexity theory, with its notion of how systems undergo increasingly complex self-organization, can explain qualitative emergence, and it does so without relying on teleology.⁸ So while I thereby support Polanyi advocacy of explicitly describing how a systemic ordering principle contributes to Darwinian evolution, I would also suggest evolutionary theory incorporates processes that implicitly produce qualitative emergence. Such notions as energy producing photosynthesis and metabolism, mutations, genetic

drift, and indeed natural selection itself jointly function as an expression of dynamic self-organization. In any case, while individual living things are very helpfully regarded as achievement-oriented, I would affirm with Grene that the *evolutionary process itself*—a higher level operating according to different principles than those followed by individuals or species at lower levels—is not achievement-oriented and therefore does not manifest any teleological or finalistic aspects.

I would add here that Polanyi's thought about evolutionary emergence is compromised by the simplistic dichotomy he offers as apparently the only basis for explaining evolutionary emergence: the laws of physics and chemistry versus his higher "active" (vitalistic) explanation.

[T]he rise of man can be accounted for only by other principles than those known today to physics and chemistry. If this be vitalism, then vitalism is mere common sense, which can be ignored only by a truculently bigoted mechanistic outlook . . . Darwinism has diverted attention for a century from the descent of man by investigating the *conditions* of evolution and overlooking its *action*. Evolution can be understood only as a feat of emergence (PK 390).

Polanyi here seems to take the epistemological insight he gained by adding an active component to Gestalt theory and extrapolate it to the theory of evolution. His approach goes astray in two ways.

First, Polanyi seizes on the notions of maturation and achievement as helpful in explaining both individual and species development (see PK 395-400). He calls phylogenetic emergence

a process of maturation which differs in the most curious manner from that of ontogenesis; for it is a maturation *of the potentialities of ontogenesis*. . . We are actually facing then the operations of a phylogenetic field guiding anthropogenic maturation along the gradients of phylogenetic achievement—as surely as the embryologist faces morphogenetic fields derived from the gradient of ontogenetic achievement. (PK 400)

But the principles guiding the maturation of an individual from an embryonic stage to adulthood are not the same as the principles guiding the development of a species as it adapts to changing environmental conditions. By using the same notions of maturation and achievement to describe these two different levels of reality, Polanyi violates his ontological insight that different levels operate according to different principles and are not reducible one to the other.

Secondly, from an evolutionary perspective, Polanyi inappropriately prioritizes both the individual and the evolutionary process as themselves active, thereby slighting the importance of the dynamic evolutionary niches to which individuals and populations adjust and exploit if the species is to survive. As Grene suggests in advocating the importance of seeing humans in terms of the dynamic *Umwelt* in which they dwell, individual and environment interact at a level of complex capacities and properties. The potentialities afforded by a niche have features supported by the laws of physics and chemistry, but they are not reducible to these laws. Thus, for instance, feeding involves such complexities as flavor and evolved taste, nutrition, seasonal availability, scarcity, and on and on. This richness cannot be reduced to a simple opposition between the laws of physics and chemistry and vitalistic impulses of an individual or a process.

Greene is a philosopher of biology of the first rank, and her criticisms of Polanyi have bite. This merited criticism, however, does not necessarily undermine the basic integrity of Polanyi's philosophy. The flow of Part IV of PK could be purged of its teleology and progressivism without damaging its vision of an increasingly complex world of biologically-based achievement culminating at present, without pre-existing design or direction, in human reality. Indeed, in the preceding paragraphs I have begun suggesting how this purging might be accomplished. By using teleology-free complexity theory, remembering the crucial developmental significance of environment, and consistently holding to the distinct rules guiding each level of reality, the integrity of Polanyian anthropogenesis might yet be reclaimed.

3. Confusion in Polanyi's Later Thought

The third general area of Polanyi's thought that gives rise to Greene's misgivings is more diffused and harder to specify than the first two areas of criticism. This criticism was not made as publicly as were the two previously described areas of critique, and so might be considered as but a continuation of the constructive criticism she offered directly to Polanyi during the 1950s when the Gifford Lectures were being shaped into *Personal Knowledge*. It has to do with some of the lines of thought Polanyi developed after the intensity of his collaboration with Greene had waned somewhat. While the fiduciary program with its features of fallibility and commitment, and tacit knowing with its from-to structure of knowing—these Polanyian notions, which Greene had a hand in developing—remain at the very core of her mature thought, she does not believe his attempts to apply these distinctive ideas to such traditional problems in philosophy as other minds, universal terms, aesthetic theory, the nature of symbolism, and principles of explanation are always successful. Thus, for instance, she writes him that many of the diagrams he was developing to map different sorts of cognition (ones that eventually made their way into *Meaning*) are problematic.⁹

Perhaps no philosophical issue is of greater concern to Greene than rejecting the heritage of Descartes's dualism. The following claim can appropriately be taken as a key to Greene's most fundamental philosophical aim: "[W]e must get ourselves out of the double dead-end the Cartesian tradition has led to, or the Cartesian alternative, as Plessner has called it: idealism or subjectivism on the one hand and on the other an alleged objectivization that also shrinks into the subjective presentation of 'observables'" (PT 47). For Greene, the proper starting point of philosophy is the person as a symbol-using animal shaped by personal history and purposefully responsive to that person's cultural and natural environment. So when Polanyi even mentions a body-mind dualism in his later work, it is like a red flag to Greene.¹⁰

Her reaction against this distinction comes to a head in relation to Polanyi's paper, written in 1967, "Logic and Psychology." In that paper he declares, "We can formulate the mind-body dualism as the disparity between the experience of a subject observing an external object like a cat, and a neurophysiologist observing the bodily mechanisms by which the subject sees the cat."¹¹ He states that the difference can be communicated via a contrast between from-to and from-at knowing. But Greene denies that there is any real difference here.

