

WHOLENESS, UNDERSTANDING, AND DEVELOPMENT:
AN EPISYSTEMIC INQUIRY

By

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ABSTRACT

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This study explores certain theoretical proposals of David Bohm and F. David Peat, and searches for their reflection in international development theory and practice. Bohm proposes an undivided wholeness that underlies all apparently separate phenomena and from which reality, knowledge, and process are abstractions. Qualitative and episystemic in design, data are gathered from multiple sources: participation in a week-long course given by Peat; Bohm's and Peat's writings on quantum theory, chaos theory, and philosophy; and literature in philosophy, anthropology, and economics. Similarities between Bohm's and Peat's proposals are found in Hans-Georg Gadamer's description of philosophical hermeneutics and in Amartya Sen's description of process as an indication of relevance. Findings will be of value to those interested in exploring an ethics of development that emphasizes a relationship between an underlying wholeness and the apparently separate phenomena with which developmentalists are involved.

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Dedicated to my husband, Shawn

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PROLOGUE

As indicated in the Abstract, the research presented in this thesis takes the relatively unusual approach of exploring ideas from two seemingly disparate fields—those of physics and international development. In embarking on this line of questioning, I join others who suggest that there is value in considering especially modern theories of physics for the purpose of “arriving at an improved understanding of better ways to coordinate human experience” (Kafatos and Nadeau, 1990: 184).

My motivation for this study stems from two personal experiences. The first was a backpacking trip taken several years ago in which my husband and I traveled through a number of developing countries. This experience propelled me to enter graduate school and become professionally involved in relieving the political and economic distress witnessed during that trip. A summary of the trip and its impact on my decision to pursue a degree in International Development is provided in Appendix 1.

The second was an experience I had several years ago in which two herniated disks in my lower back were instantaneously ‘healed.’ This experience (described in Appendix 2) seemed to represent a pretty efficient and effective example of positive change (one of the definitions of “development”). At the very least, it indicated a capacity to affect change that I have not seen addressed explicitly in mainstream approaches to social and economic development. I began to question whether that capacity could have a place in current international development paradigms.

While considering this, I came across the work of David Bohm and F. David Peat, two physicists whose perspectives seemed to provide a tentative explanation for the

experience with my back, and who also seemed to share my interest in the social and economic challenges that are the focus of development. As described in the Abstract, their perspectives have to do with understanding the concept of “underlying wholeness.”

In part, this study is very much about understanding that concept. But it also turns out to be very much about understanding—or having the capacity to understand—any world view that is very different from one’s own. Exploring Bohm and Peat’s perspectives with those aspects in mind brings something of value to those interested in the field of development. How would consideration of an “underlying wholeness” change the way in which we interpret ourselves, our context, and the processes by which we attempt to change the world around us? And how would the concept of development as the ‘capacity to understand,’ from their perspective, differ from similar interpretations of development?

CHAPTER 1: INTRODUCTION

In this thesis, I explore the work of two physicists who propose that much of what appears to be separate in our day-to-day experience might be seen as aspects of a single indivisible reality. This draws attention to the very process of understanding similarities and differences that we see around us and also to the ethical implications of that understanding. I then look for ways in which this concept is reflected in, or might bring different interpretations to, the field of international development.

In Chapter 2, I provide an overview of design, data collection, analysis, and validation strategies associated with this research. The discussion includes consideration of the study's epistemic characteristics and a description of a weeklong course I took with Peat in July 2004 (with treatment in greater depth provided in Appendix 3). Chapter 3 includes an introduction to the trends that distinguish current international development theories from their predecessors. Attention is drawn to the shift towards multi-dimensional conceptions of development that now include "a capacity to be."

In Chapter 4, I explore Bohm's quantum theory interpretation and Bohm and Peat's theories on reality, knowledge, and process.¹ And, in the fifth and final chapter, I explore ways in which Bohm and Peat's perspectives might be considered in terms of "development." This includes a discussion on the process of checking and changing various types of assumptions, including ontological. Attention is drawn to the process of reification and to the role of "the uncategorizable" in the development paradigm.

¹ Biographical summaries of Bohm and Peat are provided in Appendix 4. While an in-depth understanding of the quantum and chaos theories with which they worked is not necessary in order to consider their perspectives, a brief introduction to these theories is provided in Appendix 5.

Implications for several concepts of interest to developmentalists, including modernization, sustainability, program design and evaluation, and cross-cultural understanding, are also discussed.

Data collection

Bohm suggests that when we are faced with a limited ability to measure certain phenomena, *we should not assume either the universality of what is known or the unreality of what is not known*. With this perspective, Bohm proposes a view of reality that “is neither absolutely deterministic nor absolutely indeterministic. Rather, it implies that these two extremes are abstractions” (emphasis added; Bohm and Hiley, 1993: 324) from an underlying wholeness. As for his own quantum theory interpretations, Bohm saw no reason why there might not be determining factors “outside the context of what can enter into quantum theory” (Bohm, 1980: 87), and (perhaps more importantly) he saw tremendous benefits to *considering the possibility* that such factors might exist.

In proposing this theory, the challenge Bohm set for himself was developing a way to describe the relationship between *wholeness* and *abstractions* without relying on classical concepts of space and time. Bohm proposes that it might make sense to think about them as being at various levels of *enfoldment and unfoldment*. He suggested that where an abstraction is perceived “in its own particular region of space (and time)” (Bohm 1980: 225), the order could be described as *explicate*; where everything is *enfolded* in everything, the order could be described as *implicate*.² In the implicate order, Bohm

² The word, according to Bohm, is derived from a Latin root meaning ‘to enfold’ or ‘to fold inward’ (Bohm, 1980: 225).

proposes that “movement is a relationship of certain phases of *what is* to other phases of *what is*” (Bohm, 1980: 258). These are, in other words, “different degrees of enfoldment *all present together*” (Bohm, 1980: 2).

For both Bohm and Peat (2000), the relationship among reality, knowledge, and our participation (our experience) is a *constitutive* one: knowledge is not “*about* some sort of separate experience” (Bohm, 1980: 7). Rather, it is derived *from* active participation with reality. This perspective challenges the universality of the separations we make between individuals and society, subject and object, and mind and body.

Bohm (1998) suggests that our ability to even consider the possibility of this perspective is tied intimately to our ability to describe it. He gives particular attention to the influences of *thought* and *language* on limiting or facilitating that ability, and he proposes that both thought and language make it difficult for us to consider a world view that would include his proposed ontology. Bohm believes that the English language *could* be made conducive to discussions of the inter-relatedness of reality, knowledge, and experience. Hoping to show the potential for such a re-structuring, he developed a variation of English (the rheomode) that he suggests might provide us with “the germ of a different world view” (Bohm, 1998: 80) that includes an underlying wholeness.

As Bohm’s concept of underlying wholeness was by definition ‘beyond thought,’ he suggested that perceiving it required a “kind of attention that is subtle enough to see how thought is working” (Bohm and Edwards, 1991: 141) and that this would be realized through “*act[s] of understanding*; in which we see the totality as an actual process that [incorporates] both thought and what is thought about in a single movement” (Bohm, 1980: 70).

In considering what these acts of understanding would “look like,” Bohm and Peat propose the processes of Dialogue and Gentle Action, respectively. They describe both of these concepts in detail with emphasis on their function as a methodological expression of an epistemology. In other words, both processes reframe the question, “What needs to be done?” in a way that brings the inquiry back to the ontological/ epistemological perspective—back to the “need to understand.”

Bohm’s description of the difference between a *problem* and a *paradox* is important to understand in this context. As Briggs and Peat (1999) suggest, the typical response to *recognizing the need for something* (even for something like a “kind of attention”) is to treat the lack of that thing as a problem to be solved. However, they and Bohm propose that where a nonlinear relationship is involved, approaching a *need* as a *problem* is itself problematic. To consider a problem from this perspective, Bohm avers, is to set things up as *causally* related. This makes an assumption about the nature of nonlinear dynamics that Bohm and Peat suggest is not *universally* true.³

³ For a better-developed thesis on ‘understanding’ from a similar perspective, in this study I draw from Bernstein’s description of Hans-Georg Gadamer’s writings on hermeneutics (Bernstein, 1983). Understanding for Gadamer is not arrived at through the search for an Archimedean point separate from ourselves; nor is understanding limited to only that which we can “know” internally; rather, it is *the very stuff of engagement* between what is perceived as internal and what is perceived as external. Consequently, in this work I suggest that—as with Bohm and Peat’s perspectives—the philosophy of hermeneutics as described by Bernstein and Gadamer similarly emphasizes the circular relationship between epistemology and method.

CHAPTER 2: RESEARCH DESIGN

This chapter includes an overview of this research project's design, data collection, analysis, and validation strategies.

Design

Qualitative. First and foremost, this study is qualitative in design. Patton (1990: 40-41) proposes the following “strategic ideals” of qualitative research. I followed these as closely as possible during all stages of this study.

Inductive analysis takes place when the researcher is immersed in the details and specifics of the data to discover important categories, dimensions, and interrelationships. It begins by exploring genuinely open questions, rather than testing theoretically derived (deductive) hypotheses.

Personal contact and insight is enabled when the researcher has direct contact with and gets close to the people, situation, and phenomenon under study. The researcher's personal experiences and insights are an important part of the inquiry, and critical to understanding the phenomenon.

A *dynamic systems approach* in research is activated when the researcher pays attention to process, and assumes change is constant and ongoing irrespective of study scope (from an individual to an entire culture).

Empathic neutrality happens when the researcher understands that complete objectivity is impossible; pure subjectivity undermines credibility; and seeks to understand the world in all its complexity. The goal is understanding, and not proving something, advocating, or advancing personal agendas. The researcher includes personal experience

and empathic insight as part of the relevant data, and takes a neutral, nonjudgmental stance toward whatever content may emerge.⁴

Design flexibility requires being open to adapting inquiry approaches as understanding deepens and/or situations change. It also keeps the researcher from getting locked into rigid designs that eliminate responsiveness. The key is being able to ‘pursue new paths of discovery as they emerge.’

Systemic. My perspective on the research process itself *and* the topics of this particular project is that they are each a *soft system*, defined by Bawden as “an epistemological device for knowing about the world” (Bawden, 1991: 2367), and I am approaching this study and the concepts it draws attention to as processes for observing reality .

This study does not propose to explore the *application* of Bohm’s and Peat’s ideas on quantum and chaos theory, on the one hand, to development theories, on the other. The study purpose is to explore the similarities and differences between these two fields of thought. One of the assumptions I brought to this study is that this kind of *epistememic inquiry* would provide valuable insights into the problematic situations addressed in the field of international development. Bawden draws from Checkland (1981) in defining epistememic inquiry as that which is concerned “not with an external reality but on

⁴ This feature of qualitative research design was one of the most challenging for me. I had a strong feeling at one point during the research that, by reacting positively or negatively to what I was reading, I hadn’t been doing the proper job of a researcher. How could I be sufficiently critical if I was so against or in favor of a particular perspective? After talking this through with another graduate student, we concluded that the best we could do—and perhaps the best any qualitative researcher could do—was to be explicit about our own response and diligently question how someone with a different perspective from our own might respond to the same text. The difficulty for me in doing that was believing that my perspective brings something of value to my analysis (rather than only detracting from a fictional “objectiveness”). It was easy to see that in other’s work (including Peat’s and Bohm’s), but so much more difficult to see that in my own. “Why I have to continue to feel that [my perspective] is a liability is a mystery to me,” I wrote in my journal, “especially when that’s so explicitly what I said I would do when I described my research process in glowing qualitative terms!”

people's perceptions of reality, on their mental processes rather than on the objects of those processes" (Checkland in Bawden, 1991: 2368).

This epistemological stance and its impact on Bohm and Peat's work, as well as on my own thinking, became key factors in this research project. Both scientists write that theories are "primarily a form of *insight*, i.e. a way of looking at the world, and not a form of *knowledge* of how the world is" (Bohm, 1990: 4). While Bohm and Peat do often present their ideas as "facts," they regularly make explicit mention of the metaphorical nature of their theories and proposals. Over time, I came to consider the real value of Bohm and Peat's work as indicators of a *way of thinking*, and I became less concerned with the occasional "dogmatic" style of their delivery. I would feel less comfortable about that strategy if it were not for the time I spent with Peat. He presented his ideas on physics, philosophy, art, and ethics in a style of humility, curiosity, and openness. He once said that he enjoyed hosting workshops because of the opportunity they afforded him to learn something new, and he clearly enjoyed learning from those who came to the Center as well as from his growing collection of literature.

Autoethnographic. In keeping with Patton's description of qualitative inquiry as that which incorporates the researcher's personal contacts and insight, this research project is autoethnographic in design. Patton (2002: 132) describes autoethnography as that which asks, "How does my own experience of this culture connect with and offer insights about this culture, situation, event and/or way of life?" For purposes of this research, the culture

to which this question is addressed is my own.⁵ Initially, I saw autoethnography as a necessary by-product of the personal nature of the source of my questions (specifically, the experience with my back and the traveling I had done through developing countries). It wasn't until I was engaged in the research process that I felt an autoethnographic format was necessary in order for the entire research project to be consistent across design, purpose, and subject matter. Furthermore, my time with Peat convinced me of the value of autoethnography. He consistently made the point that Bohm's work could not be separated from his personal history. Not only could a person's work not be completely (accurately?) understood without knowing the person "behind" the work but, just as importantly, an ethnographic framework emphasizes that the work would not be as it was without just such a context.

Ethnographic. I also recognize ethnographic aspects of this research as that term is described by Kuhn and Woog. They describe *vortical postmodern ethnography* as that in which

... conceptualizes all involved in the research, together with the activities engaged in, not as separate categorical systems (such as researcher and researched) but as swirling interacting parameters." (Kuhn and Woog, 2005: 140)⁶

⁵ By "my" culture, I am referring to the cultural contexts that have shaped my perspectives. In part these include: a Protestant, middle-class upbringing in Central New York State; a liberal arts higher education; my being female; and the experiences related in Appendices 1 and 2.

⁶ Kuhn and Woog assign the following characteristics to "postmodern ethnography," of which vortical postmodern ethnography is a subset: "1) focusing on social discourse within settings created through the coming together of the researched cultural group and the researcher or the researchers' cultural group; 2) relying on qualitative data in the form of narrative descriptions made by the researcher and researched as discursive partners; 3) taking an holistic perspective, where observations and interpretations are conceived of as emergent from, and constitutive of, the totality of human interactions; 4) allowing for emergence of new hypotheses and questions as the research progresses; and 5) embodying circularity in the processes of

My perspective is that my own (and others') engagement with this thesis, as well as the engagement of complexity theories with social theories, share these characteristics.

Constructionist. There are also elements of a constructionist perspective in this study.

According to Patton, a constructive perspective is responsive to these questions:

How have the people in this setting constructed reality? What are their reported perceptions, 'truths,' explanations, beliefs and worldview? What are the consequences for their behaviors and for those with whom they interact? (Patton, 2002: 132)

These questions arose in response to the data itself, as Bohm and Peat present their theories from a *partially* constructive perspective. While Bohm, in particular, proposes a theory that is based on a determinate *and* indeterminate view of reality, constructionist elements can be recognized in both Bohm and Peat's writings. Spivey suggests that this perspective highlights "the active, generative nature of comprehending as well as composing discourse" (Spivey, 1997: 2) and emphasizes the "generative, organizational, and selective nature of human perception, understanding, and memory" (Spivey, (1997: 3). Constructivists draw attention to the metaphysical nature of reality, she suggests, "as they consider the extent to which we humans can learn about and experience reality, or put another way, the extent to which we create our realities" (Spivey, 1997: 4).

data analysis and synthesis, whereby research findings are contextualized with respect to the discourse evoked through the research activities" (Kuhn and Woog, 2005: 146).

Data collection

Data was collected from four sources: the content associated with a weeklong course at Peat's Pari Center for New Learning (Pari, Italy); two interviews conducted during that week; literature from the fields of physics, philosophy, and development; and my own notes.

Pari Center for New Learning. Although the questioning that led me to focus on Bohm and Peat's writings was part of the research process, I felt that the research component of this thesis began in earnest in May 2004. At that time, I contacted F. David Peat and received an invitation to attend a weeklong course at his Pari Center for New Learning.⁷ Prior to arriving in Pari, I had reviewed Peat's personal website and the Pari Center website (<http://www.f davidpeat.com> and <http://www.pericenter.com>); read a few of Peat's books; and exchanged several brief emails and phone calls regarding the logistics of my visit.

Peat and his wife established the Pari Center for New Learning in 1996. They are very gracious hosts, and I had an absolutely marvelous time getting to know them and their family. Their hospitality, and the Center's location in a charming, hilltop medieval Tuscan village, made for a wonderful research setting.

⁷ My decision to contact Peat was greatly influenced by reading Capra's *Uncommon Wisdom* (Capra, 1989). In this book, Capra recounts the years of research that led to writing *The Web of Life* (Capra, 1996). Where possible, Capra sought out and spent time with people who were most knowledgeable about the subjects that interested him. I read *Uncommon Wisdom* before deciding to start graduate school and remember thinking that, were I ever to become involved in a research project, I would, if at all possible, follow Capra's approach.

The Center is designed to be “a place where people from many different backgrounds can meet to explore ideas together” (Peat, n.d.c). The first conference, held in September 2000, was modeled on an understanding of the original Florentine academies. Individuals from eight countries gathered to discuss “the future of the academy.” More recently, the Center has been awarded funding from the Metanexus Foundation to host a series of dialogues on religion and science. The Center, itself, is meant to draw upon the idea of Gentle Action (one of the concepts that drew me to contact Peat, and described in detail in Chapter 4). This is reflected in the following description of their purpose and theoretical grounding:

The Pari Center for New Learning provides an opportunity for artists, scientists, thinkers, writers and all those who have concerns about the world in which we live to spend time in reflection, work on a project, or meet and talk with others at the human and personal level rather than in terms of abstractions... The Center promotes an open and continuing dialogue on issues of values and meaning in society, the role of science and technology, the marriage of science and the arts, ethics, community, the future of education, the impact of global economics on societies, the role of knowledge and the place of the sacred (Peat, 2004b: 1).

I arrived at the Center on July 6, 2004, and met the only other course participant (Jill Bingham, a teacher from Great Britain) and the Pari Center faculty and staff at that time.⁸ While at the Center, I recorded two interviews and took approximately seventy pages of notes. I also acquired two books and copies of over twenty articles.

Peat lectured each morning from 9:30 a.m. until 12:30 p.m. Then, Jill and I were invited each day to lunch with Peat and his wife at their home. Meal-time conversations were sometimes connected to the lectures, but were more often about writers and artists

⁸ The faculty and staff of the Pari Learning Center selected the participants in the course. I did not have any role in that process.

that the others knew. We typically finished lunch at around 2:30, which left about an hour and a half for “siesta.” I used this time to write in my journal, record excerpts from books in the Center’s library, make copies of Peat’s articles, or send a quick email from the Center’s computer. We met at the Palazzo again for lecture from 4:00 to 6:00 p.m., and then took a short break before meeting for dinner.

At our first meeting, Peat reviewed the topics that he wanted to cover, and solicited input for additional topics from the list that was included in the course description (for a course description including lecture topics and schedule, see Appendix 3). During lectures, he constantly referred to his notes and often pulled references from the bookshelves in the room. Jill Bingham and I were free to ask questions or offer comments at any time; however, this course was organized definitely in lecture style, and was neither seminar nor discussion in structure.

