

DEVELOPING A GROUND? FOR RADICAL PRAXIS

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**COMPREHENSIVE EXAM
SUBMITTED AUGUST 22, 2001**

It must be emphasized that however broad the circle of problems dealt with by the systems approach may become, they cannot leave the boundaries set by the relatively concrete methods and means of obtaining knowledge about real objects characterized by complex organization. The systems approach cannot claim to have fundamentally solved the problem of the relation between the subject and the object, the central problem of philosophical methodology (Blauberg *et al.* 1977: 110).

As in all loop movement, what distances us from the point of departure is at the same time what draws us near (Morin 1992: 385).

QUESTION:

Rather than attributing environmental destruction to the actions of a relatively small number of thoughtless and careless individuals, or to some passing phase of industrial recklessness that accompanies an otherwise benign evolutionary process of economic development, the destruction described here is attributed to driving forces that are pervasive, persistent, and deeply ingrained in our values, lifestyles, and institutions.

(Hempel *Environmental Governance* 1996: 52)

The themes of the future, which are now on everyone's lips, have not originated from the farsightedness of the rulers or from the struggle in parliament – and certainly not from the cathedrals of power in business, science and the state. They have been put on the social agenda against the concentrated resistance of this institutionalized ignorance by entangled, moralizing groups and splinter groups fighting each other over the proper way, split and plagued by doubts.

(Beck in Beck, Giddens and Lash *Reflexive Modernization* 1994: 19)

Any attempt at manifesting a more sustainable, equitable world must consider the foregoing. Recent advances in systems theory – to incorporate complexity, self-organization, and self-reference – claim some potential for understanding the complexities described. Recent directions in planning theory – toward participatory, communicative approaches – claim some potential to address these concerns. Yet both of these recent movements emerge from conventional, rather than radical, knowledges and politics – the very ground for these "deeply ingrained driving forces" and this "institutionalized ignorance."

Can these recent theoretical advances and directions accommodate and/or generate a more radical praxis? – one that carries the seeds of its own critique and evolution? – one that at least *attempts* to address the following challenge?

System boundaries have to be drawn so that the world acquires the possibility of observing itself.

(Luhmann *Ecological Communication* 1989: 18)

To aid in presentation, I have tightened up spacing between the lines, reducing the number of pages accordingly. I hope this makes reading sufficiently clear.

ABSTRACT:

Given a concern for sustainability – inclusive of ecological, social and ethical aspects – this paper considers possible ground for its manifestation. Beginning with a brief discussion of epistemology that points to the uncertainty involved in fully knowing or understanding ‘reality,’ the paper attempts to present a variety of perspectives. Regarding sustainability, possible causes and influences leading to environmental and social degradation described in the literature are discussed. Particular emphasis is placed on ‘deeply ingrained driving forces,’ ‘institutionalized ignorance’ and ‘moralizing groups,’ with a few examples from different authors.

Central to the paper, and forming the bulk of the discussion, is a survey and description of recent advances in systems theory and planning theory that may be relevant to understanding and manifesting a more sustainable and equitable world. Regarding systems theory, discussion includes brief reference to general systems theory and its more recent outgrowths: cybernetics, complexity, and self-organization. Particular emphasis is placed on discussion of autopoietic (self-producing) systems and sympoietic (collectively-producing) systems and their characteristics. Regarding planning theory, discussion includes reference to rational-comprehensive, participatory and communicative planning, as well as feminist, postmodern and Foucauldian critiques. Systems based planning approaches are also discussed.

Considering whether these recent advances are conventional or radically different leads to multiple answers, which are discussed briefly. Two themes that are emerging in both systems and planning are noted: recognition of complexity/uncertainty and encouragement of participation/deliberation. A third theme – reflexivity – is discussed through a sampling of different approaches, including critical theory, postmodernism, poststructuralism, Foucauldian critique and Marxism.

Throughout the paper, consideration is given to the notion of radical praxis – the linking of theory and action in a mutually constitutive fashion motivating fundamental change – which is seen as a potential means for manifesting sustainability. The potential for systems theory – in particular, self-referential poietic systems theory – to contribute to the development of radical praxis is briefly considered in the final section. While the discussion is far from conclusive, it begins to outline questions that might be addressed by deeper consideration of sympoietic systems, the subsequent consideration of boundarylessness and paradoxical self-observation, and the potential for radical praxis as embodied action assisting in the manifestation of fundamental change.

INTRODUCTION

The first (albeit minor) challenge is to choose a beginning. In a few words and sentences, I will set the tone for what follows, simultaneously revealing a sense of my positions, values and preferences. I choose to begin by raising questions with respect to this very beginning, which necessarily entails making judgements and distinctions. Do I begin with a ‘problem statement,’ indicating my grasp of the issues, and establishing my ability to carve out a particular focus or identify an important problem? But on whose authority can I do so? Is the appeal to a particular body of knowledge and expertise sufficient for making claims of concern and action? On what basis do I choose which concerns to address or how? Such questions are important to consider.

The first (albeit minor) challenge is to choose a beginning. In a few words and sentences, I will set the tone for what follows. I choose to begin by situating myself with the photo below. This indicates my background (personally and academically), illustrates my motivation and hints at the foundation for my ontological/epistemological position and my senses of self, of value and of reality. Embedded in the hush of a west-coast rainforest or the expanse of alpine rock and sunshine inculcates wonder and a sense of scale-beyond-the-human, yet also enhances connection to other. While to some degree, these beginnings are far from the words presented here, I believe they are fundamental initiators of my theoretical and philosophical affinities and contribute to my concern for action.

The first (albeit minor) challenge is to choose a beginning. In a few words and sentences, I will set the tone for what follows. I choose to state the most serious concern: *current conditions are unsustainable*. Ecologically, socially, ethically, our species is degrading the planet in a manner that reduces the potential for our own species – as well as many others – to survive. Addressing this challenge requires radically different approaches to planning and management and radically different behaviours on the part of humanity, in particular, on the part of the primary resource users: Canadians, Americans and Europeans. If we are to provide even the faintest opportunity for manifesting an environmentally, ecologically, socially, culturally and ethically sustainable world, “Western” habits of mind and behaviour must alter dramatically.

to write is to struggle, to resist;
to write is to become;
to write is to draw maps
Deluze 1987

It seems important, then, to wonder how to begin addressing the complex issues we now face. This paper sketches out recent theoretical landscapes relevant to sustainability, systems, and planning and briefly considers a variety of other issues. Attracted to multi- trans- inter-disciplinary research, I interpret ‘comprehensive’ to refer more strongly to breadth than to depth. My intent has been to learn about areas with which I am unfamiliar, yet to maintain linkages with those areas I am more comfortable with – to develop networks, rather than gather unassociated gems (although I have some of these). There are numerous holes in



what I have come to learn and in what is expressed here. My hope is that they do not severely limit my current understanding and that I can continue filling them in as necessary and finding new ones as I go. Being ‘comprehensive’ should also be, I think, about holding some sense of my *lack* of knowledge. Although the list of things I *do* know is much shorter, I have attempted to identify some key areas that seem relevant, but which I have not yet covered. Following the question I have been offered, I wonder, in particular, about the possibilities and options presented by two key words: radical praxis.

RADICAL PRAXIS – 1ST EXPRESSION

Radical

1. Inherent in the nature or essence of a thing or person; fundamental
2. Going to the root or origin; touching or acting upon what is essential and fundamental; thorough; esp. radical change, cure
3. Characterized by independence of, or departure from, what is usual or traditional; progressive, unorthodox, or revolutionary

Praxis

1. The practice or exercise of a technical subject or art, as distinct from the theory of it
2. Habitual action, accepted practice, custom
3. A term adopted by Karl Marx, to denote the willed action by which a theory or philosophy (esp. a Marxist one) becomes a social actuality.
4. Action that is entailed by theory or a function that results from a particular structure

(Oxford English Dictionary)

Radical praxis

Particularly when conjoined, these terms carry connotations for me that differ slightly from the dictionary definitions. **Radical** identifies something as *different* – dramatically different. Typically associated with change, it indicates something fundamental, not cosmetic change. **Praxis** points to the coming together of thought and action; informed practice, learned theory. Conjoined, and considered with respect to human-environment interactions, **radical praxis** alludes to deep-seated change in habits of mind and behaviour regarding interactions with others. It means rethinking our thinking and learning how to integrate the diverse, yet never separate activities of theory and practice.

The dictionary definitions indicate a subtle paradox lurking within: radical as extreme, drastic change or reform vs. praxis as conventional, habitual practice. Creative tension?...

EPISTEMOLOGY, ONTOLOGY AND SUBSEQUENT IMPLICATIONS

Each of us carries a set of assumptions and preferences, tendencies and “knee-jerk” reactions. Given the task at hand, it seems important to describe my own.

The skeptic and ‘reality’

It still remains a scandal to philosophy... that the existence of things outside of us... must be accepted merely on faith, and that, if anyone thinks good to doubt their existence, we are unable to counter his doubts by any satisfactory proof (Kant *Critique of Pure Reason*, preface to 2nd ed. [1958] in Pojman 1993).

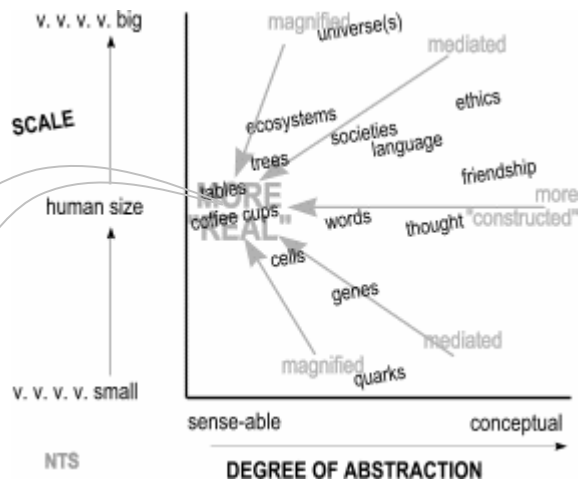
Regarding the difficulty in refuting the skeptic, I must agree with Kant. I resist the skeptic only through *disbelief* that I could imagine a world as intricate as the one I seem to experience. It is *not* because I have found an irrefutable argument against Descartes’ notion that reality could be only a dream or the more

contemporary argument offered by the movie: *Matrix*. Rather than finding skeptical arguments scandalous, however, I agree that they “are important for what they show about knowledge” (Pollock and Cruz 1999: 10). As is also argued by Williams (1999), “The task of the contemporary epistemologist is to *understand* knowledge... not to show *that* the skeptic is wrong but to explain *why* he is wrong (Pollock and Cruz 1999: 10).

Knowledge is typically considered as justified belief (Williams 1999, Pollock and Cruz 1999, Pojman 1993).¹ Agrippa’s trilemma points to the challenge of developing a complete line of reasoning to justify a belief (Williams 1999, Wood, pers com). Either one must accept assumption(s) to prevent infinite regress (foundationalism); fall back on circular reasoning (coherentism); or accept non-cognitive justifications such as a reason that ‘works’ (pragmatism). Each of these has their proponents and their problems. I tend to think most of us use a combination, relying on a (circular) network of fundamental assumptions reinforced by pragmatic workability or intuition.