Mind is not known in either case. You are not contrasting either mind & brain or knowledge of mind & knowledge of brain, but mind-working & brain-known. Besides, how can there be any knowledge that isn't somebody's from-to knowledge? . . . I don't see that the terms of your comparison match with each other. . . [The mind is not] an object, but how a certain organized being deals with its world.¹²

As Grene states, when a person observes a cat, perceptual integrations occur in the person's from-to structure; those process are the mind at work. The neurologist who, aided by some advanced technology, sees certain neurons as being fired when a patient is observing a cat, would also be integrating particulars in a from-to structure in the process of determining what neural events contribute to the patient's experience. Cats and neurons are empirical *objects* that can be directly (with mediation) known, whereas the mind, as an emergent *process* (“how a certain organized being deals with its world”) dependent upon the firing of neurons, cannot be directly known either by introspection (one can know the “contents” of the mind, but not the mind itself) or by outside observation. Polanyi thinks we can infer from people's behavior what the contents of their mind may be, but he never claims the mind can be known directly. The distinction between object and process is key to the discussion of body versus mind; the category of from-at does not get at this distinction and adds nothing to the concept of from-to.

During an inconclusive rapid exchange of letters on this topic, Polanyi has Grene proofread and return the galleys of the article in question to the journal publisher. She writes Polanyi on November 9, 1967 that “I just couldn't let your last revision stand as it was . . . So I changed ‘knowledges’ to ‘experiences’ and made two further revisions as per enclosed. Please don't be angry; what you said was false and not what your example exhibited. . .” On November 11 she writes, “It was rather nerve-wracking to assume the responsibility of altering your text—but neither could I assume the responsibility for permitting the text as it stood to see the light of day. . .” Then in a note on November 14 she adds, “Sorry if I've done something unforgivable; such is life.”¹³ I take it that this correspondence illustrates several things: that Grene identifies strongly with the non-dual philosophical position Polanyi (with her help) stakes out, that she is determined to protect that position against ideas that would betray it, yet that she honors Polanyi and his autonomy, and felt deep remorse at feeling she in this unusual instance had to alter his writing against his will.

Grene's attempt to edit Polanyi's 1970 paper, “What Is a Painting?” elicited from her the final example I'll note of her attempt to keep Polanyi harnessed to the core insights of PK.

All right, my dear—you asked for it! I've tried to edit the MS a little, but I can't make it other than rigid and prosaic—as well as wrong, of course! Its final message seems to me to be an utter betrayal of P.K. . . . But what the upshot of this paper seems to be is that an objectivistic, Laplacean view of theoretical knowledge is quite ok; only in art we have f[ocal] and s[ub]sidiary awareness and something that is entirely disconnected from either our ordinary or our scientific lives. Of course the truth of War and Peace or of Cezanne's Mont Ste Victoire is different from the truth of the kinetic theory of gases or the germ theory of disease; but this is a continuum, not a dichotomy.¹⁴

Grene is again nervous here about anything that smacks of a duality (here, science versus the arts), but I'm not sure that the issue is best resolved by settling on a continuum *alone*. True, there are aesthetic elements that may enter into formulating a theory, and there are theoretical aspects involved in judging art—the process of personal knowing uses a continuum of approaches. Judgments of beauty may be found in each discipline. Thrusts of the imagination are utilized by scientist and artist alike. But what is known in naturalistic science is different in kind, I would submit, than what is appreciated in art. Cultural symbols and practices are necessary mediators in knowing both realms (the continuity aspect), but what is known in the natural sciences continues to exist and function apart from the cultural mediators, whereas the arts would cease to exist without the cultural mediators and processes. The difference between these realms is also suggested by the contrasting

principles which are involved in judging truthful claims (and as Polanyi insisted, different levels are organized according to different principles). Notions of lawlike behavior and cause and effect, so central to scientific explanation, do not have comparable force in assessing artistic creations. Cultural trends and an emphasis on experienced meaning, so important in the arts, have little impact in the sciences.¹⁵ Scientific theories deal with the materials, structures, and processes of the natural world, where the scientific aim is to describe this world as it is apart from human desires and interests. Of course, this aim can never be fully consummated, as Polanyi so strongly stresses in his concept of the personal, but the objectivist aim of genuine science is ever-present. In contrast, artistic creations are distinctly human products expressive of and assessed in terms of human sensitivities, aspirations and standards. A scientific approach to the arts and a cultural approach to the sciences have been attempted, but I would claim the results are of limited usefulness if not incoherent. However, a scientist critiquing experimental results and a critic judging art both make claims about their subjects with universal intent (and thereby there is a continuum of truth claims exhibiting varying degrees of verification or validity). Grene, then, appropriately aspires to maintain the continuity of intellectual processes involved in science, the arts, and humanities, but Polanyi is consistent in seeking out unique characteristics of different levels of reality.

In general, Grene's criticisms of Polanyi's later writings have merit, and this is in part because as he aged Polanyi's mental acuity declined. But it must also be said that sometimes her own commitments are overly rigid, and she may have inappropriately tried to rein in potentially fruitful new avenues of thought Polanyi was trying to explore. Thus, for instance, I find Polanyi's exploration of the diverse roles of "interest" in different forms of consciousness to be highly suggestive and interesting, whereas Grene seems unappreciative of how Polanyi attempts to chart the epistemological impact of various arrangements of interest in *Meaning*. Similarly, in her battle against Cartesian dualism she is adverse to any use of the term "consciousness" as overly wedded to mind as distinct from matter. In her "Reply to Anthony N. Perovich Jr.," she writes, "You want total, utter objectivity; you don't find it, so you fall back on a secret, inner something to fill this uncomfortable gap. . . But what would [consciousness] tell me about what it is to be a human being, to live a human life? Not much, I think" (PMG , 195). Her question in this quotation reveals some of her rigidity: "consciousness" has many legitimate uses besides dealing with the question of what constitutes a human life. It is often helpful to use the term "consciousness" in distinguishing between our thought and what our thought is about.

The Treacherous Footnote

Beyond her antipathy toward Polanyi's approach to evolutionary theory, there is an additional item in Part IV of *Personal Knowledge* that Grene lambasts, and at last we have come to that treacherous footnote. In the relevant passage, Polanyi describes four grades of knowledge:

- (1) *Correct* inferences made within a *true system*.
- (2) Erroneous conclusions arrived at within a true system (like an *error* committed by a *competent* scientist).
- (3) Conclusions arrived at by the correct use of a fallacious system. This is an *incompetent* mode of reasoning, the results of which possess *subjective validity*.^{fn}
- (4) *Incoherence* and *obsessiveness* as observed in the ideation of the insane, particularly in schizophrenia. The morbid reasoning of sufferers from systematic delusions should also be classed here, rather than under (3), since such delusions impair the very core of a person's rationality. (PK 374)

Polanyi's footnote at the end of the third point (i.e., the superscripted "fn" above, which Grene alleges is "treacherous") refers back to Polanyi's discussion of implicit beliefs (PK 286-288) that form the frameworks or idioms of belief that guide our thought processes. This section on implicit beliefs focuses especially on the thought processes of the Azande. Therefore it may reasonably be inferred that Polanyi sees the framework of belief that the Azande indwell to be a "fallacious system" resulting in claims that have "subjective validity." And what is wrong with this analysis?