Peat displayed an obvious delight in the material. He spoke quickly and energetically, and I took constant notes. I did not record the lectures electronically. When I arrived at Paris, I thought my tape recorder had been broken in transit. I was relieved at the time because I was very uncomfortable with the idea of asking Peat if I could record his lectures. He was not keen on the idea of signing a consent form (although he did eventually sign one), and the idea of recording lectures did not seem to fit with the Center’s informal atmosphere. In retrospect, I wish that I had worked through my discomfort about using the recorder during lectures. I’ll never know whether or not it would have been a distraction. Although I took extensive notes, I miss not having a more detailed record of the lectures.

Interviews. I conducted two interviews while in Paris. Consistent with Warren's description of qualitative interviewing (drawing from Kvale and others), the interviews were conversational in format, conducted for the purpose of "deriving interpretations, not facts or laws" (Warren, 2002). The interviews were also "brainstorming" interviews, referring to an unstructured, exploratory method in which the researcher plays a nondirective role in the course of discussion (Fontana and Frey, 1998). My approach also reflected what Denzin and Lincoln refer to as

... feminist-based interviewing, which requires openness, emotional engagement, and the development of a potentially long-term, trusting relationship between the interviewer and the subject. (Denzin and Lincoln, 1998)

My intent was to develop "a closer relation between interviewer and respondent [by] doing away with the traditional hierarchical situation in interviewing." (Fontana and Frey, 1998: 65) This method permits interviewers to "show their human side and answer questions and express feelings [and allows respondents] the freedom of open-ended responses" (ibid.).⁹

Documents. This study drew from two sets of literature. A source of primary data was the literature on Bohm's interpretation of quantum theory and Peat's interpretation of quantum and chaos theories. I focused on the literature written by Bohm and Peat

⁹ After I'd made arrangements to stay an extra day in Paris to have a one-on-one conversation with Peat, I mentioned that I would have liked to record it and Peat found a tape recorder I could use. On that day, with prior consent, I recorded one interview each with Peat and, separately, Arnold Smith (a computer scientist and staff member; see footnote 13). I transcribed both recordings and keep the cassettes in a locked container in my home. I have been the only person to have access to the tapes. I sent a copy of Peat's interview transcript to him, and a copy of Smith's to him. I am the only other person to have a copy of the transcription. I'm sure that the use of the recorder altered the content of the discussion, as we were always aware that the recorder was on. The recordings were used to supplement my notes and to provide clarifying quotations.

themselves¹⁰ and only lightly drew from literature written by others (e.g. Gleick, 1988, Heisenberg, 1962; Kafatos and Nadeau, 1990; and Stapp, 1993) as sources of clarification and critique. Sources of secondary data included literature on *aspects* of development theory and practice (e.g. Chambers, 1983; Escobar, 1995; Keen, 2001; Martinussen, 1995; Potts, 2000) and hermeneutics (these include Bernstein, 1983; Gadamer and Hahn, 1997; Gadamer, 1975; and Kidder, 1997). Sources of secondary data were not explored in depth, but were used to identify examples of ideas in those fields that overlapped (or contrasted with) the ideas expressed by Bohm and Peat.

Notes. While preparing for this study, I read Richardson's description of the four types of notes made by qualitative researchers: 1) Concrete and detailed observation notes of what I see, hear, feel, taste, etc.; 2) methodological notes regarding the who, how, and where to collect data; 3) theoretical notes on hunches, hypotheses, poststructuralist connections, and critiques of what I am doing; and 4) personal notes that record the feelings I'm having about the research, the people I am talking to, and myself doing the process (Richardson in Denzin and Lincoln, 1998). Throughout this project, I returned to this description to help me distinguish among the types and also to remind me to include all types in my notes.

¹⁰ An unexpected benefit from my trip to Pari was that it made reading Peat's books very enjoyable. I could hear his voice and imagine him stopping from time to time, smiling at the questions he was raising.

Analysis

Gharajedaghi and Ackoff (in Patton, 1990: 108) suggest that explanations of systems require both analysis *and* synthesis. In analysis “the thing to be explained” is first taken apart and then re-aggregated into knowledge of the whole. In synthesis, the thing is first to “be a part of a larger whole [and then] the containing whole is disaggregated to explain the parts” (Patton, 1990: 79). I have attempted to reflect both of these approaches in this project.

As noted in Patton’s description of qualitative research referenced earlier, this study was intended to be primarily inductive in nature. In this strategy, descriptive (rather than causal) hypotheses are developed for the purpose of identifying patterns of behaviors, interactions, and perception. I agree with Patton (2002: 194) that “the extent to which a qualitative approach is inductive or deductive varies along a continuum,” and with Denzin and Lincoln (1998: 31) that

the field of qualitative research is defined by a series of tensions [that work] back and forth between the broad, doubting postmodern sensibility and the more certain, more traditional positivist, postpositivist, and naturalistic conceptions of this project.

I used methods described by Gilgun to reexamine, defend, and/or disconfirm these emerging hypotheses:

In analytic induction, researchers develop hypotheses, sometimes rough and general approximations... prior to data analysis. These hypotheses can be based on hunches, assumptions, careful interpretations of research and theory, or combinations. Hypotheses are revised to fit emerging interpretations of the data over the course of data collection and analysis. Researchers actively seek to disconfirm emerging hypotheses through negative case analysis, that is, analysis of cases that hold promise for disconfirming emerging hypotheses and that add variability to the sample.... Originally developed to produce universal and causal

hypotheses, contemporary researchers have de-emphasized universality and causality and have emphasized instead the development of descriptive hypotheses that identify patterns of behaviors, interactions and perceptions. (Gilgun, 1995, in Patton, 2002)

As this implies, I expected to alter the questions I was pursuing as I gained greater knowledge of the subject. As Gibbs warns (2002: 162), with this research format it is “important to refer back regularly to the initial research aims, as there is a danger that the explanation being built up may drift far from the initial concerns.” I found this to certainly be the case, and referring back to my initial aims became increasingly important as the research went on. The notes that I described above were particularly helpful in this task.

I did my best while at Pari, and also during the months of reading that followed, to absorb as much “data” as possible and to limit my analysis to simply “tracking” the path that my research seemed to be taking. The range of Bohm’s ideas include “consciousness, society, truth, language, and the process of scientific theory making itself” (Peat, 1987a: 69). Dipping into Bohm’s writing took me fairly quickly into all of these topics and more. It took months before I could see (with at least some confidence) not only the connections among these topics, but also why Bohm drew connections in the way that he did. I am not sure I could have done that without spending the week in Pari. The range of Peat’s ideas are at least as broad as Bohm’s, and it took a fair amount of “mental dancing” among their writings and the Pari course content before a “pattern of meaning” emerged for me.

While reading, I highlighted all passages that I felt to be relevant to the research and typed all of those passages into Microsoft Word (I did not use any analysis software). In

December, with the help of colleagues who were familiar with the subject matter, I drafted my first outline and began to write. Only then, did the analysis/synthesis begin in earnest as an iterative process among the raw data, the structure of the outline, and the learning that I experienced while writing. As I write this paragraph, a final draft of this thesis is due in less than two weeks, and the iterative process continues. I expect to be analyzing (and gathering supplemental sources of data) until a day or two before I submit the thesis for review.

As Patton (2002) and others encourage, I made every effort to engage in a *systemic analysis* of the subject matter. Bawden describes this as follows:

Systemic analysis does not concern itself with the lineal logic of causes and effects, nor with problems and solutions, nor with starts and finishes, nor with the unidirectional flow of information from generator, through transmitter, to receiver. Because of the connectivity and interrelatedness of wholes within wholes, systemic analysis is always recursive. (Bawden, 1991: 2366)

As such, I have attempted to provide “an analysis of the patterns that emerge when the reasons for the distinctions between [quantum/chaos theories and developmentalism] are explored as if they were different faces of the same reality” (ibid.).

In addition to the inductive reasoning implied by the primarily inductive nature of this study, the analysis will also make use of *abductive reasoning*. Bawden argues that “the usefulness of abductive reasoning in exploring complex relationships comes through the notion of searching for ‘similarities in patterns across seemingly disparate phenomena’ (Skolimowski, 1985), including the process of patterning itself” (Bawden, 1991: 2367).

Validation

Member checks. To enhance validation of my research, I shared my preliminary findings with those from whom I gathered data, as well as from colleagues and others interested in the subject matter. Their feedback was included in the data to be analyzed, and I also drew upon their responses when analyzing and interpreting the data.

Rapport. Fontana and Frey observe that

... because the goal of unstructured interviewing is *understanding*, it becomes paramount for the researcher to establish rapport. He or she must be able to put him- or herself in the role of the respondents and attempt to see the situation from their perspective, rather than impose the world of academia and preconceptions upon them. [However, this same close rapport] may also create problems, as the researcher may become a spokesperson for the group studied, losing his or her distance and objectivity, or may “go native” and become a member of the group and forgo the academic role. At times, what the researcher may feel is good rapport turns out not to be.... At the other end of the spectrum, some researchers may never feel they have good rapport with subjects. (Fontana and Frey, 1998: 60)

From my own experience, I found the source of the “validity threat” attached to this issue to be more about *not being explicit* about it and less about whether or not rapport was developed. While I was in Pari, although Peat treated me as an equal, I remained in awe of him during my entire stay (and am still amazed that I came to be on a first-name basis with him). I believe this has influenced the “data collection” more since I returned from Pari than it did while I was there. During my stay, Peat put me at ease and welcomed questions and conversation. Since returning home, however, I notice that the few emails I have sent to Peat are brief and almost apologetic when asking him for thoughts on matters pertaining to this study.

Kuhn and Woog reinforce this issue in their discussion of vortical postmodern ethnography. They claim that the value of this type of research is

not so much its capacity to verify, challenge or enhance themes that have entered the recognizable domain of ‘the literature,’ but rather that [the participants have been involved] in some depth of learning and knowledge creation” (Kuhn and Woog, 2005: 149).

An important validity check to this study, then, is the extent to which participants “come to a position of questioning and judging for themselves the meaning of truth in knowing and processes by which knowing and knowledge formation occurs” (ibid.). Following from Kuhn and Woog’s concept of vortical postmodern ethnography, described earlier, *participants* in this case refers to me; the two people that I interviewed; and all those who read this thesis (including, perhaps especially, the authors of the documents that I have cited).

Learning. As Bawden suggests,

one of the emergent properties of the inquiry system itself—one of the great ‘surprises’ it represents—is the notion of learning as transcendental to the classical trinity of activities of research, education, and extension. Knowledge is not a commodity to be transmitted as a set of propositions or practical competencies. It is rather to be created experientially as the transformation of personal experiences. (Bawden, 1991: 2370).

In keeping with this perspective, an additional source of validation is whether I learned anything while engaged in this research; and whether or not others learn something in reading the thesis. There is a teleological aspect to this as well: What did I learn that I can use going forward? What do I provide to others that will influence their theoretical and practical perspectives?

Research design. I found the qualitative aspect of the design—especially the abilities to change questions and to include personal insights—to be a further source of validation. Arnold Smith addresses the second of these features in the comments he makes on an early draft of this paper:¹¹

In reading your thesis, I learn something about wholeness and interwoven textures abstractly, but also I learn about you in particular. Learning about the ideas helps me develop my own understanding of the world around me. But learning about you lets me see not only you but also myself better, and seeing ourselves better is part of seeing the world better. (Smith, personal correspondence)

Challenges of systemic design. Drawing from others who have critiqued the soft systems approach, Bawden (1991: 2371) describes several threats to its validity: its “inherent functionalism, idealism, lack of attention to ethical dimensions, and issues of power relationships.” I have attempted to address all of these threats within the findings themselves.

¹¹ While this paper includes just a handful of direct references to Smith, this research was greatly influenced by conversations we had in Pari and via email after my return. By way of introduction, Smith’s biography is posted on the Pari Center website: “Educated at Harvard and Sussex universities, Arnold carried out research in artificial intelligence at Schlumberger, SRI International, and the National Research Council of Canada, where he has recently been conducting research in complex systems and artificial life. In the last few years Arnold has also been particularly concerned with ways in which traditional scientific approaches to understanding the world miss or fail to deal with some very important phenomena, including some critical to artificial intelligence and cognitive science. His work in these areas brings into play his extensive background in Zen and Tibetan Buddhism as well as studies in some of the shamanic traditions. Arnold worked in England and Canada until a sabbatical beginning in the spring of 2003 brought him to the Pari Center in Tuscany. Since then he has been working in Pari, and is in the process of making this his primary research home.” (<http://www.paricenter.com>)

Audience

I hope that this study will be of interest and value to those engaged in: the theory and practice of all kinds of development; non-mathematical interpretations of quantum and chaos theory; and epistemic approaches to all kinds of inquiry, whether in the form of academic research or otherwise.

CHAPTER 3: THOUGHTS ON ‘DEVELOPMENT’

This chapter provides a brief introduction to the trends that distinguish current international development theories from their predecessors.¹² These include a shift toward multi-dimensional conceptions of development that now include development as the “capacity to be.” In identifying these trends, I find it interesting to consider Gasper’s suggestion to distinguish between the roles of “ahistorical conceptualisations of development, such as development as industrialisation or progress, [and] historically specific conceptualisations” (Gasper, 2004: 26). He suggests that while a historical perspective is essential,

... no single historical definition... is adequate, certainly not the recently popular ‘made in 1949’ notion; but each of the start dates cited (such as 3500 BC, 1492, 1750, 1860 and 1945/1949) alludes to the opening of a significant phase. (Gasper, 2004: 47)

Making reference to Riggs’ 1984 survey, Martinussen (1995: 35) suggests that there has been a tendency since the mid-1950s “to abolish one-dimensional conceptions focusing on economic growth and [to] replace them with multi-dimensional notions incorporating non-economic aspects as well.” Most development theorists and practitioners from the beginning of this period, suggests Goulet,

... took it as self-evident that economic development is, everywhere and for everyone, a good thing: that technology should be harnessed to all

¹² Michigan State University’s Center for Advanced Study of International Development (CASID) defines the field of development theory and practice in terms of the issues it addresses. It suggests that these include “hunger, poverty, the global economy, the environment and its use and misuse, ethnicity and gender concerns, access to education and medical assistance, and social justice” (CASID, n.d.).

human activities because it boosts productivity; and that specialized institutions are needed to foster modernization. (Goulet, 2000: 1)

Development from this perspective was not seen as

a philosophical inquiry into value change or a search for new institutions and rules of global governance but as technical examination or how to mobilize resources most efficiently and build the infrastructures best suited to growth. (Goulet, 2000: 1)

Goulet further suggests that a shift to “multi-dimensional notions” was the predictable outcome of a “learning curve for development [that] brought to light ever more numerous and ever more complex variables in the development equation—social, cultural, environmental, political, ethical” (Goulet, 2000: 31). Under these conditions, an assault on the very concept of development ensued. These were undertaken, he avers, in the name of postmodernism, deep ecology, liberation ideologies, and ethically-based resistance to economic inequalities (Goulet, 2000).

Until the 1980s, the United Nations Development Program used Gross Domestic Product (GDP) per capita as “the single measure, and indeed perhaps definition, of development” (Gasper, 2004: 36). At that time, it added several non-GDP criteria for specifying *least development countries*: 1) a maximum per capita GDP (one of two levels, depending on whether one or both of the following two criteria were met), 2) a maximum manufacturing share of ten percent of the total GDP, and 3) a maximum literacy rate of twenty percent (Gasper, 2004). In the 1990s, the UNDP revised this perspective to incorporate “the opportunity to choose a fully satisfying, valuable and valued way of living together, the flourishing of human existence in all its forms and as a whole” (World Commission on Culture and Development, 1995: 15; in Gasper, 2004: 37).

The UNDP's Human Development Report (HDR) serves as an example of the trend to broaden the range of, and collect measurements for, categories used to assess wellbeing (Kidder, 1997). These are aggregated and dis-aggregated "in a way that yields a 'human development index,' a statistical reflection of the state of human development in a given nation" (Kidder, 1997: 1200) The categories in the report include

... life expectancy, access to health services, adult literacy rate, number of daily newspapers, number of children dying before age five, rural-urban disparity in services, maternal mortality rate, infant mortality rate, immunization rates, public expenditure on health and education, food consumption as a percentage of total household consumption, external debt, export-import ratios, amounts of arable land, rate of deforestation, rates of energy consumption, rates of accidents, rates of violent crimes, and economic gaps between men and women, between the richest and the poorest, and between cities and rural areas. (Kidder, p. 1200)

Gasper (2004: 39) writes that the HDRs "have extended the human development concept far beyond the aspects covered in their Human Development Index (HDI)." While the Index is limited to those aspects for which data can be collected, he explains, the concept of development from the perspective of the UNDP "now encompasses

- empowerment, seen in the expansion of capabilities, especially participation;
- equity in distribution of basic capabilities and opportunities, so that everybody has at least a certain minimum; choices must be not only for the rich;
- sustainability, of 'people's opportunities to freely exercise their basic capabilities;'
- community membership, belonging; [and]
- security, notably in people's daily lives (HDR 1996: 55-6)." (Gasper, 2004: 39)

Representing the most recent of these trends, Goulet suggests that

... development is above all else a question of human values and attitudes, goals self-defined by societies, and criteria for determining what are tolerable costs to be borne, and by whom, in the course of change. These are far more important than modeling optimal resource allocations, upgrading skills, or rationalizing of administrative procedures. (Goulet, 2000: 2)

With the expansion of concepts of development to non-economic issues, the conception of the hierarchy of development also changed. Since the mid-1950s, Martinussen (1995: 35) suggests, “the notion of development as something positive and good has been tied particularly to countries and population groups in the Third World.” While economics is still the primary determinant for labeling a country “developed,” “developing,” or “underdeveloped,” this is starting to change. In its description of international development, for example, Michigan State University’s Center for Advanced Study of International Development states that the issues of importance to this field are relevant to “all countries in at least some regions within their borders [including] the industrial countries of the Northern Hemisphere and the resource-rich countries of the Southern Hemisphere” (CASID, n.d.).

Since the 1990s, the shift away from an exclusive focus on economic growth has broadened the concept of development to include the *capacity* to have (Gasper, 2004). This has also been expressed as “development as being” (as in *to be* capable). The capabilities approach spawned by Sen and Nussbaum serves as an example of a movement that emphasizes this aspect of development (see, for example, Nussbaum, 2003). In *Development as Freedom*, Sen (1999) suggests that the difference between ‘development as having’ and ‘development as being’ is that the latter is “concerned with processes of decision making as well as opportunities to achieve valued outcomes” (Sen, 1999: 291). As such, it interprets the processes by which development is achieved to be both the means and ends of development. For example, he writes,

... such processes as participation in political decisions and social choice cannot be seen as being—at best—among the means to development (through, say, their contribution to economic growth), but have to be

understood as constitutive parts of the ends of development in themselves.
(ibid.)

He also suggests that there are contrasts within the “opportunity aspect” itself. “In pursuing the view of development as freedom, we have to examine... the extent to which people have the opportunity to achieve outcomes that they value and have reason to value” (ibid.).

This perspective of development as capacity overlaps considerably with the ideas described in the following chapter.