One of the classic epistemological-ontological debates is the realist–constructivist debate. Figure 1 provides a means for making relative distinctions about aspects of that-which-exists – primarily with respect to the objective vs. subjective dichotomy. The figure is intended to suggest the potential to be (more) objective or (more) subjective depending on the situation considered, rather than to take either as an absolute category. Entities at the human-scale, in the more-physical range can be considered more “objective” or more “real” than those at the extreme scales and the more “constructed” or “conceptual” range. *This figure, while useful, is problematic!* In particular, it implies an unavoidable barrier by suggesting human size and physical reality as the most “real” (see also Ashmore *et al.* 1994). To amend, the line continuing to the left can be thought of as a worm-hole into another dimension or alternate reality to recognize the potential for *many* different and equally probable interpretations of reality such as those claimed by a range of religious beliefs. (See Figure 5-1 in Wilber (1998: 64-65) for a more inclusive illustration. Also see Brier 2000.) This diagram, however, is designed specifically to point out that ecosystems and intelligence are *not* tables, despite some sense that people occasionally wish to treat them that way.²

Figure 1: Degrees of “reality”



While I am not ready to let go of the questions raised by the presence of the worm-hole, I let them recede into the background for this discussion, which is focused toward the right/central areas of the illustration.

¹ I am *still* (for my *comp!*) relying on introductory texts and reviews – authors referenced throughout are not necessarily originators or primary authorities on the material presented. When it matters, I will make it clear.

² See www.fes.uwaterloo.ca/u/mbldemps/phil/reality.htm

The diagram positions me as neither a realist nor a relativist – perhaps a critical realist (Guba 1990), a constrained constructivist (Hayles 1991), or, as Derrida (1974) suggests, a contingent realist. Another position that resonates is negotiation:

There is no single reality, but rather multiple realities, and what is represented depends on one's position in the field of negotiation... It is about an ongoing process of negotiating reality (Bird 1987: 258).

Logic of justification

Another key epistemological question is: What are accepted as legitimate logics? A basic assumption of 'Western'³ logic – the exhaustive and mutually exclusive categories: yes/no or true/false – are a subset of the possibilities considered reasonable in some logical domains and cultures. I find the seven categories of Janian logic (which includes “maybe it is and it is not and also indeterminate” as *one* category) a rather attractive idea (see Campbell 1982, Matilal 1998). Even the familiar phrase from childhood “yes-no-maybe so” provides a much richer (and more reasonable?!?) set of categories. A third, indeterminate category raises the stakes considerably, since suddenly the negation of “true” leaves one in a quandary. *Few real-life situations involve mutually exclusive yes-no*, yet the standard form of logic and reasoning – and the subsequent dualistic conclusions that are pervasive – relies on it.

An associated consideration is the standard distinction between deductive and inductive reasoning, which Pollock and Cruz (1999) expand on by providing two levels of category: deductive vs. defeasible, with the latter consisting of inductive and abductive. Defeasible reasons are, quite simply, those that can be defeated when another suitable or appropriate reason is supplied. Until such is found, however, “the premises of [an] argument can provide a reason for believing the conclusion without the reason being logically conclusive (Pollock and Cruz 1999: 9-10). In essence, abductive reasons are plausible ones (see Pojman 1996).

Other tendencies

A few other tendencies also seem relevant. I tend to see similarities: My “knee-jerk” reaction is to draw out commonalities and downplay differences. I tend to assume good, in people and circumstances. I tend to give a positive spin to anything I can, although I might also articulate otherwise. For someone drawn to recursion/self-reference I am incredibly poor at inversion and double negatives. For example, calling and crossing forms in Spencer-Brown's (1972) calculus leaves me rather puzzled, although I like the initial descriptions and clarifications. Once I jettison the sense of inferiority, I appreciate the need to become situationally focused on the concrete here and now.

The values and vagaries of language and definition also need to be noted. Regarding language, there is occasionally a challenge in easily expressing the degree of mutually influential, simultaneous interaction. Regarding definition, one of the challenges of multi- trans- inter- disciplinary work is that most disciplines have their own definitions for everything. I have tried to illustrate the diversity in the key terms I use.

³ I will use this term to refer to the Judaeo-Christian, Euro-centric, scientific culture in which I am, and have been, embedded.

Moving Further

The fundamental nature of being, knowledge and reason deserve much deeper treatment than the brevity presented here, yet only so much can be covered. Hermeneutics is another important way of understanding. Metaphor and language, which enable as they constrain, are also influential. Regarding the former, I wonder, for example, about my use of position, stance and perspective to describe my set of assumptions and being...

SUSTAIN ABILITY?

Definitions of sustainability abound (e.g. WCED 1987, Pezzey 1992, Fautin 1995, Eichler 2000) – the causes described for environmental and ethical degradation are as abundant, although more diverse. The two quotations in the question outline particular concerns relevant to sustainability, which are discussed in this section.

Hempel: Deeply ingrained driving forces

Rather than attributing environmental destruction to the actions of a relatively small number of thoughtless and careless individuals, or to some passing phase of industrial recklessness that accompanies an otherwise benign evolutionary process of economic development, the destruction described here is attributed to driving forces that are pervasive, persistent, and deeply ingrained in our values, lifestyles, and institutions (Hempel *Environmental Governance* 1996: 52).

Hempel's comment – extracted from a chapter on causes of environmental destruction – reflects an outlook on human-environment⁴ interactions that is becoming more common. His discussion is consistent with the work he builds upon: Meadows *et al.* (1972, 1992), Erlich and Erlich (1991), Commoner (1972), although he offers mild critiques for their lack of adequate attention to core values he considers important (Table 1). However, his response is simply to add a few more variables to their equations. Although he recognizes limitations, his model seems quite inadequate for understanding the depth of concerns he has drawn attention to.

Other authors from a diverse range of backgrounds and disciplines draw attention to similar concerns. As examples to illustrate the diversity, I note the following. Wackernagel and Rees (1996), attend to some of the same factors, but emphasize material flows, simplifying their expression as an ecological footprint. Nelson (1993) describes a range of environmental and social factors, summarized in Table 2. Paehlke (2000) points to an interconnected web of political,

Core values	<ul style="list-style-type: none"> • anthropocentrism • contempocentrism
Amplifiers	<ul style="list-style-type: none"> • population growth • technology
Consumptive behaviour	<ul style="list-style-type: none"> • poverty • affluence
Political economy	<ul style="list-style-type: none"> • market failure • failure to have markets

Some Environmental Changes	Some Socio-Economic Issues
Forest Cover	Population Growth
Topsoil on Cropland	Aging Populations
Fresh Water	Migration
Climate	High Consumption
Lakes	Energy
Hazards	Economic Inequities
Biodiversity	Unemployment
Desert Areas	Debt
Ground Water Quality	Social Programs
Ozone Layer	Ethnicity and Heritage
Sea level	Trade
	Diseases and Health
	Cultural Homogenization
	War and Military Activity

⁴ I will generally use the term environment to refer to the non-human biophysical systems we are embedded within. This is, however, a deeply problematic term and distinction. I grapple with other terms, including nature, ecological systems and ecosphere, but none escape the difficulties since each maintains the label of otherness, setting humans apart.

economic, cultural and social factors involved in policy challenges related to conserving biodiversity. Other authors writing in the same collection make similar comments (Bocking 2000). Paehlke places particular emphasis on economic concerns:

Underlying all of the above concerns regarding the challenges facing biodiversity protection is one overarching reality. Economic values still dominate human societies, remaining critical even when opinion polls show that most citizens are genuinely concerned about the environment (Paehlke 2000: 283).

Wilson (1998), discussing politics and policy of forestry practices in BC, also emphasizes the depth and diversity of the concerns. On a different tack, Eichler (2000, also 1995) emphasizes the importance of conjointly attending to equity *and* sustainability instead of interpreting these as two different types of problems. Inverting the norm, she advocates a focus on reducing *inequity* and *unsustainability*, rather than the seemingly unattainable goal of their obverse. Along similar lines, Merchant (1992), writing from a feminist perspective, places primary responsibility for environmental destruction at male dominated, patriarchal science and associated management advocating a need to address the fundamental imbalance inherent in “Western” culture. Deep ecologists (e.g. Devall 1988, Fox 1990,) imply the need for similarly fundamental changes, although based on a more ecocentric perspective.

From yet a different angle, Gare (1995, Table 3), describes contributions from poststructuralist thinking as they account for environmental destruction.

<p>Table 3: Factors contributing to environmental destruction (summarized from Gare 1995: 90-95)</p> <ul style="list-style-type: none"> • privileged discourse • patterns of opposition leading to celebration of domination • insatiable forms of desire leading to celebration of wasteful consumption • grand narrative(s) of progress • discursive formation/institutionalization of power/knowledge
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A considerable degree of corroboration, then, can be found for the argument that Hempel presents. Yet, A considerable degree of corroboration, then, can be found for the argument that Hempel presents. Yet, as illustrated by feminist, deep ecological, postmodern, and poststructuralist positions in particular, his categories of “core values” provide a dangerously limited representation of the driving forces. Firmly set within a modernist paradigm, his discourse is indicative of some of the factors noted by Gare (above). Although the precautionary approach, advocated by many (e.g. Costanza 1991, Norton 1992), provides a much needed caution, it too is argument that Hempel presents. Yet these authors ignore the human potential for creativity and ingenuity, which has been ably demonstrated through millennia. Rather than pessimistically call for an end to human technological progress, it is essential to muster resources in a focused collaborative manner to develop the appropriate technologies that are essential for careful, effective use of resources. To ensure its suitability, development must be tempered by application of the precautionary approach, so can a considerable degree of disagreement. As illustrated, explanation for the causal factors leading to environmental degradation covers a wide range. Although I am drawn to consider deeply ingrained driving forces as important factors, find no irrefutable position from which to make a firm statement about causes, especially one sufficiently justified to demand change in behaviour, although there does seem to be much “evidence” and “reasoning” to support particular conclusions. Given the discussion above on reasoning, I am drawn to considering a precautionary approach,

embedded within a modernist paradigm. An outgrowth of economic principles, it prioritizes quantifiable values and particular types of expertise and ignores important questions of equity: who benefits from which precautions?

which is advocated by many (e.g. Costanza 1991, Norton 1992). Yet such an approach needs to attempt balancing various factors, possibilities and constraints. There is a continual tension between the uncertainties associated with risking new ventures, and certainties associated with convention, that needs attention. The big mistake may be to assume that conventional approaches lead to certainty, a notion to be considered in the section on systems.

Such concerns point to the need for incorporating different perspectives – which must include those conventionally deemed “experts” as well as the many other “experts” involved.

Beck: Institutionalized ignorance and moralizing groups

The themes of the future, which are now on everyone’s lips, have not originated from the farsightedness of the rulers or from the struggle in parliament – and certainly not from the cathedrals of power in business, science and the state. They have been put on the social agenda against the concentrated resistance of this institutionalized ignorance by entangled, moralizing groups and splinter groups fighting each other over the proper way, split and plagued by doubts (Beck in Beck, Giddens and Lash *Reflexive Modernization* 1994: 19).

