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UNITY AND PLURALISM

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Ph.D. Thesis

City University

Department of Systems Science

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TABLE OF CONTENTS

TITLE.....1

TABLE OF CONTENTS.....2

TABLES AND ILLUSTRATIONS.....12

ACKNOWLEDGEMENTS.....14

COPYRIGHT.....14

ABSTRACT.....15

CHAPTER 1: THE AIMS OF THE THESIS.....16

 1.1 The Structure.....17

 1.2 Section 1: Pluralism and
 Critical Systems.....19

 1.2.1 Introducing the Basic Issues..19

 1.2.2 The 'Problem' of Pluralism....21

 1.3. Section 2: Contexts of the
 Debate about Pluralism.....22

 1.3.1 Unity and Pluralism.....23

 1.3.2 Social and Ecological
 Contexts.....24

 1.4 Section 3: Epistemology,
 Ontology and Legitimation.....26

 1.4.1 Ontology.....26

 1.4.2 The Legitimation of Systems
 Science.....27

 1.5 Conclusion.....28

SECTION 1:	PLURALISM AND CRITICAL SYSTEMS THINKING.....	30
CHAPTER 2:	WHY IS THE PHILOSOPHY OF SCIENCE USEFUL?.....	31
	2.1 Description or Prescription?....	31
	2.2 Conclusion.....	34
CHAPTER 3:	PERSONAL EXPERIENCES.....	35
	3.1 Studying Psychology.....	36
	3.2 Research at Portugal Prints.....	37
	3.3 Research for the Gordon Hospital.....	43
	3.4 The Microjob Research.....	45
	3.5 Conclusion.....	49
	Notes.....	50
CHAPTER 4:	PLURALISM.....	51
	4.1 Pluralism.....	51
	4.2 Paradigmatic Conflicts: Hard versus Soft.....	53
	4.3 Breaking the Stalemate.....	54
	4.4 Six Approaches to Methodology...	55
	4.5 The System of Systems Methodologies.....	61

4.5.1 Methodological Additions.....	67
4.6 Creative Methodology Design.....	70
4.7 An Ideal of Research Practice...	73
4.8 Conclusion.....	75
Notes.....	75
 CHAPTER 5: AN INTRODUCTION TO CRITICAL SYSTEMS IDEAS.....	 81
5.1 Embryonic Critical Systems Ideas.....	83
5.2 Critical Systems Heuristics.....	90
5.3 The Influence of the Idea of Pluralism.....	98
5.4 Pluralism and the Three Interests Revisited.....	103
5.5 Methodological Ideals in Critical Systems Practice.....	106
5.5.1 The Methodological Ideals....	107
5.5.2 Meta-Methodology: Total Systems Intervention.....	111
5.6 Conclusion.....	114
Notes.....	114
 CHAPTER 6: DIVERSIFICATION IN CRITICAL SYSTEMS THINKING.....	 117
6.1 The Paradigm of Communicative Action.....	118

6.2	Deeper Ontological and Epistemological Reflections.....	124
6.3	The Need for a Substantive Soft Systems Language.....	128
6.4	Power and Ideology.....	129
6.5	Liberate and Critique.....	140
6.6	Liberate, Critique, Empower and Transform.....	149
6.7	A Summary of Emergent Themes...	151
6.8	Conclusion.....	152
	Notes.....	153
CHAPTER 7:	THE 'PROBLEM' OF PLURALISM.....	157
7.1	What is a Paradigm?.....	157
7.2	The Idea of "Meta-Paradigm"....	158
7.3	The Problem.....	161
7.4	Is Pluralism a Genuinely Distinct Approach?.....	162
7.4.1	The Subsumptive Nature of Pluralism.....	162
7.4.2	From Subsumption to Isolationism.....	167
7.5	Critical Systems Thinking as a Paradigm.....	168
7.6	Conclusion.....	169
	Notes.....	169

CHAPTER 8:	PLURALISM AND CRITICAL SYSTEMS REVISITED.....	170
8.1	Denaturing and Reconstructing..	171
8.2	Rethinking Critical Systems Thinking as a Paradigm.....	173
8.2.1	Summarising the Problem.....	174
8.2.2	The Emergence of a Paradigm..	175
8.3	Conclusion.....	178
SECTION 2:	CONTEXTS OF THE DEBATE ABOUT PLURALISM.....	180
CHAPTER 9:	UNITY AND PLURALISM.....	181
9.1	The Ideal of the Unity of Science.....	181
9.2	Manifestations of Isolationism.....	187
9.3	Terminology.....	190
9.4	Isolationism in Biology.....	192
9.5	Isolationism in Physics.....	194
9.6	Isolationism in Sociology.....	198
9.7	Isolationism in Psychology.....	202
9.8	Isolationism in Systems Science.....	207
9.9	Isolationism and Subject Matter.....	210
9.10	The Trouble with Isolationism.....	212

9.11	Reflection on the Disciplinary and Systems Views.....	214
9.12	Conclusion.....	217
	Notes.....	219
CHAPTER 10: ONTOLOGICAL COMPLEXITY.....		223
10.1	Interdependence.....	223
10.2	Linking Social Justice and Ecological Harmony.....	225
10.3	Linking in Personal Freedom...	229
10.4	Complexity and the Ideal of the Unity of Science.....	237
10.5	Systems Science and Complexity.....	238
10.5.1	The "People" Aspect of Complexity.....	239
10.5.2	The "Things" Aspect of Complexity.....	240
10.6	A New Understanding of Complexity.....	242
10.7	Conclusion.....	246
	Notes.....	247
CHAPTER 11: ECOLOGY AND THE POVERTY OF SYSTEMS SCIENCE.....		248
11.1	A History of Western Ideas of Holism.....	249

11.2	Assumptions about History.....	251
11.3	Assumptions about Science.....	255
11.4	The History of Holism.....	257
11.5	The Present Day.....	262
11.6	Marginalisation of Early Holistic Ideas.....	264
11.7	The Re-Emergence of Holism....	266
11.8	Reinterpreting Holism.....	270
11.9	Conclusion.....	272
	Notes.....	274
SECTION 3:	EPISTEMOLOGY, ONTOLOGY AND PLURALISM...	276
CHAPTER 12:	META-METHODOLOGICAL REFLECTIONS.....	277
12.1	Habermas's Three Interests Revisited.....	278
12.2	The Question of Alignment.....	282
12.2.1	Alignment with the "Participants" Dimension....	286
12.2.2	The Two Dimensional Alignment.....	286
12.3	Further Avenues of Exploration.....	287
12.3.1	Self-Reflective Reductionism.....	288
12.3.2	Methodological Inflexibility.....	290

12.3.3 Beyond Alignment.....	295
12.4 Conclusion.....	298
Notes.....	299
CHAPTER 13: ECOLOGY AND THE POVERTY OF HUMANISM....	301
13.1 From Humanism to the Ecological Perspective.....	303
13.2 Boundaries, Marginalisation, Ethics and Value.....	308
13.2.1 Marginalisation.....	308
13.2.2 Values and Boundary Judgements.....	312
13.2.3 Values and Marginalisation..	314
13.2.4 Dynamism and Complexity....	319
13.3 The Profane Environment.....	321
13.4 The Question of Legitimacy....	324
13.5 Knowledge-Constitutive Interests Revisited.....	326
13.6 Conclusion.....	329
Notes.....	329
CHAPTER 14: TOWARDS AN ADEQUATE ONTOLOGY.....	336
14.1 From Epistemology to Ontology.....	337
14.2 The Limits of Ontology.....	339
14.3 Three Paradigms of Ontological Thought.....	342

14.4	Habermasian Thought.....	347
14.5	Implications for an Adequate Ontological Statement.....	349
14.6	The Limits of Human Expression.....	357
14.8	Beyond Humanism, Toward an Ecological Perspective.....	358
14.9	Ontology and Ontological Complexity.....	362
14.10	Conclusion.....	364
	Notes.....	365
CHAPTER 15:	ONTOLOGY, PLURALISM AND LEGITIMATION...	371
15.1	Ontology and Pluralism.....	371
15.2	Hard Systems Methods.....	373
15.2.1	Summative Methods.....	374
15.2.2	Formative Methods.....	376
15.3	Soft Systems Methods.....	377
15.3.1	Interpretive Methods.....	378
15.3.2	Emancipatory Methods.....	381
15.4	Exploring Subjectivity.....	384
15.5	Underpinning our Vision of Pluralism.....	385
15.6	Paradigmatic Assumptions.....	386
15.6.1	A Paradigm of "Moments".....	387

15.7	The Legitimation of Systems Science.....	389
15.7	Conclusion.....	390
	Notes.....	391
CHAPTER 16:	WORK FOR THE FUTURE.....	393
16.1	Critical Systems Thinking Revisited.....	396
16.2	Ontology and the Language of Research.....	397
16.3	What is "Being Critical?".....	398
16.4	Emancipation.....	399
16.5	Subjective or Communicative Ethics?.....	400
16.6	An Ideal Model of the Research and Change Process...400	
16.7	A Diversification of Meta-Theories.....	401
16.8	Diversification at the Methodological Level.....	402
16.9	What is this Thing called "Science"?.....	402
16.10	Conclusion.....	404
CHAPTER 17:	CONCLUSIONS.....	406
17.1	The Paradigmatic Nature of Pluralist Meta-Theories.....	407
17.2	Unity and Pluralism.....	408

17.3 Social and Ecological
Contexts.....410

17.4 Ontology.....411

17.5 The Legitimation of Systems
Science.....413

REFERENCES.....415

ILLUSTRATIONS

Chapter 4: 4.1 The System of Systems
Methodologies.....63

4.2 Table of Context-Linked Methods....64

Chapter 6: 6.1 Types of Action According to
Habermas.....121

Chapter 8: 8.1 The Relationship between
Critical Systems Thinking, it's
Metatheory, its Methodological
Options and Existing
Isolationist Perspectives.....175

Chapter 13: 13.1 Marginalisation.....311

13.2 Margins, Ethics, Sacredness,
Profanity and Ritual.....318

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ABSTRACT

The central theme of this thesis is methodological pluralism in systems science: that is, how it might be possible to draw upon different systems methods that are traditionally thought to be based in incommensurable paradigms. The thesis is split into three sections. Section One begins by reviewing ideas about pluralism as they have been expressed in the literature on Critical Systems Thinking. This section also sets out the basic 'problem' pluralists have to deal with - that the approaches drawn upon are usually thought of as philosophically contradictory. An initial (partial) resolution of the problem is presented. Section Two takes a step back in order to examine why the focus upon pluralism is important. Here the social and ecological contexts of the debate are explored. It is discovered that many of the issues we are currently dealing with in systems science, especially complex global issues, can only be dealt with adequately through a pluralist research practice. Section Three looks at the implications of these social and ecological arguments for a pluralist systems science, and reexamines some of the philosophical ideas lying behind Critical Systems Thinking. Through this re-examination a different understanding of ontology begins to emerge. Having developed a set of interlinked arguments ranging from the ontological to the practical, the thesis concludes with an assertion that pluralism is actually necessary for the continued legitimation of systems science.

CHAPTER 1: THE AIMS OF THE THESIS

The central theme of this thesis is methodological pluralism in systems science: that is, how it might be possible to draw upon different systems methods that are traditionally thought to be based in incommensurate paradigms.

In this introductory chapter, which lays out the aims of the thesis, I have tried to use a minimum of complex definitions and jargon in order to give a simple framework of ideas that can be used as a reference throughout.

It should be noted that, not only have I deliberately written much of this thesis in the first person, but the language is also more colloquial than is normally the case in scientific work. Colloquialisms are usually frowned upon because they introduce emotion into what is 'supposed' to be a purely analytical text. My own attitude to this is summed up in the following quotation from Honderich (1976):

"To my mind, no breath of apology is owed to those

who may say that they do not expect to find emotional matter within serious reflection. On the contrary, one must feel remiss for offering so small a reminder of human experience, or feel a despondency in the realisation that so little will be tolerated".

1.1 The Structure

I have divided the main body of the thesis into three sections that reflect separate, but interrelated, arguments:

Section 1 will review ideas about pluralism as they have been expressed in systems science, and the Critical Systems perspective which has come to underpin them. Within this review a pluralist framework that contextualizes a number of different systems methods will be presented.

This section will also set out the basic 'problem' pluralists have to deal with - that the approaches drawn upon are usually thought of as philosophically contradictory. An initial (partial) resolution of the problem will be presented.

Section 2 will take a step back in order to examine why the focus upon pluralism is important. Here the social and ecological contexts of the debate will be explored. We will see that many of the issues we are currently dealing with in systems science, especially complex global issues, can only be dealt with adequately through a pluralist research practice.

Section 3 will look at the implications of these social and ecological arguments for a pluralist systems science, and will re-examine some of the philosophical ideas lying behind Critical Systems thinking. Through this re-examination a different understanding of ontology will emerge.

Having developed a set of interlinked arguments ranging from the ontological to the practical, the thesis will conclude with an assertion that pluralism is actually necessary for the continued legitimation of systems science.

Over the coming pages I will provide more details about

the contents of each of these three sections. In doing so, five central, interlinked aims of the thesis will be clarified.

1.2. Section 1: Pluralism and Critical Systems

Let us now move on to detail the contents of Section 1 in more depth:

1.2.1 Introducing the Basic Issues

Before even beginning to address the issue of pluralism, it will be necessary to answer some basic questions about the role of the philosophy of science.

There are some who believe that science has a built in adaptation mechanism, so that "science as it is actually done....is also science as it ought to be done" (Masterman, 1970). These writers therefore argue that it is only legitimate to describe the theory and practice of science, rather than prescribe changes.

I intend to argue against this view on the grounds that prescriptive philosophies can themselves be seen as a necessary part of the self-correcting mechanism of science.

This grounding will set the scene for an essentially personal account as to how and why I came to believe that pluralism must become a central focus for the philosophy of science. Personal accounts such as this will be seen to have the function of exposing writers' inevitably limited perspectives to critical appraisal.

Having established a personal history of the key experiences that led me to write this thesis, I will be free to move on to a detailed review of Critical Systems ideas.

This review will focus on the use of up-front emancipatory ideals that encourage democratic dialogue and seek to prevent scientific elitism. It will also contain an explanation of how pluralism is said to differ from other approaches to methodology, including other approaches in which researchers draw upon more

than one working method. I will then be able to start on a discussion of my own first thoughts in trying to develop this field.

1.2.2 The 'Problem' of Pluralism

The Critical Systems understanding of pluralism offers a central innovation: it gives us a meta-theory which allows us to be explicit about the ways in which different methods might most appropriately relate to different research contexts.

However, this also presents us with a 'problem'. Some of the Critical Systems literature seems to suggest that such a meta-theory takes us beyond the need to see any single philosophical paradigm (in the sense implied by Kuhn, 1970) underpinning it. I will need to ask, "how can this be possible?"

I will argue that pluralism must involve researchers in the use of a philosophy that sees pluralist meta-theories as valid and, because this is not a universally accepted position, pluralism cannot be

meta-paradigmatic.

Once it becomes clear that there is indeed some sort of philosophical paradigm underpinning pluralism, it becomes necessary to identify it. The obvious candidate, given that the Critical Systems understanding of pluralism is different from any other, is Critical Systems Thinking itself.

The first aim of this thesis, then, will be to explain why a pluralist meta-theory must be paradigmatic.

1.3. Section 2: Contexts of the Debate about Pluralism

Section 1 should leave the reader with a fairly coherent position to work with, so in Section 2 we will take a step back to look more generally at what might lie behind the desire for pluralism.

1.3.1 Unity and Pluralism

We will begin by asking "what does methodological restriction do to science?" This is where the title of the thesis - Unity and Pluralism - becomes meaningful, because one of the answers I will present is that methodological pluralism is actually essential if we are to pursue the ideal of the unity of science.

This is the ideal which suggests that, ultimately, the subject matter of science should not be seen as fragmentary. This is not to say that we should be aiming toward a single Grand Truth, or even that we want unification of scientific institutions. Diversity of exploration is vitally important as a stimulant to debate and change; but, ideally, no part of this diversity should be excluded from the subject matter of science.

In order to work towards the ideal of unity, systems scientists try to dispense with disciplinary boundaries altogether (and even traditional disciplinary scientists accept complementarity between their discipline and others).

The second aim of the thesis will be to explain why methodological pluralism and pursuit of the ideal of the unity of science are so intimately bound together.

1.3.2 Social and Ecological Contexts

Following this, the third aim will be to take one further step back and examine the social and ecological contexts of this debate.

In particular it will be suggested that, while the purpose of systems science is often said to be dealing with complexity, the understanding of complexity we usually work with is rather impoverished. This impoverishment is shown up in some of the issues that we are currently trying to deal with - especially issues of a global, ecological nature.

Using a practical example of the interdependence we find between the notions of ecological harmony, social justice and personal freedom, I will argue that we need

a vision of complexity that begins to reintegrate the objective, normative and subjective "worlds" of understanding. Methodological pluralism will be presented as an answer to the question of how we are to address this newly identified complexity.

Following this, I will be in a position to suggest a rethink of the conventionally accepted history of systems science. I will argue that the issue of reintegrating the objective, normative and subjective realms has a lot in common with holistic, pre-Aristotelian and pre-Cartesian mediaeval Christian thinking (although there are significant differences too, such as the latter's mysticism).

Interestingly, I believe that it will be possible to demonstrate that the emergence, suppression, marginalization and re-emergence of these holistic ideas has an ecological context.

1.4 Section 3: Epistemology, Ontology and Legitimation

If methodological pluralism is so important, both to the project of systems science (pursuing the ideal of the unity of science) and to our current need to deal with an enhanced understanding of complexity, then it is vital that our pluralist practice be theoretically coherent.

1.4.1 Ontology

Having identified the fact that any pluralist perspective must be paradigmatic, we have to reveal our paradigmatic assumptions.

Most Critical Systems thinkers have underpinned pluralism with Jurgen Habermas's (1972) epistemological theory of knowledge-constitutive interests (to be described in the main body of the thesis). However, I intend to demonstrate that this theory makes major humanist assumptions that are inappropriate in the light of our current ecological concerns.

I will therefore be in the position of having to develop a new philosophical argument. A start will be made on this project (only a start, because to pursue all the ramifications will undoubtedly take several years' more work). The beginnings of a new vision of ontology will be presented that, I will suggest, shows promising potential as a credible philosophical underpinning for our notion of pluralism.

The fourth aim of this thesis will therefore be to make a start on demonstrating how the Critical Systems understanding of pluralism might be underpinned by a credible vision of ontology.

1.4.2 The Legitimation of Systems Science

At this point we will have generated a line of argument running from ontology, through an enhanced understanding of complexity, into research methodology. Thus, it will be argued, the Critical Systems notion of pluralism is both credible (not based on logical contradiction) and legitimate (in terms of being able

to deal with some of the pressing, complex problems of today).

It is this issue of legitimacy that we will end with. Only a systems practice that is pluralistic can help us pursue the ideal of the unity of science in an adequate manner, and it is only a pluralist systems science that can deal with the enhanced complexity that many of the current issues we are facing, especially global issues, present. Pluralism is therefore essential for the continued legitimation of systems science.

The fifth aim of the thesis, then, is to demonstrate how pluralism might enhance the legitimacy of systems science for the future.

1.5 Conclusion

In concluding this introduction, let us just repeat the five central, interlinked aims of this thesis:

- (1) To explain why a pluralist meta-theory must be paradigmatic.

(2) To explain why methodological pluralism and pursuit of the ideal of the unity of science are so intimately bound together.

(3) To examine the social and ecological contexts of the debate about pluralism.

(4) To make a start on demonstrating how the Critical Systems understanding of pluralism might be underpinned by a credible vision of ontology.

(5) To demonstrate how pluralism might enhance the legitimacy of systems science for the future.

Along the way many other subsidiary issues will be explored, and many will no doubt remain unexpressed, but these are the five central, interlinked issues I will return to at the end of the thesis.

SECTION 1
PLURALISM AND CRITICAL SYSTEMS THINKING

CHAPTER 2: WHY IS THE PHILOSOPHY OF SCIENCE USEFUL?

As explained in Chapter 1, the central theme of this thesis is the need for methodological pluralism in systems science. However, in claiming that we have such a need, and putting forward the view that it is both possible and desirable that we should meet it, I am already making a massive assumption: that critical inquiry into the rights and wrongs of science is a valid endeavour.