CHAPTER 4: WHOLENESS, ABSTRACTION, AND UNDERSTANDING

In this chapter, I explore Bohm's and Peat's theories, which propose a nonlinear relationship among reality, knowledge, and process. Bohm proposes that we consider an underlying wholeness from which these concepts are abstracted. This perspective challenges the universality of making separations among and within these concepts; a perspective that also challenges the universality of dualities, such as mind-matter and subject-object. I'll explore Bohm's suggestions regarding the ways that thinking and language place an emphasis on these separations rather than on the underlying wholeness. Bohm and Peat also suggest that to perceive of reality in this way requires acts of understanding, a suggestion that leads to an exploration of Bernstein's description of hermeneutics and Gadamer's concept of understanding. Finally, I'll set the stage for discussing the ways in which these perspectives might overlap with the field of development.

An ontological perspective

Both Peat and Bohm suggest that elements of the theories that they work with in physics might be of value in considering issues of interest to 'developmentalists.'¹³ While Bohm's work is referred to as a quantum theory interpretation, he was in fact searching for a

¹³ An introduction to both theories is provided in Appendix 5.

“qualitatively new theory, from which both relativity and quantum theory [were] to be derived as abstractions, approximations and limiting cases” (Bohm, 1980: 223). He proposes that the best place to begin such a search was with what both theories had in common: a concept of an undivided wholeness. He devotes entire sections of *Wholeness* (1980) to suggest that when we are faced with a limited ability to measure certain phenomena, *we should not assume either the universality of what is known or the unreality of what is not known*. Bohm describes this world view as

neither absolutely deterministic nor absolutely indeterministic. Rather it implies that these two extremes are abstractions which constitute different views or aspects of the overall set of appearances. The unknown and unlimited essence... may be thought of as somewhere between [determinism and indeterminism] and *ultimately beyond them*, as indeed it is beyond what can be captured in thought, which is always limited to some abstractions from the totality. (emphasis added; Bohm and Hiley, 1993: 324)

Beyond these abstractions, Bohm suggests, all is *both* thought and non-thought and *neither* thought nor non-thought. These categories “merge and flow into each other, in a single unbroken process, in which they are ultimately one [and at the same time] the ultimate ground is unknown, and therefore not specifiable, neither as [thought] nor [non-thought] nor in any other way” (Bohm 1980: 67). Peat suggests that reality from this perspective *is* determined; however, it is “of such endless complexity and subtlety that any attempt at prediction is out of the question... [It] is an infinitely sensitive feedback with the whole” (Briggs and Peat, 1989: 183).

Bohm devotes a section of *Wholeness* (1980) to describing quantum theories that, unlike his interpretation, maintain absolute indeterminism. Most of these assert that no theoretical interpretation should be based on an element (such as the quantum potential)

that is immeasurable and, therefore, untestable. Bohm defends his interpretation, stating that being open to its possibility serves an important purpose:

to remind us of the unreliability of conclusions based on the assumption of the complete universality of certain features of a given theory, however general their domain of validity seems to be. (Bohm, 1980: 140)

So what does Bohm's interpretation mean? If we theorize that there is an undividable and underlying wholeness, as he suggests, that would mean that all we can think of—such as reality, what we can know about reality, or the ways in which we set about knowing—and all that we cannot think of—the “unknown and unlimited essence” that cannot be captured in thought—are *distinct and yet ultimately inseparable* aspects of that wholeness. From this perspective, reality does not exist as a thing against which we can test the “fitting” of our ideas; it is, instead, “a kind of view or a way of looking.... in which the whole of reality appears (i.e., displays or unfolds), either in our perception or in our thinking” (Bohm, 1994). Bohm also describes reality as “the process of becoming itself, while all objects, events, entities, conditions, structures, etc. are forms that can be abstracted from this process” (Bohm, 1980: 61).

The key point for Bohm and Peat is this: while there is “meaning to a reality that lies outside ourselves, it is necessary that we, too, should be included in an essential way as participators in this reality” (Bohm and Peat, 2000: 55). For both Bohm and Peat, the relationship among reality, knowledge, and our participation (our experience) is a *constitutive* one: knowledge is not *about* some sort of experience but is derived from active participation with reality.

This was a tough concept for me to grasp, because it challenges the more common view that experience and knowledge have a *causal* relationship, in other words, that

having a particular experience would result in gaining a particular kind of knowledge. I think Arnold Smith, whom I met in Paris, did a great job of describing what Bohm and Peat have in mind in terms that made sense to me:

It is not so much that we *acquire* our direct knowledge by participating (as if the knowledge were a *residue* of the participation), as that *we realize and refine and manifest our knowledge in the process of participation itself.* (emphasis added; Smith, personal communication)

An important part of both Bohm's and Peat's perspective, respectively, is the role played by theories in understanding reality and knowledge. Bohm, for example, writes that theories are forms of insight—ways of seeing—with the purpose of organizing knowledge and experience (Bohm, 1998). Peat writes that chaos theory, like any theory, is “a mental projection onto the infinite complexity of nature—one that emphasizes certain nuances within the flux” (Briggs and Peat, 1999: 174). Of particular importance, Bohm suggests (1980: 10), are “those theories that contribute to the expression of our overall self-world views.” He proposes that these include theories from the field of physics, as that field often serves as the “basis of other sciences, or else the source of a pattern toward which other sciences would aspire” (Bohm, 1998: 73).¹⁴

As mentioned earlier, Bohm's theory emphasizes a nonlinear relationship among reality, knowledge, and process. Peat and others suggest that all social phenomena are nonlinearly related as well. One of the key and initial hypotheses of this inquiry is that Bohm's descriptions of reality from this perspective might help us to describe or understand our relationship to each other and our world.

¹⁴ Bohm's familiarity with the writings of Karl Marx influenced his approach to the field of physics. For an excellent discussion on the impact that Bohm and other physicists' socialist philosophy has had on the theory and practice of twentieth-century physics, see Kojevnikov (2002).

A different order

In proposing this kind of theory, the challenge Bohm set for himself was to develop a way to describe the relationship between *wholeness* and *abstractions*, and to do that in a way that did not rely on classical concepts of space and time. Bohm proposed that in this order, rather than thinking about abstractions as *exclusively* differentiated by measures of space and time, it might make sense to think about them as being at various levels of *enfoldment* and *unfoldment* from the whole. In this way, he felt, we would be able to keep in mind the inseparability of the various elements of reality, knowing, and experience that we were aware of. He suggested that where everything is *enfolded* in everything, the order could be described as *implicate*.¹⁵ Where an abstraction was perceived “in its own particular region of space (and time)” (Bohm, 1980: 225), the order could be described as *explicate*. Together, these two orders “are a flowing, undivided wholeness. Every part of the universe is related to every other part but in different degrees” (Peat, 1987a: 72).

From a chaos theory perspective, Peat and Briggs describe Bohm’s implicate order as

... a vast ground of feedback from which quantum processes emerge and in which everything affects everything else.... Each thing that we identify as a ‘part’ or object actually enfolds the movement of the whole because it is rooted in this *infinite nonlinear feedback ground*. (Briggs and Peat, 1989: 184)

Bohm uses the metaphors of *movement* and *pattern* to describe the implicate order and its relation to the explicate order. In *Wholeness* he proposes that his theory could “perhaps best be called *Undivided Wholeness in Flowing Movement*” (Bohm, 1980: 14).

¹⁵ The word “implicate,” according to Bohm, is derived from a Latin root meaning ‘to enfold’ or ‘to fold inward’ (Bohm 1980: 225).

In writing about reality as a “process of becoming,” noted above, Bohm was referring to this movement of constant enfolding and unfolding in which abstractions constantly form and dissolve. In the implicate order, Bohm proposes, “movement is a relationship of certain phases of *what is* to other phases of *what is*” (Bohm, 1980: 258). These are, in other words, “different degrees of enfoldment *all present together*” (Bohm, 1980: 2).

To describe this concept, Bohm looked for ways in which we already used the word movement to refer to something other than a change in space or time. He found such an example in the *movement of a symphony*. That the essence of movement

cannot be [exclusively] understood in terms of such ideas of the motions of objects through space is made very clear if one considers how inappropriate it would be to talk about the ‘motion of a symphony’ (at most this might perhaps refer to the displacement of the orchestra through space on a train). It would also evidently be inappropriate to talk about the *process* of a symphony. Indeed, the word ‘process’ is based on the verb ‘to proceed,’ which means ‘to step forward.’ It thus refers to a step following another. However, the movement of a symphony involves a total ordering that is not essentially related to a process of time (though a process of time is involved in playing the notes, in a proper order). Indeed, one may in principle apprehend the whole movement of a symphony at any moment (Bohm, 1998: 79).

Bohm also proposes that the relationship between wholeness and abstraction within this movement might be understood metaphorically as a pattern. He suggests that while the distinct features of a pattern are at times most relevant to a situation, there are also times when the pattern as a whole is most relevant. In the latter case, he suggests, “it has no meaning to say that different parts of [the pattern are] separate objects in interaction” (Bohm, 1989: 75-76), and indeed the parts themselves are also more like a “pattern of

movement than like a solid separate thing that exists autonomously and permanently” (Bohm, 1980: 161).¹⁶

On language and thought

Bohm suggests that our ability to even consider the possibility of this order of wholeness is intimately tied to our ability to describe it (Bohm, 1998, 1991). Beyond the use of metaphors that rely on concepts from classical physics, how could this order be described? In considering this question, Bohm gave particular attention to the limiting and facilitating roles played by *thought* and *language*. He proposes the 1) the distinction that is often made between the content and process of thought, and 2) the structure of the English language, make it difficult for us to develop a world view that could incorporate his ontological perspective. On the issue of language, Bohm suggests that the subject-verb-object structure of English leads to an almost exclusive concentration on “the content under discussion, so that little or no attention is left for the role that language plays in the process of abstraction” (Bohm, 1980: 40).

To illustrate this point, Bohm draws attention to the sentence, “*It is raining.*” He asks: “Where is the ‘It’ that would, according to the sentence, be ‘the rainer that is doing the raining’? Clearly, it is more accurate to say: ‘Rain is going on’” (Bohm, 1980: 37). He suggests that by drawing attention to the concepts of *rain* and a fictitious actor (*it*), the

¹⁶ Peat makes the same point, suggesting that from the perspective of chaos theory we “envison the world as a flux of patterns.” (Briggs and Peat, 1999: 4)

language has *obscured the process by which those concepts are abstracted from the whole movement of language*.¹⁷

On this issue, consider the relevance of Benjamin Lee Whorf's work on the structure of language and its ontological influence. Whorf proposes that the pattern of the English language was "rigidified... by Aristotle and [his] medieval and modern followers" (Whorf, 1956: 238). Over time, he suggests, a mechanistic way of thinking came to be a "natural type of syntax" for its users. Referring to the challenge of understanding relativity and quantum theories, he writes that "the so-called mechanistic way of thinking has come to an impasse before the great frontier problems of science" (ibid.). Peat echoes this, writing that "our own 'noun-based' language... is not well adapted to the quantum world, for this is a world less about objects in interaction than about transformation, superposition, flux, and the inseparability of observer and observed" (Peat, 2000: 143).¹⁸ The structure of the English language, from this perspective, is not well-suited to "deal[ing] directly in process, transformation, and flow" (Peat, 2000: 126).

Bohm believed that the English language *could* be made conducive to discussions of quantum theory—and therefore to discussions of the inter-relatedness of reality, knowledge, and experience. Hoping to show the potential for such a re-structuring, he developed a variation of English that he called the *rheomode* (taking 'rheo' from a Greek

¹⁷ I saw a similarity between this suggestion and the structure of the Nepali language. This supported my hypothesis that understanding Bohm and Peat's emphasis on wholeness might help me to better understand cultures that are different from my own, a point that will be further discussed in the next chapter.

¹⁸ Bohm and Peat were not the only physicists to recognize this. As the physicist Stapp (1993: 234) observed, "The latent inconsistency in using [concepts from classical physics, such as "wave" and "particle"] in the formulation of quantum theory... is an awkwardness appreciated as much by the originators of the Copenhagen interpretation as by its detractors." Heisenberg (1962: 55-56) describes this inconsistency as a paradox rooted in "the fact that we describe our experiments in the terms of classical physics and at the same time from the knowledge that these concepts do not fit nature accurately. The tension between these two starting points is the root of the statistical character of quantum theory."

verb meaning ‘to flow’). He devotes nearly twenty pages in *Wholeness* to presenting a detailed “rheomode treatment” of several verbs and nouns.¹⁹ In each case, the word “ceases to be taken as an ‘indivisible atom of meaning’ and instead [is] seen as no more than *a convenient marker in the whole movement of language*” (emphasis added; Bohm, 1980: 52). Bohm suggests that, in regular English, the verb “implies that all action arises in a separate subject, and acts either on a separate object, or else reflexively on itself” (Bohm, 1980: xiv). In the rheomode, by contrast, the verb signifies *an act of perceiving the undivided process and content of that to which attention is being drawn*. In other words, the verb structure is such that *process* (the thinker and the thinking that is going on) and *content* (that which is being thought about) *cannot* be separated. Similarly, rheomode nouns “signify not separate objects but, rather, *continuing states* of activity of the particular form indicated by the verbs” (Bohm, 1980: 45).

Years after Bohm developed the rheomode, Peat organized a series of meetings between Western scientists and Native Americans.²⁰ Bohm participated, and he was thrilled to learn of the similarities between the structure of the Blackfoot language and the structure of the rheomode (Peat, 2004a).

Peat described this meeting during the course in Pari. He provided an example from the Naskapi language, a member of the Blackfoot language family, that I think clarifies

¹⁹ Bohm offers this example: “Let us consider the Latin verb ‘videre’, meaning ‘to see’.... We then introduce the root verbal form ‘to vidate’. This does mean merely ‘to see’ in the visual sense,’ but we shall take it to refer to every aspect of perception including even the act of understanding, which is the apprehension of a totality, that includes sense perception, intellect, feeling, etc. (e.g., in the common language ‘to understand’ and ‘to see’ may be used interchangeably). So the verb ‘to vidate’ will call attention to a spontaneous and unrestricted act of perception of any sort whatsoever, including perception of whether what is seen fits or does not fit ‘what is’, as well as perception even of the very attention-calling function of the word itself. Thus... there is no division between the content (meaning) of this word and the total function to which it gives rise.” (Bohm, 1980: 47)

just what Bohm was describing with the rheomode. A particular Naskapi word, he said, translates as “the sorcerer heals the sick man,” even though the root of the word would translate as “singing going on” and the modifiers would translate as men and healing. Peat suggests that the entire state of activity included in the Naskapi word—the singing and the men and the healing all together—is obscured in the English translation.

On the subject of thought, Bohm suggests that “the content of thought and the process of thinking... are not two separately existent things [but rather are] two aspects of views of one whole movement” (Bohm, 1980: 23). He suggests that to divide things up in our thinking *is itself a way of thinking about things* that has an accurate, albeit limited, domain. To tie this to the earlier discussion on underlying wholeness, this domain would be the explicate (or unfolded) order of abstractions. From Bohm’s perspective, exclusive or primary attention to the abstractions is appropriate in the domain of technical activities where “the thing with which we are dealing is not significantly affected by our thought about it” (Bohm and Edwards, 1991: 138). But when the thing *is* significantly affected by our thought, he suggests, then we have moved into a domain in which exclusive or primary attention to that thing is no longer appropriate: in those cases we mistake “the content of our thought for a ‘description of the world as it is’” (Bohm, 1980: 4). In the language of the earlier discussion on reality and knowledge, he is suggesting that this limits our view of reality to *what is known* rather than *what is known, unknown, and unknowable* (i.e., ‘beyond thought’).

²⁰ These meetings took place at the Fetzer Institute in Kalamazoo, Michigan. For a summary, see (Peat, 1993).

To give exclusive attention to what we are thinking about, Bohm and Peat suggest, obscures the impact that the process of thinking has on our thoughts. What is needed, Bohm writes, is a “kind of attention that is subtle enough to see how thought is working” (Bohm and Edwards, 1991: 141). This kind of attention would itself be understood as a *movement* “which is involved in all our sensory perceptions, and in the act of understanding the whole of perception and thought” (Bohm, 1998: 79). This would be realized, Bohm suggests, not through an

... *explanation* that would give us some knowledge of the relationship of thought and thing, or of thought and ‘reality as a whole’ [but rather through an] *act of understanding*; in which we see the totality as an actual process that [incorporates] both thought and what is thought about in a single movement. (Bohm, 1980: 1970)

Briggs and Peat echo this message in their discussion of chaos theory as well. The linear nature of thought, they propose, no matter how insightful, “can take us only so far. To live sanely and deeply we need something else, a special sort of awareness” (Briggs and Peat, 1999: 175).

Situated abstractions

An understanding of wholeness, Bohm suggests, comes only with an understanding of the limited scope of abstractions—of any ‘thing’ that can be differentiated from the whole. An example of this can be found in Bohm’s writings on the relationship between mind and matter. As with all conceptual dualities, these concepts from his perspective are seen as “two aspects of one overall indivisible reality” (Bohm, 1994). Peat suggests a similar relationship in both *Synchronicity* (1987b) and *Blackwinged Night* (2000). As with the

rheomode, Bohm suggests that this consideration of mind and matter—what he called *soma-significance*—might “put us into much better contact with the basically unknown reality than does that of the duality of mind and matter [and its] division between actor, action, and that which is acted upon” (Bohm, 1994). By regarding mind and matter in this way, Bohm suggests, “we do not fragment life and inanimate matter, nor do we try to reduce the former completely to nothing but an outcome of the latter” (Bohm, 1980: 247). Bohm proposes that this perspective builds on the work of Einstein and others who assert that $E = MC^2$ is an expression of the convertibility of energy and matter into the other.

This proposal links Bohm with others who question the universality of dualities such as subject and object, body and mind, and objectivity and relativity. Gustavsson (1989) provides a useful overview of what he suggests are three main schools of thought on the objective/subjective split from a mind/matter perspective.²¹ He places Bohm among those who dispute an either/or categorization of these concepts. Gustavsson describes the three schools of thought as follows:

1) Those who believe that consciousness is generated by neural activity in the brain; thus matter creates consciousness and matter has a status of its own. This view is by far the most widely held among scientists (Eccles, 1980). 2) Those who believe that consciousness is fundamental to matter including the brain; thus consciousness, in a fundamental sense, is the origin of matter. In this school we find old philosophical traditions ranging from Plato (19xx), Hegel (1971) and the German idealism (even though the German idealists sometimes are interpreted as seeing consciousness as separate from matter), the ancient Vedic tradition (Maharishi, 1969), to recent quantum physicists (e.g. Hagelin, 1987; Bohm, 1984). 3) Between those two 'extremes' we can place the view of consciousness as separate from and independent of matter, and matter as independent of consciousness. Thus, the third main school of thought would be those who

²¹ Gustavsson is an Associate Professor of Business and Ethics at the University of Stockholm. I wrote to him for permission to use excerpts of his online article. In his reply, he mentioned that the article had just been published in Das Gupta (2004) That publication is the reference for my excerpts. However, as it is not yet available locally, I am not able to include page numbers at this time.

view consciousness and the brain as two separate phenomena (the dualistic approach). Here we find many psychologists (e.g. Bourne et al, 1979; Fancher, 1973) and others (e.g. Popper & Eccles, 1981). (Gustavsson, 1989)

A search among social scientists for a perspective similar to Bohm's led to anthropologist Bruno Latour's *Pandora's Hope: Essays on the Reality of Science Studies*, Latour suggests that the "way of negotiating a peaceful passage between object and subject [is to be found] *at the point of the break* itself" (Latour, 1999: 267). He further suggests that the differences between theory and practice; content and context; and nature and society, are divides that have been made. More precisely, they are unities that have been "fractured by the blow of a powerful hammer" (ibid.). Latour proposes that, for example, the categories of animate and inanimate implicate each other through the use of signals. In thousands of ways, he suggests, properties are "borrowed from the social world in order to socialize nonhumans [and] from nonhumans in order to naturalize and expand the social realm" (Latour, 1999: 204). In this way, meaning is assigned as an importation and reimportation of "ontological properties" from one realm to the other. The only settlement for such a fracture, he suggests, is one "which connects the questions of ontology, epistemology, ethics, politics, and theology" (Latour, 1999: 293).