Time and again throughout history, critical issues and concerns have been raised by citizen groups in response to injustice, discontent and concern. Multiple examples include revolts and revolutions of peasants, slaves and workers as well as movements aimed at claiming various individual and cultural rights and interests. The recent spate of demonstrations – at Seattle, Quebec, Genoa – against political-economic policies of the rich and powerful provide recent examples. In particular, the stream of debate in newspapers and list-serves that followed the death of the demonstrator in Genoa ably demonstrates the second part of Beck’s assessment.

Land-use disputes in BC, also provide examples. Protests to encourage protection and conservation of wilderness have been dogging government since the 60s (e.g. Careless 1997, Wilson 1998). Protracted civil disobedience in support of conservation reached a maximum at Clayoquot Sound. However, the biggest single protest – held on the front lawn of the legislature – was *against* the designation of protected areas. Wilson (1998), stopping short of suggesting that the big forest corporations choreographed this event and lesser acts of resistance, notes that the “countermobilization of timber workers and their neighbours was critical in demarcating the political space within which government of the 1990s operated” (1998: 341). How does the balance among the various ‘moralizing groups’ work (itself) out? Is it protest that gains attention? Are moralizing groups necessarily right (Tucs, forthcoming)? For example, if everyone had agreed that the protected area designations were unnecessary, would they have been?

Another comment from Wilson suggests that the institutions are not ignorant – a critique levelled against participants in the WTO and G7 summits also:

The forest industry’s success in these negotiations reminds us not only of its structural advantages but also of the importance of some of the fundamental ‘givens’ inherent in the nature of this policy sector [including]... technical complexity... Province’s size... small population... industry’s reach... [and] limited enforcement potential... (Wilson 1998: 340-41).

In contrast to this (possibly) cynical perspective, there is also the question of how far any of the ‘moralizing groups’ might get without at least *some* institutionalized support (see Tucs, forthcoming). How many rules or policies have gained approval *against* agreement of the majority (be that for ‘good’ or for ‘bad’)?

As with the quotation from Hempel, then, both support and refutation can be found for different aspects of Beck’s quotation. Responses emerge from different epistemological-political-economic positions and perspectives, perhaps even from different life circumstances.

Summary: Hempel and Beck and claims for action

The discussion surrounding these quotations, offered in my question, present both possibilities and challenges. In trying to understand the causal factors involved in the basic issues relevant to equity and sustainability, I find the question “Why?” must be asked and asked again, each unsatisfactory answer requiring another “but *why?*” until the argument circles around itself in a network of responses that relate to values, philosophies, and cultural influences; to the seemingly unanswerable question of individual choice vs. cultural influence; and the to the socially-constructed, but resistant, reality.

Aside from the various issues and concerns discussed in this section, I carry forward two key thoughts. First, is the epistemological quandary that emerges from the diversity of contradictory arguments. There is, subsequently, a need to attend to this disparity, but there is uncertainty regarding how, especially given the challenge of the skeptic. Second, is much more concrete and personal: affluence living beside homelessness; ethnic ‘cleansing’ and political prisoners; another species gone now, another person born now, another person born now, another person born now, another species gone... Regardless of the epistemological quandary, the possibility of alternate versions of reality, or the constructedness of cause and effect, these circumstances require a response.

RADICAL PRAXIS – 2ND EXPRESSION

The foregoing discussion provides an approach to understanding radical praxis quite different from consulting dictionary definitions: learning from people acting in the world. “Radical” has been prefixed onto a wide variety of practices. The similarity lies in that each case revolves around a particular concept(s) or value(s) which is held to be essential and which is distinguished as fundamentally different from the established norm. Radical environmentalism opposes the valuation of nature as instrumental (see Frodeman 1995), although its expression ranges from the monkey-wrenching ecotage of Earth First! to the gentler philosophical tones of ecosophy (e.g. Naess 1992). Radical feminism, opposes the domination of men over women. These differences point to the relative nature – historically, epistemologically, axiologically – of the term “radical.” A radical forester is likely a different person, promulgating different forms of action, than a radical feminist. (Although not mutually exclusive categories.)

Yet there is also a multiplicity or plurality emerging: For example, the (believed-to-be) single-minded feminist opposition to patriarchal domination grapples with radical differences within the movement: enabling and including the voices of blacks, lesbians, men. Radical democracy must contend with “different philosophical universes” (Mouffe 1992) – such as Habermasians vs. Foucauldians – which both hold themselves as different and improvements on conventional democratic norms.

The radical nature of practice shows up in more philosophical realms also. Radical constructivists distinguish themselves from “trivial constructivists” by fully giving up any notion of representationality of knowledge (von Glaserfeld 1991). While not typically called radical, there have been “revolutionary turning points in science that bring with them radical revisions of our understanding of the physical

world” such as redefinition of mass as dependent after Einstein and causality as probabilistic after Heisenberg (Polkinghorne 1996: 11).

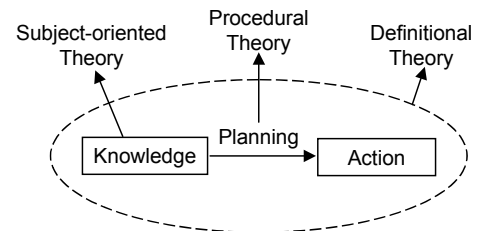
These examples, however, are best termed **radical practices** for they do not all, or necessarily, carry the mutual influence between thought and action put forward by Marx in his conception of praxis:

But for Marx, praxis is more than a principle of consciousness: it is a prereflective unity of nature and consciousness which can be explicated in thought but not initiated (Dupré 1966 Found. Philos. Materialism viii. 216, quoted in Oxford English Dictionary [Online])

A foreshadow of planning theory

To respond to the question(s) posed, it is necessary to consider systems theory, planning theory and the link between them. Before delving into the first of these, I point to the heuristic in Figure 2 to distinguish among different aspects of planning theory (Dempster 1998, 2000a). The diagram integrates Friedmann’s (e.g. 1987) notion of planning as the link between knowledge and action with discussion in the literature about different types of planning theory, colloquially referred to as theories *for*, *in* and *of* planning (see Hendler 1995, Alexander 1992, Faludi 1973 and discussion in Dempster 1998, 2000a). I present the diagram to provide a framework for considering the possible application of systems concepts to planning. As will be discussed in the section on planning theory, systems thinking can inform each type of planning theory – for describing the subject of planning (e.g. ecosystems or perhaps Hempel’s driving forces), planning procedures (e.g. interactions among participants), or definitional theory (e.g. the role of planning in the social system of which it is a part).

Figure 2: Categories of planning theory



- *Definitional theory* – describes what planning actually is and how it fits into the social context – theory *of* planning.
- *Procedural theory* – deals with the process of planning, with issues related to determining the ‘best’ approaches for transferring knowledge into action – theory *for* planning.
- *Subject-oriented theory* – provides the knowledge base to inform the planning process – theory *in* planning.
(summarized from Dempster 1998: 93-4)

SYSTEMS THEORY

As any poet knows, *a system is a way of looking at the world*. The system is a point of view – natural for a poet, yet terrifying for a scientist! (Weinberg 1975: 52)

A system is an assemblage of objects, principles, or facts, united by some form of regular interaction or interdependence into an organized whole (Roe *et al.* 1992: 27-8 [1967])

A system, for example, may be defined as any entity, physical or conceptual, which is composed of interrelated parts. This is a widely held definition of a system; yet, it is so broad as to include virtually any interdependent set of activities or things... (Catanese and Steiss 1968: 173)

Most authors provide very general definitions for ‘system.’ The tone of Catanese and Steiss hints at the potential disbenefit of such generality. As Morgan (1997: 387) puts it: “Virtually anything can be defined as a system by drawing a boundary.” Although I question Morgan’s method of definition, I agree on the ubiquitous nature of the concept. This generality, however – when encouraged by von Bertalanffy, the grandfather of General System Theory (GST) – was part of the *point*. The loose definition of ‘system’ –

“complexes of elements standing in interaction” (von Bertalanffy 1968: 33) – was intended to make the concept applicable across diverse disciplines as a means for communication and integration.

Most authors *also* provide substantial detail regarding their conceptions. It is here the diversity emerges. Since the advent of GST, ‘system’ has come to hold many different meanings for many different people, practices, disciplines and philosophies. While the general definition has encouraged broad application, broad application has given rise to specific definitions. Before sketching this diversity, it is important to explain my sense of what ‘systems’ are.

Conceptualizing “systems”

I begin by reformulating Weinberg’s statement (quoted above) to de-emphasize sight: a system is a way of *conceptualizing* the world – rather than *looking at* it. Systems are heuristics for organizing perceptions and sensations by drawing relationships among things. To my mind they do not, as Luhmann suggests (1995), exist – except as conceptual schema. Amongst my diverse reading on systems, I found considerable emphasis on systems as conceptual tools and on the important role of the observer, however, few authors specifically emphasized *conception* as significant. Exceptions include Jordan and Rosen:

‘System’ denotes an interaction between the objective world and how it is looked at or thought about; it denotes a mode of perceptuo-cognito organization (Jordan 1969: 24-5).

Our first basic dualism has separated the universe into a self and its ambience... Our second basic dualism concerns the way we partition our ambiances, the way we *manage* our perceptions of the external world... It is the dualism between *systems and their environments*. Roughly speaking, a *system* in the ambience is a collection of percepts that seem to us to belong together. It would be hard to imagine a less precise definition of anything, but that is inherent in the very idea of system. The abstract concept of *systemhood* is indeed a very difficult one to grapple with (Rosen 1991: 41).

Additional considerations, worthy of pursuit, come from the legacies of William James, who “throughout his writings... operates with a fundamental epistemological distinction between *percepts* and *concepts*” (O’Shea 2000: 18).⁵ These lead James to consider the functional value of concepts and to make statements that serve as a warning against the reification of ‘systems:’

Concepts are secondary formations, inadequate and only ministerial; ... they falsify as well as omit, and make the [perceptual] flux impossible to understand (James [1911] in O’Shea 2000: 18).

The definitions listed above emphasize “system” as a set of relations among components. Entities are understood as *systems* because elements are associated conceptually to form a “whole” or unity. References to social, knowledge, transit, information, or management *systems* point to their interactive, composite, relational nature as identifiable (singular) entities. While *perception may* be a critical precursor to *conception*, reference to anything as a “system” implies the latter. [See further comments under self-organization.] This discussion is *not* intended to disparage the emphasis placed on observing and the role

⁵ As an aside, finding/reading James provides an example of the vagaries and challenges of interdisciplinary work – especially on such broad topics. Although his name held vague familiarity through seeing/hearing brief references, I was insufficiently attracted to actually read any of it – until I picked up a book “*Pluralism*” during the writing of this paper – to be tantalized by this and other traces of thought and its application by the authors in the edited collection: Why had I not found/read James or the work of subsequent authors before? How was I supposed to ‘know’ that reading some of his work would be beneficial? Is O’Shea the only author who makes James seem interesting? How do these notions link to his pragmatism? Beyond the implications regarding the work of James, what are the implications for doing interdisciplinary work? How are ideas exchanged, hoarded, passed on, and/or refuted by which disciplines? What might one discipline “know” that another needs to “learn”? And who decides which is which?

of the observer. I wonder, however, how much our emphasis on “observers” – rather than conceptualizers, or thinkers – influences our thinking about systems, our interpretation of that-which-exists, and our legitimization of particular types of knowers and knowledge. Although interpretation and their subsequent biases are acknowledged, “observer” connotes a disinterested and objective knower or expert. Coupled with the tendency to prioritize and legitimize, perception, the notion of systems as a “way of looking” capitalizes on inherent power/knowledge traditions. Despite efforts to stress assumptions, interpretive biases and recursive processes, the notion of observing may undermine the very emphases it attempts to override.