2.1 Description or Prescription?

I am, of course, only the latest in a long line of people who have argued that scientists should be doing this, or should be doing that. There are some who say that the philosophy of science should only be descriptive rather than prescriptive: that we should think about what scientists are doing, but that it is inappropriate for us to suggest changes in theory or practice.

Masterman (1970), in a paper that is now widely seen as providing a seminal argument in support of Kuhn (1962), offers just such a viewpoint when she argues angrily with the stances taken by both Feyerabend (1962) and Popper (1963) on the grounds that they are merely pontificating. She states that:

"Science as it is actually done... is also science as it ought to be done. For if there is not some self-correcting mechanism that operates within science itself, then there is no hope that, scientifically speaking, things will ever be set right when they go wrong. For the one thing working scientists are not going to do is change their ways of thinking, in doing science, ex more philosophico, because they have Popper and Feyerabend pontificating at them like eighteenth-century divines".

In this critique Masterman appears, if I have understood her argument correctly, to assume that no working scientist wishes to learn about and share in understandings of validity that have been influenced by people not engaged directly in the practice of science. If this were indeed the case, one cannot help but wonder why the writings of Popper et al are taught by working scientists on so many undergraduate science courses.

More importantly, however, she appears not to have considered the possibility that arguments about what might be right or wrong, valid or invalid, in science are actually part of the self-correcting mechanism she talks about.

Because I share Masterman's faith in our ability to self-correct, or at the very least in the need to try and self-correct, I make no apology for talking about what systems science should be about, although I hope that it will become clear that what I am arguing for is very different from the changes proposed by many others.

Most philosophers of science have made a case for the validity of only one narrow epistemological view, and only one corresponding approach to inquiry (proscribing all others). In contrast, I wish to argue, following and building upon the seminal work of Jackson and Keys (1984), that all methods have both legitimacies and limitations according to the contexts they are applied in, and that it is possible to offer a credible ontology in order to provide theoretical coherence for

methodological pluralism.

A wish to promote openness and conciliation between working scientists using different methods lies at the heart of this proposition, as does a desire to address complex ecological and social issues that we cannot hope to deal with using restricted methodologies.

2.2 Conclusion

Here I have argued that prescriptive philosophies of science are essential for the promotion of constructive changes in our scientific practices. This clears the ground for the rest of this thesis which is undeniably prescriptive in its arguments.

CHAPTER 3: PERSONAL EXPERIENCES

In documenting a research project such as this I believe it is essential to offer some account of the personal experiences that led me to formulate my ideas in the way I did. The reasons for this are summed up by Hollway (1989) who, when introducing her own research, said that:

"It would be impossible to present these questions fully without talking about myself: the point that I was at in my life and aspects of its history, the cultural and political conditions that produced it, how these shaped my interest in certain areas of contemporary social theory. These factors together produced the conditions which made possible my research questions and shaped how I addressed them".

Making personal conditions explicit in research not only makes communicating meaning easier, but also exposes the inevitably limited life experience of the writer to the scrutiny of the reader.

Some sections of this thesis are concerned with the need for critical appraisal of research in terms of what we think of as objective truth, rightness (normative values) and meaning for individuals. A

reader might wish to cite empirical evidence to refute a particular claim a writer has made, s/he might wish to argue that the writer has not addressed the 'real issues', or s/he might wish to inquire into aspects of the writer's life in order to understand why s/he wrote what s/he wrote. Presenting a selective history of personal experiences aids the conduct of this latter form of critique.

So, let me recount what I consider to be my own relevant experiences.

3.1 Studying Psychology

At undergraduate level, from 1979-1982, I studied psychology, which at that time was an extraordinarily restrictive discipline in terms of methodology. The course I chose was especially orientated to experimental methods which were, by and large, justified through reference to the earlier works of Popper (e.g., 1959).

To give an example of the extent of the bias, in three years we had just one lecture on psychoanalytic theory, and much of that was taken up invalidating it on the grounds that it wasn't open to falsification through use of experimental methods.

However, at the time, because I didn't know any more than I had been taught, I simply experienced the course as irrelevant to the concerns that had taken me into psychology: a wish to find ways of evaluating human services in terms of our needs and desires. It took several years of hands-on experience in research for me to realise just how limited the methodology I had been taught really was.

3.2 Research at Portugal Prints

For eighteen months or so after graduation I did independent research on various issues, such as the future of health education in secondary schools, the pros and cons of different therapeutic interventions for problem drinkers, and the use of decision theory as a structuring aid in counselling. As all this work was

basically theoretical I did not have to confront the methodology problem again for quite a while.

Following a year spent in Residential Social Work, I returned to research in order to conduct a long-term evaluation of Portugal Prints; an innovative, community-based design and printing workshop for people with mental health problems.

At this facility, approximately 20 people between the ages of 18 and 55 participated in a co-operative. They not only designed, printed and packaged their own line of greeting cards, but also offered a general printing and design service.

The "workers" (as the clients of the facility were called) attended for up to two years, mostly part-time, and were supported by four full-time members of staff. Vocational counselling and basic computer literacy were offered as well as an optional art group. Workers were paid their expenses plus a small attendance allowance, and also shared the profits from their work. However, this rarely amounted to enough to affect the payment of

welfare benefits, which everybody received.

All in all it could be said that Portugal Prints offered a real work environment, but without some of the pressures open employment can bring. Further details of the running of the facility can be found in Reynolds (1984) and Evans (1990).

When I first had talks with the staff and workers of Portugal Prints, we discussed what the criteria for evaluation should be. The obvious one for any vocational rehabilitation facility was whether or not people were successful in finding and keeping work after attendance.

However, there was a general consensus that the most important thing the facility did for people was help restore a sense of self-worth. Most of the workers had been unemployed for several years and, often after several breakdowns, their morale was pretty low. Everybody seemed to be saying that, by giving people the status of "worker", Portugal Prints helped them look more positively at their abilities and, in the long run, their whole selves.

By this time I had made some progress in thinking about methodology, in that I had moved from the hard-line experimental position we were taught. I had already thought through the issue of control groups and had decided that it was unethical to refuse help to a group of people if there was a reasonable suspicion that the intervention being evaluated might be beneficial. However, the understanding I was still taking into the research was that evaluation criteria had to be objectively measurable.

My immediate reaction, then, to the discovery that what people wanted was an evaluation of how the facility affected peoples' feelings of self-worth, was concern. I explained that I thought it was going to be very difficult to conduct valid research in this area, but agreed to try to find a reliable and well validated measure of self-esteem that we might be able to use.

Now, in saying this I didn't quite realise just how naive I was being. When I conducted a literature search I discovered that no supposedly objective measure can

distinguish between a rating of high self-esteem and a rating of the wish to be seen to have high self-esteem (Kenny, 1956; Cowan and Tongas, 1959; Cowan et al, 1960).

Kenny showed that this holds true for all sorts of standardised instruments (personality questionnaires, rating scales and Q sorts), and Cowan and Tongas were forced to conclude that "self concept and ideal self measures....are so heavily saturated with social desirability as to lose meaning independent of the latter variable".

Following this discovery I went back to Portugal Prints and told them that it would be impossible to assess self-esteem. As a compromise I agreed to use Rotter's measure of locus of control (1966), an instrument which assesses the degree to which a person attributes events in their lives to the action of external forces or internal will.

Although I suspected that social desirability would influence this too, nobody had done any research into

it, so I conveniently put the possibility to the back of my mind and told myself that it was a well respected instrument and that there is a wealth of evidence that it correlates with all sorts of other important variables (Rotter, 1966).

Other than locus of control, all the variables I ended up looking at were either demographic or concerned with the assessment of mental health. Indeed, the only issue of overlap between the needs of the workers and staff and my methodology was an assessment of whether people found work after attending.

The irony here was that the facility was already monitoring this, so I had simply taken over one of their jobs! Not surprisingly, as the research continued over a three year period, I became severely demoralised. I had allowed methodology to determine the questions I could ask so that my research had become largely irrelevant to the very people I wanted to help.

This problem has been commented on by several authors (notably Levy, 1981), but is summarised neatly in one

sentence by Hollway (1989) who, after going through similar experiences, noted that "where method has come into conflict with questions it has wanted to ask, it has changed the questions and not the methods".

3.3 Research for the Gordon Hospital

My experience at Portugal Prints, drawn out over three years, gave me plenty of time to reassess my ideas, and I determined not to make the same mistake twice. After finishing that project I was asked to design a large-scale evaluation of day care for people with mental health problems in the area covered by the Riverside Health Authority.

I had three months in which to put together a proposal for funding (which I was under the impression would only be turned down in exceptional circumstances), and I designed a study which started off with a consideration of the needs of those receiving a service (as described by the users themselves, their families, their friends, and staff giving support).

I intended to use objective measures (recidivism, employment, etc.), but I wanted to interrelate the information from these with the views of those 'on the ground'. This, then, was my first intuition of the value of methodological pluralism.

To my horror, funding was actually refused on methodological grounds. Not only did the committee assessing the proposal object to the use of subjective material, but their view was that such a study would be totally invalid unless it used control groups.

This was, first of all, a clinical impossibility as there were too few referrals to the services to refuse anyone help. The facilities would have stood half-empty while people were asking to attend. To me, such a use of control groups was unethical. However, in a conversation I had with one member of the committee, it was made clear that they regarded the efficacy of their services as unproven, so it would not be a denial of help to refuse a service!

After my experiences at Portugal Prints I thought the

difficulties I had experienced were simply a result of my own ignorance. Now, however, I realised that the views I had inherited from my undergraduate training were deeply entrenched in key institutions, and that they exercised their power to keep their own research discourse dominant while burying any potential for alternative discourses to develop.

3.4 The Microjob Research

At this stage it became vital for me to find a setting in which I could develop such an alternative discourse (I had already formulated the tentative label of "integrated systems methodology" in my head), and it was not long before I was offered one. The Rehabilitation Resource Centre in the Department of Systems Science at City University secured a contract to evaluate an innovative computer training project for people with disabilities by the name of Microjob.

Microjob was in operation for an 18 month period (January 1987 to June 1988), and the application for funding for the facility (submitted to the European

Social Fund in October 1985) made the rationale of the project clear:

"Microjob aims to assist people with disabilities to obtain employment in the open market - particularly in the field of Information Technology - through the provision of a range of linked services designed to meet individual needs".

These linked services included vocational guidance and assessment, a basic course in computer literacy, in-depth training in various applications of computers, help in finding appropriate aids and adaptations, training in job-search skills and placement in employment (or further education). Further details of the basic structure and function of the service can be found in Folkes (1988), Midgley (1988) or Midgley and Floyd (1988).

When I set about starting this evaluation I thought that I was a lone voice, as the only writers on qualitative methodology that I had read were Weiss (1972, 1973, 1977), Broskowski (1976) and Patton (1978, 1980).

While I felt that these authors were streets ahead of other thinkers in the field, they nevertheless all advocated formative methodology (where the researcher and the staff of the facility being evaluated learn from each other in a heuristic process) instead of summative (where the researcher presents a final report for the facility to do with as it will). Personally, I thought that there was room for both.

Also, in the case of Patton in particular, because his primary intent was to build an evaluation practice that can at all times be seen by participants to be relevant to the task in hand, he tended to focus on consensus amongst participants in determining the value-base of the research. This ignores the possibility that situations might arise where there is no significant area of consensus, or that the consensus is seen to be so objectionable by the researcher that s/he cannot sanction the subjugation of her or his own perspective to the will of the majority.

I felt very strongly that, as well as an integrated approach to methodology, we also needed an approach

that brought values and ideology to the forefront of consideration.

When I conducted this research I made the decision to register for a Masters degree. As a literature review was a necessary part of my M.Phil. thesis, I was guided into a new area of reading. To my immense relief there was a whole body of literature, some of it still in press, documenting the birth of a new approach.

This new approach was Critical Systems, which dealt explicitly with my concerns. Ideology was indeed of prime interest, and I also found I could lay aside my tentatively labelled "integrated systems methodology" in favour of the term pluralism.

As I will show in Chapter 4, the idea of pluralism addressed my one doubt about linking methods together. I knew that each different method somehow had to be aligned in a one-to-one relationship with its most appropriate practical context, but I was unsure how this was to be done except through pure intuition during the conduct of each individual research project. In a seminal paper, Jackson and Keys (1984) took a

great stride forward when they started the process of defining ideal-type contexts that would be clearly recognisable to most people conducting research in organisations.

In evaluating Microjob, then, I worked from a Critical Systems perspective. The evaluation itself has been written up most fully in a thesis (Midgley, 1988) and a final report (Midgley and Floyd, 1988). Aspects of it have also been documented in several shorter papers (Midgley, 1989a, 1990a; Midgley and Floyd, 1990). The validity of the methodology itself has also been discussed in a number of places (Midgley, 1988, 1989a, 1990a).

3.5 Conclusion

So, this is what led me to Critical Systems Thinking and the present thesis. Having successfully applied the idea of pluralism in practice, and realising how more limited methodological discourses have become entrenched in powerful institutions that dominate the

funding of research and the training of researchers, I became fired with the challenge of focussing my own research energies on developing the new paradigm.

Having documented my own rather tortuous path toward the ideas in this thesis, I will be in a position, in the next chapter, to look more closely at the notion of pluralism as it has been expressed in the Critical Systems literature.

Notes

1. Such a summary will be "selective", not only because the writer must obviously try to be relevant, but because s/he will inevitably be working with an incomplete understanding of his or her own processes of development.

CHAPTER 4: PLURALISM

I have already touched upon the idea of pluralism, and the purpose of this chapter is to flesh out our understanding of the concept.

In Chapters 5 and 6 I will move on to a discussion of Critical Systems Thinking (the perspective into which this understanding of pluralism has been integrated), presenting the key ideas as they have been documented in the literature by a variety of authors, before entering into a critique of these in coming chapters.

Although describing pluralism first will prevent a strictly chronological exposition (Critical Systems ideas emerged in the literature about four years before pluralism was first explicitly discussed in systems science), it makes more sense in terms of the primary issues that are of concern in this thesis.

4.1 Pluralism

In the context of management science methodology, it

was Reed (1985) who originally coined the term "pluralism". Reed's initial work was then built upon and substantially developed by the systems scientists Jackson and Keys (1984), Jackson (1987a) and Flood (1989a). The thoughts of these authors will be detailed throughout this chapter.

Interestingly, the idea of pluralism arose as much in response to a protracted philosophical debate between hard (positivistic¹) and soft (interpretive) systems thinkers as to direct observations of problems in research practice.

Flood (1989a) claims, in my view rightly, that the tendency for most people to characterise their own position as the only valid one in this debate has caused a degree of stagnation in systems thinking. As he says, it is essential to overcome this if researchers are to continue to aim for a flexible and responsive research practice that still acknowledges the value of theory.

Disillusion with the philosophical debate has resulted

in many researchers taking a 'pragmatic' line in which theory is simply thrown out of the window, leading to all sorts of problems in practice (see later in this chapter). Because this debate has been an important factor in the birth of our current understanding of pluralism, it is worth reviewing it in a little more detail.

4.2 Paradigmatic Conflicts: Hard versus Soft

As Jackson (1982, 1985a, 1987b) and Flood (1989a) have pointed out, the main philosophical debate that has dominated the systems literature over the past decade or more has been this conflict between authors sticking to the more traditional hard systems methodologies in their approaches to human problematic situations (e.g. Hall, 1962; Jenkins, 1969a; Atthill, 1975; and Daellenbach et al, 1983) and those taking a soft line (e.g. Churchman, 1968a, 1971, 1979; Ackoff, 1974, 1981; and Checkland, 1972, 1975, 1981, 1985).

As both approaches have demonstrable practical utility, this has led to attempts by certain writers to subsume

one within the other. In 1974, for example, M'Pherson attempted to demonstrate that soft systems thinking is a sub-set of hard. By way of reply, Checkland (1981) put the reverse view that hard ideas are a sub-set of the soft methodology and can be used in "special cases" when there is total agreement between participants on the nature of the problematic situation. Of course neither M'Pherson's or Checkland's views were accepted by the other camp.

4.3 Breaking the Stalemate

Recently, however, there have been attempts to break this stalemate by changing the goal-posts of the debate. Instead of simply looking at hard versus soft (and the underlying conflict between positivistic and interpretive philosophies), some authors have chosen instead to examine the way different practitioners design and defend their methodologies; or, to put it more cynically, they have looked at peoples' 'styles of combat'.

Jackson (1987a) detailed four categories of methodological consideration. Following Reed (1985), he labelled these pragmatism (a supposedly atheoretical, 'mix-and-match' approach), isolationism (fixation upon just one approach, with all others deemed invalid), imperialism (fixation upon one main approach, but drawing others in as and when necessary) and pluralism (drawing upon methods in a theoretically explicit manner according to perceived situational context).

4.4 Six Approaches to Methodology

Flood (1989a) built on these ideas and sub-divided isolationism into methodological isolationism and theoretical isolationism. He also split imperialism into imperialism by annexation and imperialism by subsumption. Thus Flood talks about six distinct approaches to methodology².

As these terms are all so new, it will be necessary to explore their meanings before a critique can be entered into. The following definitions have been reproduced verbatim from Flood (1989b):

Pragmatism. "The most striking feature about the pragmatic approach is that no reference is made to inferable underlying theory or methodological rules. The main emphasis is on intra-methodological partitioning; i.e. using parts and techniques in a heuristic (trial and error) fashion. The use of a single whole methodology is not inconsistent, although somewhat unlikely, with this approach. There are no explicit considerations of either theoretical or methodological commensurability; nevertheless, superficially the pragmatist is assuming measures by the same standard."

Pluralism. "No two approaches contrast so starkly as pragmatism and pluralism. In fact, the only areas of 'overlap' are somewhat dubious anyway; i.e. inter-methodological partitioning which the pragmatist could (in principle) undertake, and theoretical commensurability which is widely contrasting even in their 'agreement'. In terms of recognising pluralism, the key observations are methodological incommensurability and theoretical commensurability (at a metalevel of reasoning) at once. Equally important, however, is inter- and intra-theoretical partitioning, which paves the way for context and methodology to be linked."

Theoretical Isolationism. "Reference to theory is made, although only the tenets of one paradigm are accepted, whilst all others are objected to; i.e. there is theoretical incommensurability. Another label for this is a 'world-view' approach. In this case differing methodological approaches are accepted, there is methodological commensurability, but each is 'seen' only to work from one world-viewpoint. In other words, certain contexts demand only a subset of concepts from the adopted paradigm. Concepts from an 'inferior' paradigm may deal with these certain contexts, but for other contexts their 'inferiority' is shown in the form of anomalies. In relation to pluralism the vital difference is the methodological commensurability of theoretical isolationism,

which then pairs with theoretical incommensurability."

Methodological Isolationism. "There is one very important distinction between methodological and theoretical isolationism, and that concerns methodological commensurability. In this case, a single methodology is isolated within some paradigm, and to which users remain loyal to the exclusion of all other methodologies. The methodology itself may 'require' minor modifications following reductionist analysis."

Methodological Imperialism by Annexation. "This can be seen as an 'advanced form' of isolationism that adds on 'bits' of other methodologies, often in response to outstanding anomalies. In this sense there is no final and complete inter-methodological partitioning, however, intra-methodological partitioning is necessary in order that annexation may be carried out."

Methodological Imperialism by Subsumption. "In this approach a methodology is adopted that may call upon other methodologies at a specific point in order to act as sub-methodologies to deal with specific matters, e.g. if the 'what' had been decided through use of the 'mother' methodology, a 'how' methodology may then be drawn into the process.... There is a great similarity and no outright contradiction between this approach and theoretical isolationism. The main differences are that in theoretical isolationism different methodologies are used in differing contexts, whereas, subsumption means that one methodology is used for all contexts although different methodologies may be called upon to 'help out'."

Flood (1989a) analysed the advantages and disadvantages of all these approaches and, in a similar manner to Jackson (1987a), concluded that pluralism is the most attractive, although imperialism by subsumption was

recognised as holding some potential.

The criteria both Jackson (1987a) and Flood (1989a) used in making this judgment were firstly a belief that openness and conciliation should be encouraged between supporters of the positivist and interpretive paradigms, and secondly the need for theoretical coherence.

Flood (1989a) goes into some detail about what he sees as the problems of the other approaches.

Pragmatism, according to him, is problematic because its refusal to recognise the implicit nature of theory and ideology in all actions renders it incapable of examining its own hidden agendas. Linked with this, pragmatists are seen to maintain and increase the power of elites by seeking, on the whole, to "keep their clients happy". Also, because of the restricted nature of pragmatic analysis, adopted approaches may embody theoretical contradictions that their practitioners can never be aware of.