An alternative to problem-solving

How might we consider *the point of the break* (to borrow Latour's language) between wholeness and abstraction? Bohm and Peat propose that *thinking about this question as one which creates the need for an answer* makes the consideration that much more

difficult. The response to *recognizing the need for something* (even for something like a “kind of attention”), as Briggs and Peat suggest, is typically to treat the ‘lack of that thing’ as a problem to be solved. However, they and Bohm propose that when a nonlinear relationship is involved, approaching a *need* as a *problem* would itself be problematic. Why? Because a *problem* is a linear concept and, as such, it has a limited role to play in considering the dynamics within nonlinear ‘systems.’ Bohm writes that

... when you accept something as a problem,” writes Bohm, “you have implicitly thought of what you need as the solution, but you don’t know how to get it.... So the word *problem* suggests that we know the end but not the means. (Bohm and Edwards, 1991: 137)

To consider a problem from this perspective, then, is to set things up as *causally* related. In a cause-and-effect manner, acquiring the means (which is ‘knowable-but-as-yet-unknown’) will result in the desired end (which is ‘known-but-as-yet-unreached’). This makes an assumption about the nature of nonlinear dynamics that Bohm and Peat suggest are *not* universally true. As Dennard explains, a nonlinear nature “does not mean that we cannot perceive a cause and effect, only that the cause and effect does not represent the entire pattern of relationships to which a problem responds” (Dennard, n.d.). Our attempt to resolve difficulties in human relationships as though they were exclusively defined as cause-and-effect problems, Bohm suggests, “may be one of the more important factors to preventing these difficulties from being properly brought to an end” (Bohm, 1996: 61).²²

As an alternative, Bohm proposes that we think about these kinds of needs as *paradoxes*. For Bohm, this term emphasizes the circular logic of means and ends that more closely describes the dynamics where “thought plays a crucial role in producing”

the need. Resolution, he suggests, will come from “sustained, serious, careful attention to the fact that the mind [tends] to be caught in paradoxes, and to mistake the resulting difficulties for problems” (Bohm, 1996: 68).

The distinction between problem and paradox is also tied to the earlier description of *movement* and its limited relevance for the concept of time. Why, Peat and Briggs ask, should “the line we assume to run from past to future... be the only one-dimensional line [in] nature?” (Briggs and Peat, 1999: 126). But how are we to consider time in any other way?

My attempt to wrestle with this was helped by going back to the discussion on the rheomode and the Naskapi language (where the context and content of an expression arise together), and by adding a third discussion on language that Peat provides in *The Blackwinged Night* (2000). Drawing from Whorf’s observations of the Hopi, he suggests that the Hopi live in terms of ‘manifesting’ and ‘manifested’ rather than in terms of past, present, and future.²³ In reading Whorf’s description of this, I found an example from the Hopi language that clarifies this point. The Hopi, he explains, use a single word to refer to the physical source of a light *and* the (flash of) light. Using very similar terms to Bohm’s, Whorf writes that in English

we are constantly reading into nature fictional acting entities, simply because our verbs must have substantives in front of them. We have to say

²² It was important for me to find a consistency between Bohm and Peat’s message and the way they lived their own lives. I was pleased to find examples in both of their writings that reflected their desire to “stay in the question” regarding their respective work in physics (see Peat, n.d.c, and Bohm, 1980).

²³ Peat (2000: 157) explains that for the Hopi, “the manifest is that which has been brought into existence within actuality. It is all that is directly experienced... Within this manifest, there is no division between past and present.” Alternatively, there is the “world that is manifesting.” For Peat, the process of manifesting can be described metaphorically as “the driver of time” (ibid.). Peat also suggests that there are similarities between the “manifesting” language of the Hopi and the Australian aboriginal concept of Dreaming. In Dream Time, past co-exists with the present (Peat, 2000).

‘It flashed’ or ‘A light flashed,’ setting up an actor, ‘it’ or ‘light,’ to perform what we call an action, ‘to flash.’ Yet the flashing and the light are one and the same! The Hopi language reports the flash with the simple verb, *rehpi*: ‘flash (occurred).’ (Whorf, 1956: 243)

For Peat, this suggests an acausal (as opposed to causal, or cause-and-effect) relationship of the light-and-flash. Similarly, he suggests that in the Naskapi example mentioned earlier that the concept of healing—rather than caused by the singing—is an acausal expression of the singing and its context.

Attention as process

How can we tell, when we address a difficult situation, whether we’re engaging in *creative acts of understanding* that recognize the acausal, paradoxical nature of the situation and its context? How does this differ from any other search for a solution?

Bohm writes that this is not something that can be “achieved by techniques and formulae. The act of seeing this deeply (and not merely verbally and intellectually) is also the act in which originality and creativity can be born” (Bohm, 1998: 26).²⁴ While Bohm writes that to try to put awareness into practice is a contradiction in terms (Bohm, 1989), it follows from his proposed ontology (that reality, knowledge, and process are fundamentally unified) that awareness *is* expressed as process. Bohm and Peat propose quite different

²⁴ A key feature of the attention that Bohm and Peat call for in an understanding of an underlying wholeness, is that it is creative, one that involves the implicate and explicate orders, insight and form. Peat spent a great deal of time, while we were at Pari, talking about creativity. He and Bohm have separately and collectively devoted much of their writing to describing the difference between a creativity that involves the enfoldment and unfoldment as described earlier and what might seem to be creative, but not in that way (e.g., rebellion, novelty) (see especially Bohm (1989, 1998); Bohm and Peat (2000); and Peat (2000)). I was greatly affected by Peat’s discussion, during the Pari course, of conceptual creativity as boundary-placing as well as boundary-removing. He spoke at one point about the challenge of using the energy released by fusion. The issue, he said, was finding a container that could hold the energy long

kinds of processes. Bohm emphasizes the role of communication, suggesting that the process of understanding would involve dialogue. Peat, on the other hand, suggests a concept of Gentle Action that blurs the distinction between individual and collective actors.

Dialogue

Bohm describes Dialogue as what happens when a group of people convenes regularly with no set agenda other than to engage with each other in conversation. Bohm suggests that as the group continues to meet, contrasting values about whatever is being discussed will eventually be made explicit. If the participants are serious, and attentive to their reactions to each other, they will slow down long enough to examine their positions. The idea, Bohm suggests, is that they will become more aware “of how the process of thought [gets] caught in *fixed sets of categories*” (emphasis added; Bohm, 1998: 61), and they would recognize the *inherent permeable nature of those categorical boundaries*. This, Bohm believed, would create a kind of awareness or intelligence among the participants. The source of this awareness would not be thought, but rather the pool of meaning generated from the very process of participation (Bohm and Nichol, 1996). The pool of meaning would not be a matter of

... accumulated knowledge or technique, nor [would] it have the goal of ‘correcting’ what may emerge in the dialogue. Rather, it [would be] more of the nature of relaxed, non-judgmental curiosity, its primary activity being to see things as freshly and clearly as possible. (Bohm and Nichol, 1996: ix)

enough to use it. I immediately suggested that this was a metaphor for concepts, in general, and for any formal or informal institution; and Peat readily agreed.

Gentle Action

Peat's mention of Bohm's Dialogue during the course in Pari was brief, and he mentioned separately that he wasn't sure it was a very useful concept. At first, I found this to be strange. But I found that Peat believed Bohm had built artificial restrictions into the concept of Dialogue. While he agreed with Bohm that social, economic, and political changes would derive from the changes in meaning that people assigned within those areas, his writing suggests that such a change in meaning could develop during discussions that resembled Bohm's Dialogue, as well as during extended periods of silence, for that matter.

Peat proposes that we emphasize what he calls "Gentle Action," a kind of action that draws from our participation in all of reality.²⁵ He developed this concept in the 1980s in response to his growing sense that oftentimes "social, economic and political actions can be oppressive and disruptive, even when operating from the best of intentions" (<http://www.paricenter.com>). The source of this action, Peat suggests,

lies within our selves, for when we work within an organization, live in a society, or participate in a family, we carry in our minds and bodies a representation of the structure and meaning of that family, society, or business. (Peat, 2000: 223)

He suggests that a linear worldview that perceives of social, political, and ecological problems as being localized at some point outside ourselves. This reinforces an erroneous belief "that problems and issues can be, to some extent, isolated, analyzed and modeled"

²⁵ Peat may be moving away from the name "Gentle Action" for just this reason. While the current Pari Center brochure refers to Gentle Action, in *Blackwinged Night* (2000: 223) Peat writes that he "has called such action 'gentle action'." While I was in Pari, he referred only to "a new kind of action."

(Peat, 1998: 131). Actions taken from this perspective, he suggests, are violent in that “they are imposed on a system from the outside [and could do] violence to the fields of meaning shared by those who live and work in such situations” (Peat, 2000: 222). A different kind of action, Peat suggests, one that flows from an entire field of meaning would be more appropriate. This kind of action would be subtle so that a “minimal intervention, intelligently made, can result in a major change or transformation. The reason is that such action [would make] use of the dynamics of the whole system in question” (Peat, n.d.b).

The origin of this kind of action, Peat suggests, should lie in a creative suspension in which we “remain just at the edge of an action” (Peat, 2000: 223). Creative suspension

... is an action that has the effect of relevating and making manifest the internal dynamics, rigidities, fixed positions, unexamined paradigms, interconnections and lines and levels of communication within the organization and the individual. (Peat, n.d.b)

From this place of creative suspension—which may take days or only the fraction of a second—the action that is taken “is no longer a ‘plan of action’ but a constantly changing creative response to a much deeper perception” (Peat, 1989).²⁶

²⁶ Peat uses a number of metaphors to illustrate this kind of action. For example, he suggests that a martial arts expert, directing “small movements and leverage in order to focus the opponent's own momentum and energy in a new direction [can be compared to the] highly intelligent and sensitive way [in which Gentle Action seeks] to guide and refocus the energies and the dynamics of the system in question” (Peat, n.d.b). Another image, he proposes, “would be the minimal movements made by a person in the sea in order to remain afloat... by remaining aware and sensitive to the movement of the sea and the position of one's own body and thus, by making tiny movements of the arms, legs and hands” (ibid.) The third metaphor is more complicated and, Peat admits, a bit counter-intuitive and far-fetched. He suggests that conventional action could be compared to a stone thrown in a pond, creating a splash at the right location but spreading disturbances throughout the water. He suggests that Gentle Action can instead be compared to “the highly sensitive and intelligent correlation of wavelets around the edge of a pond” (ibid.). In such a case, the converging wave moves inwards, creating a splash in a predetermined region of the pond. The splash is not the result of an action that is external to the pond, but rather is derived from the whole movement of the water. I find the implication that someone or something is coordinating the wavelets misleading; however, Briggs and Peat do propose that there might be a benefit to making a conscious, proactive effort to “use” Gentle Action as a means to a collectively-determined end.

Peat does not say so explicitly, but it seems to me that this is a rheomode treatment of “action,” in that it arises from the collective participation and awareness of context.²⁷ I asked Peat whether he was familiar with the concepts of Open Space and Appreciative Inquiry that draw from similar principles (see, for example, Leduma et al, 2001). He was not, but he did relate Gentle Action to other processes that brought unexamined assumptions into awareness, such as Freud’s notion of “non-judgmental listening.”²⁸

My interpretation of Dialogue and Gentle Action is that they are proposed as *methods* that bring to our attention the interrelatedness of interpretation, doing, and situation—in other words, methods for highlighting the ontology and epistemology “behind” the method itself.

How can we tell when the urge to “do something” is really what is called for and not a symptom of “epistemological panic,” as Bateson and Bateson (1987) infer? For that matter, how can we tell when *not* having the urge to do something is a symptom of misinformation, disinformation, another’s manipulation, laziness, or ineptitude? For Bohm, Peat, and others who share their perspective, this is not to ask, “How can we *know* these *things*?” Rather, it is to ask, “How are we to *interpret* whether the urge to do or not do is *appropriate* for the situation?” and to recognize that the interpretation, the doing,

²⁷ I also see a similarity between Gentle Action and the key points of the Daoist concept of WuWei. This concept means “without action... to do things such that it does not seem like one is taking the effort of doing them” (Madl, 2004).

²⁸ As indicated by the list of potential topics for the New Sciences/New Paradigms course (see Appendix 3), Peat’s interests include psychology, cognitive science, and the concept of collective consciousness. He is particularly interested in the works of Carl Jung and Wolfgang Pauli, who approach the concept of collective consciousness from the fields of psychology and physics respectively. Peat has written on this topic extensively. In *Seven Life Lessons of Chaos*, he and Briggs draw from a biological metaphor proposed by James Lovelock to suggest that further research on this would be worthwhile. They suggest that an examination of the individual cells of a body gives no indication that the body has regulatory capacity as a whole (i.e., for temperature). Similarly, they suggest, “we don’t know at this point what it would mean for

and the situation are *co-creative*. From this, I interpret that *the source of the ‘attention’* Bohm and Peat suggest is necessary for understanding the paradoxes within nonlinear ‘systems’ is to *reframe the question*, “*What are we to do?*” in a way that brings the inquiry back to the *ontological/epistemological perspective—back to the “need to understand.”*

The “action” of understanding

In *Beyond Objectivism and Relativism*, Richard Bernstein (1993) suggests that the philosophy of hermeneutics places a similar emphasis on the circular relationship between epistemology and method—or, in Bohm’s words—in not getting “lost in the fixity of categories.” This work helped me to place Bohm’s and Peat’s perspectives historically with others who have challenged the universality of “fixed categories.” It also introduced me to the philosophy of hermeneutics and Hans-Georg Gadamer, whose work overlaps with Bohm and Peat’s proposal that understanding is both an epistemology *and* an empirical process.²⁹

According to Bernstein, the skills required to understand theories (and, Bohm would add, world views) incommensurable to our own are “hermeneutical skills.” As a discipline, hermeneutics was initially applied as a means to interpret ancient literature. By the 19th century, it had become related to the study of history and historical knowledge;

the creative capacity of human consciousness to work as a whole across the planet” (Briggs and Peat, 1999: 162).

²⁹ I should mention here that reading Bernstein went about as slowly as walking knee-deep through molasses; and I had to constantly stop and translate his ideas into ‘plain English’! I had not expected to be

and philosophers in Europe had seen the potential for its application to all human sciences. Bernstein suggests that this potential was first recognized among Anglo-American thinkers in the 1970s with the publication of Rorty's *Philosophy and the Mirror of Nature* (Rorty, 1979) and the publication in English of Hans-Georg Gadamer's *Truth in Method* (1975).

Bernstein supports claims made by Gadamer, Heidegger, and Rorty that hermeneutics is universal as well as ontologically significant.³⁰ By universality, Bernstein (1983: 113-114) is suggesting that hermeneutics is not a “type of activity, to be contrasted with other human activities [but rather is] universal and may properly be said to underlie and pervade all activities.” Ontologically, he suggests that hermeneutics “pertains to questions concerning what human beings are... so if we are to understand what it is to be human beings, we must seek to understand understanding itself, in its rich, full, and complex dimensions” (Bernstein, 1983: 113).³¹ Bernstein suggests that these claims are fundamental to ‘applying’ hermeneutics as a means to “move beyond objectivity and relativity.”

Bernstein suggests that the philosophy of science as a discipline has been gradually moving away from the Cartesian perspective reflected in the dualities discussed above. Since Descartes, he writes, the philosophy of science has moved through four distinct

delving so deeply into philosophy during this project. Many times while reading Bernstein, I had to rely on a “gut feeling” that, in the end, this would all be worthwhile.

³⁰ Bernstein is drawing here directly from Gadamer and Heidegger (1962) and indirectly from Rorty (1979).

³¹ While agreeing with the universality of hermeneutics, Habermas takes issue with the universality of philosophical hermeneutics, which he sees as critique for the purpose of convincing and persuading (Madison in Gadamer, 1997).

stages:³² first, an attempt to ground scientific knowledge in “reality” by insisting on “logical proper names” for the new and competing theories; second, a shift in emphasis to the theories’ descriptive statement as the “primary epistemological unit for grounding empirical knowledge” (Bernstein, 1983: 75); and third, a further shift in emphasis to the theories’ conceptual framework. In each stage, he suggests, the *meaning* of each area of emphasis became more difficult to specify and it became increasingly difficult to distinguish between a theory’s “empirical grounding” and “epistemological framework.”

The fourth stage, Bernstein suggests, reflects an increasing realization that an understanding of the *context* of a theory is critical to an understanding of the theory itself. This context includes “the conflict of theories, paradigms, research programs, and research traditions in their *historical development*” (Bernstein, 1983: 77). With the shift to this most recent stage, he suggests, many new characteristics of scientific inquiry draw our attention. These include the role of tradition in scientific development as well as the “nature, function, and dynamics of *communities of inquirers*” (ibid.).

This last characteristic, he suggests, requires a description of what scientists *do* as well as of the *normative dimensions* of their communities. This, in turn, requires an expanded standard for rationality (as compared to that which was previously sufficient).

³² While Bernstein goes back as far as Descartes in tracing this influence, Peat suggests that the source of the separation between subject and object, or man and nature, can be seen in the late- thirteenth- and early- fourteenth-century developments of clockwork mechanics and double-entry bookkeeping (Peat, 2002). Similarly, Heisenberg (1962: 78-79) suggests that “Descartes, through his new method in philosophy, [did not give] a new direction to human thought. What he actually did was to formulate for the first time a trend in human thinking that could already be seen during the Renaissance in Italy and in the Reformation. . . . The growing interest in mathematics favored a philosophical system that started from a logical reasoning and tried by this method to arrive at some truth that was as certain as a mathematical conclusion.”

Bernstein further suggests that the need for any standards at all is driven by the *incommensurability of conflicting theories*.³³

My interpretation of this is that an understanding of any theory actually requires that there be a variety of conflicting theories to consider. This seemed counter-intuitive to me until he drew from the work of philosopher Paul Feyerabend. Attempting to understand a culture different from one's own, Feyerabend suggests, is a process of deciding whether the other culture's

...way of thinking can be reproduced in European terms... or whether it has a 'logic' of its own, not found in any Western language. In the course of the comparison the anthropologist may rephrase certain native ideas in English. This does not mean that English as spoken independently of the comparison is commensurable with the native idiom. It means that languages can be bent in many directions and that understanding does not depend on any particular set of rules. (Feyerabend in Bernstein, 1983: 250-251)

I interpret Feyerabend to be suggesting that English *by itself* is incommensurable with the native language *by itself*. However, the *application of those two languages as a means to understand the other* brings an improved understanding of the other culture.³⁴

According to Bernstein, Feyerabend's example draws attention to three features of understanding across an incommensurable divide: first, that the incommensurability of paradigms, forms of life, and traditions demands an "openness of understanding and

³³ Bernstein then traces the history of the thesis of incommensurability from Kuhn who, he wrote, first questioned the belief that commensuration was the basis for distinguishing rationality from irrationality; and to Feyerabend, who extended Kuhn's thesis from the natural sciences to the social sciences.