Let us first turn to the complainant's description of how Polanyi goes astray in this quotation. Grene notes that the purpose of Polanyi's list is to refine "the distinction between the subjective and the personal," and that he

counts as 'subjective' commitments made to a mistaken system, so that Zande practices now turn up (in a footnote which I had not previously noticed) as subjective rather than personal. We, the heirs of a modern European liberal tradition, turn out to be the only human beings who make commitments with universal intent. Everybody else is following a mere subjective impulse. This seems to me a sad betrayal of Polanyi's fundamental impulse (PT 170).

Next we need to determine what the "fundamental impulse" is that Grene thinks is being betrayed. Here are three plausible candidates:

- * The claim that all knowing is personal.
- * The fallibilistic nature of human knowing.
- *The fiduciary program centered on commitment.

In practice, each of these candidates is so fully intertwined with the other two that it would seem artificially abstract to separate out one of them as the intended impulse. So let us consider the fundamental impulse that Grene claims Polanyi violates to be the comprehensive notion of personal knowing centered on fallible commitment.

Now we can more precisely formulate the charge Grene appears to be bringing against Polanyi's passage with its treacherous footnote. She claims that in labeling the Azande framework of belief as false and merely of subjective validity, Polanyi has assumed a dogmatic stance inconsistent with (1) his belief that all serious explanations are made with universal (not merely subjective) intent, and (2) his concession that all frameworks of thought to which one is committed may be totally mistaken, including one's own (PK 404). With respect to (1), Grene claims Polanyi is introducing into PK a new meaning of "subjectivity" that is confusing because it has a connotation that conflicts with his previous twofold use of the term.

To what extent is Polanyi's usage defensible, and to what extent does Grene's complaint hit the mark? I believe Grene has identified a real problem in Polanyi's conceptuality, but that her implied resolution of the problem is not adequate. I'll make seven interpretive points with respect to the passage in question and Grene's analysis of it.

First, Grene's analysis of Polanyi's understanding of "subjectivity" is too limited. She notes that in most of PK Polanyi uses "subjective" in either of two senses: as "either 1) the passive and immediate or 2) that component of commitment, at once active and passive, that marks it out as *mine*" (PS 7). How, then, would she understand the following uses?

*“My recognition of a pattern *may* be subjective, but only in the sense that it is mistaken. The shapes of the constellations are subjective patterns, for they are due to accidental collocations . . .” (PK 37).

*“[I distinguish] between a competent line of thought, which may be erroneous, and mental processes that are altogether illusory and incompetent. The latter I would class for the moment with passive mental states, as purely subjective” (PK 318).

*“Subjective knowing is classed as passive; only knowing that bears on reality is active, personal, and rightly to be called objective” (PK 403).

In these passages, Polanyi speaks of subjectivity as involving erroneous judgment, much as he does in the treacherous footnote passage. Thus he uses “subjectivity” in three, not two, distinguishable senses.

Second, while Polanyi’s occasional equation of subjectivity with error does not just appear for the first time in conjunction with the treacherous footnote, Grene is quite right to point out that this is an incoherent and problematic usage. This is a significant point calling for further examination.

Let us look at Polanyi’s claim in the first example above that referring to, say, Ursa Major is a mistake, for it is only an accidental pattern having subjective validity. Why wouldn’t a child’s perception and identification of the pattern of stars traditionally called Ursa Major be an act made with universal intent that is culturally correct? Polanyi’s analysis betrays a not so latent positivism suggesting that only a claim making use of a scientifically established, law abiding pattern is objective and real. Just as troubling is Polanyi’s claim in the third passage just quoted that only knowing that bears on reality is personal. The Azande claim that benge reveals causes of wrongdoing is surely made with universal intent within the Azande cultural frame of reference. It expresses “the personal in us, which actively enters into our commitments” (PK 300) just as much as a scientific claim does. There is indeed a problem Grene has identified with Polanyi equating subjectivity with error. Rather, subjectivity seems to be best seen as characteristic of uncommitted states of mind (PK 303), material passively received and unreflectively passed on, the contents of which may be valid or invalid.

I’d note, however, that we have only just touched on an aspect of Polanyi’s thought deserving of more careful attention than it has generally received. What, in Polanyi’s view, is the status in the range of personal knowing of each of the following statements among many possible examples: “I feel tired.” “This soup tastes bad.” “The Empire State building is the tallest in the world.” “Picasso is a greater artist than Monet.” “Scrooge was a tightwad.” The language of “subjectivity,” “personal knowing,” “error,” “truth” as “the rightness of an action” (PK 324) in contrast to “a true system” (PK 374), and so on, stands in need of further clarification. The four points made in the table from PK 374 quoted above is a flawed start toward needed precision.

Third, let us suppose we agree with Grene that it seems imperialistic and dogmatic to call the belief systems of anybody else false. Then we would be plunged into a relativistic world in which truth, an essential value for Polanyi, loses its power. We would be captives to a rhetorically-structured rather than a truth-revealing world if there were no transpersonal criterion by which to judge the truth or falsity of competing systems of thought. Neither Polanyi nor Grene accepts a relativistic epistemology as adequate, so Grene’s reaction against calling an apparently flawed framework “false” appears to be an over-reaction. However, to be consistent with the indeterminate, a-critical nature of our adoption of at least some elements of a framework, any claim that a rival framework is false should be offered in a modest, confessional manner reflective of the fallible nature of personal knowing.