Midgley (1989b) also notes a further difficulty faced by pragmatists: if all learning about methodology within the pragmatic approach is by trial and error, and there is no common frame of reference shared by all pragmatists, then one individual's learning with regard to methodology cannot be communicated to other practitioners without the likelihood of misinterpretation.

In contrast, methodological isolationism is criticised by Flood for its "static" nature. 'Reductionist' analysis may bring about limited change to the single methodology adhered to, but practice remains severely restricted.

Theoretical isolationism, on the other hand, is recognised by Flood to be a sustainable proposition - the only restriction he sees is that all followers of one sole theory are by definition rooting their practice in a single 'world view', and therefore automatically alienate others with a different perspective.

Imperialism by annexation is attacked in scathing terms

and described as "advanced isolationism". In Flood's words (1989a),

"Because new approaches emerge some isolationists, feeling dissonance about their approach because of anomalies which may exist, consequently respond by developing their own approaches. A more cynical view is that annexationists are rapacious in their research, tracking down the 'tidbits' and drawing upon them, whilst discarding the (so perceived) offal".

Imperialism by subsumption is questioned for the way it reshapes subsumed methodologies to fit in with the dominating perspective - thus insights that could be gained from the appreciation of other viewpoints are never really taken on board.

Ultimately, Flood maintains that in terms of developing openness and conciliation (as opposed to theoretical coherence which is the other criterion Flood uses to evaluate the approaches), "imperialism....must fail on the same reckoning as pure isolationism: i.e., complete domination is unlikely because of paradigmatic conflicts".

The only remaining category is pluralism, which,

following Jackson (1987a), is identified as the most fruitful approach in terms of developing openness and conciliation.

Flood's (1989a) definition of pluralism is centred neatly around the sentence: "the key observations are methodological incommensurability and theoretical commensurability (at a meta-level of reasoning) at once". That is, working methods drawn from the various paradigms are appropriate for different perceived situations but, while this might mean that they have to be separately defined at the methodological level, at a 'higher' theoretical level they can be seen as complementary.

4.5 The System of Systems Methodologies

So, what does pluralism mean in practice? Jackson and Keys (1984) developed four categories of context which were later expanded to six by Jackson (1987b). These authors called the resulting grid of contexts a "System of Systems Methodologies".

This has been described in the literature using a number of different terminologies. In producing my own description over the coming pages I have chosen to adopt the terminology of Flood and Jackson (1991), with a single, minor modification³.

The grid defining the six contexts of application has two axes, and is presented here in Figure 4.1. One axis is labelled Participants (referring to perceptions of the relationships between participants) and the other is System (referring to perceptions of complexity).

The Participants dimension is seen as having three states: unitary (a perception of full agreement between participants on definitions of terms and problematic areas), conflictual (a perception of disagreement between participants) and coercive (a perception of disagreement that is masked, or potential disagreement that is not being allowed to surface, due to power relationships between participants).

The System dimension is seen as having two states: simple and complex.

Figure 4.1: The System of Systems Methodologies

SYSTEM		
	SIMPLE	COMPLEX
PARTICIPANTS	Simple-Unitary: All key variables easily appreciated, with no disagreements between those defined as involved or affected.	Complex-Unitary: Many interacting systems, with no disagreements between those defined as involved or affected.
	Simple-Conflictual: Clear and unambiguous disagreements between equals (in terms of power relationships).	Complex-Conflictual: Unclear disagreements between equals (in terms of power relationships).
	Simple-Coercive: One party wielding power over another so that disagreements are not allowed to surface and the dominant vision is not subjected to challenge.	Complex-Coercive: A pattern of power that has all those defined as involved or affected wrongly believing that the status quo is satisfactory.

The six contexts in the system of systems methodologies are arrived at by cross-referencing the two dimensions, and these six can be labelled simple-unitary, complex-unitary, simple-conflictual, complex-conflictual, simple-coercive and complex-coercive.⁴

Various systems methods have been aligned with these

different contexts [Jackson and Keys (1984), Banathy (1987), Oliga (1988), Flood and Jackson (1991)]. All these authors' suggestions have been brought together in Figure 4.2.

Figure 4.2: Table of Context-Linked Methods

	SYSTEM	
	SIMPLE	COMPLEX
	Methods Responsive to Simple-Unitary Contexts: (1) Classical OR (2) Systems engineering (3) Systems analysis (4) Living systems process analysis (5) Management cybernetics	Methods Responsive to Complex-Unitary Contexts: (1) Organizational cybernetics (2) Sociotechnical systems thinking (3) General systems theory (4) Modern contingency theory (5) Living system process analysis (6) System Design
	Methods Responsive to Simple-Conflictual Contexts: (1) Dialectical inquiring systems, eg, SAST (2) Double-loop organizational learning	Methods Responsive to Complex-Conflictual Contexts: (1) Interactive Planning (2) Soft Systems Methodology (3) LOM Programme
PARTICIPANTS	Methods Responsive to Simple-Coercive Contexts: (1) Education (Critical Pedagogy) (2) Critical Systems Heuristics	Methods Responsive to Complex-Coercive Contexts: (1) Consciousness Raising Groups

In broad terms, when Jackson and Keys (1984) and subsequent authors conducted this alignment of methods with their ideal contexts of application, hard systems methods (from the positivist tradition) were said to be most appropriate for the unitary contexts, soft methods (interpretive) were regarded as best for conflictual situations, and emancipatory methods were aimed at coercive contexts.

These were not arbitrary alignments however. Positivistic methods were said to be best suited to unitary contexts because formulating a picture of 'the truth' in response to a set of questions will only be of relevance to those people who agree that this set of questions is the right set.

If there is disagreement over what the basic issues are (i.e., the context is conflictual), then this will not be addressed by provision of a simple set of facts that are orientated to answer questions that only some people regard as important.

Similarly, if we are dealing with coercion, the facts provided will simply strengthen the hand of those who

have control over what issues are addressed by allowing them to pursue their aims more effectively. When there is genuine agreement on the nature of the problem, however, then positivistic methods do provide useful answers.

In contrast, interpretive methods were aligned with conflictual contexts because, when there is open and non-coercive disagreement, interpretive methods can be helpful in providing a basis for mutual understanding and decision-making.

However, when there is agreement on what the problems are (i.e., the context is unitary), then there are few differences between viewpoints to explore. Furthermore, interpretive methods are equally unhelpful in coercive contexts because open disagreement is not easy to surface, and we will inevitably end up simply supporting the dominant vision.

In contrast once again, emancipatory methods were aligned with the coercive contexts because, when mutual understanding is difficult to achieve and a necessity

for 'taking sides' arises, these methods can help in subjecting dominant visions to dialectical challenge.

When there is genuine agreement on the right course to pursue (i.e., the context is unitary), such dialectical challenge will usually be redundant. Alternatively, if we try to use emancipatory methods when disagreement is open (i.e., the context is conflictual), then their challenging nature may well threaten the potential for mutual understanding that could make conflict easier to handle in other ways.

We therefore see that each type of methodology has its legitimate uses, but each also has significant limitations.

4.5.1 Methodological Additions

It should be noted that, in figure 4.2, I have included several methods not suggested by previous authors. These are the LOM Programme, education (Critical Pedagogy), and consciousness raising groups.

First of all the LOM Programme, initiated by Gustavsen (1986) and Gustavsen and Engelstad (1986), is long overdue for integration into this body of literature. This is a well-tried Action Research methodology based upon collective democratic decision-making.

Second, there is the method I have called education. This was introduced into the Critical Systems literature by Flood and Gaisford (1989), although it obviously has roots in Critical Pedagogy.

Critical Pedagogy was developed by Freire (e.g., 1972, 1973) in Brazil. His basic idea was to make literacy politically relevant to people whose lives were dominated by poverty. In teaching adult literacy, his approach was to begin by focussing upon words that have immediate relevance to peoples' everyday experience.

These initial 'lessons' were hardly didactic however: through group discussion his students developed their awareness that the central elements of their lives - their land, food, work and family - had a political dimension. Literacy was an important tool with which

they could take power in their own lives, both individually and collectively. Essentially what they learned was the meaning of, and the means to gain, freedom.

Critical Pedagogy emerged in the context of the literacy struggle in Brazil, and Flood and Gaisford (1989) have (implicitly rather than explicitly) pointed the way for systems thinkers to develop Freire's ideas for wider application.

While Freire's Critical Pedagogy involves consciousness raising of a sort, it is largely directed by an explicit pre-formed ideology, and consequently a structured methodology. This is, of course, entirely appropriate when the form of coercion is simple and obvious.

When coercion is hidden and only vaguely glimpsed, however, such directive methods cannot help. As Flood and Jackson (1991) acknowledge, although the problem of developing systems methods to address complex-coercive contexts (characterised by false consciousness) was first identified in 1987 (Jackson, 1987b), we are no

further forward four years later.

As an inspiration to begin work in this area we might turn to some of the Feminist literature, especially the experiences of women setting up consciousness raising groups in the mid-1980s. Hollway (1989) has already considered how these experiences might inform the discipline of psychology, and her analysis might well prove useful for systems scientists.

I will not digress by exploring these methods any further here. I hope to do this in future work.

4.6 Creative Methodology Design

Pluralism encourages openness and conciliation between supporters of currently isolationist methodologies and philosophies, but it also promotes creative methodology design.

A glance through the literature will reveal that most researchers who have used the System of Systems

Methodologies to reflect upon their interventions in organisations have tended to define their research in terms of just one category of context and have therefore ended up applying a single 'off the shelf' systems method (e.g., Jackson, 1987c; Flood and Jackson, 1991).

However, my own experience (e.g., in Midgley, 1989a, 1990a) is that research problems are very rarely so straight-forward that they can be reduced down to just one category of context in this way. Indeed, such reduction can lead to a significant impoverishment of our understanding of situations (Gregory, 1990), and I have found that methods often have to be interrelated systemically in order to address complex issues.

New methodologies can be developed that draw on parts of older, previously distinct methods to create a practice that is genuinely flexible and responsive to perceptions of the situation under investigation. This technique of bringing together a variety of methods according to perceived need has been termed methodological partitioning by Flood (1989b), and for further details see Midgley (1989a, 1990a).

Now, at first sight this would seem to contradict the pluralist idea of working methods remaining incommensurate at the methodological level. However, this is not so. With methodological partitioning, as method and context are still paired in a one-to-one relationship, the assumption of methodological incommensurability is not violated.

To explain further, the research task can be conceptualised as a series of questions, each of which has a single context. In deciding upon an appropriate methodology the researcher will have to draw upon working methods relevant to all the contexts defined.

More often than not the questions will be interrelated, so the working methods will have to reflect this through a systemic process of methodology design using a pluralist meta-theoretical construct (such as the System of Systems Methodologies) to aid critical reflection.

We therefore move from a picture of a pluralist meta-

theory as an ideal to aid the selection of single 'off the shelf' methods (which, despite notional recognition of methodological partitioning, the System of Systems Methodologies has largely been seen as) to one in which it becomes an integral part of a creative process of methodology design.

4.7 An Ideal of Research Practice

It is very important to be aware that the System of Systems Methodologies is most expressly not a 'rule book' to be followed systematically. It should be regarded as an ideal of research practice that is useful for critical reflection on methodology design.

Ideals can be defined as theoretical constructs guiding critical reflection. They are principles which we aspire to, or believe underlie our actions in the world.

Popper (1959) describes truth as an ideal because, while human perception is conceived as fallible, truth is still something we aim towards. Also, Bauman (1976)

has claimed that socialism is an ideal, in that it represents what he describes as an "active utopia". Practical politics may require compromise, but socialism is a guiding principle which helps to inform theory and practice for those on the political left.

In using the System of Systems Methodologies as an ideal, it is recognised that practical situations may require compromises with what we might like to do in an ideal world, and researchers must be prepared to embrace the flexibility necessary to achieve these compromises.

Jackson (1990) has considered this issue in detail, and has successfully demonstrated that the few researchers who have attempted to use the System of Systems Methodologies as a systematic, inflexible rule book (e.g., Banathy, 1987, 1988, and Keys, 1988) have ended up violating the basic premise of pluralism as developed in systems science.

When practical compromise to achieve desired ends in human problematic situations is refused (i.e., when

those ends are not being considered as an issue in methodology design), absolutism about methodological rules results in the researcher taking a positivistic line (this being the only tradition in the philosophy of science in which absolutism has ever been acceptable), instead of maintaining a meta-position. Thus the use of interpretive and emancipatory methods becomes contradictory.

4.8 Conclusion

In this chapter I have provided an overview of the development of the idea of pluralism as it has emerged in systems science. Now we will be able to go on to look at the paradigm of Critical Systems Thinking, into which these thoughts about pluralism have been integrated.

Notes

1. I have used the term "positivistic", and have also on occasion talked about views of science "with a

positivist root", to refer to all those isolationist perspectives in the philosophy of science that hold objective truth to be the only ideal worthy of pursuit (whether or not truth is seen as absolute), and which espouse epistemological value-neutrality (i.e., those which maintain that knowledge must always be seen as independent from values - see Chapter 9 of this thesis for more details). I feel it is important to be aware that these assumptions can indeed be seen to stem from classical positivism, but I do not want to denigrate these modern, tenable perspectives by referring to them as "positivist" (classical positivism has long since been found to be untenable). This polemical use of "positivism" as a pejorative term has been promoted by critical and constructivist theorists such as Horkheimer (1937), Adorno (1957), Lorenzen (1969), Wellmer (1970), Habermas (1972) and Offe (1972), but as pluralism actually seeks to promote the appropriate use of positivistic ideas, such denigration should be deemed inappropriate.

2. It should be noted that there is a difference of opinion between Flood and Jackson as to the utility of

defining six approaches to methodology rather than the original four. In response to Flood (1989a), Jackson (1991a) accepts that we have to be clear about the differences between isolationism and imperialism on the methodological and theoretical levels, but nevertheless says that some of Flood's categories can be rolled together without impoverishing our understanding. For the purpose of this thesis I have stuck with Flood's six categories (1989a), largely because I feel that the term imperialism by subsumption needs to be differentiated from other forms of imperialism and isolationism. In Chapter 7 I will argue that imperialism by subsumption is difficult to distinguish from pluralism, and in Chapter 8 I will offer a resolution to this problem. Although one could argue that I am making it difficult for myself by accepting Flood's categories rather than Jackson's, there is a danger of missing a central philosophical issue, that of the nature of paradigms, by not confronting this difficulty (see Chapter 7 for details). Indeed, I have found that all sorts of important questions arise from close consideration of the nature of paradigms (many of the arguments in this thesis have developed out of such work). My reason for using Flood's system (1989a),

then, is purely practical (relating to my present research needs). Both Flood and Jackson's views are, it seems to me, equally valid: one could even say that there is no substantive difference between them - they only really differ in the extent to which they break the ideas down into detailed sub-categories.

3. The term "conflictual", as used here to refer to situations where there are multiple viewpoints, is part of Flood's terminology (1989a). Originally Jackson and Keys (1984) called these situations "pluralist", but this introduces an obvious area of confusion with the wider notion of pluralism, which is why Flood chose to use "conflictual" instead. Ultimately, however, it appears that neither Flood nor Jackson were happy with the word "conflictual", and in their latest works (e.g., Flood, 1990a; Flood and Jackson, 1991; Jackson, 1991a), they return to using the word "pluralist" as a label for situations where there are multiple viewpoints, and adopt the term complementarity to refer to the over-arching perspective. While this makes some sense in terms of avoiding a confusion with political pluralism, I prefer to stick with Flood's terminology

(1989a) because the link between unity and pluralism is so important to maintain (see Chapter 9 of this thesis for details). Unity and Complementarity just doesn't have the same ring to it!

4. In conversations I have held with M.C. Jackson, he has made it clear that he believes that the two dimensions of the System of Systems Methodologies should be seen as independent of one another. Personally, I have never seen how this could be the case. It seems to me that the term "complexity" (which is central to the System dimension) changes its meaning as we move across the Participants dimension. This is not an issue I wish to explore in the main body of the thesis, but for the record let me detail how I see the term "complexity" changing. In unitary contexts (when there is agreement between participants), simplicity refers to our ability to appreciate all key variables that impinge on a given task relatively easily. Complexity, on the other hand, refers to situations where it is thought there are intricate interactions between different systems. In conflictual contexts (when there is open disagreement between participants), simplicity refers to knowledge about where differences

between people lie. In contrast, complexity refers to situations where there are a whole set of conflicting perspectives and nobody is absolutely sure why this should be, or what the underlying issues really are. In coercive contexts (when disagreement or potential disagreement is being suppressed), simplicity refers to situations where one group wields power over another and it is clear what is going on. Complexity, on the other hand, refers to situations where none of the participants are even aware of coercion (perhaps because they have all internalised a 'false consciousness').

CHAPTER 5: AN INTRODUCTION TO CRITICAL SYSTEMS IDEAS

Talk of flexibility, practical context and critical reflection in the previous chapter brings me on to a discussion of Critical Systems Thinking, into which the System of Systems Methodologies and ideas about pluralism have been integrated.

Over the next two chapters I intend to outline the history of the movement and many of the key ideas, although, as you read on, it will become apparent that every author who has worked under the Critical Systems banner has his or her own unique vision. It seems that, while each person has a lot in common with others in the 'movement', nobody is afraid of divergent opinion, even if this means contradicting key assumptions made by others.

For this reason I have not followed Schechter (1990, 1991) and Jackson (1991b) in structuring my review around a set of "commitments" Critical Systems thinkers are all said to make, but prefer to show a more or less chronological development of ideas (except the idea of pluralism already presented) which will not try to

force divergent understandings together artificially, or diminish contradictions.

Having demonstrated what we will come to see as a magnificent creativity on the part of the Critical Systems research community, we will then, and only then, conclude in Chapter 6 by drawing out some central threads linking all the authors together.

Given my own involvement in the Critical Systems community, this will inevitably be a partial account: I can only work with the literature in relation to my own ideas, testing out my interpretations with other people where possible, and so I will almost certainly be missing nuances that others have picked up on. For as near a complete picture as possible, I would recommend reading other reviews too (e.g., Flood, 1990a; Ulrich, 1990a; Jackson, 1991b).

Let us start, then, with an analysis of the Critical Systems perspective as it was developed before the concept of pluralism came to be integral to it.

5.1 Embryonic Critical Systems Ideas

In the 1980s, an early strand of critical thinking emerged in the systems literature out of what was seen as a need to integrate 1970s social theory into systems thinking (most especially the works of Habermas, 1972, 1974 and 1976a).

Now, Habermas's writings are deep in their analysis and immensely broad in their scope, so it would be impossible to do them justice by trying to préciise them in just a few short paragraphs.

For now, then, let us simply note Habermas's central concern (1978) that traditional scientific inquiry, hermeneutic science and self-reflective critique all have their place in addressing different human interests - interests embedded in the need for environmental control, common social understanding and emancipation from false consciousness respectively.

Of these, it is self-reflective critique that Habermas sees as pivotal. Ultimately we pursue the ideal of

undistorted communication. This is a postulated ideal speech situation in which no false consciousness is manifest, and in which arguments can be won or lost by "the peculiarly unforced force of the better argument" (Habermas, 1974).

In pursuing the ideal of undistorted communication we can draw upon traditional science and hermeneutics to provide support for our self-reflective activity, which in turn helps us to conduct our traditional scientific and hermeneutic inquiries in a non-oppressive fashion.

This ideal of undistorted communication is central because Habermas claims that meaning originates in communicative action - a "transcendental link" between the practice of communication (using socially shared classificatory systems) and human activity (Habermas, 1978).

Given such an assumption, freedom from false consciousness (false meaning leading to action that is not in the best interests of the actor and those affected by such action) comes to be of paramount

concern. I will say more about the influence of Habermas, and its obvious roots in Marx's understanding of false consciousness, later in this chapter.

The first movement towards a Critical Systems paradigm was initiated by Jackson (1982) in response to an attempt by Mingers (1980) to underpin Checkland's Soft Systems Methodology with Habermasian theory. Mingers tried to improve soft systems thinking with an infusion of critical ideas, but Jackson argued that this is not possible within the Soft Systems paradigm because of the interpretive assumptions Checkland makes.