³⁴ I was interested to discover later that Bohm had been a "significant influence" on Feyerabend (Stanford Encyclopedia of Philosophy, 2002). According to Peat (1997), Feyerabend and Bohm became close while both were at the University of Bristol, and Feyerabend's interest in physics and philosophy made life more tolerable for Bohm there. Feyerabend apparently found Bohm's discussions intense: Feyerabend told Peat that on one occasion, "Bohm called at Feyerabend's home, walked into the living room, and took off his raincoat, all the while enthusiastically discussing philosophy, only to find that Feyerabend was not home!" (Peat, 1997: 187-188)

communication” (Bernstein, 1983: 92); secondly, that this openness allows for an understanding of what is distinctive about others in a way that appreciates the limitations of their perspective; and, third, that this process of comparison and contrast results in a better understanding of others, but also of ourselves. Incommensurability, in other words, “does not get in the way of understanding and comparing the concepts—it rather sets a challenge to us of finding out how to understand and compare them” (Bernstein, 1983: 96). Looking back at Bohm’s and Peat’s theses from this perspective, I can see a similarity. Peat, for example, writes that “from the chaos perspective, individual differences actually form the basis [for] resolution” (in footnote, Briggs and Peat, 1999: 161).

Bernstein then draws from Hans-Georg Gadamer to describe understanding as a process that moves beyond the dichotomy of objectivism³⁵ and relativism.³⁶ Bernstein emphasizes that he is not concerned with taking one side or the other of this dichotomy, or with assessing its strengths and weaknesses. Rather, he views it as “misleading and distortive” (Bernstein, 1983: 19), and draws from Gadamer to describe an ontological perspective that contrasts significantly with Cartesianism. Bernstein describes Gadamer’s concept of

... a distinctive ‘mode of being’ of play [in which] the players are not the subjects of play; instead play merely reaches presentation through the players’ (*Truth and Method*, p. 92). [In this mode] play is not even to be understood as a kind of activity; the actual subset of play is not the

³⁵ By objectivism, Bernstein (1983: 8) means “the basic conviction that there is or must be some permanent, ahistorical matrix or framework to which we can ultimately appeal in determining the nature of rationality, knowledge, truth, reality, goodness, or rightness.”

³⁶ By relativism, Bernstein (ibid.) means “the basic conviction that [concepts of rationality, truth, reality, right, the good, or norms] must be understood as relative to a specific conceptual scheme, theoretical framework, paradigm, form of life, society, or culture.”

individual, who among other activities plays, but instead the play itself.
(Bernstein, 1983: 121)

This concept of play, Gadamer suggests, illustrates a “to-and-fro movement, a type of participation characteristic of our involvement with works of art” (Bernstein, 1983: 122) or any entity that from a Cartesian perspective is seen as separate from the “subject.”

According to Bernstein,

... this play between the ‘things themselves’ and our prejudgments helps us comprehend why ‘understanding must be conceived as part of the process of the coming into being of meaning.’ Meaning is always *coming into being* through the ‘happening’ of understanding. (Bernstein (1983: 139)

Bernstein suggests that this concept serves to illustrate

... what is wrong with that way of thinking that dichotomizes the world into ‘objects’ which exist *an Sich* and ‘subjects’ that are detached from and stand over against them. We do not comprehend what the things themselves ‘say’ unless we realize that their meaning transcends them and comes into being through the happening or event of understanding” (p. 337). Through this ‘happening’, Gadamer writes, “the significance of all statements—those of art and those of everything else that has been transmitted—is formed and made complete. (Bernstein, 1983: 125)

The point that Gadamer is making, Bernstein suggests, is that

understanding, interpretation, and application (or appropriation) are not three independent activities to be relegated to three different subdisciplines but rather are... all moments of the single process of understanding. (Bernstein, 1983: 145)

In this way, Gadamer negates the Cartesian claim that the subject acquires an understanding of the object through a distanced build-up of knowledge gained through the application of reason. Understanding for Gadamer, rather, is not arrived at through the search for an Archimedean point separate from ourselves; or is understanding limited to

only that which we can “know” internally. Rather, it is *the very stuff of engagement*, between what is perceived as internal and what is perceived as external.

This seemed to me to reinforce and build upon Bohm and Peat’s descriptions of understanding, and it helped me to make sense of Bohm’s concept of soma-significance. Bernstein’s description of Gadamer seemed to me to resemble Bohm’s perspective in which reality, knowledge, and process are united in a single *movement*; concepts arise *acausally* from that process. Gadamer’s concept of play was also, for me, an important validation of Bohm’s rheomode experiment. And while Peat does not reference Gadamer directly in his writing, he uses language similar to Gadamer’s, for example, in describing the act of understanding a work of art or text as “merging horizons” with that work (Peat, 2000).

With all of this as background, a proposed “Gadamerian framework” for the ideas of Bohm and Peat described earlier in this chapter is presented in Table 1.

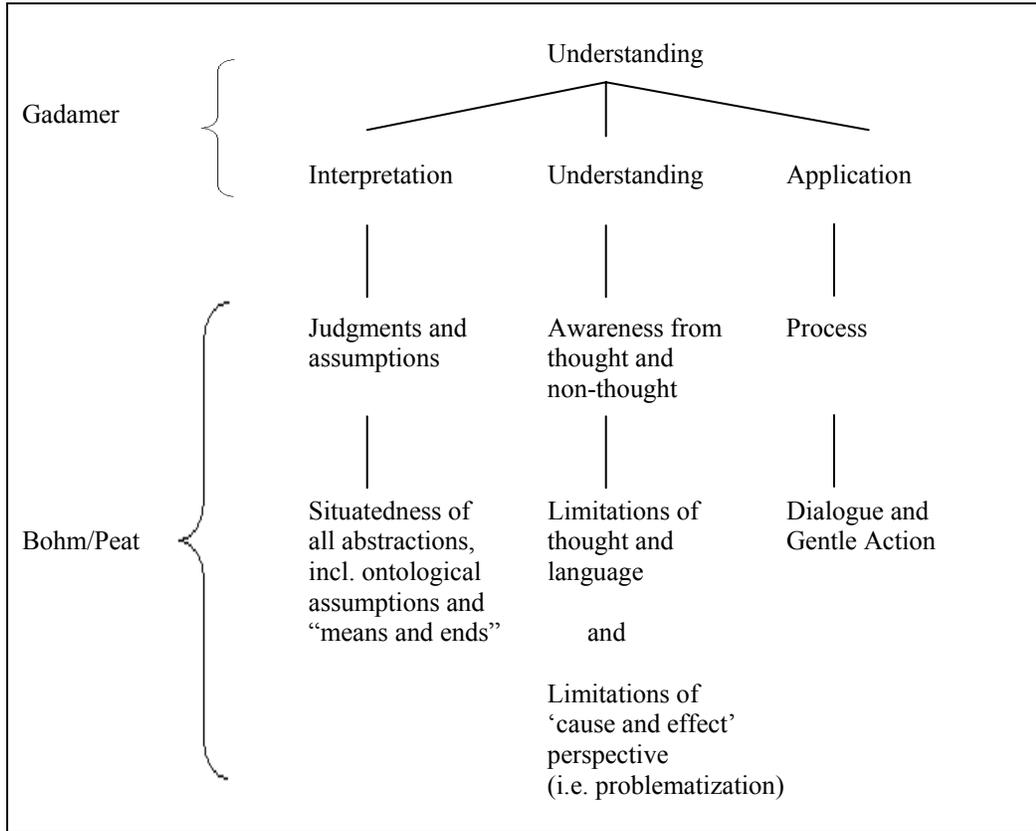


Table 1. Suggested Gadamerian framework for Bohm and Peat's perspectives

CHAPTER 5: MORE THOUGHTS ON ‘DEVELOPMENT’

This chapter explores ways in which Bohm and Peat’s perspectives might be reflected in international development theory.

Recalling the earlier discussion on recent trends in this field, at first glance the ideas presented in this thesis would seem to be most compatible with ahistorical “development as capacity” theories, such as Sen’s “development as freedom” (Sen, 1999). Sen frames ‘development’ as that which seeks to address issues of deprivation, destitution, oppression, hunger, the violation of elementary political freedoms, the neglect of the interests of women, threats to the environment, and threats to economic and social “sustainability” (Sen, 1999). He proposes that the end and means of this effort should be the expansion of various, interconnected, individual freedoms, including “economic opportunities, political freedoms, social facilities, transparency guarantees, and protective security” (Sen, 1999: xi).³⁷ Sen suggests that these freedoms are

... not only instrumental... but also *constructive*. [For example, our] conceptualization of economic needs depends crucially on open public debates and discussions, the guaranteeing of which requires insistence on basic political liberty and civil rights. (emphasis added; Sen, 1999: 147-148)

In another example, he draws attention to the “interrelated structure” of markets and institutions on the one hand and, on the other, “the formation of values and the emergence and evolution of social ethics” (Sen, 1999: 297).

³⁷ While Sen frames these freedoms as primarily individual, he suggests that “individual freedom is quintessentially a social product, and there is a two-way relation between (1) social arrangements to expand individual freedoms and (2) the use of individual freedoms not only to improve the respective lives but also to make the social arrangements more appropriate and effective” (Sen, 1999: 31). In this, I see similarities

The processes by which development is achieved, Sen suggests, are not to be taken as rules of behavior, as much as they are indicators of “the relevance of our shared humanity in making the choices we face” (Sen, 1999: 283). By emphasizing the constitutive relationships among these indicators, Sen implies that they indicate relevance “all together” (to borrow Bohm’s language). This implies a co-determined nature among any non-economic indicators of ‘development,’ which now include a “human development concept” extending to empowerment, equity, sustainability, belonging, and security (Martinussen, 1995).³⁸

Gadamer’s concept of play, as well as Bohm’s rheomode experiment seem to expand on Sen’s description of the constitutive nature of social and economic phenomena. In what way? How is the concept of development, as interpreted by Bohm and Peat,

to the way in which Bohm distinguishes—as a matter of emphasis rather than division—the concepts of individual and societal.

³⁸ With the exception of Sen, I had a difficult time finding any reflection of Bohm and Peat’s perspectives in the field of economics. For his part, Gadamer wrote that his lack of expertise in the area of economics precluded him from arguing too strongly about the implications of hermeneutics within that field. He did suggest, however, that there was an exact correspondence between his concept of play and “the balancing-out (Sich-Einspielen) of prices in the market event” (Gadamer, 1997. p. 337). He also suggested that discussions of the practice of economics rather than of the “regulative schemata of economic models” (Gadamer, 1997: 337) would contribute more meaningfully to an understanding of the discipline. Don Lavoie (2002), a proponent of the Austrian school of (institutional) economics, counted Gadamer among his philosophical influences. He suggests that the field of hermeneutics shares a tradition with the Austrian school, and expresses a need to move “beyond object and subject” in a way that reflects Bohm and Latour when he writes that our understanding of society has been hampered by “the attempt to treat social phenomena as objective things... external to human purposes and subject to our technical manipulation and control” (ibid.)

But I did not find any reference here that emphasized a constitutive relationship between object and subject. After further research, I have come to interpret that as a consequence of the field theory that underlies current economic theory. Potts writes about this explicitly in proposing an economic theory on the basis of “an ontological and analytical axiom that the geometry of economic space (and time) is non-integral” (Potts, 2000: 21). He is unaware of nonlinear dynamics, and writes extensively about chaos theory, suggesting that “existence and change are the same thing” (Potts, 2000: 105) This reminds me of the Hopi description of the light and its flash. But, rather than emphasizing the circular definition of their components, he emphasizes the characteristics of path dependency, sensitivity to initial conditions, and the difficulty of mapping causality. However, in the very next sentence, he suggests that “what is meant by coordination [between and within complex organizations] is a selection of connectivity” (ibid.). This reflects an ontological perspective that is in marked contrast to Bohm’s.

fundamentally different from Sen's description of development as a capacity to participate in "the process of making relevant"? To begin with, it might be helpful to propose an interpretation of the concept of development from Bohm and Peat's perspectives. Drawing on ideas presented in Chapter 4, I propose that Bohm and Peat's interpretation of development would include the *capacity to consider an underlying wholeness* from which all concepts and experience are abstractions. Such consideration would involve acts of understanding, interpretation (judgments/assumptions), and application (process), and would draw attention to a constitutive (nonlinear) relationship among all components of this understanding.

Assumptions

Sen suggests that one of the merits of approaching development as 'freedom' is that it makes explicit the need to address value assessments. Bohm and Peat also draw attention to these assessments (or interpretations), and extend the need to address them beyond the realm of values. An impressive variety of assumptions has been compiled by Ruonavaara (2003), including ontological (reality), epistemological (what is knowable or unknowable), axiological (values), methodological (experiential process), ideological (power), and rhetorical (language or expression)).³⁹ To these I would add spiritual⁴⁰ (the divine or lack thereof) and teleological⁴¹ (purpose).

³⁹ Ruonavaara's sources are Smith (1997); Maguire (1987); Creswell (1994, 1998); Kemmis and McTaggart (2000); Wolf (1999); Brown and Tandon (1983), and Harding (1991) (2003).

⁴⁰ I thank Richard Bawden for this insight.

⁴¹ This category was prompted by Gustavsson's discussion of the teleological assumptions built into the concept of organization (Gustavsson, 1989).

Bringing hermeneutic inquiry and the subject of axiological assumptions together, Gadamer suggests that understanding may be ethical or unethical or neither. “Even immoral beings try to understand one another,” he writes (Gadamer in Haney, 1999: 36). Bernstein proposes that while ethics is “not in the foreground of [Gadamer’s] investigations” (Bernstein, 1983: 150), Gadamer can be interpreted as saying that understanding is a form of “ethical know-how in which *what is universal and what is particular are codetermined*” (emphasis added; Bernstein, 1983: 146). The end of this ethical know-how, Bernstein suggests, “is not a ‘particular think’ or product but rather the ‘*complete ethical rectitude of a lifetime*’” (Bernstein, 1983: 149).⁴²

Attention to the importance of explicit and situated assumptions can already be recognized in a number of approaches to development.⁴³ The growing interest in axiological assumptions parallels the growing unease in applying the term “objective” to describe even economic indicators of ‘development’ (Martinussen, 1995). An example of this can be found in Gasper’s discussion of the implicitly subjective nature of Gross Domestic or Gross National Product (GDP/GNP):

In one respect GDP/GNP per capita is an objectivist measure: it includes no clause of the form ‘development/improvement is whatever a group of people think it is.’... Under the surface, it is subjectivist in a different way.... The clause tacitly becomes ‘development/improvement is whatever people around the world with money and saleable resources, backed up by political and military power, think it is.’ (Gasper, 2004: 41)

⁴² Bernstein is drawing here on Gadamer’s interpretation of Aristotle’s concept of *phronesis*, which he defines as “a form of reasoning and knowledge that involves a distinctive mediation between the universal and the particular [that] is not accomplished by any appeal to technical rules or Method (in the Cartesian sense) or by the subsumption of a pre-given determinate universal to a particular case” (Bernstein, 1983: 146). Looking for a better understanding of *phronesis* led me to Hanley, who suggests that “*phronésis* determines the right means to the right end of a particular action” (Hanley, 1998).

⁴³ Bernstein, I think, would connect this interest to the fourth stage of the philosophy of science as described in Chapter 4.

While attention to axiological assumptions (value judgments) are changing the way that developmentalists look at previously-considered “objective” indicators, Martinussen (1995: 349) suggests there yet remains a “not particularly respectable tendency... to allow personal values and preferences... to appear to be considerably more objective than they are.” Recent work in the areas of feminist theory (i.e. Beasley, 1999), discourse theory (i.e., Escobar, 1995), and ideology (i.e., Foucault, 1997) represent just a few of the directions in which this tendency is being addressed.

In the context of development programs, Kidder (1997: 1199) suggests that attention to axiological assumptions “means that just as the community’s values and traditions come under critical scrutiny and discussion, so equally do the aims of developers.” He also suggests that this “adds a theoretical legitimacy [to] listening to the poor that otherwise might be dismissed as liberal romanticism” (Kidder: 1997: 1200). As such, he writes, the role for hermeneutical skills provides a theoretical foundation for the kinds of inclusive, participatory development practice urged by the likes of Chambers (1983), Sen (1999), and others.

Again, what would set Bohm and Peat’s interpretation of ‘development’ apart from these theories? I think the answer lies in their ontological stance. The list of assumptions noted above includes “ontological.” What does it mean to be explicit about ontological assumptions? From a perspective in which ontology-epistemology-and-methodology are not created all together, the term “ontological assumptions” might seem oxymoronic. From a perspective that views these concepts as distinct-yet-inseparable-aspects-of-an-underlying-wholeness, the term serves as a reminder to be just as explicit about

ontological assumptions as of any other type—even in those cases where reality and matter are not believed to be “assumed.”

I suggest that Bohm and Peat’s attention to being situated and explicit about assumptions might resemble recent approaches to development, such as the “capabilities approach” of which Sen’s “development as freedom” concept is a part (see, for example, Nussbaum, 2000), or the “humanist approach” to participatory research (see, for example, Reason and Rowan, 1981). The ontological assumptions underlying Bohm and Peat’s perspectives, however, present quite a different interpretation of the concept of development. Table 2 provides a suggested framework for the perspectives described in the previous chapter, as well as the indicators of a similar perspective within a development concept.

Relevant aspects of Bohm and Peat's proposed ontology/epistemology	Draw attention to their perspectives on:	Indicators of a similar perspective:	Similar 'development' concepts would place an emphasis on:
<p>Reality as both determinate and indeterminate</p> <p>Nonlinear relationship between:</p> <ul style="list-style-type: none"> ◆ Self and other ◆ Inner and outer ◆ Now and then 	<p>Knowledge and truth</p> <p>Constitutive relationship among people and their context (socially, environmentally, technologically, etc.)</p> <p>Framing as paradox vs. problem (considering "what is" and "what is" vs. cause-and-effect)</p>	<p>Explicit and situated (limited) role for</p> <ul style="list-style-type: none"> ◆ Reification ◆ Assumptions ◆ Incommensurability <p>Beginning anew at each step</p>	<p>The constitutive nature of relationships, including those between people and their social and environmental context</p> <ul style="list-style-type: none"> ◆ Meaning-making ◆ Learning ◆ Emergence

Table 2. Suggested framework for considering the perspectives of Bohm, Peat, and development

Checking ontological assumptions

As discussed earlier, Bohm and Peat's emphasis on the situated appropriateness of any assumption stems from their ontological suggestion that all that can be known or unknown (or unknowable) is an abstraction from an underlying wholeness. From this perspective, the truth of any insight is a function of its 'fitting' moment to moment. If our perceptions of reality (our world views) are abstractions from "a whole movement in

which end and means are the action of fitting,” Bohm writes, “it is clearly of key importance to give attention to the fitting or non-fitting of our overall world views in the broader reality within which we live” (Bohm, 1998: 88). Peat expresses a similar perspective:

‘Truth’ does not mean something absolute (this truth is *the* truth) or relative (you have your truth and I have mine). Truth [is] something lived in the moment and expressive of an individual’s connection to the whole... and responding authentically to the present.” (Briggs and Peat, 1999: 20-21)

Madison also writes similarly, extending the context of a situated truth from the individual to the nation-state:⁴⁴

It is the same for nations as it is for persons... They are in the truth when, in their ongoing self-transformations they are able to incorporate in their even sometimes revolutionary projects their own specific traditions or personal histories. They are in the untruth, are inauthentic, when they are unable to do so... We are in the truth when we are able to overcome the distortions, systematic or otherwise, that constantly menace our conversations, the ones we pursue with our own selves as well as those we pursue with others, when we can maintain the openness of the conversation and keep it going. For what we most truly are in our own most inner self is a conversation. (Madison, 1988: 169)

The inference I take from these perspectives is that the need to check whether our assumptions ‘fit’ is not only for the purpose of being explicit or for “appropriately situating” our conversation; rather, it is for the purpose of remaining open to *changing* our assumptions as needed. Bohm speaks to this specifically, stating that the function of considering world views as insights is that “*our world views have thus to be able to alter*

⁴⁴ Both Madison and Peat saw similarities between this kind of collective breakdown and the psychological breakdown of the individual. Madison refers here to general psychoanalysis. Peat writes of the implications for Jungian psychoanalysis at the level of society (Peat, 1987).

radically if this is called for by what we learn and by what we observe” (Bohm, 1998: 72).