Fourth, Polanyi most emphatically thought that a criterion for distinguishing a true from a false framework does exist: the capacity of a system to make contact with reality now and in the future. He quite clearly claims that insofar as the Azande system of thought is centered on witchcraft, it dismisses evidence that might question the validity of its set of assumptions (PK 288-292). It is therefore not fully open to the manifestations of the real, and so the framework may be called methodologically false.¹⁶ Judgments based on frameworks not intentionally open to the full witness of reality don't seem to me to be best characterized as "an incompetent mode of reasoning" (PK 374), but it is likely that such judgments are incomplete or erroneous.

Fifth, Grene claims Polanyi contrasts the Azande conceptual framework with the "modern European liberal tradition," but Polanyi does not make that contrast. In fact, he classifies some modern European liberal traditions, such as positivism and behaviorism, as being comparable to Azande belief. "Our objectivism, which tolerates no open declaration of faith, has forced modern beliefs to take on implicit forms, like those of Azande" (PK 288). Moreover, Grene says Polanyi denies that the Azande make commitments with universal intent—that only we Europeans (and Americans) do this. But, again, that is not what Polanyi says. The Azande speak of benge magic and witchcraft with universal intent, but their claims are false because their informing framework is erroneous (PK 294).

Sixth, in an open frame of mind in which one attempts to take judicious account of all available evidence, one is called to speak the truth of one's commitment with both passion and humility. One might be wrong in regard to one's claims, but with respect to satisfying one's passion to know as a responsible member of society, public proclamation of one's beliefs and discoveries from within one's considered framework is a necessary step toward contributing to the store of knowledge by which society as a whole prospers. Polanyi notes that "while appetites are guided by standards of private satisfaction, a passion for mental excellence believes itself to be fulfilling universal obligations. This distinction is vital to the existence of culture" (PK 174). Further, Polanyi states, "By contrast to the satisfaction of appetites, the enjoyment of culture creates no scarcity in the objects offering gratification, but secures and ever widens their availability to others" (PK 174). Labeling other frameworks as false for reasons one gives, as Polanyi does in discussing the Azande, must be seen in a positive light as inviting public discussion of the reasons given and conclusions arrived at, for Polanyi also emphasizes that rational persuasion is the mark of a convivial society (PK 378; LL 202). So, again, it seems that Grene's reaction against Polanyi's "dogmatism" is overdone.

Seventh, if Grene scolds Polanyi for claiming that some frameworks are false even while she accepts his fiduciary stance of commitment, her scolding reveals a contradiction between her own conceptions and her actions. After all, Grene is not hesitant at labeling false or incoherent the assumptions and foundational ideas of a most variegated groups of thinkers. That is, her own actions are an expression of the alleged wrongdoing of which she accuses Polanyi. Of course, since I think Polanyi's assessments of others' frameworks is perfectly compatible with his notions of fallibility and commitment, I also don't see any problem with Grene's negative assessments. I just don't see why she thinks Polanyi should not make these assessments, so long as he does so with universal intent and while confessing the personal nature of his claims.¹⁷

In sum, Grene helpfully calls attention to the possible confusion that Polanyi creates by saying the correct use of a fallacious system has "subjective validity." Polanyi contrasts subjective experiences as passive or non-committal with claims that seek to make objective claims. Verification involves less personal participation in the claims about some subject matter than validation. "But both *verification* and *validation* are everywhere an acknowledgement of a commitment: they claim the presence of something real and external to the speaker. As distinct from both of these, subjective experiences can only be said to be *authentic*, and

authenticity does not involve a commitment in the sense in which both verification and validation do” (PK 202).¹⁸ Since, however, we acknowledge that the Azande speak with universal intent while using a fallacious system, it follows that they are claiming their magical acts have real results which are external to the speaker. Within the logic of their circular system, they believe their claims are more than subjective in either of the two senses Polanyi normally uses. To avoid the appearance of inconsistency, he should have said these claims are invalid, not that they manifest subjective validity.¹⁹ Grene’s comments helpfully lead to this conclusion.

Conclusion

As mentioned in my introductory comments, generally Grene identifies with Polanyi’s philosophical stance, although largely through the influence of Merleau-Ponty and the Gibsons she modifies and extends some aspects of it. She is an engaging writer; I have found her *A Philosophical Testament* to be one of the most interesting works of philosophy published in the last several decades. But, as I have also indicated, I also find her criticisms of Polanyi’s thought to be spotty and uneven. Her understanding of evolutionary theory is far deeper and more nuanced than Polanyi’s understanding, and to that extent her criticisms of Part IV of *Personal Knowledge* are insightful and well taken. Her reaction against Polanyi’s interest in religion seems rather idiosyncratic. Her attempts to counsel Polanyi in the last years of his philosophizing are generally on the right track but also sometimes constricting and unsympathetic. And her rejection of the passage in which she finds the treacherous footnote identifies, I have argued, problems in the clarity of Polanyi’s exposition, although she does not offer a satisfactory alternative. For the most part, however, I think the philosophical visions of Polanyi and Grene are harmonious and mutually enriching—even more so than Grene at times seems to believe.

Endnotes

¹Grene’s address is published both in *Polanyiana* 2:4/3:1 (1992) and in *Tradition and Discovery* 22:3 (1995-1996), 6-16, the version cited in this essay. One can find reflections by Grene on Polanyi’s philosophy in many other places. Her Introduction to *Knowing and Being*, the articles by Polanyi that she edited, is primarily an exposition of Polanyi’s theory of knowledge as a whole rather than a focused assessment of *Personal Knowledge*. The same broad, while still philosophically acute, interpretation of Polanyi’s philosophical achievement is found in her “Tacit Knowing: Grounds for a Revolution in Philosophy,” *Journal of the British Society for Phenomenology* 8:3 (October, 1977), 164-171. The scope of Grene’s involvement with and criticism of *Personal Knowledge* is set forth with great clarity by Phil Mullins in this issue of *Tradition and Discovery*, and other articles he has written interpreting Grene’s thought, referenced in his article in this issue, provide further useful background information. I will make primary use of and internally cite Grene’s “The Personal and the Subjective”—hereafter PS—and her *A Philosophical Testament* (Chicago: Open Court, 1995)—hereafter PT.

² In a comment published in 2002, Grene reaffirms her criticism of Polanyi: “I do still distrust that ‘treacherous footnote’” (“Reply to Phil Mullins,” *The Philosophy of Marjorie Grene* [The Library of Living Philosophers, Volume 29], ed. by Randall E Auxier and Lewis Edwin Hahn [Chicago: Open Court, 2002], 62). This volume is hereafter cited as PMG.