Over the coming pages I will review Mingers' argument and also Jackson's response to it - a response that can be said to have led to the birth of Critical Systems Thinking.

Mingers' basic argument (1980) is that there is a substantial overlap between Checkland's Soft Systems Methodology (e.g., 1972, 1975) and Habermas's social theory. Rather than characterising Checkland's work as purely interpretive (the theoretical alignment that is now most commonly made), Mingers suggests that it might

actually be critical in its theoretical roots.

Mingers makes such a diagnosis on the basis of three seeming similarities between the works of the two authors:

First, both Habermas and Checkland accept that there are elements of human action that are physiological in character, and are therefore beyond our capacity to change, while other elements are "purposive/rational" (Checkland, 1981), and are therefore subject to potential change.

Second, both recognise the weakness of hard systems ideas in coming to grips with human subjectivity.

Third, according to Mingers (1980),

"both aim to write theory and praxis and develop a rational approach to the realm of communicative interaction in order to bring about change in the world and help people solve their own problems".

However, Jackson (1982) is severely critical, both of Mingers' interpretation of Habermas, and his

characterisation of the supposed 'similarities' between Checkland's and Habermas's thought:

First, while it is true that both authors make a theoretical differentiation between human actions with a physiological and a social root (the former being impervious to human attempts at change), Jackson notes that Checkland offers no practical means of identifying the difference between them.

Habermas accepts the need for 'hard' inquiry in order to make such a distinction, while Checkland does not. Therefore, in Soft Systems Methodology, there can be no explicit historical analysis to determine the roots of ideas of what is and is not social in origin (i.e., there is no explicit requirement to reveal false consciousness)¹, and therefore we ultimately have to resort to a consensus about what is amenable to change that we have no means of validating.

Secondly, while Jackson (1982) accepts that hermeneutics are important for both Checkland and Habermas, he points out that the theories of the latter

go much further than simple hermeneutics. Consequently, Habermas offers us a sounder theoretical framework for helping people to solve their own problems. As Jackson (1982) indicates,

"he can provide a theory of distorted communication and a theory of the kind of social structure which brings about distorted communication. This gives people the chance to get to the root of their problem".

Underlying the problems Jackson (1982) finds with Mingers' analysis is what he sees as a basic misinterpretation of Habermas's work. He claims that both Mingers and Checkland see the essential difference between Soft Systems Methodology and critical theory as the overtly political stance taken by the latter. According to Jackson, however, this is missing the point:

"The major difference is theoretical. Habermas recognises that though the social world is created by Man, it is not 'transparent' to him. It escapes him, takes on objective features and constrains him. Man is still in the grip of unconscious forces and his actions still have unintended consequences. In these circumstances hermeneutics cannot be the sole method appropriate to the social sciences. There must also be a positivist moment in social inquiry in which the objective features of the social world - when men do appear

to act as things - can be studied. There is need too for a critical moment (corresponding to an 'emancipatory' interest). The hope is to reduce the area of social life where men act as things and to increase the realm of the hermeneutic - where rational men's intentions become realised in history. Though the major difference is theoretical it does have a political result. Habermas's work opens up the possibility of political action to accomplish real change - it is radical. Checkland's methodology confines itself to working within the constraints imposed by existing social arrangements - it is regulative".

While Mingers (1980) simply wants to add a critical theory onto Checkland's hermeneutic practice, Jackson (1982) demonstrates that this is impossible without severely limiting ones critical capacities.

Now, the Critical Systems movement itself has evolved out of Jackson's argument, but the critical-hermeneutic strain of thought has not died out. Fuenmayor (1985) has also attempted to show that there is a critical kernel in Checkland's work, and he chooses to base much of his thinking on Husserl's phenomenology (e.g., 1929) to achieve this, thereby avoiding Jackson's Habermasian critique.

Through such an analysis, Fuenmayor has developed what he calls Interpretive Systemology, and his research in

this area is still on-going (see Fuenmayor, 1989, 1990, 1991a,b,c, for recent interesting thoughts)².

5.2 Critical Systems Heuristics

The first work to explicitly identify the term "Critical Systems" was Ulrich's critical systems heuristics (1983).

The major challenge social scientists face, according to Ulrich, is inherited from Kant (1788). Kant identifies two strands of reason: theoretical (concerned with reflection upon truth) and practical (concerned with reflection upon what is right). As Ulrich (1983) says,

"reason is theoretical, according to Kant, when it produces understanding or knowledge of what is or what happens; it is practical when it helps us determine what ought to be or what ought to be done, i.e., when the problem involves our will".

Our central problem, Ulrich maintains, is that we still have no satisfactory philosophy that can help us make

validity judgements in the area of practical reason. Can, for example, such judgements be based on anything more than subjective criteria?

In reviewing the history of attempts to deal with this problem of practical reason, Ulrich notes that the philosophy of science has bifurcated so that some authors have taken a purely analytical approach (e.g., Albert, 1971; Popper, 1972; and Spinner, 1974) while others have taken a dialectical position (e.g., Horkheimer, 1937; Adorno, 1957; Lorenzen, 1969; Wellmer, 1970; and Offe, 1972).

The analytical philosophers maintain that knowledge is essentially value-free, and thereby neuter the whole question of practical reason, while the dialectical philosophers see themselves as championing the Kantian vision, but without addressing the validity question in sufficient depth. As Ulrich (1983) observes,

"neither side has thus far realised the Kantian program of a practical reason that would critically justify itself. One need not elevate oneself to the status of the arbiter in order to observe that on the one hand the scientists [Popper, et al] operationalise practical reason by reducing it to theoretical-instrumental reason,

while on the other hand their opponents [Adorno, et al] insist on the irreducible character of practical reason without having shown how practical reason can be practiced".

Traditional systems science, according to Ulrich (1983), has taken the analytical route, and the task of critical systems heuristics is to correct this imbalance. However, we cannot simply swing over into the dialectical camp which takes the possibility of valid practical reasoning for granted, but must address the validity problem head-on.

Ulrich (1983) offers an interesting answer to the question of practical reason. First of all he makes it clear that reflection upon moral and ethical judgements cannot take place in a purely theoretical realm, but must be embedded in a heuristic. In other words, they must be related both to on-going reflection on the practical circumstances in which we find ourselves, and to the learning that results from the actions that we take.

Ulrich also conducts an in-depth exploration of the social creation of meaning, following Habermas's theory

of communicative action. Through this he concludes that the criterion for valid inquiry into the making of value-judgements has to be normative acceptability to all concerned citizens (i.e., all those involved in, or affected by, the judgement).

This conclusion comes about because, if meaning cannot be said to be 'owned' by any one individual (it is dependent on socially shared classificatory systems), then any value judgement that is made by a researcher has its roots in the wider community.

Given that individuals are never in a position to know absolute truth or have an absolute idea of what is right (their understandings will inevitably be distorted by the power relationships they are subject to), the best a researcher can do is to refer back to the community from which the understanding s/he is aware of originated. In practice this means those involved in, or affected by, the research in question.

Because the essential criterion for valid inquiry into any area of practical reason is normative acceptability to all concerned citizens, Ulrich's critical systems

heuristics inevitably proposes a moral baseline of liberation. The idea is that all research into problematic situations within the sphere of human relationships and organisations should ideally recognise an emancipatory purpose.

This means that research should explicitly consider how the situation being investigated touches all the people involved or affected (directly or indirectly), and should promote their interests. Definition of who is involved or affected comes about through making critical boundary judgements.

Ulrich (1983), following the dialectical thinkers (especially Habermas), also takes the view that knowledge and inquiry cannot legitimately be seen as separate from values. Thus he claims that epistemological value-neutrality is untenable.

To support his argument he engages in a critique of the ideas of Weber (1907) who claims that one has to separate means from ends. Thus, for Weber, ends are value-laden, but means are neutral and called upon to

meet ends. Ulrich (1983) objects to this in the following way:

"Counter to what the German sociologist Max Weber (1907) assumed in his decisionistic model of the relation of science (theory) to politics (practice), decisions on means cannot be kept free of normative implications by referring all value judgements to the choice of ends; for what matters is not the value judgements that an inquirer consciously makes (or not) but the life-practical consequences of his propositions (regardless of whether they concern 'means' or 'ends') for those affected".

The above reference to "life-practical consequences" is absolutely central to Critical Systems Thinking. For Ulrich (1983), the 'mere' acceptance of the relevance of value judgements in directing research is not enough. As we have seen, it is essential that these value judgements be concerned with ensuring that, as far as possible, all those involved in, or affected by, research are considered, and that an emancipatory goal is declared.

When we talk about practical consequences for "all those involved and affected", we must of course recognise that the method chosen, as well as the ends being declared, will indeed have a real impact on

participants.

Now, just as Kant (1787) maintains that there can be no absolute truth in the realm of theoretical reason (because we can only know our knowledge constructs - the real world lies beyond our perception), Ulrich follows with the claim that there can be no absolute right and wrong. Our task, then, is to be continually critical: i.e.,

"to make transparent to ourselves and others the value-assumptions underlying practical judgements, rather than concealing them behind a veil of objectivity".

Our ideal, then, is to critically reflect on the origins of every assumption that "flows into" rational inquiry, whether in the realm of theoretical or practical reason. However, because we are now talking about heuristics rather than purely theoretical discourse, we immediately come up against the problem of practical restraints on critical reflection.

Ulrich's ingenious way around this problem represents a key innovation: he offers a marriage between critical

and systems ideas. Truly rational inquiry is said to be critical, in that no assumption held by the inquirer should be beyond question, and systemic, in that boundaries always have to be established within which critique can be conducted.

Within the context of heuristics, both ideas come to be seen as inadequate without the other. Critical thinking without system boundaries will inevitably fall into the trap of continual expansion and eventual loss of meaning (as everything can be seen to have a context with which it interacts, questioning becomes infinite).

However, systems thinking without the critical idea may result in a "hardening of the boundaries" where destructive assumptions remain unquestioned because the system boundaries are regarded as absolute. For me, the marriage of the critical and systems ideas represents a crucial advance in our understanding of rational inquiry in systems science.

At this stage in the development of Critical Systems, the idea of pluralism had not entered the discussion

[it only surfaced as a force to be reckoned with in Jackson and Keys' paper (1984), dealt with in Chapter 4]. Therefore Ulrich's methodological response to the issues he raises is to offer a single, practical approach to work in organizational settings: a new systems method, also called critical systems heuristics, that is explicit about acknowledging and dealing with power relations.

5.3 The Influence of the Idea of Pluralism

Independently from Ulrich (1983), Jackson continued to develop his thinking about a critical approach to management science. By 1985 he had already introduced the fundamental tenets of pluralism into the literature (Jackson and Keys, 1984), and so his task was to integrate this understanding with the critical idea. In 1985 he had two papers published (Jackson, 1985a,b), both of which make substantial, but different, contributions to the debate.

The first, Jackson (1985a), is basically a development of his 1982 paper in which he clarifies how Habermas's

ideas might be used to build an emancipatory approach³ that can sit alongside the positivistic and interpretive approaches in a pluralist framework.

Here he is particularly concerned with the utilisation of Habermas's notion of distorted communication (1970a,b), underpinning ideas of false consciousness, in order to show how appropriate methodological responses to research situations characterised as coercive might be developed. Jackson does not mention Ulrich's critical systems heuristics here, but there is an obvious similarity between the concerns of the two authors.

The second contribution made by Jackson in this year (Jackson, 1985b) represents the first attempt to find out what might lie behind the idea of aligning working methods with ideal-type contexts. Once again Jackson draws upon the work of Habermas, this time his 1972 writings:

"According to Habermas there are two fundamental conditions underpinning the socio-cultural form of life of the human species - 'work' and 'interaction'".

"'Work' enables human beings to achieve goals and to bring about material well-being through social labour. The importance of work to the human species leads human beings to have what Habermas calls a 'technical interest' in the prediction and control of natural and social events. The importance of 'interaction' calls forth another 'interest', the 'practical interest'. Its concern is with securing and expanding the possibilities of mutual understanding among all those involved in the reproduction of social life. Disagreement among different groups can be just as much a threat to the reproduction of the socio-cultural form of life as a failure to predict and control natural and social affairs".

"While work and interaction have for Habermas.... pre-eminent anthropological status, the analysis of power and the way it is exercised is equally essential, Habermas argues, for the understanding of all past and present social arrangements. The exercise of power in the social process can prevent the open and free discussion necessary for the success of interaction. Human beings therefore also have an 'emancipatory interest' in freeing themselves from constraints imposed by power relations and in learning, through a process of genuine participatory democracy, involving discursive will-formation, to control their own destiny".

It is these interests that Jackson says underpin both our search for knowledge and our use of the System of Systems Methodologies as an aid to problem management.

To deal with knowledge-gathering methods first, Jackson (1985b) notes that when we have an interest in predicting and controlling the environment (a technical

interest), it is most appropriate to use systems approaches with a positivist root (e.g., traditional scientific, mechanical, functional and cybernetic methods - Buckley, 1967).

When we have an interest in promoting mutual understanding (a practical interest), interpretive approaches come into play. While Jackson notes that interpretivism has found expression in the philosophies of hermeneutics and phenomenology, he observes that no interpretive knowledge-gathering systems methods have yet emerged.

When we have an interest in challenging oppression and uncovering false consciousness (an emancipatory interest), historical-reconstructive (e.g., Marxist) and psycho-analytic methods come to the fore. Once again, however, Jackson notes that no such methods have actually emerged in systems science⁴.

When it comes to using the System of Systems Methodologies as an aid to problem management, Jackson (1985b) claims that the technical interest lies behind

the need to classify situations as simple or complex. In other words we need to make a judgement about whether prediction and control is going to be easy or difficult.

Similarly, the practical interest lies behind the need to classify relationships between participants. We need to know whether we already have a consensus, we are faced with dissensus, or we are dealing with a situation where disagreement is not coming to the fore because of repression of the powerless by the powerful.

Now, in this paper Jackson does not discuss the emancipatory interest in relation to the System of Systems Methodologies. In 1988, however, he updated the work to align the emancipatory interest with coercive contexts. If I have understood his argument correctly, the emancipatory interest would appear to be an extension of the practical, which would fit with Habermas's work (1972).

5.4 Pluralism and the Three Interests Revisited

This idea of the three interests lying behind the use of different methods has also been picked up by other authors (e.g., Oliga, 1986, 1988; Flood, 1990a; and Gregory, 1989, 1990).

Flood (1990a), for example, explicitly draws upon Habermas's argument (1972) that knowledges and interests are inseparably interrelated: Habermas talks in terms of knowledge-constitutive interests because knowledges shape interests and interests direct the search for knowledges.

However, Flood (1990a) does not make it clear exactly what relationship he sees between the three knowledge-constitutive interests and the System of Systems Methodologies. Such clarification is left to Flood and Jackson (1991) whose vision appears, interestingly enough, to be different from that proposed by Jackson (1985b, 1988). My interpretation of Flood and Jackson's work is that they align the three interests with the three categories in the Participants dimension of the System of Systems Methodologies:

"It is clear that 'hard' and cybernetic systems approaches can support the technical interest, soft methodologies the practical interest, and critical systems heuristics can aid the emancipatory interest".

Flood and Jackson (1991) don't make this alignment of the three interests with the Participants dimension explicitly. Nevertheless, when we realise that 'hard' and cybernetic approaches are considered most appropriate for unitary contexts, soft methods for conflictual contexts, and emancipatory methods for coercive contexts, then this interpretation of their alignment might be said to gain some force.

Thus, it seems to me that Flood and Jackson (1991) are suggesting that successful pursuit of our technical interest in predicting and controlling the environment depends upon there being some agreement on defining the problematic areas - i.e., in terms of the System of Systems Methodologies, there should ideally be a unitary context. In these circumstances, systems methods with a positivist root are the most appropriate to use.

In contrast, when we are dealing with dissensus (i.e., in terms of the System of Systems Methodologies, there is a conflictual context), our practical interest in promoting mutual understanding comes into play. This achieves its most adequate expression in the form of methods with an interpretive root.

When we are faced with a coercive context in terms of the System of Systems Methodologies, however, our emancipatory interest in challenging oppression and uncovering false consciousness comes to the fore. The emancipatory interest is best expressed through the use of emancipatory methods.

Given that Jackson's original ideas regarding the relationship between the three interests and the System of Systems Methodologies have not been mentioned in the literature for two years (the last time they surfaced was in Jackson, 1988), it might be assumed that the alignment offered by Flood and Jackson (1991) has supplanted it.

However, in a recently published work (Jackson, 1991a),

his original alignment resurfaces. If my interpretation of Flood and Jackson's (1991) work is right, we appear to be left with two seemingly contradictory messages about the nature of pluralism - a problem to be addressed later in this thesis.

5.5 Methodological Ideals in Critical Systems Practice

We have already discussed Ulrich's attempt (1983) to deal with the problem of practical reason, which gave rise to many early Critical Systems ideas and the methodology of critical systems heuristics.

We have also seen how the idea of pluralism has been integrated into both the theory and practice of Critical Systems Thinking (drawing upon the seminal works of Habermas, 1972, and Jackson and Keys, 1984, respectively).

However, it is possible to identify another important strand to Critical Systems Thinking. We find that methodological guidelines are offered for ideal

approaches to applied systems research. Also, quite recently, a specific meta-methodology has been developed for use in organizational research and intervention. Both the ideals and the meta-methodology will be reviewed briefly below.

5.5.1 The Methodological Ideals

Let us start with the methodological ideals. The first is that we should accept a moral baseline of emancipation.

This lies at the root of Jackson's argument (1982) for a critical management science; is made explicit in Ulrich's critical systems heuristics (1983); is implicitly brought into the Critical Systems understanding of pluralism by Jackson (1985b) when he discusses Habermas's knowledge-constitutive interests; and is made fully explicit once again by Flood (1990b).

Indeed, it is Flood (1990b) who clarifies the key point that the ideal of emancipation always has to be borne in mind however the research context is defined. In

other words, the ideal of emancipation is not reserved solely for coercive contexts when explicitly emancipatory methods are called upon.

As mentioned previously when discussing critical systems heuristics, the ideal of emancipation suggests that all research into problematic situations within the sphere of human relationships and organisations should consider how the situation being investigated touches all the people involved or affected (directly or indirectly), and should promote their interests.

Midgley (1989a) has argued that, in practice, this must involve starting any research project by interviewing all known participants, and ensuring that, as far as is practicable, these participants actually co-determine the design of the research. The scientist is therefore explicitly prevented from assuming an "elite" position.

Of course knowing who is actually going to be involved or affected by the work is not always straight-forward, especially if there are unequal power relationships which result in an affected group or individual not

coming to the attention of the researcher through his or her initial approach.

As far as possible it is necessary to retain the flexibility to expand the research remit at any time: one may, for example, find that initial interviews reveal the involvement of other people who will themselves need to be followed up and interviewed (see Midgley, 1989a, for a practical example).

In saying that research should ideally recognise an emancipatory purpose, we have to remain aware that what is considered to be emancipatory by one person might not appear to be so to another, so the definition of emancipation must, in an ideal world, be down to the individual researcher, in partnership with those seen to be involved in, or affected by, the research, to determine.

A statement of the assumptions and/or motivations of the researcher and his or her research partners (those involved or affected) needs to be made when writing reports, as it is just as important not to lose the connection between what we do and why we do it when

communicating research results as it is when conducting the research itself (Midgley, 1988).

We therefore see that ideology comes to the forefront of Critical Systems research practice. The gap is closed between conducting research and the reasons why it is conducted. This is believed to be necessary in order to allow the researcher to be exposed to critical comment, not just on the quality of his or her scientific method, but on the reasons why s/he does what s/he does.

In the light of these methodological ideals, the meaning of the statement that the System of Systems Methodologies should be regarded as an ideal of research practice that is useful for critical reflection on methodology design becomes clearer.

We start with a specific emancipatory goal (arrived at through democratic dialogue) and, in partnership with those involved and affected, and using the System of Systems Methodologies to aid our understanding, decide on the most effective approach for the research given

both the practicalities of the situation and the stated ends.

At any point during its conduct, the research goals, the methodology, and/or those defined as involved or affected may be altered in the light of either changes in practical circumstances, discovery of hitherto hidden information, or impact made by the research itself. Thus the System of Systems Methodologies has an on-going role to play in Critical Systems research.

5.5.2 Meta-Methodology: Total Systems Intervention

These methodological ideals took time to evolve. They emerged gradually through conversations, theoretical reflections and practical discovery. By 1991, Flood and Jackson felt they were ready to design a meta-methodology, which they called Total Systems Intervention (TSI).