Hard systems vs. soft systems

One of the simplest categorizations is hard vs. soft systems. This generally refers to a comparison between the realist, reductionist perspective that prioritizes quantification and predictability that is characteristic of the “harder” sciences vs. a constructivist perspective prioritizing qualitative description and uncertainty that is characteristic of the “softer” sciences (Checkland 1986, Rosenhead 1989, Flood and Romm 1996). The distinction offers a simplistic, but useful, shorthand. However, I find it too easily misrepresents the degree of complexity involved.

Disciplinary categories

This hard-soft distinction can be elaborated by considering disciplinary differences, regarding development and application of the system concept. Edited collections illustrate otherwise, however. For example Emery (1969), Dalenoort (1989), Langton (1989), represent edited collections based on particular conception of systems, yet each volume contains papers by authors from a variety of disciplines.

General System Theory

As noted above, this was the brainchild of von Bertalanffy with original publications in the 1930s. In providing a historical context for the systems concept, Von Bertalanffy (1968) points to intellectual predecessors inclusive of Paracelsus, Vico, Ibn-Kaldun, Marx, Hegel and Lotka, among others. Von Bertalanffy, along with Boulding (an economist), Gerard (a physiologist), and Rapoport (a biomathematician), formed the original Society for General System Theory in 1954.

The basic thesis of GST was that systems, in whatever form they are manifest, carry similar characteristics. From the current vantage-point, many of these characteristics seem rather mechanical, yet Von Bertalanffy’s biological background is notable in the development of a more organismic notion of systems. Systems were conceived as having boundaries separating them from their environment, but could be open, exchanging inputs/outputs with that environment. A key concept is the notion of *emergent properties* – properties of the whole which are not attributable to constituent parts but only to their interaction as a composite entity. The difference between a bicycle lying in pieces on the ground vs. connected by particular relations that allows its use as a bicycle, is a common example. Life is a much more interesting one: the complex system of molecules typing out these words carries much more satisfying properties than the same molecules would have as a disorganized collection. (Admittedly a personal preference.)

Emergence emphasizes the need for a holistic and synthetic approach – as opposed to a reductionistic and analytic approach. The former approach is seen as the hallmark of systems thinking.

Despite emphasis on similarity among systems, different levels of complexity were also recognized. I still find Boulding’s (1957) typology (Table 4) instructive. At the time, he noted our limited ability to understand only the first three types, with some comprehension of the fourth and less of the others. It is humbling to recognize that this has hardly changed.

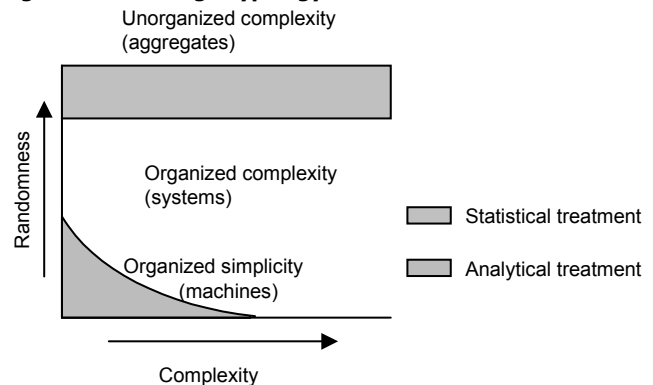
Table 4 Boulding’s hierarchy

SYSTEM TYPE
1. static structures
2. simple dynamic systems
3. cybernetic systems
4. open systems
5. plant
6. animals
7. humans
8. social organizations
9. transcendental systems

In a similar vein, Weinberg provides another simple typology that indicates approaches suited to the different types of system (Figure 3). We still grapple with medium number systems – each of the concepts listed below representing a different, and variably unsuccessful attempt.

Tektology is a concept similar to system that was published by Bogdanov prior to von Bertalanffy’s work, but which is not well known (see Capra 43-6: 1996, Gare 2000).

Figure 3: Weinberg’s typology



Cybernetic systems

Typically associated with the development of information theory and the technological developments during the war effort, the basic principle is that system outputs feed-back into the system as inputs so systems have the ability to be self-steering. The term “cybernetics” – from the Greek for “steersman” – was suggested by Wiener (1948) to emphasize this capacity. Of particular emphasis here is the notion of homeostasis: systems govern their behaviour, through feedback, to maintain particular states.

Second-order cybernetics – or the cybernetics of cybernetics – is an outgrowth of the preceding conception. Hayles (1999), offering an interesting historical/narrative description, points to the importance of the Macy conferences for development of these ideas, which primarily focus on grappling with the role of the observer. Von Forester’s ambiguous play on words in the book *Observing Systems* (1973) offers a sense of the twists involved. Due in part to his reliance on optical illusions and more mechanical examples, I find his work does not address deeper issues although it was obviously significant for developing the transition from first to second order cybernetics. Bateson (1972), an anthropologist, using a more socio-ecological mindset, can also be included in this category. Maturana, who also participated in the Macy conferences, is discussed below, although he could be considered as a second-order cyberneticist.

Complex systems

This heading represents a range of definitions, interpretations and applications and could be associated with the middle number systems in Weinberg’s “organized complexity” category. Definitions of ‘complex’ vary from the colloquial (the “complexity” of water quality problems in Ontario) to the specific and disciplinary

(“complexity” as a mathematical theory). The distinction between complex and complicated – made frequently – is clearly described by Cilliers and also provides a definition for complex:

If a system – despite the fact that it may consist of a huge number of components – can be given a complete description in terms of its individual constituents, such a system is merely *complicated*. Things like jumbo jets or computers are complicated. In a *complex* system, on the other hand, the interaction among constituents of the system, and the interaction between the system and its environment, are of such a nature that the system as a whole cannot be fully understood simply by analysing its components. Moreover, these relationships are not fixed, but shift and change... (Cilliers 1998: viii).

Although self-organizing and self-producing systems are also complex, and many authors discuss both, I place them in separate categories, discussing key features below.

Complex Adaptive Systems is a phrase primarily associated with the Sante Fe group and associated work, and is consequently based on computer modeling and simulation. The key notion here is that complex behaviour emerges from simple rule sets, with the Game of Life as a paradigmatic example. Systems in simulated (computer) environments, manifest complex behaviours, learning and evolution. Work includes biology (Kauffman 1993, Goodwin 1994), AI (Langton 1989), and economics (Arthur 1997), among others.

Self-organizing systems

It is difficult, probably impossible, to find a precise definition of what is understood by a *self-organizing system*. Nevertheless it is an important and useful idea” (Andrew 1989: 24).

This comment – echoed by many – indicates self-organization to be another broad, indistinct category of system type. Table 5 notes key concepts and authors that have contributed to an understanding of self-organization, primarily through study of biophysical systems. Given the emphasis Hempel, Beck and others place on socio-cultural factors, and my emphasis on systems-as-heuristic, I focus my discussion on broader conceptualizations of self-organization that may be relevant to understanding these factors. *These conceptualizations are generalized to a degree that hinges on simplistic, but I believe they remain consistent with the more specific discussions* in, for example, non-equilibrium thermodynamic applications to understanding ecosystems (e.g. Kay and Regier 1999, 2000).

Table 5: Key concepts and authors in self-organization

Hypercycles Eigen and Schuster 1979
Dissipative structures Nicolis and Prigogine 1977, 1989
Synergetics Haken 1983
Self-organization Jantsch 1979
Biology Goodwin 1994
Ecology Kay 1983, Ulanowicz 1997, Wicken 1989, Perry 1995, Patten et al. 1996
Sociology Geyer and Zouwen 1986
Urban form Allen 1982
Politics Dobuzinskis 1987

To understand the meaning of the concept, it is useful to begin with a distinction between order and organization,⁶ which is emphasized by authors such as Wicken (1989) and Kay (1983), who also note the interchangeability, overlap and lack of consensus regarding meaning. Order is simpler, generally referring to a regular arrangement or pattern, hence the term has a rather static, structural connotation. While it can refer to pattern generated according to some simple rule such as the sorting of pebbles on a beach or crystalline structures it does not necessarily imply the existence of a “system.” In contrast, organization could be considered as that quality which contributes to the “systemness” of a system, since it implies a

⁶ See www.fes.uwaterloo.ca/u/mbldepts/systems/orderorg.htm and associated files for more detail on this discussion

functional arrangement of some kind: a whole consisting of interdependent or coordinated parts. Molecules, ecosystems, and social groups, exhibit organization. The factors described pose some challenge for objectively and universally defining the meaning of “organization,” which consequently points to the role of the observer in defining such a system.

The foregoing discussion is relatively common in the literature on self-organizing and complex systems. However, what seems more interesting, but infrequently discussed, is the question asked by Morin:

What does the radical “self” of self-organization mean? (Morin 1992: 5)

Such a question de-emphasizes debates about the meaning of “organization” and emphasizes the question: *What “self” is being organized?* Framed in this way, the discussion takes a shift, for many of the entities referred to as “self-organizing” have rather weakly defined “selves.” What might this mean with respect to Benard cells or a tornado? In more complicated examples, such as an autocatalytic network, where generation of the entity involves feedback processes in which a system’s outputs enhance its own creation, the “self” is perhaps a little easier to imagine. In a cell or simple organism the system can be interpreted as defining its own “self” in a much more identifiable manner. From a social or psychological perspective, however, where defining a “self” could be taken to require consciousness, even these designations seem weak.

The usefulness (noted above) of the concept “self-organizing” lies in a sense that the term intuitively offers an appropriate signifier for a particular – and rather ubiquitous – type of phenomena:

On an intuitive level, self-organization refers to exactly what is suggested: systems that appear to organize themselves without external direction, manipulation, or control (Dempster 1998: 41).

Self-organization is to be understood as the spontaneous emergence of coherence or structure without externally applied coercion or control” (Ho and Saunders 1986: 233).

Self-organization may be taken as the opposite of construction. It probably is due in part to our cognitive make-up, but also to cultural factors in science, that we see the systems of the world as coming into existence under the control of an agent, or according to an algorithm, specified in genes, or in something else. Most people seem to have great difficulty in imagining that order at large, may emerge out of local interactions, without any general plan being present anywhere. And this is exactly what self-organization amounts to (Dalenoot 1989: ix).

The concept is predominantly about emergence – yet not *only* emergence – emergence without design from an external source. Causal explanations for this emergence seem to fit loosely into two categories that arise from study of physical vs. biophysical systems. A distinction between creative and transmitted self-organization (Dempster 1998) fits with these two categories. In the first case, structures emerge from global-local interactions. Global influences provide coherent direction to particular components (e.g. gravity on water droplets) which, by interacting with the constraints imposed by local influences (e.g. soil particles to landscape features), form coherent patterns (dendritic river systems). Interactions among multiple global and multiple local influences have the potential to create significant complexity. Haken (1988) emphasizes that specific pattern emerges from non-specific influences, pointing to the emergence of Benard cells – hexagonal structures that emerge in a heated fluid – as an example. The generation of dissipative structures in non-equilibrium thermodynamic conditions (Prigogine’s work) is another example which Kay used to illustrate the second law of thermodynamics as, what I would call, a global-directional influence leading to the manifestation of life.