³Since Grene was in ongoing critical dialogue with Polanyi, it is useful to distinguish between her critique of Polanyi’s publications, the publicly endorsed ideas emphasized in this article, and the informal conversations and correspondence that sometimes resulted in the mutual adjustment of thought or in the fine-tuning of Polanyi’s ideas that eventually appeared in print.

⁴ “[I]t is successively Polanyi, Merleau-Ponty, and Gibson who mark the significant stages on my (intellectual) life’s way” (“Reply to Jacquelyn Ann K. Kegley,” PMG 81).

⁵Of course Polanyi's earlier *Science, Faith and Society*, like PK, contains references to God. I do not mean to suggest the theological references were forced on Polanyi, for he believed a religious foundation, properly laid out, was beneficial to society.

⁶Grene originally intended to call *A Philosophical Testament* "Persons" (PT 173), but she feels she has not yet come up with a comprehensive and satisfactory account of what it is to be a person. "Being a person is precarious. I'm as sure as I am of anything that it's not just being a nervous system, or being a product of natural selection, or being a bunch of molecules. But what more it is both difficult to say and difficult to maintain" (PT 184).

⁷Marjorie Grene and David Depew, *The Philosophy of Biology: An Episodic History* (Cambridge: Cambridge University Press, 2004), 319.

⁸See my "Polanyi on Teleology: A Response to John Apczynski and Richard Gelwick," *Zygon* 40:1 (March 2005), 95. In this article, I critique Polanyi's progressivism and teleology along lines I believe Grene would accept.

⁹Grene appreciated Polanyi's emphasis on the role that passion plays in epistemology. And she certainly was not hesitant about expressing herself passionately. Thus with respect to material Polanyi wrote supporting one of his prospective diagrams, she added in pen this exclamation to her more restrained typed comments: "Please rewrite that flag piece more soberly—it makes me want to vomit!!" (Letter of January 11, 1970, Papers of Michael Polanyi in the Department of Special Collections of the University of Chicago Library, Box 16, Folder 5).

¹⁰While Polanyi may not have been as cautious as he should have been in referring to the body and the mind, I believe Grene over-reacts to Polanyi's use of these terms. Certainly, Polanyi never sees body and mind as two separate substances à la Descartes. In his hierarchical vision of reality, body and mind may be seen as two among many ontological levels. They are the levels most important in the daily life of humans, and it should be possible to use these terms without being accused of being a dualist. Essentially, Polanyi is a pluralist.

¹¹Michael Polanyi, "Logic and Psychology," *American Psychologist* 23:1 (January 1968), 39. See the comparable discussion by Polanyi in his "Life's Irreducible Structure," the last article included in KB, especially KB 237.

¹²Letter of October 28, 1967 from Grene to Polanyi in Papers of Michael Polanyi, Box 16, Folder 1.

¹³This November correspondence is found in Box 16, Folder 4 of Papers of Michael Polanyi. The changes Grene makes are quite mild; for instance, she does not change the reference to the mind-body dualism mentioned at the beginning of the quotation referenced in footnote 11. This implies she recognizes here the legitimacy of Polanyi's pluralism even as she blanched at his use of dualistic terminology. I surmise that Polanyi called the mind-body distinction a dualism because he was trying to show how his thought solved the dilemmas associated with dominant philosophical ideas from the past, not that he had somehow lapsed into substance dualism himself.

¹⁴Grene's letter to Polanyi of January 11, 1970 in Box 16, Folder 5 of Papers of Michael Polanyi.

¹⁵By insisting on continuities, I wonder if Grene is not herself being somewhat inconsistent. Teleological concerns are embedded in artistic creations, but Grene, as we have seen, is intent on purging any such aspects from science. To her, there is a difference in kind between the arts and the sciences; they do not exist as degrees on a continuum. And ironically enough, Grene's criticisms of Polanyi's anthropogenesis in Part IV of PK can be interpreted as her attempt to eliminate what she saw as unscientific continuities in his thought.

¹⁶Andy Sanders has written persuasively on the tension in Polanyi's thought between the need to affirm one's commitments even in the face of apparently contrary evidence and the stance of fallibilism. He claims Polanyi opts for a methodological dogmatism "which prescribes that one should stick to one's theories or beliefs as long as it is reasonably possible. . . For, as already C.S. Peirce (and in his footsteps Popper and

others) pointed out, if we [give up our theories too soon], we would deprive ourselves of the opportunity to find out their strength” (Andy F. Sanders, “Tacit Knowing—Between Modernism and Postmodernism: A Problem of Coherence,” *Tradition and Discovery* 18:2 [1991-1992], 20). I am suggesting that, in addition to the methodological tenacity Sanders appropriately calls for, Polanyi also supports the notion of a methodological openness to the full range of potential evidence even as one does not flinch in the face of a few initial anomalies. The burden of deciding when to sustain one’s belief and when to break out is finally a matter of personal judgment. Polanyi asserts that “we must accredit our own judgment as the paramount arbiter of all our intellectual performances” (PK 265—see Diane Yeager’s fine article on this topic: “The Deliberate Holding of Unproven Beliefs’: Judgment Post-Critically Considered,” *The Political Science Reviewer* 37 [2008], 96-121).

¹⁷Grene’s perplexing rejection of the treacherous footnote stands in contrast to her usual understanding of the need to accept the contingencies of one’s calling and act with universal intent as a critic on behalf of what one sincerely believes. For instance, she states that “as long as we see that we are truly acting our way, affirming our standards with universal intent, we may both understand others, up to a point, and look at their practices critically from the position that we do in all honesty accept” (PT 170).

¹⁸Grene, as well as Polanyi, touches upon the usefulness of the notion of authenticity (see PT 186-187). It would seem one could be an authentic Azande as well as an authentic Westerner, and this suggests “authentic” could be usefully developed as a concept that acknowledges cultural differences without implying malignant relativism and allows for discriminations of truth without lapsing into imperialism.