Until recently, much of the Critical Systems literature was written in a specialist language that largely restricted its accessibility - it was mainly read by

professional systems thinkers and philosophers. Flood and Jackson (1991), in seeking to make Critical Systems ideas accessible to an educated, but non-specialist, audience of managers and consultants, came up with TSI. Essentially TSI represents a "pragmatisation" of Critical Systems ideas.

TSI uses the System of Systems Methodologies to align various methods with ideal-type contexts of application. It also seeks to show that different systems methods imply different metaphors of organization.

For example, implicit in system dynamics is the view that organisations are like machines. Cybernetic methods, on the other hand, look at organisations as if they are neuro-cybernetic learning systems (brains). In contrast, many interpretive methods (e.g., soft systems methodology) assume a culture metaphor, and emancipatory methods (such as critical systems heuristics) view organisations as if they are prisons.

The actual meta-methodology involves gathering together

in a group those involved in, and affected by, the workings of an organization in order to discover what the dominant issues facing people are. These issues will tend to be described in terms of the various systems metaphors identified by the authors.

This, together with reflection upon the System of Systems Methodologies, should, the authors suggest, give enough information to make a reasonably good judgement on which specific systems methods are most appropriate for the job in hand. For an in-depth description of the logic and process of TSI see Flood and Jackson (1991).

Before concluding this final section on methodological ideals and meta-methodology, it is worth noting a key difference between the practical proposals for implementing the ideals put forward by Midgley (1989a), on the one hand, and Flood and Jackson (1991) on the other.

Midgley talks about interviewing groups and individuals to determine what is needed in terms of methodology. In contrast, Flood and Jackson (1991) advocate bringing

together a group of participants only. Similarly, Midgley discusses the role of the individual researcher who has to negotiate with participants to formulate a vision of the organization. In TSI, such formulation is a group responsibility and the part the researcher plays in this is not made an explicit issue.

5.6 Conclusion

This chapter has introduced the reader to some basic Critical Systems ideas. In the next chapter I will explore some of the more recent diversifications.

Notes

1. Revealing false consciousness requires historical analysis because, for both Habermas and Jackson, it is the notion of forces of power limiting human understanding that defines the term. Only if we can become aware of the forces of power that have been operative in the past can we judge whether a particular

belief held in the present is indeed "true" or "false". However, it is important to note that, in the work of both Habermas and Jackson, judgements of false consciousness are not of an absolute character: like all judgements they have to be dealt with critically.

2. Personally I find Fuenmayor's phenomenological root rather problematic. In his 1990 paper he argues that the work of Habermas cannot be seen as a significant advance on the writings of Husserl. He is able to put such a viewpoint across because he equates Habermas's desire to liberate people from unconscious presuppositions with Husserl's wish to liberate theory from interests. I do not find Habermas's position unproblematic either: the idea that the acquisition of knowledge about oppression will inevitably lead to action to challenge it seems to me to be an erroneous assumption inherited from Freud. However, Husserl's view differs significantly from Habermas's vision because Husserl claims that the revelation of interests alone breaks the dependence of theory on those interests. Therefore, according to Husserl, theory becomes interest-free when interests are declared, while for Habermas theory can never be interest-free.

There are certainly some issues requiring further research here.

3. In his 1985a paper, Jackson appears to use the term "critical" to signify appropriate methodological responses to coercive contexts. However, in his 1991b work, he switches to the term "emancipatory" in order to distinguish appropriate responses to coercive contexts from the over-arching Critical Systems perspective (the latter terminology is in line with my own use of the words "emancipatory" and "critical" in this thesis). Thus, for example, Ulrich's critical systems heuristics offers an emancipatory method when seen within the pluralist conception.

4. It should be noted that Jackson updated his 1985b paper three years later (Jackson, 1988) to take the works of Ulrich (1983) and others on board.

CHAPTER 6: DIVERSIFICATION IN CRITICAL SYSTEMS THINKING

We now have a reasonably coherent picture of the history and main tenets of Critical Systems Thinking. However, in the last three years a significant deepening and broadening of the philosophical and social-theoretical base of the perspective has been achieved.

In particular we can identify Ulrich's development (1988) of the paradigm of communicative action; the further reflections on ontology and epistemology offered by Flood and Keys (1989) and Flood (1990a); the claim that we are in need of "a substantive soft systems language" (Flood, 1988, 1990a); the explorations of power and ideology provided by Oliga (1989a,b, 1990a); and the efforts of Flood (1990a,c,d) and Wooliston (1990, 1991a,b,c) to come to grips with post-modern criticisms of the Habermasian framework. Amongst other things, the latter has resulted in a far-sighted 'unification' of the supposedly contradictory perspectives of Habermas and Foucault.

It is worth reviewing all the above ideas, although it

should be noted that, with these recent debates, diversity has proliferated to the point where writers can regularly be seen to be contradicting each other, and any common threads we have identified so far begin to look rather tenuous. Let us simply take each of these recent contributions in turn:

6.1 The Paradigm of Communicative Action

We can begin with Ulrich's development (1988, 1990b) of what he calls "the communicative paradigm of rational social practice" (Ulrich, 1988). This is essentially an extension of his 1983 work on critical systems heuristics, and is based in the Habermasian notion that knowledge and meaning are social creations, arising through communicative action¹.

In 1983, having focused on the split between theoretical and practical reason inherited from Kant (1788), Ulrich (1988) went on to examine how his notion of valid practical reasoning differs from the traditional subjectivist approaches. He states that....

"Subjectively an individual acts rationally if his ends are in agreement with his standards of value and if he efficiently utilises the means at his disposal to achieve these ends. The two conditions mentioned correspond to Max Weber's 'ideal types' of rational action, 'value-rationality' (Wert-rationalitat = convergence of purposes and values) and 'purposive-rationality' (Zweckrationalitat = adequacy of means in regard to purposes). Together they are constitutive of the utilitarian concept of rationality. This type of rationality is oriented toward the success of one's actions, whereby ends are assumed to be given and 'success' is measured in terms of cost-benefit analysis. It clearly belongs to the dimension of theoretical reason".

Practical reason, then, comes to be defined as the 'other' of subjective reason within the overall blanket category 'reason' (just as, in the original Kantian vision, theoretical reason is the 'other' of practical reason).

I actually find Ulrich's division of the subjective from the practical rather problematic, but let us pursue his line of inquiry as he seeks to underpin the practice of pluralism with an epistemological vision based in the communicative paradigm.²

In order to build a new understanding of pluralism,

Ulrich (1988) draws upon another Habermasian taxonomy (Habermas, 1984a,b) which proposes that we can distinguish between success-oriented action (referring to the subjectivist, utilitarian paradigm of purposive-rational action) and consensus-oriented action (referring to the communicative paradigm of action based on norms acceptable to those involved and affected). As Ulrich says,....

"The distinction is akin to his [Habermas's] earlier discussion of two fundamental dimensions of practice, the dimensions of 'work' and 'interaction' (1971). Rationalisation of these two domains implies two entirely different conceptions of rationality: rationalisation of 'work' implies an expansion of technical control over objectified processes, while rationalisation of 'interaction' implies an expansion of argumentative means for resolving conflicts of interests and needs through mutual understanding, which amounts to an expansion of control over the domination of men by men (power)....

Habermas now refines this earlier distinction by adding a second distinction, that between situations of action in which interpersonal relationships do and do not play a role ('social' vs 'nonsocial action'). Cross-tabulating the two distinctions yields three basic types of action, one referring to nonsocial action and the remaining two to social action".

This cross-tabulation can be found in Figure 6.1, in which we can identify instrumental action (non-social

and success-orientated), strategic action (social and success orientated) and communicative action (social and consensus-orientated).

Figure 6.1: Types of Action According to Habermas

	Success-orientated (own interest)	Consensus-orientated (mutual understanding)
Non-Social	Instrumental Action	-
Social	Strategic Action	Communicative Action

Ulrich (1988) suggests....

"that this taxonomy offers itself as a systematic framework of three complementary levels of systems practice, each of which requires its own concept of systems rationality.... The three levels of systems practice thus gained are roughly parallel to the three levels of planning distinguished by....Jantsch (1975) in his 'vertical integration' approach to planning: operational (or tactical), strategic, and normative planning".

Here, then, we have the basis for an alternative to the System of Systems Methodologies (and its earlier Habermasian underpinnings).

Ulrich (1988) indicates that the traditions of systems

analysis (e.g., as represented in the works of Smith, 1966; Quade and Boucher, 1968; Emery, 1969a,b; de Neufville and Stafford, 1971; Quade et al, 1978) and systems engineering (e.g., as presented by Goode and Machol, 1957; Gosling, 1962; Hall, 1962; Chestnut, 1967; Jenkins, 1969b; Optner, 1973; Daenzer, 1976) offer instrumental methods of action.

He also sees the approaches that attempt to sort out the complexities of human problematic situations, such as cybernetics, simulation techniques, game theory, portfolio management, etc., as techniques of strategic action. Some of the methods Ulrich identifies as useful here are contained in the works of Rappoport (1960), Emery and Trist (1965), Forrester (1971), Rawls (1971), Beer (1981, 1985) and Vester and Hestler (1980).

When it comes to communicative action, however, Ulrich (1988) follows Jackson (1982) in warning the reader not to think that the formation of consensus merely requires hermeneutic methods.

Ulrich declares the importance of revealing false

consciousness and dealing with types of coercion that prevent the formation of genuine consensus. As such he identifies his own critical systems heuristics (Ulrich, 1983) as an appropriate method of communicative action, although he says we might still learn from writers in the hermeneutic tradition (such as Churchman, 1968b, 1979; Checkland, 1981; and Mason and Mitroff, 1981) who have gone part of the way toward designing critical approaches.

Although Ulrich's vision of pluralism obviously stands in opposition to the work of Jackson and Keys (1984) and Jackson (1987b), he never makes it clear why he has discarded the earlier framework. Certainly Ulrich's perspective has the advantage of moving beyond methods designed solely for intervention in human problematic situations, but it has the disadvantage of losing all but the most basic and obvious links between method and context.

Let us move on now and consider the ontological and epistemological reflections of Flood and Keys (1989) and Flood (1990a):

6.2 Deeper Ontological and Epistemological Reflections

While much of the epistemological work already presented has been inherited from the writings of Habermas, Flood and Keys (1989) have also considered the ontological position Critical Systems Thinking takes (ontology being our understanding of 'reality').

Flood and Keys identify only two ontological positions it is possible to hold (ontological realism and ontological nominalism), and two possible epistemological ones (epistemological positivism and epistemological anti-positivism). Ultimately, they claim, all ontological and epistemological stances are based in these.

By cross-referencing them they offer four categories of onto-epistemological understanding that are said to represent fundamentally different viewpoints of the world and knowledge of it: ontological realism & epistemological positivism (OREP), ontological realism & epistemological anti-positivism (OREAP), ontological

nominalism & epistemological positivism (ONEP) and ontological nominalism & epistemological anti-positivism (ONEAP).

These terms will obviously require some explanation. Flood and Keys offer elaborations of the above positions that are worth quoting verbatim:

"OREP suggests that complexity is of a real social world; that we can know it, represent it accurately and disseminate concrete knowledge of it. All we need to do is to develop isomorphic systemic representations of the complex real-world. We might alternatively choose to represent it (by varying resolution) with simpler models that maintain an identity, assessed through empirical observation, yet which are more manageable. In this case 'complexity' and 'system' are synonymous and the world is accepted as a complex of systems.

OREAP suggests that complexity is formulated in our perceptions, i.e. we conceptualise a real-world through systemic abstractions. The real-world is therefore thought of in terms of complexity, however, these abstractions are only related to a world of reality, of real objects. This reality is, however, somewhat 'distant'. It is preferred not to think of complexity as if it were a real property of those 'distant objects', only that it might be useful to think about them in this subjective way. Objects are assumed to exist in a real-world independent of a human observer, but it is the human observer who owns the concepts 'complexity' and 'system'. In this sense 'complexity' and 'system' are synonymous in abstract terms only.

ONEP suggests that complexity might be of a real-

world, yet it is extremely difficult to know about that world, and impossible to know it as it is. Language structures, and labels and systemic representations can be used to describe the real-world where complexity lies. With these reflective forms we can learn about the structure and function of the real-world, that exists 'beyond our horizons', and hence the complexities of it. Again, 'complexity' and 'system' are synonymous in abstract terms only. Therefore, real tangible immutable knowledge may be ascribed to a real-world which, nevertheless, remains beyond our absolute knowing of it.

ONEAP accepts that complexity is of our perceptions. A systemic structure may be used to organise perceptions, yet no direct reference is made to a real-world because it is accepted as unreal beyond our consciousness. Complexity is only partly explained through systemic structures, being also clearly associated with our psychological and cultural being. Complexity and system are therefore not synonymous at all, but are useful concepts nevertheless, i.e. there is systemic complexity and pluralistic complexity. Thus our knowledge is subjective, it is not immutable but is up for negotiation and reappraisal with our social partners."

Critical Systems Thinking, Flood and Keys (1989) claim, is based in this last position, ONEAP: i.e., it is ontologically nominalist and epistemologically anti-positivist.

This exploration complements the earlier ones, in that it reintroduces some of the original subtlety of the Habermasian position that, one could argue, got lost

during the necessary process of *précising* Habermas's ideas to facilitate concise communication. Habermas (1972), for example, talks about the essential process of refusing to make assumptions, and ensuring that all possible efforts are made to subject knowledge and belief to recurrent critical appraisal.

Habermas sees this as necessary precisely because we are unable to know the accuracy of our knowledge in any absolute terms (the anti-positivist assumption), and because 'reality' itself is constructed through communicative action (the nominalist assumption). Indeed, Habermas (1972) goes as far as to identify his position as a modern version of Hume's skepticism (1777).

According to Flood (1990a), who built upon the Flood and Keys' framework (1989), acceptance of the ONEAP position has important practical implications, not only in the way that it brings the need to be critical to the forefront of our agenda, but also in terms of the methods of communication we adopt.

6.3 The Need for a Substantive Soft Systems Language

Given the assumption that the 'real world', which is nominally assumed to exist, is nevertheless to be seen as a reflection of consciousness, it must be a priority for Critical Systems thinkers to develop a language that makes this ontological and epistemological position explicit.

From the ONEAP perspective, both our everyday and scientific use of language encourages hypostatisation (treating concepts as real entities). For this reason Flood (1988, 1990a) calls for the continual use of qualifying sub-clauses in scientific writing that can serve to focus the reader's attention on the subjective and/or normative nature of what is being said.

For example, instead of stating that "the work force went on strike because they were not satisfied with the wage offer", we can paraphrase the sentence to read "it can be said that the work force went on strike because they were not satisfied with the wage offer". Or, better still, "the Managing Director claimed, in my

view with some justification, that the workforce went on strike because they were not satisfied with the wage offer".

The first paraphrase makes it explicit that all we really know of the motivations of the work force are our assumptions about them. The second paraphrase, on the other hand, acknowledges both the writer's ownership of the assumptions and their source.

In fact, from the ONEAP perspective, we must accept that the use of hypostatizing language obstructs critical thinking. As soon as we have assumed a thing to be absolutely true, it can no longer be held up for critical re-appraisal. If our language is impoverished in making the normative and subjective explicit, then we are more likely to pass over such assumptions uncritically. When our language no longer hypostatizes, our attention is drawn to human assumptions.

6.4 Power and Ideology

Let us now move on to the fourth major area of recent

theoretical exploration in Critical Systems Thinking:
the critique of power and ideology.

We have already described how:

(i) the System of Systems Methodologies deals exclusively with methods used to intervene in organizational settings;

(ii) Critical Systems theorists have been explicit in their demand that researchers working in these settings declare emancipatory goals; and

(iii) the limitations of approaches which refuse to acknowledge the problems of coercion and false consciousness have been exposed.

Clearly, understandings of power and ideology must be central to Critical Systems Thinking, although defining these two terms is highly problematic [see, for example, Lukes (1974), Larrain (1979) and Oliga (1990a) for reviews of some of the problems].

Oliga (1989a,b, 1990a) has taken it upon himself to

deal with these problematic concepts head-on. Rather than simply describe his own view of power and ideology, however, it might be instructive to review his commentary on the works of other key writers in this area. From such a review we will be able to tease out the key assumptions he makes in arriving at his own perspective.

Oliga (1989a,b, 1990a) identifies a series of different perspectives on power and ideology. In his 1990a paper, he begins by outlining three views, each of which can be seen as a step on from the last. First of all there is Dahl's view (1958) that power can be defined....

"in terms of an individual's successful attempt to secure a desired outcome through processes entailing the making of decisions on issues over which there is an observable conflict of subjective interests" (Oliga, 1990a).

Then there is the extension of this view, offered by Bachrach and Baratz (1963), that we have to include in our definition of power an understanding that one party may exercise power by preventing decisions from being taken on potential issues.

Thirdly there is the view of Lukes (1974) who, in criticising both of the above authors for focusing solely upon the individual, introduces the Marxist notion of false consciousness, saying that we must also include....

"(a) social forces and institutional practices as sources of bias mobilisation, (b) control over political agenda through ideological processes of preferences shaping and selective perception and articulation of what counts as social problems and conflicts, and (c) latent conflicts representing a contradiction between the interests of those exercising power and the 'real' interests of those they exclude" (Oliga, 1990a).

By presenting these three views as a neat progression of ideas (a review of the literature on power indicates that these three positions have actually competed for intellectual credibility), Oliga (1990a) clearly identifies himself with a perspective which refuses to see power as lying solely in the hands of individual human manipulators, but is essentially systemic in nature, having roots in human consciousness.

Oliga then goes on to review the works of two theorists (Minson, 1980, and Hindess, 1982) which he sets against

the above. He starts with the work of Hindess (1982), who argues that considerations of power should not be separated from an analysis of the practical conditions through which power relations emerge. Thus, according to Hindess (1982),

"arenas of actual or potential struggle would then have to be analysed not in terms of the differential possession of quantities of power but rather in terms of the differential conditions and means of action available to the contending forces, their strategies and objectives, and so on".

Oliga then proceeds to a discussion of Minson's work (1980), and thereby also tackles Nietzsche (1901; posthumous publication) and Foucault (1972, 1977) whose thoughts have influenced Minson. Minson recognises that, for both Nietzsche and Foucault, power and knowledge are intimately related. As Foucault (1980) says,

"Now I have been trying to make visible the constant articulation I think there is of power on knowledge and knowledge on power. We should not be content to say that power has a need for such-and-such a discovery, such-and-such a form of knowledge, but we should add that the exercise of power itself creates and causes to emerge new objects of knowledge and accumulates new bodies of

information.... The exercise of power perpetually creates knowledge and, conversely, knowledge constantly induces effects of power.... Knowledge and power are integrated with one another, and there is no point in dreaming of a time when knowledge will cease to depend on power; this is just a way of reviving humanism in a utopian guise. It is not possible for power to be exercised without knowledge, it is impossible for knowledge not to engender power".

Minson takes this view of power and contrasts it with the Marxist perspective (exemplified here by the work of Lukes, 1974). In all, Minson identifies three major areas in which Foucault contests Marxist orthodoxy:

"his [Foucault's] attack on global conceptions of social relations; his relocation of such categories in the limited field of 'social' strategies; and finally, his attack on 'possessive' conceptions of power and concomitantly his emphasis on the determinants and effects of the 'technical' forms of implementing policies and strategic programs".

However, rather than simply following Foucault in his belief that power should be seen as a partner to the many and diffuse forms of everyday knowledge (which contrasts with the Marxist view that power concentrates in the hands of the owners of the means of production), Minson declares the very notion of power to be null and void. In his own words,

"Nothing can be explained in terms of power because on any understanding, one thing (be it political subject, economic structure or whatever) must be attributed the unconditional capacity to dominate the other.... To set conditions on a capacity to dominate is to deny that a thing has that capacity".

Therefore Minson is reduced to talking in terms of differential advantages and disadvantages faced by social agents.

Now, Oliga chooses to lump the works of all the above authors (Nietzsche, Foucault, Minson and Hindess) together on the grounds that they share what he calls "a number of untenable elements in their analysis of power". Let me quote Oliga (1990a) verbatim:

"First, outcomes of struggle are seen as simply dependent on heterogeneous, interdependent, possible tactics and strategies, or on conditions and means of action available in specific situations of action. Second, their alternative explanatory categories are all simply taken as given (spring from nowhere). This naturalistic conception betrays an uncritical view of surface-level appearances. The possibility that such parameters of struggle may be ideologically structured is ignored. Thus there is a danger of overconcentrating on the tactics and actual 'playing out the game', to the exclusion of the ground rules of the game itself, which

circumscribe, structure and bias potential outcomes".