I describe the other sense in which self-organization is used as *transmitted self-organization* because it generally refers to the process by which a system generates itself through internally specified information or code (e.g. development of living organisms from genetic information). This code is generally transmitted from one generation to the next. I follow this discussion in the next section.

Poietic systems

I use this phrase to refer to *autopoietic* (Maturana and Varela 1980 etc. and others) and *sympoietic* (Dempster 1995, 1998 etc. Guddemi 1997) systems, each of which I describe in some detail. Maturana and Varela developed the notion of autopoiesis (self-production) to distinguish living from non-living systems and also to respond to puzzles about cognition. Developed further by these and other authors, the notion has also – when integrated with 2nd order cybernetic thinking – spawned conceptualization of self-referential systems (especially Luhmann, also Maturana and Varela, von Forester, von Glaserfeld, etc.). I will discuss these toward the end of this paper.

AUTOPOIESIS

In order to understand the implications of these ideas it is essential to understand particular aspects of autopoietic theory. I briefly reiterate, and to some degree extend, explanations I have made elsewhere (e.g. 1998, 2000b). As presented here *these descriptions are so brief as to be beguilingly, perhaps distortingly, simplistic*, yet I believe they adequately express the essential features. I re-emphasize my interpretation of systems as *heuristics* that assist in *conceptualizing* that-which-exists.

I begin with specific concepts developed by Maturana and Varela (1980, Varela *et al.* 1974, Maturana 1980a, 1980b), building on their work with reference to my own and others.

The *pattern of organization*⁷ of a system is the relations among components that define a system as member of a particular class of system (e.g. living system, tree or car). The *structure*⁸ of a system is the actual relations and components that constitute a pattern of organization as an existing entity in a particular domain (e.g. physical manifestation of a specific individual tree or car in the physical domain). Any pattern of organization can be manifest in many different structures. A limited analogy is to think of pattern of organization as an interactive dynamic blueprint, and structure as its interactive dynamic manifestation.

Distinguishing between these two aspects allows recognition that a system can simultaneously be open and closed in different, mutually interactive, ways: systems can be *organizationally closed* but *structurally open*. For example, a living organism with a genetic ‘program’ determining its pattern of organization is closed to anything but ‘programmed’ changes to its pattern of organization but it processes structural inputs of energy and nutrients and is, consequently, structurally open.

⁷ Maturana and Varela use only the term *organization*, however, this can be confusing, when extending the discussion into social systems where organization carries a different meaning, so I follow Capra (1996) and use the phrase *pattern of organization*.

⁸ Note that this definition of the term *structure* does not match the definition applied in some disciplines. For example, in some cases *structure* more closely represents what is here being termed *pattern of organization*. As used here, *structure* more closely represents vernacular meaning, which typically refers to a physical entity – something present and ‘real.’

Organizational closure refers to the degree of self-containment a system has with respect to its pattern of organization. A system can be organizationally *open*, *closed* or *ajar*, depending on whether its pattern of organization is completely determined by *external* sources, completely determined by *internal* sources, or primarily determined by internal sources but also influenced by external sources. In contrast to the genetically programmed organism, a human made artifact is organizationally open, and an ecosystem, which allows, but limits, the introduction of new species in a self-determined manner is organizationally ajar.

A *poietic system* is a system with a pattern of organization that enables it to perpetuate itself by producing its own structural components from structural inputs and organizing the relations among these components in such a manner as to ensure the continuation of its own pattern of organization. Maturana and Varela termed such a system – when organizationally closed and producing its own boundaries as “surfaces of cleavage” that identify it as a composite unity separate from its environment – an *autopoietic system*. I use the term *poietic system* to refer to the more general class that includes sympoietic systems. The latter systems are *organizationally ajar* and *boundaryless*.

I coined the term “sympoiesis” (collectively-producing) when writing my B.Sc. thesis (Dempster 1995) as a means for characterizing ecosystems which I found difficult to describe using some of the autopoietic system characteristics. Most notably, although there is some degree of ‘self’-production ecosystems do not produce their own boundaries but gain their system-ness from continuing mutually influential interactions among components. The concept continues to develop⁹ (e.g. Dempster 1998, 2000), although full understanding of this heuristic and its implications will be continually evolving.

Guddemi (1997) has also used the term sympoietic to describe similar characteristics:¹⁰

In the definition of “sociality,” e.g. human sociality, we are concerned with a special case of this, that in which autopoietic entities of similar phylogeny each form part of an environment or milieu for the other, making each a part of the niche for the other. The structural coupling and the predictabilities of behavior which it entails for each party create a resulting system, which I term a sympoietic system in order to bracket the question of its possible autopoiesis. It is clear that there can be two-, three-, four-, or n-entity sympoietic systems; thus they do not maintain the same sort of boundedness as is characteristic of autopoietic systems proper. The number of possible relationships between entities is a trivially calculable number. Drawing boundaries around such systems depends on an observer (Guddemi 1997: 1).

However, his final comment, which implies that drawing a boundary around an autopoietic system is *not* dependent on an observer raises a concern. It is essential to acknowledge the subjective nature of poietic system definition. Defining/describing a pattern of organization and categorizing it as a member of any particular class of systems is the act of an observer and consequently inheres bias and assumption. This is

⁹ I intentionally use the dissociating phrase, rather than claiming that I continue to develop the concept. While my earlier discussion points to a belief in the constructed nature of reality, I find the development of this concept as a fine example of negotiation – with colleagues *and* with that-which-exists. While I have been instrumental in development of the concept, it carries on its development without me – at least to some degree.

¹⁰ In communication regarding respective and almost simultaneous development and use of the term, I commented on our respective decisions as an example of self-organization, to which he responded: “I am really quite fascinated by the independent invention of the sympoiesis/sympoietic term, and it is probably precisely “a fine example of global constraints leading to similarity of patterns” (Guddemi, email correspondence 11/6/2001, internal quote is mine).

particularly important to remember when referring to systems as ‘producing their own boundaries’ – which easily slides into interpreting an entity-so-conceived as existing objectively.

In relation to this concern, the distinction between autopoietic and sympoietic systems provides an opportunity for acting on the ‘system-as-heuristic’ principle, which I continue to grapple with. I have often referred to autopoietic and sympoietic systems as two different ‘lenses’ to view the world through. Appearances – of the same phenomena – will depend on which lens is used. Looking through the autopoietic lens, entities seem more bounded, autonomous, homeostatic, and predictable with more centralized information and control and a developmental orientation. Looking through the sympoietic lens, entities seem more boundaryless, amorphous, homeorhetic, and surprising with more distributed information and control, an evolutionary orientation and balance maintained through dynamic tension. I also, however, continue to use organisms as the paradigmatic example of autopoietic systems and ecosystems as the paradigmatic example of sympoietic systems. This may exhibit the notion that some interpretations work better than others. In applying the concepts to understanding psycho-socio-cultural phenomena, I begin to find it easier to consider applying *both* conceptions to gain different understanding – a notion I have been pointing to all along.

The final important concept related to autopoietic systems that was described by Maturana and Varela is *structural coupling*. This refers to the recognition that a system’s *structural* relationship with its (structural) environment will determine its ability for continued poiesis. For example, a house-plant moved to a shady corner or a person fed only sawdust, will not survive since it no longer receives appropriate structural inputs (energy and material) even though its pattern of organization has not changed. A system with a sufficiently adaptable pattern of organization – that would enable it to develop an appropriate structure (bigger leaves, enzymes for digesting sawdust) could continue autopoiesis. A critical point made by Maturana and Varela and subsequently emphasized by many others is that systems receive triggers, but not information from their environments. As Rasch (2000) puts it: perturbations, not instructions. This becomes particularly important in Luhmann’s theory and in developing the epistemological aspects of autopoiesis.

Many have found the notion of autopoiesis and the associated concepts useful and have applied them to a range of social situations (Bednarz 1988, Luhmann 1989, 1990a 1990b, 1995, Fleishaker 1992, Kickert 1993, Mingers 1995). There is considerable discussion in the literature about whether application to social systems is appropriate. As heuristics, I think both poietic concepts are applicable to social systems, although I make reference back to the diagram of “reality” to point out that organisms, ecosystems and social systems are all on the ‘more constructed’ end. My interpretation of reality stresses that these are *only* heuristics which aid conceptualization of complex phenomena. The validity of their application to social phenomena *and* biological phenomena is continually suspect, but also potentially useful. Although, I stress that the questions – Useful to who? And for what? – are of much greater significance and importance than are usually stressed.

There is another thread of theory and discussion regarding autopoiesis – focused on the biology of cognition – which has a more philosophical flavour. Rather than move into discussion here, I will take it up in the section on self-observation and turn away from systems theory, to consider planning theory. To

conclude this section, I sketch distinctions among self-ordering, self-organizing, and self-producing systems – suggesting that they are not precise categories, but possible distinctions along a continuum.¹¹

- Self-ordering is the simplest heuristic. I suggest that ‘self’-ordering entities are created through the interaction of global(directional) and local(constraining) influences such as in the generation of eddies and tornadoes. If the influences are removed, the ‘system’ dissolves. In this case, it seems a little hard to imagine the entity as a “self”...
- Self-organization is a more complicated heuristic and implies something system-like, perhaps involving feedback processes such as in an autocatalytic network where outputs of the system enhance its own existence. Here it is easier to imagine a “self”...
- Self-production is an even more complicated heuristic and perhaps even involves something complex. In this case, a set of interconnected, interdependent processes (the system) creates some kind of outputs (or products) which become functional components of the system. They play an active role in the system’s creation, rather than just feedback that enhances existence. Consequently, there is something here about the system defining its own “self” in a much more identifiable manner (the role/bias of the observer in establishing such possibility not to be forgotten).

PLANNING THEORY

DEFINITION OF PLANNING

Planning is the practice that mediates between past, present and future. Defined generally, it is practised by everyone, defined more specifically, it is a professional activity, practised by few.

I have written about the variable definitions of planning more extensively elsewhere than I can cover here (Dempster 2000a, see also Alexander 1992, Friedmann 1987).

SURVEY OF CONVENTIONAL AND CURRENT MOVEMENT

Over the past 25 years a few authors have presented surveys or reviews of planning theory, attempting to provide organizational schema to cope with the range and diversity of theory (Hudson 1979, Briassoulis 1989, Friedmann 1987). A few compilations of key planning papers or collections of planning theory have also been produced: Faludi (1973) is key, Mandlebaum *et al.* (1996), and Campbell and Fainstein (1996) are more recent versions. These collections indicate the broad loose range of planning theory. Mandlebaum (1996: xiii) notes that, despite divergence on many considerations, many planners agree upon a “capacious conception of theory and theorizing.” Referring back to distinctions between procedural and definitional theory (Figure 2), it seems to me that much of this discussion focuses on procedural theory that *assumes a particular definitional theory – without raising question about its appropriateness*. In particular, it tends to assume the basic tenets of the modernist paradigm: maintenance of the current political economic status

¹¹ See www.fes.uwaterloo.ca/u/mbldeps/systems/orderorg.htm and associated files

quo, dependence on rationality (with possible variations) as the principle logic of justification, bureaucratic processes (even if ‘participatory’) as the most appropriate means to manifest democratic principles and continued reliance on experts (although this may shift to expertise on facilitation rather than outcomes). As Beauregard (1996: 224) claims: “Theoretically, planning remains in a modernist mode.”