¹⁹Here is Phil Mullins’ comment on the “treacherous footnote” in his thoughtful piece, “On Persons and Knowledge: Marjorie Grene and Michael Polanyi”: “To this reader Grene makes an interesting case in her careful exegesis of *Personal Knowledge* that has ferreted out this conceptual problem, but it is a case based largely on one footnote. It is a case, at best, of inconsistency . . .” (PMG 45). Yes, although perhaps the problem is not so much a matter of inconsistency, since as noted above Polanyi uses the same connotation of “subjectivity” elsewhere, but a matter of confusing equivocation in the use of the term.

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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REVIEWS

Alva Noë, *Out of Our Heads: Why You Are Not Your Brain, and Other Lessons from the Biology of Consciousness* (New York: Hill and Wang/Farrar, Straus & Giroux, 2009). Pp. 214 + xv. ISBN-13: 978-0-8090-7465-5. \$25.00 hardcover. ISBN-13: 978-0-8090-1648-8, \$15.00 paperback.

Alva Noë, *Action in Perception* (Cambridge, MA: MIT Press, 2006). Pp. 289. ISBN-13: 978-0-262-64063-3. \$21.00, paperback.

Alva Noë is a major, relatively young contemporary philosopher in philosophy of mind and consciousness who Polanyians should get to know. They should do so not because he knows and draws upon Polanyi's thought, for Noë acknowledges no indebtedness or even awareness of Polanyi in what he has published. His work is worth knowing because his ideas about mind, body, and perception are profoundly resonant – indeed, significantly convergent – with Polanyi's and because of Noë's increasing stature in the field of consciousness studies. Many students of Polanyi have wondered about the relevance of Polanyi's thinking to the latter field. An acquaintance with Noë's thinking promises to disclose what implications lie in store and to be an ally in establishing connections.

Noë's position, in brief. Consciousness is not something that happens inside us – not in our brains, or anywhere else inside; it is something we do, something we enact, something we achieve. Consciousness for Noë is first of all perceptual awareness (all higher order and reflective forms of consciousness, so far as Noë is concerned with them, are considered to be derivative from perceptual consciousness via the senses and some means of representation). Perception itself for Noë, though, is not an event or process in the brain which produces some representation of the world on the basis of sensory stimuli – which theory remains the dominant orthodox conception in contemporary neuroscience – but instead is contended to be a dynamic

activity, an achievement of a biological organism that puts it in touch with and successfully engages its ambient world. Consciousness for Noë is a relation (or complex of relations) of the whole embodied organism interacting with its environment, a dynamic activity, dependent to be sure on what takes place in the brain but essentially taking place in the world, relating the organism to its environment and empathetically accessible by observers from the outside.

Noë's position stands clearly against scientism, especially counter to narrowly conceived, reductionistic scientism. So also, it stands against residual Cartesianism: all radical disjunctions of subject and object, all 'brain-in-a-vat' thinking, and all flirting with the possibility of the perceptual world being some sort of 'Grand Illusion.' Further, with his appreciation of the intelligent achievements of biological organisms, Noë's position is opposed to the fact-value split, the ideal of a detached god-like knowledge of an objectified world from which all normative qualities are absent, and the correlative critical modern hostility between the sciences and the humanities disciplines. Without realizing it, Noë has sketched what Polanyi has termed the panoramic perspective of "ultra-biology" (PK 363): a continuum of progressive achievements of each level of life from the lowly amoeba to the highest reaches of human culture.

Noë's background and current position. Before coming to Berkeley in 2003, Noë taught philosophy at UC Santa Cruz. He received his doctorate from Harvard University in 1995; he has a BA from Columbia (1986) and a BPhil from Oxford University (1986). Currently he is Professor of Philosophy at the U of California, Berkeley, and a member of the Institute of Cognitive and Brain Sciences and the Center for New Media, both at Berkeley. Major influences on Noë include J. J. Gibson (who was so important to Marjorie Grene's later work in philosophy of biology), Maurice Merleau-Ponty, Hubert Dreyfus, Stephen

Toulmin, and John Searle – all of whom Noë cites. He also studied under Daniel Dennett, from whom he has earned considerable respect though not much agreement.

Noë on recent brain research. Noë has made considerable effort to become acquainted with what is going on in cognitive science, and his books review a good deal of this research. What do the recent breakthroughs in sophisticated brain scanning teach us? What does computer modeling of the brain activity teach us? Do they not establish that the brain, as an essentially information processing device, is in control, is the thing which produces consciousness, that creates subjective mental life as we know it? As a matter of fact, Noë argues, the answer is “No, they do not” – though to listen to the explicit claims of many of the principal and better known expositors in the field, it would appear that they do.

The problem is that the empirical data compiled through recent neuro-physiological research, more and more of which are being turned up every day, continue to be held hostage to and are made to serve reductionistic metaphysical assumptions (essentially mechanical, but not really ecological/biological), assumptions which are not themselves dictated by the data. On the contrary, a good deal of the empirical data themselves, Noë argues, point to contrary assumptions – though not undeniably so, for the same data to a degree permit divergent interpretations. According to those contrary assumptions, the seat of control is the organism as a whole in interaction with its environment, not the brain (although, to be sure, the brain, or neurological system specific to the organism, limits and channels, while it also enables, that control). The organism in dynamic, two-way interaction with its environment is what creates the corresponding neuro-physiological state, rather than vice versa – not as a stand-alone result but as an underlying, enabling structure. According to Noë’s account, the organism-environment interaction invokes or calls into being the neuro-physiological state to enable the success of the interaction, not the other way around. If adopted, Noë’s way of putting it would amount to a major shift of perspective and orientation of the neuro-physiological research program to an es-

entially biological/ecological one from being for the most part an essentially mechanical one. None of the empirical data would be denied or suppressed; they would simply be taken up into a different orientation of research.

Noë on perception. Perceptual knowing is the practical achievement of an acquaintance relationship (picking out and engaging an object in its environment as it pertains to the organism’s active interest); it is not passively representational as if it were an image in the brain, for Noë places an emphasis on sensory-motor activity over vision (or rather vision as itself a function of sensory-motor activity – for what we see is invariably experienced as a direct result of how we are situated and moving in relation to, and bodily interacting with, the things we see) and sensory-motor skills over intellection. (This is not to deny intellection, but to construe intellection as being derivative from and subsidiarily grounded in sensory-motor interaction.) Perceptual consciousness, for Noë, is thus a tacit knowing, but even more dynamic than it seems to be for Polanyi. All successful perception entails a skillful, interactive know-how and embodied access. In this manner, Noë seeks to counter representationalist construals of knowing and all efforts to render knowledge as explicit data.