Oliga claims that there is danger in such 'limited thinking', and cites the argument put forward by Warren (1984) against the work of Nietzsche. Warren claims that, by saying power pervades every aspect of knowledge, Nietzsche effectively makes all knowledge ideological, and therefore the notion of truth flies out of the window.

Oliga maintains that the writings of Foucault, Hindess and Minson are also prone to such relativism. Following Habermas (1976b), Oliga asserts that, when all knowledge is seen as ideological, a critique of ideology becomes impossible - such a critique depends on the possibility of distinguishing truth from falsehood (at least in a critical, rather than an absolute, sense).

Here, then, lies the crux of Oliga's argument. A credible understanding of power must allow a critique of ideology. Having attacked the works of Nietzsche, Foucault, Minson and Hindess on the basis of this

criterion, he places himself in a position to define ideology in a return to what, in his 1989a paper, he calls the "contingent relationist" view of power (i.e., similar to the one proposed by Lukes, 1974, based in a neo-Marxist analysis):

"The relational nature of this [the contingent relationist] view derives from a focus upon both the self-understandings of the agents involved in a power relation, and the structural constraints and conjunctural opportunities they confront in a particular, concrete situation. And it is contingent in a dialectically critical sense; that is, coercion is not seen as immanent in power, yet power can be noxiously exercised; or looked at from the other side of the coin, power is not seen as inherently positive (for the good of all) yet it can be, in a distributive sense, a source of emancipatory potential, as much as a creative, transformative capacity in a synergistic sense".

Thus, because power can be either oppressive or transformative, Oliga (1990a) can define ideology, following Marx (1887) and Larraín (1979), as "distorted knowledge which, in the interest of the dominant class, masks contradictions of capitalist social relations".

For Oliga, then, ideology is always a negative, with critically accepted truth being its positive 'other'. Our task, according to him, is to expose coercive power

relations and use power in a transformatory manner to challenge ideology (which is always a symptom of false consciousness).

Having fixed upon his definitions of power and ideology, Oliga (1990a) then proceeds to evolve an explicit theory about the relationship between the two that has profound implications for how we see the process of liberation (which is, of course, at the centre of Critical Systems Thinking):

"The processes of ideological interpellation [the act of addressing].... of the ruled result in either their acceptance or their rejection of the (ruler's) dominant ideology. This, however, is at the discursive level. Obedience (or resistance and struggle) depends additionally on the power balance, that is, on the matrix of material affirmations and sanctions available to the rulers relative to the ruled. For analytical purposes, power can therefore be related to the non-discursive (i.e., economic and political) dimension of social relations. In these critical terms, power and ideology thus become dialectical notions. The idea of ideology is meaningless except in the context of organising, maintaining, and reproducing power through 'subjection-qualification' processes [subjection refers to the force applied to an individual to make her or him conform, and qualification refers to the enabling of an individual to take up and perform the repertoire of roles given in society (including the role of agent of social change)]. This is the sense in which ideology reflects power. Obversely, all ideologies operate only in a material matrix of affirmations and sanctions (power). Thus power

in turn reflects ideologies".

I would suggest that this is important for the Critical Systems understanding of pluralism because it helps us broaden our definitions of problem contexts beyond what Oliga (1990a) calls "structural aspects of system control".

Now we can begin to look at context more closely in terms of power and ideology so that, when we wish to promote emancipatory change, we can determine whether the priority is intervention to challenge prevailing ideology, intervention to transform power structures, or intervention in both simultaneously.

The critical use of soft systems methods (in situations of equal power relations) or emancipatory methods (in situations of unequal power relations) can help us challenge ideology, and the critical use of hard systems methods can help us alter power relations through planned intervention in organizational structures.

6.5 Liberate and Critique

Lastly, in this review of recent diverse contributions to Critical Systems Thinking, let us look at the theory of liberate and critique propounded by Flood (1990a,c,d).

Central to this theory is a far-sighted integration of the very different perspectives championed by Habermas and Foucault (a union that would at first sight seem impossible to attain). Flood saw such an integration as an essential next step due to the powerful critique of modernism³ launched by the post-modern philosopher Michel Foucault.

Because Critical Systems theorists have drawn so heavily upon the works of Habermas, and Habermas can be identified as one of the staunchest and most sophisticated defenders of modernism (see his 1985 work in particular), Flood was aware that Critical Systems Thinking was running the risk of exposing itself to a similar critique. Indeed, Wooliston (1990, 1991a,b,c) has already begun to engage in this.

Before detailing Foucault's position, let me just clarify the Habermasian understanding of power which Foucault criticises:

The possibility of having an emancipatory interest which is seen as pivotal presupposes a neo-Marxist understanding of power. That is, as a function of the capitalist system, power concentrates in the hands of a minority of citizens, and the majority accept this situation through the internalisation of ideologies (false consciousnesses) supporting the status quo.

Power is seen as 'sovereign' (i.e., 'owned' by individuals and groups of people) and negative (it is an oppressive force). Consequently a causal analysis is encouraged in which people are thought to be subject to the oppression of others both in terms of observable social relations and ideological rationalisations of these. There is therefore a need for emancipation both from the power relations themselves and the false consciousnesses that support them.

Foucault's understanding of power is very different

however. As already touched upon in my earlier review of Oliga's work (in particular, 1990a), not only does Foucault see power as bound up with knowledge (Habermas prefers a knowledge-interest link that keeps the analysis of power separate), but he specifically states that power is not sovereign (i.e., it cannot be said to lie in anyone's hands), and oppressive power relations do not lead to the development of distorted knowledges.

Indeed, the very idea of distorted knowledge presupposes that it is possible to have a (critical) notion of true knowledge, which Foucault does not accept. For him, knowledge and power are so intimately linked that there can be no acceptable criteria for the establishment of truths, and no "peculiarly unforced force of the better argument" (Habermas, 1974). For Foucault, any determination of what is true has to have its origins in the (non-sovereign) exercise of power.

This viewpoint, then, stands in direct opposition to that of Habermas and, if accepted as it stands, raises the possibility of establishing a powerful counter-paradigm to Critical Systems Thinking, and even

threatens to undermine the (Habermasian) Critical Systems perspective altogether.

Now, Foucault's understanding of power is notoriously difficult to grasp, running, as it does, against all the 'common sense' notions we have held unquestioningly for so long. Let me detail the concept further, then, by quoting Flood's (1990a) *précise* (or interpretation) of it:

"Power is rejected in the form of right, sovereignty, and obedience and as being like a commodity. The idea that power is descending and negative, as would be the sovereign case, is replaced by an idea of ascension and positiveness. Power is constructed and functions on the basis of particular micropowers and is productive in the way that it produces reality (i.e., domains of objects and rituals of thoughts). These are not autonomous or independent, being integral with a broad series of processes.

Emergence of knowledge is explained as a consequence of domination at local discursivity levels [the everyday level at which discourses are developed], imposed by non-discursive subjugators. There are forces holding together discursive formations. A situation of conflict leads to the rising of some and the subjugation of other knowledges and thus to resistance and relations of power. Historical succession of discursive formations becomes a matter of contests and struggles over systems of rules".

Rather than seeing power as a causal agent in social

processes, operating from the top down, Foucault sees it as a constituting agent, operating from the bottom up.

Indeed, Foucault (1980) specifically claims that what we normally see as the sovereign exercise of power causing oppression (as in the Marxist case of the owners of the means of production dominating the lives of producers) is actually a 'coming together' (an emergent property perhaps?) of domination at the level of discursive micro-power relations by non-discursive forces.

In other words, knowledge is shaped during everyday power relationships, yet these are themselves subject to the rules of a wider power/knowledge system that is constituted by the relationships between all our micro-level interactions.

Thus the whole conventional notion of the causal power relation is inverted. Foucault believes that happenings at the level of everyday discourse give rise to what we think of as sovereign power.

Now, I have said that Flood (1990a,d) has striven for an integration of the supposedly contradictory perspectives of Habermas and Foucault. He has approached this through consideration of two key aspects of Critical Systems Thinking: critical thinking and pluralism.

To take critical thinking first, we must inevitably accept that to be critical we must hold onto the possibility of comparing and contrasting different knowledges. It is because some knowledges can become dominant, and others repressed, that Foucault identifies the liberation of suppressed knowledges as the essential antidote to the totalising power of a dominant discourse.

In a wide-ranging review of Foucault's critique, Smart (1983) has drawn out five key critical-methodological principles that Foucault claims we need to hold onto if we are to liberate knowledges without being seduced by the sovereign view of power. Flood (1990a) summarises these as follows:

"(1) Avoid an analysis of power in terms of sovereignty and obedience. Rather than focusing on regulated, legitimate and centralised forms of power, be concerned with power at the extremities, with its regional and local forms, where it becomes less legal.

(2) Rather than concentrating on conscious intention in the analysis of power, look for the point of application, where it is in direct relationship with its object. So questions like 'Who has the power?' or 'What intentions or aims do power holders have?' would be replaced by interest in how things work at the level of ongoing subjugation, of continuous and uninterrupted processes that subject our bodies, govern our gestures, dictate our behaviour, etc. (Foucault, 1980). Attention should therefore be focused on the process by which subjects are constituted as effects of power rather than issues of motivated interest of particular groups, classes, or individuals in the exercise of domination, or on the constitution of an all-powerful state or sovereign.

(3) Power ought not to be conceptualised as being attributable to individuals or classes. It is not a commodity. Rather it is of a network which.... can grow and pervade and become strong. Individuals do not possess power, rather they constitute its effects.

(4) Analysis of power should proceed up from a microlevel and seek to reveal how mechanisms of power have been colonised by more general or macro forms of domination. This requires an examination of how the techniques and procedures of power that operate routinely at the level of everyday life have been engaged by more general powers of economic interest. It is not the other way around. This is, in other words, an analysis of the individual mechanisms, histories and trajectories of the micro-powers which then proceeds to a documentation of the manner and method of their colonisation.

(5) The exercise of power is accompanied or paralleled by the production of apparatuses of knowledge".

Having identified (with Foucault) a need for the liberation of knowledges, Flood (1990a) goes on to examine the nature of critique in more detail through a consideration of the central tenets of pluralism.

Rather than treat knowledge as having only a singular aspect (identified solely with truth in the analytic understanding of Popper and others, Habermas offers us the chance to critique liberated knowledges in more than one area of human interest. By holding onto the validity claims of both truth and rightness, relating to the technical and practical interests respectively, the totalising power of a dominant discourse distorting one interest can be challenged by growth of knowledge relating to the other.

So, in contrasting the ideas of Habermas and Foucault, Flood demonstrates that each addresses the central themes identified by the other. Thus, in his 1990a writings, he can claim that....

"Interpretive Analytics [the label given to Foucault's perspective by Dreyfus and Rabinow (1982)] can release rationalities, thus helping to grow diversity. Habermas's critical theory accepts openness and conciliation and welcomes this diversity. Knowledge-constitutive interests then deals critically with the tensions between rationalities.

On the one hand, with Foucault, we acknowledge and attempt to deal with forces of isolationism through a liberating rationale; on the other hand, with Habermas, we work against those forces by seeking epistemological and methodological legitimacies and limitations in order to deal with the complexities that ultimately must have given rise to such diversity".

Although Foucault and Habermas obviously share much common ground (see Fay, 1975, and Smart, 1983, for earlier comparisons), Flood still faces the fundamental problem of reconciling their diametrically opposed views on the nature of power.

Habermas maintains that an analysis of power (defined as sovereign) is dependent on the ability to make a (critical, non-absolute) claim to know truth, whereas Foucault says that truth itself is dependent on (non-sovereign) power relations. Flood (1990a), however, believes that a reconciliation is achievable....

"via the notion that truth is dependent on power and that there is need to liberate discourse. We then employ Habermas's ideal by looking for the truth of judgement according to our interest, explicit ideology and critical analysis. In this process, however, we drop the idea that truth comes about from the force of the better argument. Ideology, for example, can never be said to be absolutely right, although many may find a particular position desirable".⁴

Here, then, we have the theory of liberate and critique which Flood uses to underpin Critical Systems Thinking.

6.6 Liberate, Critique, Empower and Transform

Now, it is fairly obvious that the influence of Foucault makes Flood's perspective incompatible with Oliga's expressly sovereign view of power (1990a). However, Flood (1990d) is so impressed with Oliga (1990b), when he argues that an adequate theory of ideology and social control is essential, that he decides to establish the groundwork for a further expansion of liberate and critique to include the words Empower and Transform:

"The aim of this project is to undertake a critical study of the concepts control, power and

ideology with the purpose, not only of uncovering their potentially dominative and oppressive nature, but also of gaining a penetrative understanding of the way they contain their own seeds of transcendence. This means that, on the one hand, there is an equal need to tease out those aspects that contradict their oppressive consequences. In the latter case, the aim is to use such penetrative revelation to raise the consciousness and spur the will to self-determination of those subjugated to domination, hence the project is called 'empower' and 'transform'....

[Critical Systems Thinking] can be summarised in terms of a process that leads to progressive change in social order. This process 'starts' with the need to tackle the difficulty of the suppression of knowledges, for without such an attack we begin our scholarly efforts enjoying only diminished intellectual possibilities. Liberating knowledges demands of us that we also undertake an adequate critique of these rationalities, so that their legitimacies and limitations are thoroughly explored. This builds a strong position from which empowerment of those oppressed can be promoted and hence transformative action can be pushed for. Complementarism [pluralism] thus extends to the methodological process 'liberate, critique, empower and transform'".

Here, then, we have the most comprehensive perspective worked out to date, although it is quite clear that there are many unresolved issues still hanging in the air.

6.7 A Summary of Emergent Themes

In introducing Critical Systems Thinking to the reader in the previous chapter, I stressed the importance of being aware of the diversity of ideas that have been brought under its extremely broad mantle. No two authors are entirely in agreement with one another; but then, given the stated need for both the liberation of knowledges and continual critical thought about the nature of critique itself, this can be interpreted as a positive, healthy attribute of the 'movement'.

I place the word "movement", above, in inverted commas because one might claim, quite justifiably perhaps, that there is no single, identifiable Critical Systems perspective.

Nevertheless, it has been claimed that there is some common ground on which the theorists whose works have been reviewed stand. This has been described by Jackson (1991b), drawing upon the writings of Oliga (1989a) and Schecter (1990, 1991), as a set of five commitments all Critical Systems thinkers make:

"[Critical Systems Thinking] seeks to demonstrate critical awareness; it shows social awareness; it is dedicated to human emancipation; it is committed to complementarity [pluralism] and informed development of all the different strands of systems thinking at the theoretical level; and to the complementary and informed use of systems methodologies".

At this point, however, it is important to hold onto the image of diversity I have tried to conjure. For example, although there is a general acceptance of the idea of pluralism, we can observe that the difference between the 'pluralism' of Ulrich (1988) and that of Jackson (1987b) is quite marked. Also, the emerging, explicitly post-modern work of Woolliston (e.g., 1991a,b,c) challenges the meaningfulness of talking in terms of commitments.

6.8 Conclusion

In this chapter and the last we have tapped into some of the rapidly accumulating and divergent literature on Critical Systems Thinking.

Later in the thesis, as my own perspective begins to

evolve, I will be exploring a few of these divergences and differences in more detail (only a few, because of the necessity of imposing boundaries on this thesis). I hope to tackle some of the others in future work.

Notes

1. Indeed we might trace the origins of the paradigm of communicative action back to Wittgenstein's posthumously published "Philosophical Investigations" (1958), in which many 'private' experiences of individual consciousness, such as pain, are shown to have their roots in socially shared meaning, thus inverting the Cartesian assumption that individual consciousness provides the ultimate reference point for knowledge about Being.

2. Unfortunately it is not within the remit of this thesis to critique Ulrich's work. However, I hope to pursue this line in my post-doctoral research (see Chapter 16 for details).

3. Modernism, post-modernism and anti-modernism (the latter is a category introduced by Habermas, 1984a,b) are by no means easy terms to define. If, however, I had to summarise the meaning of the term modernism into one sentence, I would say that it is an assumption underlying any area of theory, practice or aesthetics that human beings are progressing toward a better way of living. As such, the modernist assumption underlies the thinking, not only of those in the analytical camp (e.g., Albert, 1971; Popper, 1972; and Spinner, 1974) who champion the progressive-technological bias of positivistic science, but also the dialectical thinkers (e.g., Horkheimer, 1937; Adorno, 1957; Habermas, 1971, 1972, 1974, 1976a, 1984a,b) who seek progress through liberation from oppressive power relationships. Post-modernists (e.g., Foucault, 1970, 1972, 1973, 1976, 1977, 1980, 1984a,b; Derrida, 1973, 1976, 1978; Lyotard, 1984; Rorty, 1989) hold onto rational thought, although they acknowledge the irony of inevitably conflicting rational arguments based in contrasting vocabularies. Indeed, the post-modern reduction of debate to "language games" undermines the very notion of rationality (Rorty, 1989). Rationality is the central tool with which modernists pursue progress, but

in post-modernism the notion of 'progress' itself is abandoned in favour of a perpetual shifting of knowledges through which human beings live their lives. In even starker contrast, anti-modernists (e.g., Campbell, 1988; Panikkar, 1989; Ash, 1989; McBurney, 1990; Wilber, 1990) not only reject the idea that we are currently progressing toward a better state of being, but claim that over-concentration on critical rationality is a central cause of alienation. For them, real progress entails the development of a more aestheticised, mythologised or spiritual way of living in which we are prepared to contextualise much of our critical thinking within a wider spirituality so as to move toward the ideal of a deeply beautiful, socially and ecologically harmonious existence.

4. Flood (1990a) freely admits that his 'reconciliation' sets up new tensions, but in many personal communications with me he has consistently maintained that, when engaged in the creative process, we must be prepared to ride with such tensions in order to expand the possibilities of thought. Thus, the fact that a major integrative work (such as, in this case,

bringing together the ideas of Habermas and Foucault) might contain areas of unresolved conflict is only important in the longer term. Such conflicts indicate the need for continued change through critical reflection, rather than abandonment of a project that is seen to be vital. As Connerton (1976) so aptly notes, even the ways in which we understand the term 'critical reflection' itself (a central concern of both Habermas and Foucault) are open to critical reflection and change!

CHAPTER 7: THE 'PROBLEM' OF PLURALISM

As mentioned in Chapters 4 and 5, both Flood (1990b) and Jackson (1990, 1991b) have considered the possibility that Critical Systems Thinking might be pluralist in outlook. The contents of this chapter represent my first attempts to get to grips with this notion of pluralism.

Flood (1989a) has argued that Critical Systems Thinking is "meta-paradigmatic". We might ask what this could mean. In order to answer such a question, we first of all need to define our terms.

7.1 What is a Paradigm?

The main concept we need to clarify is that of "paradigm". Kuhn (1970) describes a paradigm as a view of something that contains certain assumptions that are incompatible with the assumptions of another view of the same thing. We therefore say that paradigms are incommensurable with one another.

Of course this is not to say that there can be no communication between people supporting different paradigmatic positions. There will generally be enough common ground to allow dialogue, and hence the emergence of new paradigms becomes possible as people struggle to deal with the differences they find between their own paradigms and others.

The idea that paradigm incommensurability is based on partial incompatibility only, and that dialogue does actually result in change, is very often passed over when people talk about Kuhn's view of paradigms (Bernstein, 1983). It is a very important point, however, because it means that paradigms only represent "moments" of commitment to theory in a wider process of discourse (even if, in some instances, a "moment" may last most of a human being's life-time).¹

7.2 The Idea of "Meta-Paradigm"

What, then, does Flood (1989a) mean when he says that Critical Systems Thinking is meta-paradigmatic? Does he

mean a paradigm encompassing views absorbed from other paradigms, or does he mean a perspective that lies above (outside) all paradigms and contextualises them?

It seems to me that he means a perspective that lies above all paradigms. This interpretation can be supported by two pieces of evidence:

First, Flood (1989a) argues that pluralism offers theoretical commensurability between paradigms. It is the pluralist meta-theory that provides this theoretical commensurability: "the pluralist view insists that we have methodologies and paradigms as they are, using the language unaltered". Furthermore, this view is repeated in Flood's updated work (1990a).