In this regard, Friedmann’s (e.g. 1987) distinction between “societal guidance” and “social mobilization” is valuable for the discussion here. The latter incorporates “radical planning” – attempts to change the status quo, whereas the former is about planning that fits within the current social structure. As will be indicated by descriptions of current approaches, however, planning appears to be primarily about societal guidance.

I begin with brief descriptions of different theories, most of which fit in the procedural category, followed by discussion of systems applications in planning.

Rational-comprehensive

This theory or model is characterized by a standard rational decision-making process: (1) define the problem, (2) determine possible solutions, (3) forecast outcomes from the solutions, (4) evaluate the alternatives according to chosen criteria, and (5) choose the best solution. The approach rose to dominance at a time before Beck’s “moralizing groups” had much to say about planning, but is still pervasive. The basic model has, however, received modifications and improvements, primarily to recognize the need for evaluation throughout and at the end of the process in order to provide the opportunity for learning. This points to what I see as one of the subtle and powerful influences of this approach, however. Campbell and Fainstein’s (1996: 261) introducing a section on planning theory suggest that “It is useful to begin with comprehensive planning and then see the four other approaches as responses to comprehensiveness.” This seems to be a common habit – to describe ‘other’ approaches as just that, alternatives. Does rational comprehensive planning – through its continued description (even as antithesis) – continue to be viewed as the ideal despite valid critiques against it? Is this appropriate? What plays of power/knowledge are hidden behind such descriptions?

A “capacious conception of theory”

Taking a cue from Mandlebaum’s description, several different approaches can be highlighted. Advocacy planning (Davidoff 1965) is primarily about the planner as an expert who could advocate for disadvantaged groups offering them greater access to decision-making processes. Mixed-scanning (Etzioni 1967) emphasized the multiple scales and concerns relevant to any planning process suggesting the need to alternate between a broad comprehensive view and a focused specific view to balance the need for enough-but-not-too-much information. Transactive planning (Friedmann 1987) described an interactive participatory process. Equity planning can be considered as a newer version of advocacy planning that attempts to diminish the planner-as-expert and elevate the people involved in the situation to be recognized as ‘experts.’

This capaciousness has led theorists to develop schema or frameworks for choosing appropriate theories or models depending on situation it will be applied in. As Brooks (1993: 143) notes: “all of these approaches

are valid and appropriate *some* of the time under *some* circumstances.” Alexander – one of the key promoters of such an approach – refers to these as contingency theories (e.g. 2000). Christensen (1985) developed a framework focused on uncertainty, building on aspects of chaos theory. Mixed scanning is also ‘contingent’ to some degree. Although useful devices, none of the frameworks I have seen adequately address the question of how/when and who decides. In most, the latter question is typically (and unwittingly) taken to be the planner or the ‘system,’ pointing to one of the problematic aspects of a contingency approach.

Participatory and communicative planning

Reflecting similar movement in other disciplines, there has been an increasing call for greater public participation in planning processes.¹² In many cases, this results from a vocal public demanding to be included in decisions affecting their well-being, such as urban environmental issues and concerns. Bureaucratic institutions are being encouraged to develop – and some are – processes that are more inclusive, representative, and – to some degree – pluralistic. Arnstein (1969) – still frequently referenced – developed a ladder of citizen participation which advocated more “collaborative” involvement of the public (see also Rocha 1999, Brown 1996). More recently, planning theory has developed a “communicative” turn, integrating the Habermasian notion of communicative rationality (e.g. Forester 1999, Innes 1995, 1996, Healey 1997, 1999, Mandelbaum 2000). The notions of “ideal speech” and “deliberative democracy,” which involves the development of fair and just rules for deliberation (e.g. Bohman and Rheg 1997, Habermas 1984, 1996, Rawls 1996, 1997), provide a fruitful theoretical basis for planning, especially given attempts to become more inclusive. The communicative turn, however, is still embedded within the rationalist mode as exemplified by the very notion of “communicative rationality” upon which it is based (e.g. Alexander 2000).

Emerging from a critical theory approach, communicative planning does attempt to take a reflexive stance, questioning its own influence on the processes it creates, however, it still “takes place *within* modernist and/or humanist modes of thought and does not (cannot?) transcend them” (Huxley and Yiftachel 2000: 336).

Theorizing planning requires stepping outside the planning discourse (Huxley and Yiftachel 2000: 337).

Feminist, postmodern, Foucauldian and other critique

In response to the foregoing approaches to planning, a variety of critiques have emerged. Perhaps this is an indicator of the progression or evolution of planning: the key ‘opponent’ was once the rational-comprehensive approach, now it is the communicative model. Perhaps this is an indicator of my own progress and evolution: a couple of years ago I would have advocated the communicative model, now I question it. A recent theme issue in the *Journal of Planning Education and Research* (Lauria 2000) is especially useful in this regard, since most of the authors critique communicative planning based on a Foucauldian perspective. They note the lack of attention communicative planners give to institutionalized

¹² Dempster (2001) was revised during the writing of this paper and expresses some similar ideas. On these particular topics, more detail is provided in the other paper.

power/knowledge, to historical context, or to the problems of representation. Planning needs to be recognized as a discourse and strategy of government. The historically generated interdependence of power, knowledge and processes of legitimation that are embedded within the structures of planning, tend to entrench rather than neutralize current inequities, and must be examined and deconstructed (see especially Huxley and Yifchatel 2000, Neuman 2000, Abram 2000).

In addition, Table 6 lists some of the more general postmodernism critiques which make similar claims (e.g. Allen 1996, Beauregard 1996, 1999) as do feminist critiques (e.g. Moore-Milroy 1991, Sandercock and Forsyth 1992, Friedmann 1996).

Other approaches

Perhaps due to its urban focus, there seems to be a range of planning approaches and practice that is seldom included in discussions of planning theory. Briassoulis (1989) is an uncommon exception. Two particular areas, in which new developments carry some ‘radical’ characteristics seem important: planning related to natural areas and to business.

Natural areas/natural resources planning covers a variety of approaches. Although much fits within a rationalist frame, some changes are occurring. Adaptive management – with its emphasis on ‘learning by doing’ – is a notable example. It is being applied to forestry (BCFS), parks and protected areas (Agee 1996), watershed management (Columbia River Basin [Lee 1993], Chesapeake Bay [Hennesey 1994]) and more. The complex-systems ecosystems approach noted above and applied, for example, in the Great Lakes Basis is another example (e.g. Allen *et al.* 1993). Although the “theory” is more focused on *description* than *prescription*, by incorporating aspects of post-normal science and participatory processes, the approach is developing theoretical applications relevant to planning.

Business/corporate/strategic planning also covers a variety of approaches from the staid and pedantic to the wild and entrepreneurial. Given the nature of the business environment, notions of coping with surprise and uncertainty have long been common here. New systems thinking is being incorporated in a variety of ways. While some applications seem like little more than a new gimmick, this is one of few places I have found where planning process has begun to incorporate notions of complexity, uncertainty etc.

Table 6 Postmodern and feminist critiques of planning

<p>POSTMODERN PERSPECTIVE (summarized from Beauregard 1989)</p>	<p>Postmodern critique of planning incorporates:</p> <ul style="list-style-type: none"> • a turn to historical illusion and spatial understandings • abandonment of critical distance for ironic commentary • embracing of multiple discourses and rejection of totalizing ones • skepticism toward master narratives and general social theories • disinterest in the performativity of knowledge • rejection of notions of progress and enlightenment • tendency toward political acquiescence
<p>FEMINIST PERSPECTIVE (summarized from Sandercock and Forsyth 1992, Friedmann 1996)</p>	<p>Planning practice needs to:</p> <ul style="list-style-type: none"> • encourage different ways of knowing, in particular: <ul style="list-style-type: none"> • talking; listening, tacit or intuitive knowing, creating symbolic forms, and acting • incorporate an ethic of caring • incorporate a feminist methodology: <ul style="list-style-type: none"> • continuously and reflexively attending to significance of gender and gender asymmetry • consciousness raising as tool and orientation • challenging the norm of objectivity • concern for ethical implications of research • emphasis on empowerment of women and transformation of patriarchal social institutions

Systems and planning

The rise of general and cybernetic system theories described above led to tantalizing possibilities that planners could little resist since they offered a new set of tools to carry out Saint Simon's and Compt's initial vision of social engineering: applying scientific knowledge to create desired social systems by controlling various social factors (Friedmann 1987). In this sense, the earlier forms of systems thinking – which were integral to engineering – underlie planning on a fundamental level. Friedmann (1987) noted that it is from, in particular, the influence from this social engineering tradition that the use of systems and systems analysis – especially manifest as the rational-comprehensive approach – became widely applied.

Applying systems concepts to human societies lead to thoughts of prediction and control (e.g. Forrester 1975), especially with improved computational and modeling ability of computers. This did not occur, however, without caution, disquiet and dissent (e.g. Kriesis 1968, Dimitriou 1972, Faludi 1972).

The predominant application of systems thinking in planning, both recently and historically, appears to be associated with subject-oriented applications – gaining knowledge of planning situations, most notably what was termed systems analysis. When first applied in planning, the basis for systems analysis were the general and cybernetic conceptions of systems (e.g. Beer 1959, 1966, Catanese and Steiss 1968, 1970, Chadwick 1966, 1971, Chapin 1968, Forrester 1969, 1975, and McLoughlin 1970). Descriptions were quantitative, specific, and positivistic often consisting of computer models to manipulate various factors so that a variety of possible futures could be generated and reviewed for desirability. They were the subject of many critiques – both then and now. In reading the work of these early systems-thinking planners, however, I noticed that many of them spoke of these critiques themselves. Further, many of their cautions regarding the application of systems ideas and systems models are *still* made by *new* systems thinkers – a sobering thought.

An added aspect of systems analysis was when planning was seen to play a critical role as 'controller' of a cybernetic social system (Batty 1981, e.g. Chadwick 1966, McLoughlin 1970, Forrester 1975). According to this view, social systems are governed by feedback, and maintain a steady state that can be predicted and controlled. Manifesting the desired state simply requires understanding the various components, relations, feedbacks, and environmental interactions, and then applying suitable control measures. Initially the factor limiting such understanding and control was taken to be the difficulty of adequately modeling the complexity of social systems. With the advent of computer technology after WWII there was an increase in systems applications in planning, and a fervour of excitement about the potential for societal steering. Some early authors noted cautions with respect to this role (e.g. Chadwick 1966, Catanese and Steiss 1970, Forrester 1975). I do not have the sense, however, that such awareness was ever emphasized, nor that it has been maintained.