From this perspective, to alter a world view is also to alter reality, which is an idea that Bohm suggests has critical implications for understanding psychological and social change. “The notion of generalized soma-significance,” he writes, “implies that each thing is its total meaning (which, of course, must ultimately include all of its relevant context)” (Bohm, 1994). If meaning (or relevance) is itself a key part of reality

...then whenever society, the individual, and their relationships are seen to mean something different from what they did before, a fundamental change has already taken place.... The content of will and the framework of perceived possibilities within which choice takes place, along with the restriction to the one of these actually chosen, will themselves grow out of the meaning of the total situation that confronts us at any given moment. Or to put it differently, what man does is an inevitable signa-somatic consequence of what the whole of his experience, inward and outward, means to him. (Bohm, 1994)

The capacity to consider an underlying wholeness, then, would involve engaging in the process of checking *and changing* our interpretations, and to do so in a way that would bring attention back to our epistemological and ontological stance. To attempt to engage in that process—and to help others to do so—would perhaps be a useful complement to other work done in the name of development. In this capacity, Kidder emphasizes the importance of hermeneutic inquiry, and he proposes that to pursue “the philosophical exploration of hermeneutic as a fundamental methodological and ontological reality” (Kidder, 1997: 1200) would have a substantial impact on social and economic development.⁴⁵

⁴⁵ Unlike Kidder (1997), most of the published material linking *hermeneutics* to *development* discusses either the application of hermeneutical methods as an aid to understanding patients within the fields of nursing and psychology (i.e., Fleming et al. (2003) and Giannoni (2004)), or the application of those

What would this “checking” involve? Bernstein suggests that it is a process by which any “means that allow it to arrive at an end be *weighed anew* on each occasion... for the end itself is only concretely specified in deliberating about the means appropriate to a particular situation” (emphasis added; Bernstein, 1983: 148).⁴⁶ Kidder writes that this process is a particular feature of hermeneutical inquiry, in which

...the crucial thing is that one avoid allowing the starting point to control the inquiry. False assumptions can be excellent inroads to genuine understanding, but only if one is open, in the course of interpreting, to the clues that reveal the inadequacy of those assumptions and point the way to needed revisions. Thus hermeneutic properly manifests a circular or cyclic pattern in its unfolding: the progress of the inquiry returns one to the beginning, and the new beginning sets a new course of progress; the interpretation of parts yields a conception of the whole, but that conception brings new meaning to the parts, whose re-interpretation may again require reconception of the whole, and so on, in a circle that would be merely vicious were it not propelled by concrete and cumulative acts of genuine understanding (Dilthey, 1990; Schleiermacher, 1819). (emphasis added; Kidder, 1997: 1194-1195).

methods to the area of qualitative research in general (as in Feyerabend’s example of understanding another culture). To be consistent with Bohm and Peat’s emphasis on understanding as explicitly *more than* methodology, I continued to search for material that would emphasize hermeneutics as an expression of that perspective. I found such a source in the article written by Paul Kidder (1997). Kidder studied under Gadamer in the 1980s (personal correspondence) and is currently Associate Professor and Chair of the Department of Philosophy at Seattle University in Washington.

⁴⁶ The chaos theory metaphor of *sensitivity to initial conditions* can be seen to play a role in Kidder’s concept of “weighing anew” and “avoiding allowing the starting point to control the inquiry.” Briggs and Peat suggest that one attribute of nonlinear systems is a potential *sensitivity to subtle forces*. From Bohm’s quantum theory perspective, these subtle forces include the placement of our conceptual boundaries. When I arrived in Paris, I thought that *all* nonlinear systems were susceptible to subtle influences; and it has been an important part of my education on chaos theory to understand that this is not always the case. Nonlinear systems, Peat suggests, *may be* “so sensitive and so complex that their future cannot be predicted and that the implications of any outcome, or corrective action applied to them, may be totally unexpected” (Peat, n.d.b). This potential depends on the system’s sensitivity to what are called *initial conditions*, such that “the notion that a butterfly stirring the air today in Peking can transform storm systems next month in New York” (Gleick, 1988: 8).

I think Bohm and Peat would agree, and that they would extend Kidder's suggestion to "avoid allowing the starting point to control the inquiry" to *all* types of assumptions, including ontological.⁴⁷

As described in the previous chapter, Bohm and Peat suggest that all of the concepts that would be checked in this process are abstractions from an underlying wholeness. This draws attention to the process of reification.⁴⁸ In *Against Method*, Feyerabend (1975) shares his experience with this process. He writes that one of his motives for writing the book was to

...free people from the tyranny of philosophical obfuscators and abstract concepts such as 'truth,' 'reality,' or 'objectivity,' which narrow people's vision and ways of being in the world. Formulating what I thought were my own attitude and convictions, I unfortunately ended up by introducing concepts of similar rigidity, such as 'democracy,' 'tradition,' or 'relative truth.' Now that I am aware of it, I wonder how it happened. The urge to explain one's own ideas, not simply, not in a story, but by means of a 'systematic account,' is powerful indeed. (Feyerabend, 1975: 179-180)

From the perspective of Bohm's rheomode or Gadamer's concept of play, I would suggest that reification is an inevitable "side-effect" of the process of abstraction. An equally inevitable "side-effect" would be the assessment of value (i.e., an interpretation or assignment of meaning) to any concept.⁴⁹ It follows that equally inevitable is the work

⁴⁷ At Pari, Peat described Gentle Action in similar terms and also agreed with my suggestion that such a continual assessment of means and ends might be metaphorically referred to as "repeated initial action."

⁴⁸ Defined by Merriam Webster (<http://www.merriam-webster.com>) as to "regard (something abstract) as a material or concrete thing."

⁴⁹ Aravamudan lists a number of dualistic concepts (for example, man and woman; work and play; truth and rhetoric; and reason and imagination) and suggests that "Western philosophy has systematically attempted to characterize the [first idea in each pair] as inferior to, or derivative from, and secondary to, the [second]" (Aravamudan, 1989: 240). The source is the chapter of a book, and I originally came across its title online. Aravamudan was kind enough to send me a copy and I was interested to see that it was published in a book edited by Paavo Pylkkänen, and that additional chapters had been written by Bohm and Peat.

of developmentalists and others who seek to to shift the balance, or minimize the conflict, between concepts-as-things.⁵⁰

As described in the previous chapter, Bohm and Peat's perspectives suggest that to limit one's attention to abstractions is to preclude the capacity to consider an ontologically constitutive relationship among reality, knowledge, and process. Bohm and Peat are suggesting, I think, that to treat even subjective and non-economic indicators as "things" is of situated—or limited—appropriateness.⁵¹ From this perspective, I think that Roy is referring to this limitation when he suggests that the recent emphasis in the field of development to build the capacity of civil society at the expense of the state "is problematic and conceptually faulty [since] civil society cannot be de-linked either from the state or from the market" (Roy, 2003: 86). From Bohm's perspective, the exclusive emphasis on any content of thought—whether that content takes the form of civil society or nation, individual or community, man or nature, etc.—would be the source of this "conceptual fault."

⁵⁰ For a seminal discussion on the effects of hierarchy within the field of international development, see Chambers (1983). For an interesting thesis on hierarchy within social structures, see Fuller (2003).

⁵¹ An example of what I interpret to be a 'reified' approach to meaning can be found in an article written by economist Peter Boettke for the USAID Forum Series. The goal of this series was to "help USAID make its donor assistance more effective and sustainable by incorporating insights from the New Institutional Economics into USAID's programming and delivery of development assistance" (Boettke, 2003: ii). Boettke suggests that the USAID should focus its efforts on the culture, values, and religions that "form the underlying framework of the social order" in the countries in which it is active (Boettke, 2003: 33). He suggests that whether "institutions that are successful in one country [can] be exported and imposed in other countries in the hopes that the results will be the same [is] the question that underlies the entire endeavor of economic development" (ibid.). Boettke defines this as a "cultural problem" in that while "we may know what institutions are necessary for growth (i.e., capitalist institutions), we are still unable to impose them" (Boettke, 2003: 34). He suggests that economists engaged in the "development aid project... should dispose of any plans of imposing institutions on countries [and focus instead] on policies that will result in changing the underlying cultural norms and conventions with respect to markets" (Boettke, 2003: 35-36). Only by dovetailing "culture, which cannot be imposed, and economic logic," he suggests, will a society meet its full potential. Boettke further suggests that "the engineering mentality" should be replaced with an attention to cultivating institutional conditions in this way.

To concern ourselves exclusively with reified concepts, Briggs and Peat (1999: 8-9) suggest, is to allow “our categories [to] dominate us to the point where we ignore the finer, uncategorizable inner nature of human situations.” How can the development paradigm make room for the uncategorizable? What steps could we take to draw attention to the process by which concepts are abstracted (reified)? Perhaps we can draw attention to ways in which concepts are bound to other concepts (rather than to the process of conceptualization). This might happen, for example, by labeling a theory as “alternative” thereby binding it to a “non-alternative” counterpart, or as postmodern (or post-postmodern and some day, post³modernity, post⁴modernity) thereby binding it to the concept of modernity. And perhaps the concepts explored in this paper—wholeness, understanding-as-interpretation-and-application, Dialogue, Gentle Action, hermeneutics—might draw attention to the uncategorizable often left implicit in discussions about development.

Selected interpretations

The sections that follow draw attention to a few areas of interest to developmentalists, and suggest that Bohm and Peat’s perspectives might bring something of value to each.

Modernization. Escobar (1995) suggests that the organizing premise for the discourse of development was to establish a role for modernization as the only way of escape from archaic superstitions and beliefs. Latour (1999) suggests that the “mixing up” of objectivity and subjectivity—such as is done in Nepali and, I would guess, other

Sanskrit-based languages—has been inextricably linked to what he calls the “myth of progress”: that to separate objectivity and subjectivity is a hallmark of civilized life. This has interesting implications, I think, for a reinterpretation of the situated, or limited, appropriateness of the concept of “modernization.” Would “moving beyond” a dichotomy between objectivity and subjectivity change our perspective on the hierarchical relationship of “modern” and “pre-modern” world views?⁵²

This question has relevance for me even in the context of this research project. I had a dream while I was in Pari that was just as important a source of “data” as any of the published documents cited throughout this paper.⁵³ But I have struggled with whether to reference it explicitly for the very reason Latour addresses: to my way of thinking, it is a “less professional” (he would say, less modern) expression vis-à-vis my other sources. If I cannot assign value to a source of this kind, then how can I approach as an equal those who would? And, if I cannot do that, what right do I have to participate in any process in the name of “development?”

Sustainability. The notion of situated ontological assumptions invites a re-interpretation of the concept of sustainable development. Streeten (in Goulet, 2000: 6) suggests six

⁵² Beck lays out an interesting argument for a reflexive assessment of modernization that—in the language of chaos theory—draws from the nonlinear relationship among people, nation-states, and environment. The first of these is the “globalization of side-effects” such as nuclear proliferation/control and ecological matter. Second are “circular, cumulative and boomerang effects” (Beck, 1997: 31) that call the assumption of externalizability into question. Third is the effect of people’s consciousness, orientations, and conflicts on their natural and organizational environment. And fourth is that the “side-effect” itself (and not instrumental rationality) is the “motor of social history” (Beck, 1997: 32).

⁵³ In the dream, I was carrying a number of people across a large field. They were easy to carry and I felt glad to be with them. Each body was straight and stiff and encased in a layer of clear, wet ice. Only the faces were uncovered, and as I carried each body I kissed their closed, fluttering eyes. I wrote about this in my journal and talked about it with Peat and Smith. Both are interested in dream interpretation; and Peat is

different meanings for this term. These include the rate of asset maintenance, replacement, and growth; maintenance of environmental conditions; a “system’s” resilience; debt-reduction for future generations; the capacity to implement fiscal, administrative, and political policy; and, in the realm of international development projects, the transfer of management responsibility from foreign experts to local citizens.

Bohm and Peat’s perspective, I believe, would be closest to that of resilience, although the resilience would be anything but static. Any abstractions made relevant during the process of checking one’s assumptions, Bohm writes,

... is to be understood not as something independently and permanently existent but rather as a product that has been formed in the whole flowing movement and that will ultimately dissolve back into this movement.
(Bohm 1980: 16-17)

I think Latour is referring to this metaphorically when he writes about the dualistic concepts of object and subject: “The object is there to protect the subject from drifting into inhumanity; the subject is there to protect the object from drifting into inhumanity” (Latour, 1999: 294).

Program design and evaluation. From Bohm and Peat’s perspective, as well as from the perspective of the episystemic and vortical postmodern ethnographic perspectives described earlier in this paper, the following observations can be made:

- Every research project is as much about the researcher as about the researched.
- Every development theory or practice is as much about the developer as the developed.

especially interested in Jung and Pauli’s interpretation of dreams—as sources of knowledge stored in a collective subconscious.

- Every project is as much about the project designer as the project beneficiary.

To include the researcher in the research project, or to include the “developed” in the development project, is to be explicit and consistent with this perspective.

The role of “weighing anew” for the purpose of changing the means and ends of a project, where appropriate, also has interesting implications for project evaluation.

Kidder (1997: 1199) suggests that “in the course of implementing a project the goals as well as the means can change. The project might even, under certain circumstances, be judged a success even though none of its original goals were achieved.”

Cross-cultural understanding. Political scientist Fred Dallmayr suggests that hermeneutic inquiry would play a valuable role with regard to cross-cultural encounters.⁵⁴ Our interaction with other cultures, he suggests, only provides an opportunity for understanding when it is approached

...through a mode of interaction [that] presupposes the encounter of *situated, but not absolutized*, differences where...a concrete mode of ‘being-in-the-world’ opens itself up to the challenge of otherness in a manner yielding a deeper, transformative understanding of self and other. (emphasis added; Dallmayr 1996: 7)

On the topic of cross-cultural understanding, Kidder (1997: 1191) proposes hermeneutic inquiry as a complement to critical dialectic⁵⁵ and critique: “The

⁵⁴ I thank Paul Kidder for alerting me to Dallmayr’s work.

⁵⁵ Kidder describes dialectic as a Socratic characteristic of philosophical discourse, as one that aims to “provoke inquirers towards an organic change of mind through the examination of opposing arguments with the sole purpose of determining which is more reasonable or more true” (emphasis added, Kidder, 1997: 1191). In the context of Socratic dialectic, he suggests that “this sort of reasoning process, then, has everything to do with persuasion, but it is... a matter of... allowing the power of argument to sway oneself along with the others” (Kidder, 1997: 1197).

contemporary exploration of hermeneutic and dialectic [holds] the potential for multicultural understanding without abandoning the option of cultural critique.” Martha Nussbaum makes a similar suggestion within the context of international relations. Echoing Pylkkänen’s description of Bohm’s dialectic between determinism and indeterminism, she writes:

The obstacles to understanding a sister may in some instances be greater than those to understanding a stranger. At least they are different. All we can do is trust our imaginations, and then criticize them (listening if possible to the critical voices of those we are trying to understand), and then trust them again. Perhaps out of this dialectic between criticism and trust something like understanding may eventually grow. At least the product will very likely be better than the obtuseness that so generally reigns in international relations. (Nussbaum, 2003: 26)

Bernstein emphasizes this as well, quoting Gadamer’s claim that understanding cultures in and through dialogue, questioning, and conversation leads to a “more sensitive and critical understanding of our own culture [and a] practical wisdom that is characteristic of the ongoing interpretation of our own tradition” (Bernstein, 1983: 36).

My limited experience with the Nepali language indicates that there might be a specific advantage to exploring similarities between the world views of Sanskrit-based cultures and the world view expressed by the concepts of Bohm’s Dialogue, Peat’s Gentle Action, and Gadamer’s play.⁵⁶ Notwithstanding the situated (limited) appropriateness of *any* concept, perhaps the appropriateness of any *development*

⁵⁶ I remember the first time I became aware that English and Nepali expressed different relationships among subject, object, and verb. Having just added the verb “to think” to my vocabulary, I said in Nepali, “I think, therefore I am!” My tutor corrected me, saying that this statement made no sense in Nepali. In that language, one cannot express the concept of “thinking” without “thinking something” and one cannot express the concept of “being” without “being something” (this turns out to be true of all Nepali verbs). In

concept—no matter how well-intentioned—that does not explicitly make room for the ontological assumptions presented in the previous chapter would be especially limited for those cultures that assign explicit value to the inseparable nature of what, to others, might appear as exclusively distinct.

Bohm's terms, the process of thinking cannot be expressed in Nepali without simultaneously expressing the content (or context) of that thinking.

EPILOGUE

As described in the Prologue, the paths of inquiry presented in the previous chapters were motivated by two personal experiences. It seems fitting at this stage to revisit them.

Did the research indicate a place, in the field of development, for the “capacity for change” represented by the physical experience I had with my back? I think so. If that resolution began with the recognition of a paradox (for example, simultaneously “knowing” I was healed *and* “waiting” for that healing), then a concept of development that makes relevant the paradoxical nature of our social and political context should bring us closer to resolving those kinds of difficulties.

The second motivation was my desire to contribute to the work being done in the name of international development. I do feel better prepared to enter this field as a result of conducting this research. While the emphasis within Bohm and Peat’s work on ontology and epistemology led me farther from an inquiry into *practices* than I expected, I no longer equate that to being led away from *practical implications*.

And, I’ll take from this experience a stronger confidence in offering tentative answers to my own questions. This will not be because those answers may be “more right;” rather, I have become more comfortable with the process by which answers are transformed into new questions. To me, the ideas discussed in this paper will be of most value if they contribute to that process.

APPENDIX 1: AUTOBIOGRAPHICAL SUMMARIES

This Appendix includes two essays that I prepared for graduate school and a language fellowship. Together, they provide autobiographical information that I believe has an important impact on this research project's design and direction.

Graduate program application statement of purpose, January 2002

Thank you for the opportunity to provide this Statement of Purpose outlining my academic and career goals, my reasons for seeking a degree from the Department of Resource Development, and the contribution I will make to the Department as a graduate student.