Second, Flood (1989a) suggests that Critical Systems marks a departure from Kuhn's "world view" approach (1970), and the associated idea of paradigm incommensurability. Paradigms become commensurable through the development of an adequate epistemological theory that becomes part of the pluralist meta-theory. Flood (1990a) follows Jackson (1985b) in identifying

Habermas's theory of knowledge-constitutive interests as providing just such an adequate epistemology.

This is a departure from Kuhn's "world view" approach because Kuhn would say that such a meta-theory, together with what it contextualises, must stand in opposition to the old paradigms. Flood insists that it actually makes them commensurate with one another.

Now, when I started this line of research I was horrified by this. I felt strongly that it would be impossible to have a fully formed theoretical perspective that sat outside paradigms. I believed that it would be important, right from the outset, to guard against this 'misinterpretation' of pluralism because it would mean that Critical Systems would be setting itself up as an absolute truth that everybody would simply accept.

This would mean it would be setting itself up to fail. As far as I am aware, no theory has yet been advanced that has united every single human being in agreement with it. My first task therefore had to be to argue against this notion of "meta-paradigm".

As the argument in this chapter unfolds, I will demonstrate that a meta-paradigmatic position is impossible to sustain because every pluralist meta-theory must contain assumptions that are unacceptable to isolationists. Yet isolationist theoretical perspectives remain tenable in their own terms. Tenability is granted by the use of a restricted vocabulary that provides internal, logical consistency. Thus pluralist perspectives must indeed be paradigmatic rather than meta-paradigmatic.

7.3 The Problem

The argument will be pursued through consideration of a central 'problem' that pluralism, as Flood (1989a) describes it, might be seen to present:

If pluralism was indeed meta-paradigmatic, and this was perceived to be the vital stuff of Critical Systems, it's validity would have to depend on there being a real, basic distinction between pluralism and the other

approaches. It must be said that there is some doubt about whether this distinction does actually exist.

7.4 Is Pluralism a Genuinely Distinct Approach?

The problem comes in trying to show that pluralism, as I have interpreted Flood's description of it, is sufficiently different from imperialism by subsumption. This is revealed in Flood's discussion (1989a) of the theories of Kuhn (1970).

7.4.1 The Subsumptive Nature of Pluralism

Kuhn's central thesis is that knowledge does not accrue in an additive or cumulative fashion. Faced with anomalies, people search for a new theory that explains both the anomalies and whatever the previously existing theory satisfactorily explained. The new theory does not offer the old view plus a little bit extra, it actually offers a different view of the world. In other words a new world view is created.

Flood gives an example of how this process has worked in systems science. He cites Checkland's claim (1981) that hard methods can be seen as part of the soft approach because they can be applied in special cases when there is no disagreement between participants on the nature of the problematic situation. In his 1985 writings Checkland demonstrated that he viewed the integration of hard thinking into the soft approach in a Kuhnian fashion.

However, Flood recognises that Checkland actually approaches the task of integration in an imperialist manner (by subsumption). This, he says, raises "questions that will have to be aired elsewhere".

By deferring consideration of this issue, Flood has left an important anomaly in pluralist theory unaddressed. If Checkland can be said to have operated imperialistically, perhaps pluralists are doing exactly the same in claiming theoretical commensurability between positivistic and interpretive ideas.

Maybe, in order to differentiate pluralism from

imperialism by subsumption, pluralists would have to claim that they do not need to alter the world views of the paradigms encompassed in order to provide commensurability. Indeed, this is what Flood (1989a, 1990a) suggests. It is the subjugation of the perspective of the subsumed paradigm that defines both imperialism by subsumption and Kuhn's theory of the advance of knowledge.

Only if pluralism does not require the modification of constituent perspectives would it be more than another perspective itself: only then would we be able to claim that it is meta-paradigmatic - of equal acceptability to all.

Now, as already mentioned, it is quite easy to demonstrate that the epistemological world views of the isolationist hard (positivistic) and soft (interpretive) paradigms contain assumptions that make them incompatible within a single meta-theory.

To give an example, let us take a scientist steeped in the positivistic tradition who believes that each new

theory represents a closer approximation to the 'truth' than its predecessor, and who does not subscribe to the view that the researcher cannot help but influence the researched (either through interpretation, direct action or indirect influence).

Such a person will be unable to accept the practice of interpretive methods (however context-linked) because these involve intervention in the situation under analysis. To a positivistic thinker, such methods will always be viewed as an obstacle to discovery of the 'truth' rather than part of it.

Similarly, an isolationist interpretive thinker will never be able to accept the notion of a single 'truth' that must be worked towards. This is because the interpretive paradigm assumes the real world to be unknowable, and hence perceptions of it become the stuff of analysis.

For either paradigm to accept the practice of the other, the assumptions of both would have to be harmonised. To achieve harmony, pluralists must require the adherents of the approaches subsumed to alter their

epistemological perspectives. For example, Jackson (1985b) asks readers to accept Habermas's (1972) theory of knowledge-constitutive interests. If they do so, and thereby embrace pluralism, they will have gone through an epistemological paradigm shift. Hence pluralism (and also Critical Systems Thinking) must be subsumptive, and cannot be seen as meta-paradigmatic.

Of course it might be argued that the power of the new paradigm will eradicate the old subsumed ones so that it will in effect become meta-paradigmatic. However, the acid test of the likelihood of this happening is whether people holding the older perspectives can object to pluralism in their own terms. If they can, then there should be no claim that the metatheory is meta-paradigmatic.

From both the isolationist positivistic and interpretive viewpoints there is a central anomaly in pluralism: it requires one to believe that there are different "moments" in inquiry where different ideals are pursued (this will be a central theme of the latter half of the thesis, so will not be expanded upon here).

Since neither paradigm could ever accept this, the only possible conclusion we can reach is that pluralism, rather than being meta-paradigmatic, must be an aspect of an entirely new paradigm.

We have seen that, while pluralists claim theoretical commensurability is possible, in practice this can only be attained at the expense of the epistemologies of the subsumed paradigms. Thus the practice of pluralism cannot help but turn out to be an advanced form of imperialism in the same way that imperialism has been shown by Flood (1989a) to be an advanced form of isolationism.

7.4.2 From Subsumption to Isolationism

This brings us to the difficulty Flood (1989a) expected readers to have with pluralism: that people could confuse it with theoretical isolationism. Going back to the definition of theoretical isolationism presented in Chapter 4, Flood (1989b) maintains that within this approach the uses of different methodological

techniques according to context are dominated by a single isolated world view.

It has already been demonstrated that this is also the case within pluralism, its claim to meta-paradigmatic status falling on the grounds that it can only be seen as a meta-theory from within a paradigm, and thus no basic differences can be identified between theoretical isolationism, imperialism by subsumption and pluralism.

7.5 Critical Systems Thinking as a Paradigm

The logical consequence of the above argument is that we should accept Critical Systems Thinking, not as meta-paradigmatic, but as a new paradigm differing from both the positivistic and interpretive viewpoints in its assertion that methods should be related to context and that research should be emancipatory. It is the explicit focus on ideology in determining methodology design and influencing outcome that appears to define Critical Systems Thinking.

7.6 Conclusion

Having established the paradigmatic nature of Critical Systems, we are now in a position to review its commitment to pluralism once again in the next chapter.

Notes

1. Wendy Gregory should get some credit here for bringing Bernstein's argument to my attention. We neglect the communicative nature of science at our peril.

CHAPTER 8: PLURALISM AND CRITICAL SYSTEMS REVISITED

When I first read Flood (1989a, 1990b), and conducted the critique presented in the previous chapter, I wrote it up for publication in the journal Cybernetics and Systems (Midgley, 1989b). In that paper I went a step further than the argument in Chapter 7 and suggested that, because we cannot say pluralism is meta-paradigmatic, we should abandon the term. The words I used were:

"Given that the pluralist ideal is not actually attainable, and therefore pluralism cannot be seen as distinctly separate from imperialism by subsumption and theoretical isolationism, it is prudent to abandon the classification. In rejecting pluralism, we must not try to rescue the rest of Jackson's terminology (1987a). It would be easy to redefine Critical Systems as isolationist or imperialist (subsumptive), but the terms isolationism and imperialism have negative connotations that have served to highlight the supposed benefits of pluralism. Redefining it in these negative terms would be self-defeating".

This is a position that has since been supported by others (e.g., Fuenmayor, 1989). However, during the time between submission and publication, I began to realise the usefulness of distinguishing between pluralism, imperialism by subsumption and isolationism - even if

we do acknowledge that all three are paradigmatic.

8.1 Denaturing and Reconstructing

Pluralism involves the use of a meta-theory which reconstructs some of the assumptions of the paradigms in order to maintain theoretical coherence, but still preserves and contextualises the most important elements of them within the new paradigm. Such a meta-theory also gives equal respect to the validity of different working methods by aligning them with categories of situational context (none of which are capable of being marginalised or described as "special cases").

An isolationist theoretical perspective, in contrast, denatures other paradigms. It does so by refusing to accept the possibility of contextualisation within a paradigm. Instead, a theory is used which is single-rather than multi-faceted. More than one working method may be used, but these are all seen to operate in the same basic way.

Alternatively, in the case of imperialism by subsumption (advanced isolationism), working methods may be drawn into a paradigm from others, but they are ascribed only marginal validity. It is still maintained that a single approach is applicable in most circumstances. The ascription of marginal validity is generally justified on the grounds that there are a few "special cases" in which the new method might be required.

An example of theoretical isolationism can be found in the work of Brewer and Hunter (1989). These authors explore possible complementarities between fieldwork, surveys, experimentation and non-reactive research (i.e., use of documentation and archival materials). We have to recognise, however, that each of these methods is orientated toward 'hard' data-gathering only. Methods that are orientated toward value clarification and change are excluded. Presumably these would not fit with the authors' over-arching, single-faceted "world view". Furthermore, there is no attempt to align these methods with situational contexts in the form of a meta-theory. For a more detailed analysis of Brewer and

Hunters' work see Midgley (1990b).

In a sense, explaining the precise difference between reconstruction and denaturing is the task of this whole thesis, but for now let us just say that, to avoid denaturing a perspective, not only the working method itself has to be preserved, but also key aspects of ontology and epistemology (i.e., those aspects that are not specifically isolationist in character). A vision of ontology that can achieve this pluralist reconstruction for the paradigm of Critical Systems Thinking will be discussed in Chapter 14.

8.2 Rethinking Critical Systems Thinking as a Paradigm

I wrote to Cybernetics and Systems when it came to editing the page proofs of that first paper (mentioned above) in order to ask them to remove the section on abandoning pluralism. Unfortunately they replied that they could not do so.

The onus, therefore, was on me to set the record

straight and look more closely at the Critical Systems claim to pluralism in order to set the views expressed in that paper against those of Flood (1989a, 1990b), and reconcile both into a new viewpoint. This chapter documents that task.

8.2.1 Summarising the Problem

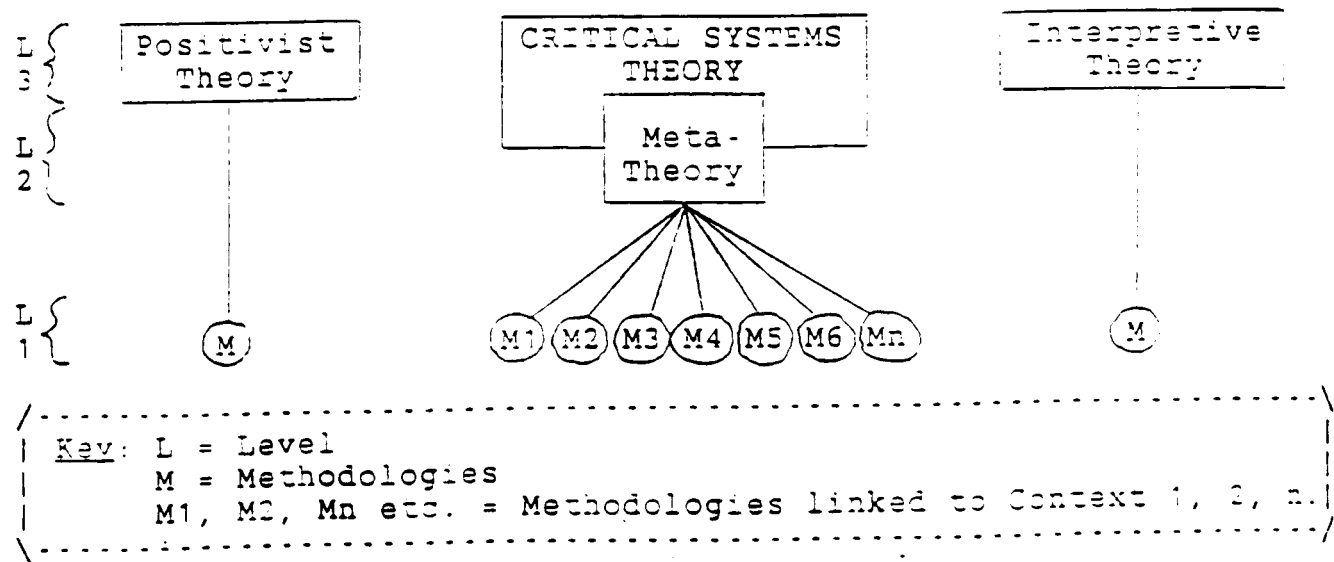
Flood (1989a) maintains that methods drawn from different backgrounds are incommensurate at the methodological level but commensurate at the level of theory.

In essence, what I was arguing in Chapter 7 was that this assumption of theoretical commensurability is problematic in the terms Flood sets. This is because pluralism cannot be seen as meta-paradigmatic: such a position is untenable because isolationists will always be able to object to pluralism in their own terms. We have to face the fact that any reconciliation of isolationist positions has to involve reconstruction at the theoretical level.

8.2.2 The Emergence of a Paradigm

In order to begin to address the above difficulty and find an adequate paradigmatic conception of pluralism for Critical Systems Thinking, we can set out the relationships between Critical Systems, the System of Systems Methodologies, its methodological options, and existing isolationist perspectives and methods. Such a set of relationships is presented diagrammatically in Figure 8.1.

Figure 8.1: The Relationship between Critical Systems Thinking, it's Metatheory, it's Methodological Options and Existing Isolationist Perspectives



Within the Critical Systems perspective we see that the various methods (level 1) can be drawn upon according to definitions of research context clarified by the meta-theory (level 2: the System of Systems Methodologies), which itself is part of Critical Systems Thinking (level 3).

Critical Systems Thinking stands in opposition to the isolationist theories of classical positivism and interpretivism (level 3). The meta-theory (the System of Systems Methodologies) is operated critically, and the various methods it encompasses have their ideal domains of legitimacy and their limitations defined by it.

If we focus now upon this meta-theory (level 2 in figure 8.1), we can see quite clearly that Flood (1989a) was right to claim theoretical commensurability and methodological incommensurability. Theoretical commensurability is provided by Critical Systems Thinking (level 3), and yet the various methods remain incommensurate because each can only be used to their best advantage in separate contexts.

However, if we focus upon the relationship Critical Systems Thinking has with the various isolationist perspectives (level 3), then we see that each justifies calling itself comprehensive. This is because each is based on a set of fundamentally different ontological and epistemological assumptions, and all are internally consistent.

It is clear that if, in drawing upon the System of Systems Methodologies within Critical Systems Thinking, we elect to use working methods derived from either the positivistic or interpretive camps, the underlying assumptions will not reflect the original isolationist thinking (although other aspects of ontology and epistemology will be preserved - see later in the thesis).

Techniques drawn from positivistic sources will be transformed in that their use will, in the ideal situation, reflect a perception of agreement on problematic areas between all those perceived as being involved or affected.

Techniques of interpersonal exploration drawn from interpretive sources will, in the ideal situation, likewise be transformed in that their use will reflect a perception of disagreement between people who are also perceived to have power relationships with each other that will not obstruct this exploration.

Here, then, we see the emergence of Critical Systems Thinking as a new paradigm which is pluralist in outlook. It's particular vision of pluralism is granted by a multi-faceted epistemological theory (Habermas's theory of knowledge-constitutive interests, 1972) and a meta-theory aligning methods with ideal-type contexts of application.

8.3 Conclusion

At this point we have a vision of Critical Systems Thinking, including its pluralist meta-theory the System of Systems Methodologies, which we should (at least provisionally) be able to describe as internally consistent. As such, this is a convenient point to start a new line of argument and enter into a

wider critical reflection upon the contexts of our
debate about pluralism.

SECTION 2

CONTEXTS OF THE DEBATE ABOUT PLURALISM

CHAPTER 9: UNITY AND PLURALISM

So far the analysis I have conducted has been confined to the exploration of Critical Systems Thinking as presented in the work of others, and the promotion of internal coherence with regard to the idea of pluralism.

In particular, Chapter 4 dealt with Jackson's (1987a) and Flood's (1989a) reasons for accepting pluralism: i.e., we need a research practice that is capable of promoting openness and conciliation between supporters of the different methodological paradigms.

However, in this chapter, I want to dig a little deeper. My intention is to propose that pluralism is an essential pre-requisite for an adequate pursuit of the ideal of the unity of science.

9.1 The Ideal of the Unity of Science

It generally seems to be 'taken as read' that all

scientists accept an ideal of the unity of science: a belief that, while disciplinary boundaries might be useful for some, we should, in principle, try not to let them stop us from exploring issues we feel are relevant to our particular interests. Thus the subject areas covered by the various disciplines are seen to be complementary and, to an extent, overlapping¹.

It is important to make it clear that, by talking about an ideal of the unity of science, I am not suggesting that scientists want everybody to share a single vision of the world, or even that we want unification of scientific institutions. Diversity is vitally important as a stimulant to debate and change, and the vast majority of people recognise this.

However, most people also realise that, by arbitrarily restricting oneself, it becomes possible to remain unaware of knowledges that might substantially affect ones approach to a research issue.

Implicit in this is an understanding that knowledges and interests are intimately linked, in that our interests direct the search for knowledge and yet these

interests arise out of the knowledges we already have.

Thus, if an area of study is limited so that only certain knowledges emerge (leaving other knowledges marginalised or isolated within a "separate" practice), the only questions that will arise are those based on the restricted knowledges. We therefore cannot help but see that our critical faculties are being limited.²

This is why pursuit of the ideal of unification is important. There is a need to oppose restrictive fragmentation and, at the same time, preserve a diversity of theories and practices.

However, despite recognition by most disciplinary scientists of complementarity between subject areas, systems scientists still maintain that traditional divisions of subject from subject tend to prevent the effective development of many important knowledges that do not sit comfortably within any one particular set of disciplinary boundaries.

Most systems scientists think of systems scientific

inquiry as being an approach in which study areas are not differentiated through reference to conventions of disciplinary boundaries, but develop and change through the on-going practice of defining and redefining systems.

The argument between the holistic (systems scientific) and complementarity (disciplinary scientific) positions is not actually over the basic ideal of the unity of science, but over its expression.

Systems scientists maintain that the acceptance of disciplinary boundaries may still promote unwitting restrictions of knowledges and interests, while disciplinary scientists recognise that it is impossible for any one individual to investigate every area. As a consequence, some guidance or directed learning is necessary to prevent the scientist becoming swamped or engaged in holistic, but superficial, analysis only.

There appears to be some validity in both these viewpoints. Direction and specialisation are obviously necessary, which is why, in practice, specialisations have evolved within systems science itself.

To give some examples, people tend to work on answering and raising questions in the fields of organizational management, ecology, cosmology, education, philosophy, etc. While the potential to move between these areas is always there, and some movement will take place, I cannot think of anyone who is equally proficient and active in all these fields simultaneously - which one would have to be if one were genuinely to claim to have stepped beyond specialisation.

Equally valid, however, is the view that problems have been encountered as a result of the acceptance of disciplinary boundaries.

Lovelock (1988) gives a good example when he cites the separation between biology and geology which for a long time obstructed the emergence of knowledge about the co-evolution of biological and geological forms as a total system. As a result both geological and biological theories of evolution have been impoverished. In this case our understanding has clearly been obstructed by disciplinary boundaries.

It appears that the balance between specialisation and pursuit of the ideal of the unity of science is different for disciplinary and systems scientists.

While both groups pursue both functions, disciplinary scientists favour specialisation in their balancing act, and are therefore prepared to take on board socially accepted boundaries that serve the function of focusing their inquiries. Systems scientists, on the other hand, favour pursuing the ideal of unity in trying to maintain this balance; they therefore resist the 'imposition' of disciplinary boundaries.