Several of the early authors who advocated understanding the *subjects* of planning as systems, also advocated a very *systematic* (i.e. methodical, step-wise) process driven by the analyst-planner (e.g. Chadwick 1966, 1971, Harris 1967, Catanese and Steiss 1968, 1970, Teitz 1968). Such an emphasis was coherent with the mechanical-cybernetic conception of systems that was prevalent at the time.

Implicit in these “engineering” applications were particular epistemological and political stances. The positivistic belief in the possibility for finding and manifesting the ‘best’ solution to any problem was coupled with a paternalistic belief in the ability and responsibility of leaders and experts to decide and control for the social good. These assumptions de-emphasized the normative aspect of planning and made the link between the role of planning in society and the tools for achieving this role – systems analysis – appear self-evident.

Friedmann’s (1987) distinction between societal guidance and social mobilization is relevant for considering the application of systems thinking to planning. System applications seem to have occurred exclusively within the former, likely for two reasons, both of which challenge the potential to apply them for social mobilization. First, planners advocating the latter tend to oppose the epistemological and – especially – the political stances implicit in systems applications to planning. In addition, there is a (justifiable) distrust of systems-thinking among the social mobilizers, who necessarily react to the earlier control-oriented applications of systems in planning.

GROUND?

...Yet both of these recent movements (advances in systems theory and directions in planning theory) emerge from conventional, rather than radical, knowledges and politics – the very ground for these “deeply ingrained driving forces” and this “institutionalized ignorance.”

CHARACTERIZING DESCRIPTIONS OF SYSTEMS AND PLANNING THEORY

These descriptions of the recent advances and directions in systems and planning theory indicate their modernist legacy. Regarding systems theory the physical science/engineering mentality is still pervasive. While uncertainty and unpredictability are articulated, hidden within the discourse is the hint at continued belief in these as qualities of ignorance rather than indeterminacy – the presence of possibilities that are fundamentally unknowable. Within planning, the bureaucratic model dominates. While movement towards more participatory approaches are attempted, continued reliance on experts is pervasive, supported by continued reliance on rationality. Hempel's “deeply ingrained driving forces,” act as anchors resisting change in institution and public space alike. Change toward anything more

These descriptions of the recent advances and directions in systems and planning theory indicate that both have moved a considerable distance from the standard rationalist, reductionist model that has characterized modernist approaches toward something different, perhaps even radically different. These recent movements incorporate greater epistemological and political (even in systems) awareness; and a radically different

These descriptions of the recent advances and directions in systems and planning theory indicate the need to deconstruct the modern/postmodernism distinction – a distinction that is itself, constructed through the rhetoric of dissent; nurtured and affirmed through reluctance to relinquish power. To question if these ‘new’ notions are emerging from any particular ‘ground’ is a question that itself implies a particular understanding. Ground is a very solid metaphor. Something fundamental to stand on; immovable and unchanging, yet carrying the potential to create/nurture growth as fertile soil. It suggests a modernist perspective. It is seldom considered as

quicksand – a shifting, moving space of possibilities – or as an ecology. Yet the living quality of the soil suggests some potential for an alternative understanding of ground: I think of microrrhizal fungi and Deleuze and Guattari's rhizome. As network, the very ground changes as the ideas change and theories change and actions change. Continual movement... a poststructural ground... As such the question becomes moot: the ground theory emerges from is the ground it creates.

notion of understanding and assessment. Rather than emerging from the 'ground' of modernity, they emerge from the fringes; from radical knowledges and politics that are struggling against the "deeply ingrained driving forces," contributing what they can to bring about change.

egalitarian is hindered by the "institutionalized ignorance" governing various processes, ensuring continuation of rational comprehensive variants rather than the adoption of something new and different. Despite the varying epistemological outlooks and participatory movement, the ground from which these systems and planning theories have emerged is infused with modernist qualities – knowledge and politics based on rationality, objectivity, experts, predictability and controlability.

Despite variable expressions of degree and response, there is general (although not universal) agreement that current habits of mind and behaviour are producing unsustainable, inequitable outcomes. Given the associated uncertainties, a precautionary approach seems wise. This does not, however, allay the questions: What? Who? How? How much of what? etc. Two themes have been emerging that claim, and perhaps have, some potential to address the concerns – although, admittedly, not to answer them: recognizing complexity/uncertainty and encouraging participation/deliberation. Each of these are characteristic of recent turns in systems theory and planning theory, with a hint of both in both. Anything described in this paper so far, however, suggests, but seems short of, the radical praxis that may be most appropriate.

Another theme gaining attention, that is worthy of note, is reflexivity. Although not new, popularity is increasing as variants emerge in systems, in planning, in philosophy, in research. I turn to this, then, as the final thread to weave into the map.

REFLEXIVITY

As with the other topics covered, there is a broad range of discussion. Again, I provide a sample from what I have read, trying to cover key themes and individuals.

Sampling approaches to reflexivity¹³

Critical Theory

Initially associated with the Frankfurt School (current: Habermas; older: Horkheimer, Adorno, Marcuse, Fromm), this term can also refer to a broader range of critique which has arisen in response to particular themes of modernity, yet which, many argue remains firmly entrenched within the paradigm.

¹³ I originally titled this section: *Critiquing/countering modernity*. Although emphases have been altered, the ease with which the new name fit as the paper took its final shape is noteworthy. Despite attempts, most notably by Critical Theory, to be reflexive, the modernist paradigm suffers from its lack.

Recognizing socially-constructed reality, the key principle is to take a 'critical' attitude to society and research by recognizing that ones own ideas and perspective emerge from the very same society and research. Generally considered to carry an emancipatory focus, although criticised for positing the emancipator as expert instead of recognizing the need for self-empowerment. This approach is the foundation for the "communicative turn" in planning. There is also an associated systems approach: critical systems theory (e.g. Flood and Romm 1996).

Postmodernism

This is a very broad and ambiguous term, including a range of critique that defies definition or categorization.¹⁴ Of course such defiance is what it strives for... While it is often interpreted as nihilistic, some authors make distinctions to indicate a more positive version: Roseneau (1991) refers to these as affirmative and skeptical, Oelschlaeger (1995) as deconstructive and reconstructive. In addition, critics claim that the extreme postmodern position leaves no room for action since any movement may tread on some other's equally legitimate toes. I find this critique problematic. It seems to me that the extreme postmodern position indicates exactly what must be done: engage others in dialogue in order to incorporate their concerns as a precursor to action, and then continually revise, reconsider, and renegotiate other positions, concerns, beliefs and understandings as action proceeds. Not simple, but certainly straightforward. As Yannow states:

Multiple interpretations do not obviate the need to act (Yannow 1996: 238).

Rather than criticize postmodernists I should thank them for enabling my own awareness of how subtle an influence I have on others. Where I previously bumbled along assuming that what I thought was good *was* good, I now realize that to minimize harm against other I must question the depth of systemic and structural inequities that exist and my role in creating them.

Similarities between new systems theory and postmodernism have not gone unnoticed, regarding the notions of complexity/self-organization (e.g. Cilliers 1998; Rosneau 1991) and autopoiesis (e.g. Wolfe 1998, Hayles 1999, 2000, Rasch 2000, Hoendahl 2000).

Poststructuralism is a sibling to postmodernism. The distinction is tenuous, one suggestion being that postmodernism is more broadly cultural, poststructuralism more focused on literature and language (Roseneau 1991), primarily due to its emergence as critique in these areas.

Foucauldian critique is typically categorized as postmodern and/or poststructural – he would probably have preferred being uncategorical. The primary theme distinguishing his work is the questioning of power/knowledge as expressed through historically embedded discursive structures of society. It is expressed succinctly in the following quote:

What false idea has knowledge gotten of itself and what excessive use has it exposed itself to, to what domination is it therefore linked? (Foucault 1997: 49)

While it is simplest to see his critique as relevant to understanding planning and systems because of their dependence on expert based approaches, this is not deep enough. Rather, the legacy of these dominant

¹⁴ See www.fes.uwaterloo.ca/u/mbldemps/phil/pomo-whatis.htm and associated files for more detail on this discussion.

mode of theorizing must be recognized in the challenge of using language expressing an evanescent rather than concrete reality; in the heedless prioritization of perception; in the pragmatic valuation of “it works” without careful consideration to the full implications for other; in the construction of knowledge and processes of legitimation by those in/with power, generating its subsequent reinforcement; and finally, of my own participation in this very process, even as I write to question its validity.

With regards to planning, Foucault proposed “as a very first definition of critique, this general characterization: the art of not being governed quite so much” (1997: 29) which raises questions over the very notion of planning – at least of a professional, bureaucratic style – a question consistent with the notion of serendipitous planning that seems to be the outcome if consideration is given to developing sympoietic planning systems (Dempster 1998).

Marxism

I am on thin ice again here! To date, my understanding has been a general, but limited awareness of socialist politics. Given the nature of the question, most specifically the reference to radical praxis, it seems important to at least acknowledge this body of theory and literature. In my (recent) brief forays, three aspects resonate. First is attention to the concrete/material. Second is the notion of praxis: “The coincidence of the changing of circumstances and of human activity or self-change” (Marx in Lebowitz 1992: 141). Third is reference to the processes of production, which have a very systems – especially poiteic systems – flavour:

... What Marx was describing is class struggle *as a process of production*.

Just as every activity of the worker alters her as the subject who enters into all activities, similarly the process in which workers struggle for themselves is also a process of production, a process of purposeful activity in which they produce themselves in an altered way. They develop new needs in struggle, an altered hierarchy of needs. Even though the needs which they attempt to satisfy do not in themselves go beyond capital, the very process of struggle is one of producing new people, or transforming them into people with a new conception of themselves – as subjects capable of altering their world. *Nothing is more central to Marx's entire conception than this coincidence of the changing of circumstances and self-change.*

Every struggle to change circumstances is a process of self-change; it alters the people who engage in it – *and they enter into all their other relations as these altered human beings*. Insofar as those struggles (to be successful) must be collective, they produce people for whom unity becomes an end rather than mere means (Lebowitz 1992: 143, 147).

RADICAL PRAXIS – 3RD EXPRESSION

Two themes were articulated following the discussion on sustainability above: epistemology and concreteness. I like the work of Wolfe, Rasch, Hayles and others, as they pull theory from Luhmann, Maturana and Varela as well as postmodern theorists to write essential philosophical critique. Yet these seem a little distant from the concrete/material concerns evidenced by the daily news. Such stories, however, are reminders that behaviours are informed by theories, philosophies and values – which are, at the same time, constructed and reinforced by lived experience, which is, in turn, constrained by “reality” (with its constitutive degree of constructedness).

Hence: Consideration of praxis: Theory emerging from action emerging from theory emerging from action... Beyond this: Radical praxis: Mutually constitutive theory and action motivating fundamental change, constitutive of fundamental change... The latter, another turn, back to the self. Hence: recognition of the need for self-observation, but critical introspection rather than mere mirror-gazing. How to overcome the egocentricity of self-reflection? Or, to put it in Beth-

mediated systems terms: How to learn to become a sympoietic self?¹⁵ And further, how to develop this self in, and with, collective interactions among others?

At core, radical means something different than the self – something fundamentally other (Tucs, forthcoming). Praxis means action that is embodied in the self. As noted before, then, radical praxis incorporates paradox: fundamentally other embodied through thinking–doing of the self. Yet the nature of complexity and self-referentially suggests paradox is not a barrier, but may be a way through by encouraging the development of a more reflective assessment...