Noë characterizes the mind as “distributed” spatially from within the organism’s embodied interaction with its environment in a manner that profoundly resonates with, if it does not exactly mirror, Polanyi’s understanding of the mind as extended through its tools, language, and culture. In this respect, Noë re-opens the table of consciousness studies to the humanities and the arts, much as Polanyi does. In this respect he takes a strong position on the irreducibility of higher order functions to lower order functions, but frames it all in a naturalist framework. Though he doesn’t talk much about emergence in these books, I would say that he would place himself in the emergent naturalist camp.

What Noë can contribute to Polanyi’s thought. Noë provides an excellent avenue for extrapolating Polanyi’s thinking to current work in cog-

nitive science and consciousness studies, and does so with a familiarity with relevant empirical studies and sophistication in analytic argumentation rarely found among Polanyi scholars. Moreover, the possibility of appeal to the work of a philosopher with the stature of Noë in these areas without the usual reductionistic and scientific bent would help to give Polanyi a voice he does not otherwise have.

What Polanyi might contribute to Noë's thought. I can imagine several things, chief among them might be Polanyi's account of the tacit fiduciary component of all knowing, particularly as exhibited in the process of discovery. As well, Polanyi's extension of this understanding of knowing to all forms of knowing, foremost among them knowing throughout the sciences—including the exact sciences, is something that Noë has yet to discover, as far as I am aware.

Some critical remarks. As is no doubt evident, I have become quite an enthusiast of Alva Noë. However, I have not found him to be as persuasive to some of my scientifically inclined colleagues in psychology and philosophy. This led me to look a bit closer at the way *Out of Our Heads* was put together. He does have a tendency to exaggerate, oversimplify, and state things provocatively at times. It is definitely addressed at a more popular level of presentation and has an element of preaching to the choir. Much less so is his *Action in Perception*, which is much more closely and carefully argued.

Also, Noë is not very convincing to persons who identify consciousness primarily with reflective self-awareness (as in the Augustinian-Cartesian line of identifying mind in terms of intellect, the 'inner self,' and/or the abilities to think and be self-aware). This is not to say that he cannot consistently handle the issues raised by this tradition of thought from the perspective he sets out; it is only to say that he does not address them well.

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Marjorie Grene and David Depew. *The Philosophy of Biology: An Episodic History*. New York: Cambridge University Press, 2004. Pp. 440. ISBN 978-0-521-64380-1. \$39.99pb.

The Philosophy of Biology: An Episodic History is a rich, rewarding, and complex look at a collection of events in the history of philosophy which intersect with events in the history of biology. Grene and Depew mention several times that three topics recur in the book, namely questions concerning classification of organisms, mechanism and teleology, and the relation of biology to other sciences. But the book is not a survey of views related to these topics—the figures mentioned do not necessarily address each recurring topic and many additional topics are broached (xvi). The reader must take the subtitle, *An Episodic History*, seriously and recognize that Grene and Depew use “a highly selective, if not idiosyncratic, procedure [to] illuminate some facets of the prehistory of the philosophy of biology” (xvi). The procedure is to give a detailed account of a few events and characters in the story of the philosophy of biology. The scope of the book combined with these idiosyncrasies make it impossible to discuss all the interesting topics, events, and implications of the work in a review. In lieu of this, it may be best to pick out one implication of the book, one that fits nicely with two comments that Phil Mullins made about Grene in a memorial essay printed in an earlier edition of *TAD*. These two comments are that Grene was “irreverent before orthodoxies” (*TAD* 36:1, 55) and “always appreciated Polanyi's ideas about embodiment” (*TAD* 36:1, 60). In Grene and Depew's book, the irreverent implication is that there is no grand narrative to be discovered in the history of the philosophy of biology because every episode, embodying different individuals in different environments, confronts different issues. As such, the book is organized more like a collection of short stories and less like a novel.

The structure of the book provides some evidence for this interpretation. The book is more or less temporally organized beginning with Aristotle in Chapter 1 and ending with some musings about what

philosophy of biology can contribute to the future of the philosophy of science in Chapter 12. While Grene and Depew do not group the chapters into sections, there are groupings that can be constructed. The first four chapters cover pre-19th century episodes which touch on biological topics. First, Grene and Depew discuss Aristotle, “the only major philosopher in our tradition who is also a major biologist” (1). Aristotle’s world view is not the modern view of the external world. Teleology is important to classification, mechanism is not. Furthermore, physics concerns itself with things that have an internal source of motion, i.e., are living things. In a sense, the nature of inquiry in physics follows biological inquiry and not the other way around. After Aristotle, they investigate the 17th century episode in which Descartes and Harvey provide alternative accounts of the circulatory system focusing on the recurring topics of mechanism and teleology, with a brief aside about the relation of biology to physics. This is followed by a chapter on Buffon’s taxonomic inquiries which focuses on classification issues. The fourth chapter focuses on Kant’s interest in teleological issues as well as Kant’s discussions of race.

By the end of the first four chapters, three patterns have emerged that continue throughout the book. Between the chapter on Aristotle and chapter 10, no chapter discusses each of the three recurring topics identified by Grene and Depew. At most two of them are discussed. Furthermore, each chapter addresses at least one, and usually more, new topic which does not reappear later. For example, while the circulatory system is central to the chapter on Descartes and Harvey, it does not get mentioned in subsequent chapters; vitalism plays a significant role in the chapter on Buffon, but Grene and Depew only mention it again to point out that they will ignore it (221). Finally, each chapter involves a clearly defined spatiotemporal environment. Aristotle inhabited Greece over 2000 years ago, while Descartes was in 17th century France and Harvey in 17th century England. Buffon was an 18th century Frenchman and Kant an 18th century Prussian. These patterns support a reading in which Grene and Depew are implying that

there is no grand narrative in the philosophy of biology. As Grene and Depew point out at the end of the book, what they “are trying to understand, as philosophers, is the life of science: how scientific practices originate and continue as epistemic enterprises” (352). This involves “trying to understand certain ways of coping in, and with, certain environments” which they think is the most promising model for doing philosophy of science in the future (356). In this sense, the book is a demonstration of this model of doing the history and philosophy of science by looking at spatiotemporal episodes and what is unique about each.