The experience of traveling independently through South Asia three years ago left me with a strong desire to contribute to its development. My career goal is to earn a position of responsibility and impact in a non-profit organization that contributes at a grassroots level to the development of South Asian communities. In that capacity I want to offer not only the skills I already possess, but also a specific knowledge base about that field: what is being done and why, program and policy successes and failures, and what is being planned for the future. The best way for me to jumpstart the learning process is with a master's degree program that will provide knowledge as well as research and analytical skills I will need to do my job well.

I was initially attracted to MSU because of its Center for the Advanced Study of International Development (CASID) and its specialization in International Development. In investigating the graduate programs that would lend themselves to this specialization, I met with faculty of the Departments of Anthropology, Political Science, Agriculture and Natural Resources, and Resource Development, as well as the Office of International Development, CASID, and the Asian Studies Center. I am convinced that the Department of Resource Development is the right place for me. Its approach to resources makes room for tangible and intangible assets—from a people's culture and belief system to property rights and economic standing. This mirrors my interest in building as complete an understanding of the field as possible. The Department reinforces that inclusiveness by offering the flexibility I need to incorporate my areas of interest into a single graduate program. Within one master's, I can study the disciplines which fascinate me—the anthropology of South Asia, non-profit management—as well as how they interconnect and impact each other. And I will learn from the required courses how to assess that impact and understand the political, organizational, and economic context in which this all takes place.

As a graduate student, I look forward to making a meaningful contribution to the Department. I bring strong problem-solving and communication skills, as well as a love and respect for diverse cultures and an appreciation for the complexity of the issues involved in the field of international development. Additionally, I bring an intentional optimism about the international community's ability to meet the challenges it faces. My

participation will be positive and forward-thinking, and will reflect my belief that the goal of balanced and sustainable development can be reached.

Foreign Language Advanced Study Fellowship statement, February 2002

My interest in international development began well after college; however, foreign cultures and languages have fascinated me since I was young. I collected pen pals from Egypt and Belgium, started Spanish classes as early as possible, and took on French as well after an exchange program mistakenly arranged for me to spend a summer in France instead of Spain as planned (it turned out to be a fortunate mistake, and I am now also fluent in French and have enjoyed returning to France many times). The language study and exchange experiences focused my attention on Europe through college. I earned a bachelor's in Political Science (International Theory) from the State University of New York (Albany) in 1988. I married and settled in Central New York and, because of the lack of international activity there, turned my attention to my second interest—small business management. I spent nine years learning as much as I could, and in time assumed responsibility for managing a rapidly growing financial services company. As I became proficient in the art of doing business, and less distracted by the challenge of it, it felt less and less satisfying. I turned thirty and became increasingly frustrated that my life did not reflect my passion for different cultures, and that it did not fulfill any wider purpose than creating a source of income for my company's staff and shareholders. I started looking for a catalyst that would propel me off of my current track and onto one that would include the international focus that I missed.

It was in this environment that my husband decided to look for new employment, and I jumped at the chance to convince him that we should take a sabbatical that would include overseas travel. We quickly committed to the idea, and I spent four months planning what would become a yearlong backpacking trip through Costa Rica, Southeast and South Central Asia, Egypt, Israel, and Europe. During the trip, my interest in the issues of international development took hold.

In Costa Rica, I received an introduction to grassroots environmental protection. We volunteered for a small biological reserve that protects a watershed region outside San Isidro. I was struck by how far a modest (by U.S. standards) investment could go there, by how dedicated the Board of Directors was to the goal of acquiring land to protect the watershed, and by how difficult it was for the reserve to raise the funds it needed. We continued on to Southeast and South Central Asia, and as we moved through the region I had a close view of what the people there are struggling with. We were forced out of Jakarta by rioting; saw vacant real estate developments in Malaysia that stretched on for miles; met the brother of a political prisoner in Burma; and were approached again and again by the hawkers and street children of Kathmandu and northern India. I also saw a truly fascinating and diverse people, and especially in Burma and Nepal was greatly impressed with their tenacity and kindness. Our travels continued until we spent a final month in Western Europe. For the first time, Europe seemed small and self-important, and I resented its history of exploitation.

Returning home, it took the better part of a year to process the experience of the trip and to catch up with the changes I had undergone as a result. It's one thing to ask for a shift in priorities and a renewed sense of purpose, and another thing altogether to go through the transformation they demand. At times it was overwhelming to sense the sheer volume of people on the planet; to feel more strongly than ever a compassion for and responsibility to this population; and to feel for the first time that it is not only possible but necessary for me to join the effort to improve its condition. The internal work I have done since returning home, in addition to crystallizing my intent to work on development issues, has also brought a shift in my political thinking and a new gratitude for my U.S. citizenship, and for this country's resources and stability.

As I responded to these changes, I felt an increasing sense of urgency to get involved with South Asia in general and Nepal in particular. I am drawn to that area by its people, its culture, its languages, its physical beauty, and by the political and economic challenges it faces. I have a specific memory from my time in Nepal that also pulls me to get prepared and get involved. I was hiking outside Pokhara when a boy called us off the path to buy fruit. We sat in his grandparents' yard, eating pineapple while he answered our questions and called to other hikers. His face was pinched and serious, and he seemed weighed down and angered by the responsibility of earning money for his grandparents. He seemed very intelligent and his English was good and I thought that if his family could afford to send him to school he would do well there, but there was probably little chance that he would do anything but sell pineapple to hikers while his grandparents needed his help.

I had similar experiences in other countries, but it is the affection I feel for Nepal and its people that draws me to want to apply my efforts there. I should also stress my understanding that the challenges facing Nepal's economic development and political stability are complex and require broad thinking and long-term effort. In that environment, I want to become a key contributor to a nonprofit organization that works at a grassroots level in Nepal, in an area that improves education and/or economic development in rural communities. I expect to work for one of the smaller NPO's because that is where I have experience, but it is possible that, as I learn more about what is being done in the area and by whom, I will join forces with a large organization.

First, though, I want to develop a context and the appropriate skills for my work. I have applied to the master's program at MSU's Department of Resource Development in order to gain a knowledge base in international development policy, economics, organizational issues, and research processes, and to develop the requisite methodological and analytical skills. I will also draw from other departments to study the anthropology of South Asia and international non-profit management. The fact that this master's program includes a research requirement is particularly important to me, and I look forward to the process of linking the knowledge base of a particular issue affecting the development of rural Nepal with the professional practice of an NGO active in that area.

In addition to this education, I will bring to the field a wide range of non-academic skills including organizational, management, and cross-cultural communication. I will also bring a strong belief that the benefits of international development are not zero-sum—there are sufficient resources to meet any need, and they can be developed and allocated in a manner which benefits everyone involved—and that the presence of

nonphysical resources such as motivation, empowerment, and spirit are as critical to success in this field as that of resources that are more easily quantified.

I am fluent in French and Spanish, and while traveling I quickly picked up working vocabularies in Bahasa Indonesia, Thai, Burmese, and Nepali. I am greatly looking forward to bringing a fluency in Nepali to my work. Just the act of learning the language will teach me a great deal about Nepalese culture. It will also allow me to speak directly and authentically with the people of the rural communities I wish to impact. And most importantly, my fluency will demonstrate the respect I have for the Nepalese. It is a compliment that I want to give in exchange for the permission to work closely with them.

I am thrilled by the prospect of developing skills in the field of international development, and working closely with the Nepalese in their own language to make tangible improvements for Nepal and its people. Thank you for the opportunity to outline these goals, and for considering my application for a FLAS Fellowship for the 2002-2003 Academic Year.

APPENDIX 2: A RELEVANT PHYSICAL EXPERIENCE

Several years ago, I herniated two disks in my lower back and was flat on my back (except for daily visits to physical therapy) for the next six weeks. One morning, the therapists shared with me that they thought it would be six months to a year before I'd be moving around normally. As I left their office, I decided to set aside the doctor's message and see whether I could apply what I'd been taught in church to this situation. As a Christian Scientist, I had been taught that man was created by God; that God is only good; and that man is a reflection of his Creator.⁵⁷ By the end of the day, I felt I had accepted this as my truth and was waiting for the pain to go away.

I was starting to wonder why my back wasn't feeling any better when it suddenly dawned on me that if I really *had* accepted that message, then my back would *already* be better. If that was the case, my role was not to wait for a change but rather to recognize that the change had already taken place. At that moment, the pain in my back was gone. I went to the therapists' office the next morning to jump around the office and show them all was well, and that weekend drove two hours to play volleyball for the weekend with friends. That moment of realization was the end of the herniated disks.

⁵⁷ For information on Christian Science, see Eddy (2000).

APPENDIX 3: PARI CENTER COURSE DESCRIPTION

New Science/New Paradigm
July 6-12, 2004
Pari Center for New Learning
Pari, Italy

Schedule: Reflects input from Peat, Jill Bingham, and me. Lectures are by Peat, unless otherwise noted.

Thursday	Morning	History of Physics: Ancient Times through Einstein
	Afternoon	History of Physics: Einstein through Superstring Theory
Friday	Morning	Quantum Theory
Friday	Afternoon	David Bohm & “Creative Change” (Egger)
Saturday	Morning	“Beyond Conceptuality” (Smith)
Saturday	Afternoon	“Grounded observation” (resident artist)
Sunday	Morning	Ethics
Sunday	Afternoon	Synchronicity
Monday	Morning	Wolfgang Pauli; Art & Science

Course description: The following text and list of topics are taken directly from <http://www.paricenter.com>. Topics in italics were actually discussed during the course.

“This week-long workshop will range over many of the issues discussed in David Peat's books, essays, and on his web site. The aim is to explore the various ways in which the new paradigms and the new stories that are being told by science have an impact on our lives, society and values. Are we beginning to see the world in new ways? Is a new thinking emerging? How are the visions of the artist and the scientist related? Are we moving towards a new integration of knowledge? How is this changing the way we think about ourselves and our society? The course will proceed via a combination of lectures and discussions. When scientific ideas are involved these will be explained and explored in a non-technical way. This course is therefore suitable for laypeople and anyone interested in the history and evolution of ideas. It has been given each year since 2001 and has seen many stimulating and productive discussions. The course will be far ranging and will draw on some of the topics listed below - the actual choice made will reflect the particular interests of participants. In light of the range of ideas to be covered, the workshop will proceed in a gentle way. In addition to lecture periods with time for questions, there will be group discussions and one-on-one sessions when participants have a chance to discuss, in depth, issues of particular interest to them.

“Note: Absorbing and discussing new ideas can be exhausting. The fourth day of course will be an open day for those who wish to do a little sight-seeing. Participants may also wish to engage in some art work or creative writing during the course.”

Paradigm Shifts

Changes in European society and consciousness from the Early Middle Ages to the present day.
13th Century - new ways to represent the world
Renaissance and the Rise of Science
Newtonian world view and the Rise of Mechanism
Revolutions in the Twentieth Century

Perception and the Mind

Theories as ways of perceiving the world
How objective is science?
Can science embrace values and qualities?
Visual Perception: the eye and brain
Context dependence in perception
Whitehead and the way the mind "sees" and understands the world.
Jung's Rational Functions
What is "understanding"?

Quantum Theory

The stories of Planck, Bohr, Pauli and Heisenberg
Heisenberg's Uncertainty Principle: what does it mean?
The Observer is the Observed: undivided wholeness
Schrödinger's Cat Paradox: The collapse of the wave function
Chance in Quantum Theory
The Copenhagen Interpretation
Einstein-Bohr debates
Is the quantum world a "veiled reality" or is there no reality?
What are the limits to what can be said
EPR Paradox, Bell's Theorem and Non-locality
Crisis between Relativity and Quantum Theory
Symmetry Breaking
Theories of Everything: Superstrings and Twistors
Pre-space
A New Order in Physics?

David Bohm's Contributions

The Plasma State
The Implicate Order
The Quantum Potential, Active Information and proto-mind
Dialogue
The Role of Language and the Rheomode

Relativity

The Special Theory (1905)
Space-time
The General Theory(1915)
Bending of light and a curved universe
The Twin paradox
The Big Bang and the history of the universe
Black Holes
Missing Mass of the Universe

Language

How does language relate to the world?
Fauconnier's "mental spaces"
Linguistic approaches of Kourzybski, Russell and Wittgenstein.
"We are suspended in language" (Bohr)
Bohm and the Rheomode
The relationship between language and world view (Whorf-Sapir Hypothesis)
The Blackfoot world and their language

Alternative World Views

European consciousness in the early Middle Ages
The world of the Blackfoot and Iroquois
To what extent does science present us with facts about the world and to what extent is it a story created by our society?

Creativity

What is the nature of creativity in nature and mind?
Creativity as: "making it new", "acts of renewal", "making it whole"
Creativity and embodiment
Dionysus and Apollo in the act of creation
Alchemical Cycles in the body
The role of beauty in physics and art

Chaos Theory

The basic ideas of chaos theory and their applications in society, organizations and everyday life
Self-organization and Open systems
Limit cycles, Strange Attractors and Fractals
Chaos as infinite order
Limits to description, prediction and control

Society

What can the study of natural systems teach us about ethical behaviour?
Can the lessons of the new sciences lead us towards a new Gentle Action?

Art and Science

General discussion of the scientific and artistic approaches and the possibilities for dialogue between them.

From Certainty to Uncertainty

Revolutions in twentieth century thought including. Postmodernism, Godel's Theorem, post-modern physics

Synchronicity: Jung and Pauli

Some basic ideas in Jung
The encounter of Jung and Pauli
The "Irrational in Nature"
Synchronicity
Matter and Psyche"

APPENDIX 4: BIOGRAPHICAL SUMMARIES OF PEAT AND BOHM

Originally from Great Britain, F. David Peat, Ph.D., was for many years a theoretical physicist with Canada's National Research Council. While at the Council, Peat's emphasis was on quantum theory and its links with the theory of relativity. Peat met Bohm while both were at Birkbeck College in the early 1970s during a time when Peat was on sabbatical.⁵⁸ Their collaborations continued for twenty years and included the co-authored publication of *Science, Order, and Creativity* (1987).

Peat is the author of over twenty books, including *Infinite Potential: The Life and Times of David Bohm* (1997); *The Blackwinged Night: Creativity in Nature and Mind* (2000); *Superstrings and the Search for the Theory of Everything* (1988); *Synchronicity: The Bridge Between Matter and Mind* (1987b); *From Certainty to Uncertainty* (2002), and co-author with John Briggs of *Seven Life Lessons of Chaos* (1999); and *Turbulent Mirror: An Illustrated Guide to Chaos Theory and the Science of Wholeness* (1989). He also published dozens of articles and written several plays and documentaries. He has had a lifelong interest in the arts, and has served as "Scientist in Residence" for a number of art colleges in England. In 1996, Peat moved to Pari, Italy, and founded the Pari Center for New Learning, where he hosts artists- and scientists-in-residence and organizes seminars on physics, psychology, religion, and economics.⁵⁹

David Bohm, Ph.D., is recognized for his work in quantum theory and philosophy. He spent many years at the University of California in Berkeley and at Princeton University before relocating to the University of Sao Paulo in Brazil in the late 1950s.⁶⁰ He eventually settled in England where he took a position as Professor of Theoretical Physics at Birkbeck College, University of London. Two influences on Bohm from this period are worth mentioning. The first is Bohm's collaboration with the Indian philosopher Krishnamurti. He was intrigued with Krishnamurti's suggestion that it was possible for a human being to have some kind of contact with the subquantum field that

⁵⁸ Peat overheard "an older man" (Bohm) ask a graduate student, "You say there is no absolute. Is that an absolute statement?" (Peat, 1997: 256)

⁵⁹ An autobiographical essay is available online at <http://www.f davidpeat.com/biography/biotext.htm>

⁶⁰ Following his studies at CalTech, Bohm worked with J. Robert Oppenheimer at the University of California in Berkeley. Bohm was eventually called to testify before the House Un-American Committee during the McCarthy hearings. He was unwilling to testify against Oppenheimer and others; and was arrested, and later acquitted, for contempt of Congress. Bohm did not know at the time that Oppenheimer had named him as "suspect" to Federal Agents. This hurt Bohm very deeply, as he had come to think of Oppenheimer as a father figure. With Oppenheimer's encouragement, Bohm decided to leave the United States. He accepted a position with the University of São Paulo in Brazil, where he published his initial quantum theory interpretation (Bohm, 1951).

I found it interesting to learn from Peat that the American Embassy confiscated Bohm's passport while he was in Brazil. U.S. citizenship was eventually restored to Bohm during Carter's presidency, and within months of receiving notice of its restoration, Bohm received a bill for back taxes. He never again lived in the United States. (Peat, 1997)

was the focus of Bohm's theories (Bohm, 1998).⁶¹ Bohm was also strongly influenced by his lengthy correspondence with the painter, Charles Biederman. As a result of their collaboration, Bohm became increasingly interested in the role of creativity and communication in the development of scientific theory.⁶² While at Birkbeck, Bohm wrote *Wholeness and the Implicate Order* (1980). He continued to develop his ideas—including soma-significance and a mathematical interpretation of the implicate order, among others—until his death in 1992 (Peat, 1997).

⁶¹ Three collections of their conversations have been published: Krishnamurti and Bohm (1985, 1986); and Krishnamurti (1996).

⁶² A collection of their correspondence was also published: (Pylkkänen, 1999).

APPENDIX 5: CHAOS AND QUANTUM THEORIES

Chaos theory presents a way to think about complex patterns of activity, in general, and about the unpredictability of ‘nonlinear systems,’ in particular.⁶³ *Nonlinearity* means that the relationships of elements within a ‘system’ are “not strictly proportional. Linear relationships can be captured with a straight line on a graph... [Relationships within and among] nonlinear systems generally cannot be [mathematically] solved and cannot be added together” (Gleick, 1988: 23-24). A very basic definition of *system* describes it as an “interacting or interdependent group of items forming a unified whole.” (<http://www.merriam-webster.com>) This definition is fairly straightforward where applied to “hard systems,” such as a collection of wires in an electrical component, but it’s a bit more tricky when applied to “soft systems,” which include social groups, or groups of ideas and where the elements of ‘group’ or ‘items’ are nonlinearly related. *System* in this paper will refer exclusively to “soft systems.”

Chaos theorists use the concept of positive and negative *feedback* to describe the ways in which (and the extent to which) a nonlinear system is affected by stimulus or input. Systems with a multiplicity of feedback loops, such as diverse sources of matter, energy, or information, tend to display great stability. Young describes the nonlinearity of social systems in terms of feedback loops as follows: “For human beings in social matrices, any number of feed-back loops displace the model of causality which mark formal theory construction in sociology... Anticipation of behavior B may invoke behavior A which... affects indeterminate probabilities of B” (Young, 1991).

Like chaos theory, quantum theory invites us to think differently about concepts that depend on classical mechanics for their definition. At the quantum level, as Bohm explains, “it has no meaning to say that a system passes through a continuous series of intermediate states, similar to initial and final states” (Bohm, 1980: 162). In 1935, Einstein, Podolsky, and Rosen demonstrated that “if you correlate two quantum particles and send them flying in opposite directions, whatever you do to one of them will be ‘felt’ by the other, which will react accordingly—even though the two are separated in space” (Briggs and Peat, 1989: 184). This is interpreted as a *nonlocal relationship* which, according to Bohm, “can best be described as a non-causal connection of elements that are far apart” (Bohm, 1980: 223). This is very different from classical laws of physics in which a thing moves continuously from one spatio-temporal coordinate to another.