Many authors defend the need for developing such approaches, ideas and attitudes. Yet, the key question remains: How? The short answer is: I don't know! But I have a few pages left, so I will sketch some outlines. These could easily be interpreted as research directions...

BOUNDARIES AND SELF-OBSERVATION

...Can these recent theoretical advances and directions accommodate and/or generate a more radical praxis? – one that carries the seeds of its own critique and evolution? – one that at least *attempts* to address the following challenge?

System boundaries have to be drawn so that the world acquires the possibility of observing itself. (Luhmann Ecological Communication 1989: 18)

Epistemological Autopoiesis or Autopoiesis of Epistemology

I begin with cognitive aspects emerging from autopoietic theory – ideas epitomized by the phrase: “we do not see that we do not see” (Maturana and Varela 1987: 19). The essence is to conceive of cognition as embodied action (especially Maturana and Varela 1987). Each of us should be aware of an “unbroken coincidence of our being, our doing, and our knowing” (Maturana and Varela 1987: 25). As another form of the statement: “every act of knowing brings forth a world.” Maturana's insight was to apply the notion of operational closure to the perceptuo-cognitive act. The percept-concept distinction discussed above becomes correlated to the structure-organization distinction, with poiesis as their ongoing mutually constitutive, but separate, interaction. Cognition, then, is inherently and fundamentally self-referential.

What the theory of the observation of observation holds, then, is that the world is not given – as in the traditional, representationalist frame – but is rather brought forth in the dynamic interaction of observer and observed. As Maturana and Varela put it, “Our intention is to bypass entirely this logical geography of inner versus outer by studying cognition not as recovery or projection but as embodied action: (1987: 172). But more than this, since that bringing forth takes place by means of paradoxical distinctions, it means, as Maturana and Varela put it, that “every world brought forth necessarily hides its origins. By existing, we generate cognitive 'blind spots' that can be cleared only through generating new blind spots in another domain. We do not see what we do not see, and what we do not see does not exist” (1987: 242) (Rasch and Wolfe 2000: 13).

To think of this another way, system-environment is typically described as the basic distinction: What is not part of the system is part of the environment – a convenient duality. Those writing on 2nd order observation draw attention to the critical role of the observer, yet this is still typically offered with a dualistic flavour – observer/observed, system-environment – rather than with a clearly articulated three way assessment: system-environment-observer. This is, however, the essence of Maturana and Varela's

¹⁵ Lucas (2001), having recently come upon the notion of sympoiesis, wrote it into a section on values. My knee-jerk “systems theorist” response was as disturbingly immediate: why not in the “serious” section on systems *theory*? The ensuing and almost as immediate philosophical reflection that the very notion of values interaction among sympoietic systems/individuals is valuable/important possibility to consider...

point in stating that observation is always done by an observer. They try to escape by emphasizing the dynamic nature of the process, yet it *still* ‘hides its origins.’

Given emphasis on system–environment–observer it should become obvious that we begin an infinite regress. Yet the most significant aspect of the triad remains forever beyond specification: I must recognize it as *myself*. I must also recognize it as fundamentally inescapable.

One can see in much writing an attempt to get out of it – to turn oneself and other inside out to escape the impossible – reflexive recursion : recursive reflexivity – yet the attempts are just that: attempts. In science it becomes the dispassionate analytic rhetoric required for publication or for being ‘taken seriously.’ In postmodern extremity it becomes the a-structural, squirming diffuse rhetoric breaking all rules, squirming to get *itself* out from inside of *itself*.

But success is ever out of reach. No matter how hard one tries, the observer is always lurking behind the rhetoric and the notions expressed, neither severed from nor unattached nor uninfluenced by the environment or surroundings, but ever present in the articulation and negotiation from which “reality” emerges.

Rather than see these as failures, however, they could be recognized as examples of ingenuity and difference, alternative responses for dealing with the impossibility of self-obliteration.

But what of the *world* “acquiring the possibility of observing itself”? Is there a chance that a collective spins out of the dilemma – each observer/distinguisher also observing another and being observed itself – the collective subsequently formed of interacting observations/conceptions that neutralize or counteract the frailty of the individual? It is tempting to think so: I observe you, you observe me, and together we cover the blind spots. Yet here, new blind spots become evident: Our interaction forms a coherent mutually constructed observation that – through its mutual construction – “hides its own origins.”

Luhmann, the one asking the question in the first place, suggests that is it *not* possible for society to observe itself (Luhmann 1995, see also Gare 1995). Building on the notion of operational closure or autopoietic systems, Luhmann interprets society as composed of differentiated systems each unable to communicate with others. I also believe this is a powerful and important interpretation of the application of autopoiesis to understanding social systems. I also believe it is inappropriate. A sympoietic systems interpretation also seems important.

The value of the interpretation he makes in *Ecological Communication* (Luhmann 1989) that different functional systems in society see concerns differently, is to recognize the impossibility of ever understanding the other – be it an individual or collective. Closure and perturbations (rather than information) from the environment enable construction of an interpreted-environment as long as there is a continued ability to structurally couple (hence, survive). But there is no guarantee that any system will be able to develop a “correct” interpretation. As far as our species goes, the jury is still out, and evolution of the universe may have a long history...

For every inside that succeeds in seeing itself from its own outside, there is a further outside that can be discerned, distinguished, and designated. The inside turned outside is recaptured as an inside...

The outside is acknowledged as the absolute condition for the existence of the inside, but it remains supremely unknowable. It is the silence that delimits the world (Rasch 2000: 80).

This is the fundamental, inescapable and unspoken power of the observer: In defining any particular system the observer decides who is silenced. Too frequently this is done unwittingly – typically by reproducing a previous distinction or delimitation, most especially one that “worked.” This raises again the question: “worked for who?” As Wolfe notes with respect to science:

From critical theory, to hermeneutics, to pragmatism, the standard response to so-called relativist arguments has been that the scientific stories are different from other stories for the simple reason that they “work.” If there is a single overriding point I want to make... it is to identify a chronic ellipsis in these responses: As routinely as the effectiveness of science is invoked, equally routine is the failure to go on to say what it is that science works *at*, to note that “working” is a necessary but not sufficient constraint (Wolfe 1998: 52).

How can the silenced tell of the need for change?

There are two arguments that point to the need for learning a way out of this situation. First is an ethical argument that calls for change due to concern for other. Second is a prudential argument that calls for change due to a concern for self. Self-referential systems are challenged in both respects. In the first case, the words of Hawes indicate the degree of challenge:

... the bodies of objects, machines and organisms are radically *other* to and for each other... you operate your body from your inside (i.e., my outside) and I observe your body from my inside (i.e., your outside). Animals, machines, organic and inorganic objects are the more obvious examples of radical others. My claim here is that communication, rather than presupposing something like “shared understanding” or “common ground” or “consensus,” actually must construct correspondences across the boundaries that separate the autonomous bodies radically other to one another (Hawes 2000).

Krippendorff (1996), taking a second-order cybernetic approach to communication studies, discusses some important considerations regarding (researcher) interactions. His categorization of I-Other interactions offers a simple but useful heuristic for thinking about interactions with others (Table 7). Moving toward consideration of radical praxis, he makes the following comment:

The construction of a Thou in a world that may be radically different if not incommensurate with ones own yet occupiable as well opens *the possibility for I to see itself through an Other's (Thou's) eyes* (Krippendorff 1996: 13-14).

Table 7

I-They	• statistical aggregates
I-It	• trivial machines
I-It	• non-trivial machines
I-You	• persons in communication
I-Thou	• human beings in conversation (or perhaps that should be humans being in conversation)

A key theme in Young’s (1990, 1997) work is also important: the emphasis on difference as a resource.

Regarding concern for the self, the key point to recognize, which seems to be infrequently discussed in literature on autopoietic and self-referential systems, is that such systems are finite. As long as they can maintain a structure that successfully couples with their environment, they will continue poiesis – if the environment provides a perturbation that they cannot accommodate, the system dies.

There is according to Luhmann, no *causal* relationship between environment and autopoietic social system, just as there is none between environment and living system. Social systems receive no informational inputs, no directives, no instructions, and no programs from their environments. They can be “perturbed,” they can react to these “perturbations,” but the “perturbations” do *not* enter the system as “units of information” that can dictate the way a system organizes its own reaction. Therefore, systems have no direct access to their environments, cannot “refer” to their environments, and can make no representation of that which is external to them. The problem systems are faced with, then, is

not one of adaptation and adequacy, but rather of how the tautology of self-reference can be interrupted and unfolded in a productive manner. They are faced with the interesting and circular problem of generating "meaningful" external references where none exist (Rasch 2000: 75-6).

The distinction between Maturana and Varela's statement: "we do not see *that* we do not see" (1987: 19) and their (1987: 242) and others' (e.g. Rasch and Wolfe 2000: 13) rephrasing of the statement to become "we do not see *what* we do not see" (emphasis added) is perhaps considerable, reflecting a shift from the something that is forever outside, to something that might be indicated by others.

In the *Tree of Knowledge*, they point out that "*We affirm that at the core of all the troubles we face today is our very ignorance of knowing*" (1987: 248, emphasis theirs). Yet they continue with:

...it is not knowledge, but the knowledge of knowledge, that compels. It is not the knowledge that a bomb kills, but what we want to do with the bomb, that determines whether or not we use it. Ordinarily we ignore it or deny it, to sidestep responsibility for our daily action, as our actions, – all without exception – help bring forth and validate the world wherein we become what we become with others, in that process of bringing forth a world. Blind to the transparency of our actions, we confuse the image we want to project with the being we want to bring forth. This is a misunderstanding that only the knowledge of knowledge can correct. We have reached the end. This book has invited you, the reader, to make a reflection. Such reflection will lead you to know your own knowledge. It is up to you to make this knowledge the pith and substance of your action (Maturana and Varela 1987: 249).

Yet these comments seem to contradict their very emphasis: I would suggest that it is not the knowledge of knowledge that compels, but the awareness of its *lack* that does so.

RADICAL PRAXIS – 4TH EXPRESSION

... there is not and there will never be a pure observer (he is always tied to a transforming praxis); no absolute knowledge... But, with the loss of the absolute, we gain in communication and in complexity... What we already perceive... through this translating, transducing, transforming, relativizing relation between the psychic and the physical, between the observer and the observation, is a first emergence of the relation between subject and object, because all knowledge, in an observer, is both subjective (self-referent), returning to its own interior organization (cerebral, intellectual, cultural) and objective (hetero-referent), returning to the exterior world. We can, therefore, perceive that *it is never by excluding the subject that we must look for the object, that is it not outside of praxis, but in a meta-praxis which is a new praxis, that we must look for knowledge* (Morin 1992: 365).

It is an intriguing twist to learn that the root word *poiesis* came to the attention of Maturana because of a friend who was reading Don Quixote and who noted Don Quixote's choice between praxis (action), the path of arms, or *poiesis*, (creation, production) the path of letters (Hawes 2000). At this point, the extent of Maturana's notion of *autopoiesis* is expressed as "embodied action" – which could also be a suitable definition for praxis...

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