Chapters 5 and 6 continue each of these patterns. Each chapter involves someone in the 19th century, but each is located in a different environment. Chapter 5 is entitled “Before Darwin I: A Continental Controversy” and focuses on the 1830 debate between Georges Cuvier and Étienne Geoffroy Saint-Hilaire in France concerning comparative anatomy. Here we have a new interest, comparative anatomy. One part of the debate that Grene and Depew highlight is the different guiding principles for research in comparative anatomy put forth by Cuvier and Geoffroy. Cuvier uses “conditions of existence” to identify why a particular entity functions as a whole in an environment and Geoffroy uses the “unity of composition” to trace how both humans and dogs have feet, or humans and birds have arms, but that these materials are used differently (140). The one recurring topic that is brought up here is that of classification. However, the interest even in these two men in the subject was quite different: “For Geoffroy ... classification was not an overriding interest” but “For Cuvier ... the development of a ‘natural classification’ was always a predominant aim” (143). So, even within this one episode one is hard pressed to uncover a unified narrative, a common set of philosophical interests that are at the heart of the practice of biology.

Chapter 6, “Before Darwin II: British Controversies about Geology and Natural Theology” is still temporally located in the 1830’s, but now in the environment of Britain where science and theology are maintaining a fragile peace. However, controversies in

geology and biology are active in this situation. The controversies mentioned include, on the geological side, uniformitarians, who believed the earth has been gradually changing, and catastrophists, who believe sudden, large events are responsible for these changes. On the biological side, the controversy was between the transmutationists, who believed one species gradually became another, and the fixists, who, for theological reasons, believed that species did not change. Again, most of these issues do not appear later in the book (one could argue that similar ideas were revived as punctuated equilibrium by Niles Eldredge and Stephen Jay Gould, ideas discussed in chapter 9). So, we have a new environment and new topics, with barely any mention of the recurring topics at all.

Chapters 7-8 can be viewed as forming another grouping which describes the developments of Darwin's theories (Chapter 7) and the interest in heredity and variability (Chapter 8), which is leading to the Modern Synthesis. Given the wide variety of developments in biology mentioned in these chapters, Grene and Depew's presentation of the material gives one a sense of chaos within biology. In Chapter 7, "Darwin," Grene and Depew are not so interested in the development and particulars of Darwin's biological theory and focus instead on the theory's "epistemic presuppositions and some of its consequences for the nature of biological explanation, as well as the place of man in nature" (200). The recurring topics of classification and teleology do appear in this chapter. But these appear alongside the new topics of sexual reproduction (relevant to *The Origin of Species*) and discussions of the relation between biology and psychology (relevant to *The Descent of Man*). Chapter 8, "Evolution and Heredity from Darwin to the Rise of Genetics," sees the environment change once again to one in which heredity and variation are the main topics. The time period covered by this chapter is the late 19th and early 20th century. Here we finally have what seemed to be impossible for Kant, namely, a search for biological laws. First we have attempts to discover biogenetic laws (which focus on DNA) by individuals such as Ernst Haeckel and biometric laws (which focus on physical and behavioral traits) by Karl

Pearson. Furthermore, we see the development and influence of cytology, or the study of chromosomes, as an important area of research. By this point, with all of the new topics, characters, techniques and questions that are discussed in each chapter, and almost no mention of the recurring topics, it becomes clear that each new generation of biologists, embedded in new environments, address different philosophical issues.

Chapter 9 discusses the Modern Synthesis and begins a new approach to discussing the development of biology related philosophical issues. This new approach is one in which Grene and Depew provide sign-post discussions for those who wish to look into the details through personal research. This approach, in which significant topics and episodes are discussed briefly but clearly (with many footnotes directing the reader to further readings), is necessitated by the explosion of biological inquiry in the 20th century. Some of the topics mentioned in this chapter include controversies about the unit of selection (individuals or groups), the development of sociobiology by E. O. Wilson and Richard Dawkins, the thesis of punctuated equilibrium and the dispute between the developmental gene concept of classical population genetics and the molecular concept of the gene. The result of all of these research programs can be seen as negative by some individuals. As Grene and Depew explicitly state at the beginning of chapter 10, these developments in biology call into question the idea "that all the sciences would one day (perhaps even soon?) be unified in the terms of, and through the theories of, the most basic level of physics" (290). Considering the lack of a grand narrative in the history and philosophy of biology, such a result is unsurprising.

In the last three chapters, Grene and Depew eschew the strictly episodic approach that they have used throughout the book to focus directly on more philosophical issues in biology. Chapter 10 touches on each of the recurring themes. First it discusses the species problem and the development of different methods of classification such as the biological species concept and cladistics. They also revive the question of whether biology is an independent sci-

ence or reducible to chemistry and physics. Finally, they bring up the use of teleological explanations in biology. Chapter 11 completely shifts the discussion of issues about biological approaches to theories of human nature. Here they discuss the nature versus nurture debate and its ties to eugenics, whether human consciousness and language are evolutionary adaptations, and the Human Genome project. They finish the book in chapter 12 by exploring ways in which “the emergence of a philosophy of biology can contribute to the philosophy of science in general” (348). Their conclusion is that the method implicitly used in the creation of this book, an ecological-historical view, can be a fruitful contribution. In this approach science is conceived as “communally organized efforts of real people to find their way in some section of the real world” and the philosopher of science is trying to understand “how scientific practices originate and continue as epistemic enterprises (352). Their final assessment is consonant with the implication that there is no grand narrative to be found: “there is no overall rationale to be found here; we are restricted in every case to a given historical context, in a way that goes far beyond the dreams – or better, the nightmares – of the sage of Konigsberg” (360).

Greene and Depew’s *The Philosophy of Biology: An Episodic History* is an incredible achievement. This review has barely touched on the wealth of information they have provided. At best it hints at the breadth of topics, provides some insight into one of their goals, and describes some of the strategies they utilize in realizing that goal. The book is already well respected and should be considered a major source for anyone interested in any topic in the history and philosophy of biology.

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