⁶³ The theory evolved from the work of Edward Lorenz, a mathematician and meteorologist who was looking for explanations for the unpredictability of weather. Lorenz’ experiments demonstrated that the behavior of any unstable or unperiodic system (in other words, a system that does not exhibit regular fluctuations, like the movement of a pendulum) cannot be predicted. Lorenz was working in a period of rapid advancements in computer technology (the early 1960s), and he was able to generate complex graphic representations of this behavior. According to Gleick, these showed “a kind of infinite complexity [that] stayed within certain bounds, never running off the page but never repeating itself” (Gleick, 1988: 30). Lorenz eventually looked beyond weather patterns for simpler ways to produce this behavior. According to Gleick, he found that he could do so with a system of only three equations *if* those equations had a nonlinear relationship to each other.

Also at the quantum level, “under different experimental conditions, matter behaves more like a wave or more like a particle, but always, in certain ways, like both together” (Bohm, 1980: 163). Quantum-level experiments indicate that it is the “environmental context within which [the entities] exist and are subject to observation” (Bohm, 1980: 223) that determine whether one or the other quality is shown. Bohm suggests that the qualities of “wavelike” or “particlelike” do not refer directly to “the *actual* properties of an individual object, event, or process” (Bohm, 1980: 163). Rather, they are descriptions of the “*potentialities* within the physical situation” (ibid.).

Peat explains that Bohm and Hiley’s reformulation of conventional quantum theory involved writing the equations in such a way that they contained two terms: a conventional classical potential, and a new term they called the “quantum potential” (Peat, personal communication). The classical world view, Bohm and Hiley suggest, “arises wherever the quantum potential can be neglected so that the classical world can be treated on its own as if it were independently existent” (Bohm and Hiley, 1993: 177). Similarly, the quantum world view arises when the quantum potential cannot be neglected. The sub-quantum or quantum potential, which Bohm “added” to quantum theory, was the *determining* (“absolutizing”) factor responsible for “ontologizing some aspect of the physical reality” (Kafatos and Nadeau, 1990: 178). For Peat, the quantum potential is that which introduces nonlinearity into the quantum theory (Briggs and Peat, 1989).

For his part, Bohm did not explicitly recognize the ontological nature of his work until the 1980s, when he and Hiley came to “agree that what they were dealing with was an ontological interpretation of quantum events” (Peat, 1997: 268). He had already changed the original name of his theory (*hidden variables*) to *causal interpretation* and, in the mid-1980s, he and Hiley changed it a second time to *ontological interpretation*. According to Peat, Bohm “liked the neutrality of the word *ontological*, for it had no previous associations within the physics community” (ibid.). That says something to me about the prevalence of “unexamined assumptions” within the field of physics!

Bohm did not fully develop a mathematical expression of the quantum potential, however, and he knew that his interpretation would not be taken seriously by the physics community without it. Even so, he believed that he had “carried the theory far enough to show that we can explain the essential features of the quantum mechanics in terms of a sub-quantum-mechanical level [such as the quantum potential]” (Bohm, 1980: 139). Also, while Bohm and Hiley’s view remains controversial, they emphasize that it gives identical results to that of conventional quantum theory.

Explorations of chaos theory and quantum theory are influencing discussions in the fields of cognitive science, computer science, philosophy, organizations, metaphysics, religious studies, and qualitative research. Peat suggests that many social concepts, such as public policy, assume that “it is possible to focus upon a well defined system. This implies that the system can be conceptually isolated from its surroundings... Moreover it must be possible to separate the internal behavior of the system from external fluctuations... When we enter the non-linear domain we discover that many of these assumptions are no longer valid” (Peat, n.d.a).

In the 1980s, while working with quantum theory, chaos theory, and systems theory, Peat developed serious reservations about the use of any linear model for addressing difficulties of a social, economic, or political nature. As he put it during the Pari lecture, finding and isolating a “faulty bit” in these areas could not be an appropriate strategy. “Chaos theory teaches us that we are always a part of the problem,” he writes with Briggs,

and that particular tensions and dislocations always unfold from the entire system rather than from some defective ‘part.’ Envisioning an issue as a purely mechanical problem to be solved may bring temporary relief of symptoms, but chaos suggests that in the long run it could be more effective to look at the overall context in which a particular problem manifests itself. (Briggs and Peat, 1999: 160-161)

BIBLIOGRAPHY

- Aravamudan, Srinivas (1989). "Deconstruction, Soma-significance and the Implicate Order: Or, Can David Bohm and Jacques Derrida Have a Dialogue?" In Paavo Pylkkänen (ed.), *The Search for Meaning*. London, UK: The Aquarian Press.
- Bateson, Gregory and Mary Catherine Bateson (1987). *Angels fear: towards an epistemology of the sacred*. New York, NY: Macmillan.
- Bawden, Richard (1991). "Keynote Address: Systems Thinking and Practice in Agriculture. 85th Annual Meeting, American Dairy Science Association, Raleigh, NC, June 1990." *Journal of Dairy Science* 74: 2362-2373.
- Beasley, Chris (1999). *What is Feminism?: An Introduction to Feminist Theory*. London: Sage Publications.
- Beck, Ulrich (1997). *The Reinvention of Politics: Rethinking Modernity in the Global Social Order*. Malden, MA: Blackwell Publishers, Inc.
- Bernstein, Richard J. (1983). *Beyond objectivism and relativism: science, hermeneutics, and praxis*. Philadelphia, PA: University of Pennsylvania Press.
- Boettke, Peter J. (2003). "The New Comparative Political Economy." Prepared for USAID Forum 6: Session on Comparative Political Economy, April 4, 2003, Washington DC. Accessed on February 20, 2005 at http://www.usaid.gov/our_work/economic_growth_and_trade/eg/forum_series/f6-session1-full-boettke.pdf.
- Bohm, David (1998). *On Creativity*. Edited by Lee Nichol. London, UK: Routledge.
- Bohm, David (1996). *On Dialogue*. Edited by Lee Nichol. London, UK: Routledge.
- Bohm, David (1994). "Soma-Significance: A New Notion of the Relationship Between the Physical and the Mental." Accessed December 2003 at <http://goertzel.org/dynapsyc/1995/bohm.html>.
- Bohm, David (1980). *Wholeness and the implicate order*. Boston, MA: Routledge
- Bohm, David (1951). *Quantum theory*. New York, NY: Prentice-Hall.
- Bohm, David and Mark Edwards (1991). *Changing consciousness: exploring the hidden source of the social, political, and environmental crises facing our world*. San Francisco, CA: Harper San Francisco.
- Bohm, David and B. J. Hiley (1993). *The undivided universe: an ontological interpretation of quantum theory*. New York, NY: Routledge.

- Bohm, David and F. David Peat (2000). *Science, order, and creativity*. New York, NY: Routledge.
- Briggs, John and F. David Peat (1999). *Seven Life Lessons of Chaos: Timeless Wisdom from the Science of Change*. New York, NY: Harper Collins Publishers.
- Briggs, John and F. David Peat (1989). *Turbulent Mirror: An Illustrated Guide to Chaos Theory and the Science of Wholeness*. New York (NY): Harper & Row.
- Capra, Fritjof (1996). *The Web of Life: A New Scientific Understanding of Living Systems*. New York, NY: Anchor Books.
- Capra, Fritjof (1989). *Uncommon wisdom: conversations with remarkable people*. New York, NY: Bantam Books.
- CASID (Center for Advanced Study of International Development). "About CASID." Accessed on May 15, 2005 at <http://www.isp.msu.edu/CASID/about.html>.
- Chambers, Robert (1983). *Rural development: putting the last first*. New York, NY: Longman Scientific and Technical.
- Checkland, Peter (1981). *Systems Thinking, Systems Practice*. New York, NY: John Wiley and Sons.
- Dallmayr, Fred (1996). *Beyond Orientalism: Essays on Cross-Cultural Encounter*. Albany, NY: State University of New York Press.
- Das Gupta, Ananda (ed.) (2004). *Human Values in Management*. Hampshire, UK: Ashgate Publishing.
- Dennard, Linda (n.d.). "The New Sensibilities of Nonlinear Decision-making." Accessed on July 20, 2004 at <http://www.ucc.ie/acad/govt/ethos/documents/decisionmaking.htm>.
- Denzin, Norman K. and Yvonna L. Lincoln (eds.) (1998). *Collecting and Interpreting Qualitative Materials*. Thousand Oaks, CA: SAGE Publications, Inc.
- Eddy, Mary Baker (2000). *Science and Health with Key to the Scriptures*. Boston, MA: Writings of Mary Baker Eddy.
- Escobar, A. (1995). *Encountering Development: The Making and Unmaking of the Third World*. Princeton, NJ: Princeton University Press.
- Feyerabend, Paul (1975). *Against Method: Outline of an Anarchistic Theory of Knowledge*. London, UK: NLB.

- Fleming, Valerie, Uta Gaidys, and Yvonne Robb (2003). "Hermeneutic research in nursing: developing a Gadamerian-based research method." *Nursing Inquiry* 10, no. 2: 113-120.
- Fontana, Andrea and James H. Frey (1998). "Interviewing: The Art of Science." In Denzin, Norman K. and Yvonna S. Lincoln (eds.), *Collecting and Interpreting Qualitative Materials*. Thousand Oaks, CA: SAGE Publications, Inc.
- Foucault, Michel (1997). *Society must be defended: lectures at the Collège de France, 1975-76*. Edited by Mauro Bertani and Alessandro Fontana; general editors, François Ewald and Alessandro Fontana; translated by David Macey. New York, NY: Picador
- Fuller, Robert (2003). *Somebodies and Nobodies: Overcoming the Abuse of Rank*. Gabriola Island, British Columbia: New Society Publishers.
- Gadamer, Hans-Georg (1975). *Truth and Method*. New York, NY: Seabury Press
- Gadamer, Hans-Georg and Lewis Edwin Hahn (1997). *The philosophy of Hans-Georg Gadamer*. Chicago, IL: Open Court.
- Gasper, Des (2004). *The Ethics of Development: from Economism to Human Development*. Edinburgh: Edinburgh University Press.
- Gharajedaghi, Jamshid and Russell L. Ackoff (1985). "Toward Systemic Education of Systems Scientists." *Systems Research* 2(1): 21-27. In Patton, Michael Quinn (1990). *Qualitative Evaluation and Research Methods Second Edition*. Thousand Oaks, CA: SAGE Publications, Inc.
- Giannoni, Massimo (2004). "Epistemological premise, developmental idea, main motivation in Jung's and Kohut's psychoanalysis: looking for some analogies." *The Journal of Analytical Psychology* 49, no. 2: 161-175.
- Gibbs, Graham R (2002). *Qualitative Data Analysis: Explorations with NVivo*. Buckingham, UK: Open University Press.
- Gleick, James (1988). *Chaos: Making a New Science*. New York, NY: Penguin Books.
- Goulet, Denis (2000). "Changing development debates under globalization." Working Paper #276 prepared for the Pontifical Academy of Social Sciences Workshop on "Social Dimensions of Globalization," Vatican City, February 21-22, 1999. Accessed on April 5, 2005 at <http://www.nd.edu/~kellogg/WPS/276.pdf>.
- Gustavsson, Bengt (1989). "The nature and understanding of organization from a 'samhita' perspective: On the ontology of organization and how to understand it, including the knower, process of knowing, and the known." Paper to the course "Paradigm, method, and organizational analysis," University of Stockholm Dept. of Business Administration. Accessed on September 15, 2004 at <http://www.fek.su.se/Home/gus/PAPERS/Samhitap.htm>.

- Haney, David P. (1999). "Aesthetics and Ethics in Gadamer, Levinas, and Romanticism: Problems of Phronesis and Techne." In *PMLA*, Vol. 114, No. 1, January 1999: 32-45.
- Hanley, Catriona (1998). "Theory and *Praxis* in Aristotle and Heidegger." Paper given at the Twentieth World Congress of Philosophy, August 10-15, 1998, Boston, MA. Accessed on February 1, 2005 at <http://www.bu.edu/wcp/Papers/Acti/ActiHanl.htm>.
- Heidegger, Martin (1962). *Being and Time*. Translated by John Macquarrie and Edward Robinson. London, UK: SCM Press.
- Heisenberg, Werner (1962). *Physics & Philosophy: The Revolution in Modern Science*. New York, NY: Harper & Row.
- Kafatos, Menas and Robert Nadeau (1990). *The Conscious Universe: Part and Whole in Modern Physical Theory*. New York, NY: Springer-Verlag.
- Keen, Steve (2001). *Debunking Economics: the naked emperor of the social sciences*. New York, NY: Zed Books.
- Kidder, Paul (1997). "The hermeneutic and dialectic of community in development." *International Journal of Social Economics* Vol. 24 No. 11: 1191-1202.
- Kojevnikov, Alexei (2002). "David Bohm and collective movement." *Historical Studies in the Physical & Biological Sciences* 33, No. 1: 161-192.
- Krishnamurti, J. (Jiddu) (1996). *The Limits of Thought: Discussions*. London, UK: Routledge.
- Krishnamurti, J. (Jiddu) and David Bohm (1986). *The Future of Humanity: A Conversation*. San Francisco, CA: Harper & Row.
- Krishnamurti, J. (Jiddu) and David Bohm (1985). *The Ending of Time*. London, UK: Gollancz.
- Kuhn, L. and Robert Woog (2005). "Vortical Postmodern Ethnography: Introducing a Complexity Approach to System Social Theorizing." *Systems Research and Behavioral Science* Vol. 22 No. 2 March-April 2005: 139-150.
- Latour, Bruno (1999). *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge, MA: Harvard University Press.
- Lavoie, Don (2002). "Main Ideas." Accessed on March 24, 2005 at <http://psol.gmu.edu/dlavoie.nsf>.
- Leduma, James D., David L. Cooperrider and Frank J. Barrett (2001). "Appreciative Inquiry: the Power of the Unconditional Positive Question." In Peter Reason and Hilary Bradbury (eds.), *Handbook of Action Research: Participative Inquiry and Practice*. Thousand Oaks, CA: SAGE Publications.

- Madl, Pierre (2004). "Theoretical and Practical Observations from an Ecological Perspective." Contribution for the Symposium Theory and Reality—Fractures and Bonds (Original German Title: "Theorie und Praxis – Brüche und Brücken"). Accessed on March 15, 2005 at <http://www.sbg.ac.at/ipk/avstudio/pierofun/transcript/waestern-society.pdf>.
- Madison, Gary B (1988). *The Hermeneutics of Postmodernity*. Indianapolis, IN: Indiana University Press.
- Martinussen, John (1995). *Society, State and Market: A guide to competing theories of development*. London: Zed Books.
- Nussbaum, Martha C. (2003). "Compassion & Terror." *Dædalus* Winter 2003: 10-26.
- Nussbaum, Martha C. (2000). *Women and Human Development: The Capabilities Approach*. Cambridge, UK: Cambridge University Press.
- Patton, Michael Quinn (2002). *Qualitative Evaluation and Research Methods*. Thousand Oaks, CA: SAGE Publications, Inc.
- Patton, Michael Quinn (1990). *Qualitative Evaluation and Research Methods Second Edition*. Thousand Oaks, CA: SAGE Publications, Inc.
- Peat, F. David (2004a). Course lecture: New Science/New Paradigm, July 6-12, 2004. Pari Center for New Learning, Pari, Italy.
- Peat, F. David (2004b). Pari Center brochure. Pari Center for New Learning, Pari, Italy.
- Peat, F. David (2002). *From Certainty to Uncertainty: The Story of Science and Ideas in the Twentieth Century*. Washington DC: Joseph Henry Press.
- Peat, F. David (2000). *The Blackwinged Night: Creativity in Nature and Mind*. Cambridge, MA: Perseus Publishing.
- Peat, F. David (1997). *Infinite Potential: The Life and Times of David Bohm*. Reading, MA: Helix Books.
- Peat, F. David (1993). "The Indigenous American-Western Circle." Kalamazoo, MI: The Fetzer Institute.
- Peat, F. David (1989). "Comment on Chaos." Accessed on June 1, 2004 at <http://www.paricenter.com/library/papers/peat03.php>.
- Peat, F. David (1988). *Superstrings and the Search for the Theory of Everything*. Chicago, IL: NTC/Contemporary Publishing Group, Inc.
- Peat, F. David (1987a). "Interview: David Bohm." *Omni* January 1987: 69-74.

- Peat, F. David (1987b). *Synchronicity: The Bridge Between Matter and Mind*. New York, NY: Bantam Books.
- Peat, F. David (n.d.a). “Non-Linear Dynamics (Chaos Theory) and its Implications for Policy Planning.” Accessed on June 3, 2004 at www.f davidpeat.com/bibliography/essays/chaos.htm.
- Peat, F. David (n.d.b). “Gentle Action and Global Solutions.” Accessed on June 1, 2004 at <http://www.paricenter.com/library/papers/peat02.php>
- Peat, F. David (n.d.c). “F. David Peat – Biography.” Accessed on March 3, 2004 at <http://www.f davidpeat.com/biography/biotext.htm>.
- Potts, Jason. 2000. *The New Evolutionary Microeconomics: Complexity, Competence and Adaptive Behavior*. Northhampton, MA: Edward Elgar Publishing, Inc.
- Pylkkänen, Paavo (ed.) (1999). *Bohm-Biederman Correspondence: Creativity and Science (Bohm Biederman Correspondence)*. London, UK: Routledge.
- Pylkkänen, Paavo (n.d.). “Consciousness in David Bohm’s Ontology.” Written for the Consciousness Studies Programme, Department of Humanities, University of Skövde. Accessed March 2005 at <http://www.consciousness.arizona.edu/quantum/web5.htm>.
- Reason, P. and J. Rowan (eds.) (1981). *Human Inquiry: A Sourcebook of New Paradigm Research*. Chichester, UK: Wiley.
- Rorty, Richard (1979). *Philosophy and the Mirror of Nature*. Princeton, NJ: Princeton University Press.
- Roy, Indrajit (2003). “Development and its Discontents: Civil society as the new lexicon.” In *development* Volume 46 No 1 March 2003: 80-87.
- Ruonavaara, D.L. (2004). “Adaptive to Critical Learning Organization: Participatory Research and the Evolution of a Grassroots Organization in Southern Mexico.” Discussion, unpublished Ph.D. dissertation, 2004, Michigan State University, East Lansing.
- Sen, Amartya (1999). *Development as Freedom*. New York, NY: Anchor Books.
- Spivey, Nancy (1997). *The constructivist metaphor: reading, writing, and the making of meaning*. San Diego, CA: Academic Press.
- Stanford Encyclopedia of Philosophy (2002). “Paul Feyerabend.” Accessed on February 17, 2005 at <http://plato.stanford.edu/entries/feyerabend>.
- Stapp, Henry P. (1993). *Mind, Matter, and Quantum Mechanics*. New York, NY: Springer-Verlag.

Warren, Carol A.B. (2002). "Qualitative Interviewing." In Jaber F. Gubrium and James A. Holstein (eds.), *Handbook of Interview Research: Context and Method*. Thousand Oaks, CA: SAGE Publications, Inc.

Whorf, Benjamin Lee (1956 [1941]). "Language, mind, and reality." In John B. Carroll (ed.), *Language, Thought, and Reality: Selected Writings of Benjamin Lee Whorf*. New York, NY: MIT.

Young, T.R. (1991). "Chaos Theory and the Knowledge Process." Accessed on September 1, 2004 at http://uwacadweb.uwyo.edu/RED_FEATHER/.