My purpose in writing the current chapter is to argue that the basic ideal of the unity of science, which we all accept whether we opt for the holistic approach or disciplinary complementarity, should be extended to embrace theoretical complementarity between methods of inquiry as well as subject areas.

Indeed, I hope to demonstrate that subject and method are so intimately connected that failure to embrace the fullest possible range of working methods (for use in

appropriate contexts) will actually militate against the common desire of disciplinary and systems scientists alike to pursue the ideal of developing unrestricted knowledges.

This is particularly important for systems scientists, however, because isolationism becomes more problematic the wider the research remit is.

9.2 Manifestations of Isolationism

My intention is to begin the analysis with a 'surface' examination of how methodological and theoretical isolationism manifests itself in various disciplines. This survey is not intended to be comprehensive: I have simply selected a few disciplines that have very different histories and which make use of different and contrasting working methods.

In doing this, it should become apparent that isolationism takes different forms, and indeed whether isolationism is even seen to be an issue worthy of

discussion crucially depends on how the discipline's subject area is defined.

I have chosen to look at the disciplinary sciences because their relatively separate development has made the links between subject specialisation, epistemology and methodology particularly obvious. After discussing a number of disciplines I will return to systems science in order to demonstrate that isolationism only becomes a major problem when pursuit of the ideal of the unity of science is prioritised over disciplinary specialisation.

In tackling an issue as broad as this, it would be easy to get tangled in a complex web of arguments. We could note, for instance, that some scientists hold to a realist position (in which there is said to be a real world which our knowledge reflects, albeit imperfectly), while others take an idealist line (in which it is assumed that knowledge constructs 'reality').

As different approaches to methodology assume either realism or idealism, whichever is adhered to will

affect how the isolationist decides which working methods s/he will proscribe.

Similarly we could focus upon the issue of reductionism, the belief that events can best be explained through analysis of relationships between the smallest identifiable parts of phenomena, versus holism, an understanding that the whole phenomenon is often different from the sum of its parts.

The relationships between these and other issues can all be seen to have affected the development of a variety of subtly differentiated isolationist positions. However, for the sake of clarity, I want to focus on just one central issue here. I intend to concentrate on how assumptions about the relationships between values, knowledges and methods of inquiry affect understandings of methodology.

I have chosen this path for two reasons. The first is that the reductionist/holist debate has been discussed by Critical Systems thinkers quite comprehensively elsewhere (see Flood, 1990a, for example), and I intend

to deal with the realist/idealist debate myself in Chapter 14.

The second is that it is through an exploration of views on the relationship between values and inquiry that we will best be able to see how the form of isolationism a particular scientist takes is so often intimately linked with his or her subject specialisation.

9.3 Terminology

In order to conduct this analysis in as simple and straight forward a manner as possible, I want to establish some basic terminology before we start.

Throughout the coming chapter I will be talking about value-neutral epistemologists and value-explicit epistemologists. If epistemology is the study of knowledge, then those who believe that knowledge must be regarded as independent from normative, ideological or subjective positions can be called value-neutral epistemologists.

This inevitably means that I will be treating positivists, neo-positivists, logical positivists and critical fallibilists as a group. However, I do not wish to diminish our awareness of the transition that has been made from classical positivism, in which it was seen to be possible to have absolute proof for a theory, to neo-positivism where only falsifiability was seen to be possible, to the more refined position of critical fallibilism proposed by Popper (1972).

Popper, while always insisting that objectivity is inter-subjective, still shares a central belief with positivists and neo-positivists that objective knowledge is neutral in terms of belief and ideology. In his own words (1972):

"Knowledge in this objective sense is totally independent of anybody's claim to know; also it is independent of anybody's belief, or disposition to assent; or to assert or to act. Knowledge in the objective sense is knowledge without a knowing subject".

Thus we can make a clear distinction between value-neutral epistemologists (those who take an 'analytical'

line) and value-explicit epistemologists (e.g., interpretivists and critical thinkers) who say that neutrality is impossible and that knowledge and the knower must always be viewed as walking hand in hand.

Having clarified the terminology to be used, let us move on to look at epistemological theory and research practice in our selected disciplines.

9.4 Isolationism in Biology

Starting with biology, we can observe that it has clearly been dominated by value-neutral epistemologists. Biologists have tended to concentrate on structure and function (seen to be objective), rather than meaning in social context (seen to be normative and/or subjective).

The value-neutral epistemologists, with their methodological emphasis on experiment and observation within the functionalist and structuralist paradigms³, have clearly served the majority of research biologists

well. To date, biologists have had so little use for other forms of inquiry (e.g., heuristic and emancipatory methods) that the question of isolationism has, as far as I am aware, never had to be considered.

In general, the debates from the philosophy of science that have been seen as most relevant to biologists are those that have revolved around the importance of metaphysics (ideas that cannot be directly validated by empirical means), and the related issue of the meaning of empirical support for a theory (see, for example, Northrop, 1967).

Although an understanding of metaphysics challenges the view that human beings have no input into theories other than through assembling empirical information into patterns, it does not affect the dominant perspective of epistemological value-neutrality.

Indeed, the appreciation of metaphysics in biology is so recent that its implications have not yet been fully felt in methodological discussions (in contrast to those occurring in physics, which will be dealt with later).

The possibility of using heuristic and emancipatory working methods that focus on inquiry into, and intervention in, the social applications of biological knowledges (these methods involve acceptance of the idea of value-linked knowledge) has not become an issue in mainstream biology at all as far as I am aware.

Of course values are of as much concern to biologists as to any other human being, but they tend to be removed from mainstream practice and marginalised into the realm of ethics, which is not considered a branch of science in the same sense as biology.

9.5 Isolationism in Physics

If we transfer our attention to the discipline of physics, we find that thinking about metaphysics has matured over a longer period of time, and this has had an impact on methodological practice, albeit only a limited one.

Questions about non-empirical human input began to emerge in modern physics along with Einstein's theory of relativity. Einstein (1934) said that:

"The belief in an external world independent of the perceiving subject is the basis of all natural science. Since, however, sense perception only gives information of this external world or of 'physical reality' indirectly, we can only grasp the latter by speculative means. It follows from this that our notions of physical reality can never be final. We must always be ready to change these notions - that is to say, the axiomatic substructure of physics - in order to do justice to perceived facts in the most logically perfect way".

For Einstein, then, our inability to know the world 'as it really is' (a split between the worlds of perception and physical reality that can be seen to have roots in the idealist philosophy of Kant, 1787) meant that human, non-empirical "speculation" had to be an integral part of physics.

These ideas took even more concrete form through the development of quantum theory, which challenged the conventional separation of the observer from the observed by noting that the former cannot help but influence the latter.

Thus Einstein's assumption (1934) that "the belief in an external world independent of the perceiving subject is the basis of all natural science" was challenged, and the worlds of physical and metaphysical reality were seen, not only to meet, but to be inseparable (see, for example, Prigogine, 1989).

Quantum theory consolidated the inevitable role of metaphysics in that it involved theorising about the existence of sub-atomic particles that are simply not directly observable. Thus we have witnessed the acknowledgement of a complementarity between physics and philosophy which has been expressed most forcefully in the seminal works of Bohr (1963), Bohm (1980) and Capra (1983).

Philosophical inquiry is of course very different, methodologically speaking, from that traditionally practised by physicists. An understanding that physics and philosophy can be complementary has led to the conduct of non-empirical analyses into issues that bear heavily on the subject matter of physics but are seen

as metaphysical. An example, in the work of Bohm (1980), is the ontological relationship consciousness and memory have to the physical world. Previously, empirical experimentation was considered to be the only valid form of inquiry in physics.

We see that over half a century of exploring metaphysics has led to a move away from traditional isolationism. However, as noted before in the discussion of biology, although an understanding of metaphysics challenges the view that human beings have no input into theories other than through assembling empirical information into patterns, it does not affect the dominant perspective of epistemological value-neutrality.

Therefore the possibility of using heuristic and emancipatory working methods that recognise the value-laden contexts of knowledge, and focus on inquiry into, and intervention in, the social applications of physical knowledges, has not, as far as I am aware, become an issue in mainstream physics.

9.6 Isolationism in Sociology

The discipline of sociology is very different however. When it comes to the study of social phenomena, knowledge is often seen to have normative, ideological and/or subjective contexts.

For example, while some explorations of unemployment can be conducted as if they were purely information-gathering exercises (e.g., finding out who is registered as unemployed, how long they remain registered, etc.), this information is often only seen as meaningful in relation to questions about the nature of work, the social distribution of wealth, the choice of indices of unemployment, etc. All of these questions involve overtly normative, often ideological, sometimes subjective understandings and choices.

Because of this, the debate about methodology and associated philosophy has been conducted at a very sophisticated level in sociology, with many theoretical and methodological variations emerging.

Burrell and Morgan (1979) offer an interesting

framework within which all these approaches can be viewed in relation to each other. They identify four broad themes: functionalism (characterised as objective and regulative), interpretivism (seen as subjective and regulative), radical structuralism (viewed as objective but concerned with radical change) and radical humanism (seen as subjective and concerned with radical change).

Perhaps because the meanings of sociological knowledges are more likely to be viewed as having an explicitly normative or subjective component than biological ones, the non-neutral epistemological positions have assumed as much mainstream credibility as those with roots in value-neutral epistemology.

On first sight, then, there would seem to be no isolationism in sociology. However, a closer look reveals that, just because credibility is granted to the various approaches, this does not mean that pluralism is embraced.

For some there is simply a 'pragmatic' (i.e., atheoretical) acceptance that people work from

different perspectives, and that they can all produce equally convincing arguments for epistemological validity. These people do not cross traditional paradigmatic boundaries, but simply 'live and let live'.

For others there are both theoretical and ideological reasons for resisting pluralism. Let us look at the argument put forward by Jackson and Carter (1990a,b), who follow Foucault (1971) and Cooper and Burrell (1988) in emphasising that the development of knowledge cannot be separated from the development of power structures as evolved through both personal relationships and institutions.

Jackson and Carter fix upon an early conception of pluralism advanced by Reed (1985) in which it is suggested that we should reunify science. This, Jackson and Carter argue, would be a dangerous move because, as things currently stand, scientists who defy epistemological convention can still practice in their own (largely independent) research communities. In this way they can generate alternative viewpoints. If science were reunified, they claim, there would be no

independent institutions to resist domination by a single viewpoint.

For Jackson and Carter, pluralism merely masks repression under a veneer of democracy. A summary of my thoughts about this view can be found in the notes at the end of this chapter. These largely concentrate on the observation that Jackson and Carter identify a relatively immature conception of pluralism to attack, and that a more advanced understanding takes account of their argument⁴.

Suffice it to say that, for one reason or another, most sociologists have not embraced pluralism. It is perhaps appropriate to observe that the various approaches outlined by Burrell and Morgan (1979) are generally thought of as incommensurable paradigms, none of which embrace a multi-faceted epistemology that could allow a contextualisation of different working methods. Thus isolationism does still exist in the practice of most individual sociologists.

While there is an anti-isolationist strand of opinion

in sociology (e.g., in the work of Brusaglioni, 1982, and De Masi, 1987), this is largely a pragmatic movement in which the necessity of developing an adequate vision of ontology and/or epistemology to underpin pluralism has, as far as I am aware, not been addressed in any great detail. Until it is, their work will inevitably appear theoretically contradictory.

9.7 Isolationism in Psychology

The discipline of psychology offers a contrasting picture to biology, physics and sociology, as it embraces diverse areas of inquiry ranging from neuro-chemistry to the understanding of problem solving, from psycho-social development to the promotion of organizational change! Anybody who is not aware of the history of psychology might be forgiven for expecting there to be a correspondingly large variety of methodological approaches within the mainstream.

However, this is not the case. When mainstream psychology moved away from introspection and toward the experimental method, researchers were struggling to

have the discipline recognised as a science. Given the dominance of physics, chemistry and biology, which were promising to deliver great advances in technology and living standards, it is hardly surprising that the concepts of validity and empirical, value-neutral science were closely associated.

Of course those areas most amenable to the traditional experimental method were precisely those which were not obviously dependent on ideological, normative or subjective contexts for their meanings. Thus, for most of the 20th Century, value-neutral epistemologists have dominated psychology, and areas of inquiry which were seen as interventionary or ideological were ruled as scientifically invalid.

Major theories and practices, such as psychoanalysis, were marginalised. Despite the fact that important thinkers like Freud, Jung and Klein have had a considerable influence on the way many people understand individual and group dynamics, they have had little credibility in much mainstream psychology.

Even when methods based on self-report questionnaires have been developed, the authors have rarely recognised that they are actually creating tools to help us build pictures of the internal worlds of individuals.

It is usually said that questionnaire scores are objective measures of some personal characteristic (introversion, extroversion, neurosis, etc.). If we think about it, however, they are perhaps more appropriately seen as quantifications of aspects of the subjective, internal worlds of individuals which can be used to make a well-founded claim about a characteristic thought of as objective. By seeing the method as through-and-through objective, the subjective element is denied and therefore placed beyond possible critical appraisal.

It is no wonder, then, that the research mentioned in Chapter 3, which showed that no supposedly objective measure can distinguish between a rating of high self-esteem and a rating of the wish to be seen to have high self-esteem (Kenny, 1956; Cowan and Tongas, 1959; Cowan et al, 1960) was 'buried' in the literature, unrefuted but largely unread. To have tackled the issue raised

by these authors would have seriously threatened the dominant thinking about how knowledge should always be seen as remaining independent of the knowing subject.

Recently, however, occupational psychologists in particular have become increasingly interested in issues of organizational change, not just as 'observers' but as agents of that change. They have therefore had problems with experimental working methods that do not explicitly recognise the subjective, normative and ideological meanings of intervention by the researcher.

However, marginalisation of these modern concerns is not so easy. Occupational psychologists are addressing problems faced in industry that have a real impact on production, the environment and quality of life, so they now have some powerful allies with access to financial resources. For the first time calls to move away from a value-neutral epistemology (see Hollway, 1989, for a strong recent example) are receiving serious attention in mainstream psychology.

Even if authors do not always explicitly link the epistemological/methodological issue to the industrial and environmental contexts within which much of their research takes place, it is a plausible possibility that the seriousness with which the issue is now being taken is connected with the demands of these powerful research partners (it is difficult to call industrial organisations "subjects"!).

It may be that value-neutral epistemologists, who still constitute the majority in psychology, will head off the interpretive/humanist challenge, but it is also a possibility that psychology is heading for a similar epistemological/methodological debate to that which has already been conducted in sociology, and which has recently dominated thinking about methodology in systems science (the focus of attention in the next section).

That this possibility is real is evidenced by the fact that the anti-isolationist, sociological works of Bruscaaglioni (1982) and De Masi (1987) have begun to influence some occupational psychologists, most notably Francescato (1989, 1991, 1992).

As mentioned in the discussion of sociology, this movement has not yet explored the full ramifications of pluralism, but the very fact that the issue of isolationism has surfaced amongst psychologists at all suggests that value-explicit working methods are already becoming established alongside those traditionally seen as value-neutral.

9.8 Isolationism in Systems Science

As both Jackson (1982) and Flood (1989a) have pointed out, in systems science the main philosophical and methodological debate that has dominated the last decade has been this conflict between authors sticking to value-neutral epistemological positions (in systems terms these can be seen to underpin the hard methodologies), and those taking an interpretive, non-neutral (soft) line⁵.

In addition there has been a recent growing interest in the development of an explicitly emancipatory

(humanist, non-neutral) approach, typified by Ulrich's development of critical systems heuristics (1983).

As in psychology, those of a neutral epistemological persuasion are still in the ascendancy. However, unlike psychologists as yet, many systems scientists have found themselves deeply entrenched in one or other side of the philosophical debate between hard and soft thinkers. In other words endemic isolationism has become deeply problematic in systems science.

Flood (1989a) claims, in my view rightly, that the tendency for most people to characterise their own position as the only valid one has caused a degree of stagnation and disillusion in systems thinking which it is essential to overcome if researchers are to continue to aim for a flexible and responsive research practice that still acknowledges the value of theory.

While sociologists, for example, have also had to enter this debate in a serious way, room has been made in the mainstream for all the principle positions, with proponents of each agreeing to disagree. However, within systems thinking, the degree to which the debate

has become bogged down in a particularly defensive form of isolationism has become extremely worrying to some (e.g., Flood, 1989a, as well as myself).

Unfortunately there is so little connection between both the theories and practices of the hard and soft thinkers that they can almost be seen as working in separate disciplines.

Perhaps, then, this is the nub of the problem: in systems science the ideal of the unity of science is expressed holistically - systems scientists tend to maintain that the disciplinary boundaries that divide the traditional sciences from one another prevent the effective development of knowledges, many of which do not sit comfortably within any single discipline. As a result of accepting such a broad vision of inquiry, the need to seek objective knowledge inevitably rubs against the need to deal with knowledges which are seen as normative or subjective.

Not one of the traditional paradigms in systems science can deal with this friction without coming up against

anomalies (Flood, 1990a).

9.9 Isolationism and Subject Matter

So, as suggested at the beginning of the chapter, a theme of this overview begins to emerge. We cannot help but observe that the form isolationism takes in each discipline is related to its subject matter.

When disciplines restrict the scope of their inquiries to the search for what are seen as objective knowledges of the physical world, experimental methods that assume value-neutrality are considered the only legitimate forms of scientific practice.

The prime example of this is biology. A second example is psychology, in which psychologists have been able to defend the value-neutral epistemological position against challenges until fairly recently when the disciplinary boundaries began to change to include inquiries that have a quite obvious social context.

In other disciplines, such as sociology, where

knowledges are regularly seen as normative, ideological or subjective, interpretive and emancipatory methods that assume epistemological non-neutrality begin to emerge to sit alongside the traditional value-neutral ones.

In these cases, because the approaches are regarded as constituting separate paradigms which can all claim validity but are viewed as incommensurable, scientists still engage in isolationist practice. There has only been a limited movement towards pluralism.

However, when the inevitability of metaphysics becomes an important issue, as in the case of physics, isolationism does, to a limited extent, become problematic, and a complementarity between empirical and non-empirical working methods is sought. However, value-neutral isolationism (the proscribing of value-explicit methods) is not challenged in these circumstances.

Now we can make a very broad observation. It seems that, when the subject of investigation is what we see

as the natural world, epistemological value-neutrality is largely taken for granted, but when the subject matter is seen to derive its meaning from social context, then both value-neutral and value-explicit epistemologies (and associated methods) are seen to have validity⁶.

9.10 The Trouble with Isolationism

At this point the central argument of the chapter begins to take shape. Given the intimate link between subject areas and working methods, if we wish to hold to the ideal of the unity of science in which, for the traditional scientist, disciplinary specialisations are regarded as complementary, we must accept the use of a full range of working methods.

Similarly, if we wish to follow the holistic road to the unity of science, we cannot do this by marginalising or invalidating areas of study by adherence to a limited methodology. A whole range of potential knowledges simply become unavailable for development if we limit ourselves in such a way.

To give an example, we can consider the case of a hypothetical biologist who wishes to venture into the subject area of sociology, but believes that only methods assuming value-neutrality can be considered as valid.

In these circumstances the sociological knowledges s/he can obtain will necessarily be restricted to those that can be gained through experimental, 'non-interventionary' work alone. This represents a restriction of both knowledges and interests that, in my view, has to be seen as unacceptable to scientists in the light of our wish to pursue the ideal of the unity of science⁷.

Of course a sociologist who isolates him or herself within the functionalist paradigm could argue, quite legitimately, that his or her practice is not at odds with that of our hypothetical biologist, and that the other sociological paradigms should simply be disregarded. We must recognise that, in the terms set by isolationist functionalists, this is a valid

counter-argument.

However, I do not see my task as the invalidation of isolationism. As I argued in Chapters 7 and 8, isolationists of any persuasion can object to pluralism in their own terms. Rather, I want to press home the point that all isolationist positions are impoverished, or lack legitimacy, given our current need for a flexible and responsive research practice. What this "current need" is will be fleshed out in coming chapters.

There is a difference between saying that something is impoverished, or lacks legitimacy, and saying that it is untenable. My view is that isolationist practices can be maintained without internal contradiction, but that they are all severely limited given our present needs.

9.11 Reflection on the Disciplinary and Systems Views

We have already seen how method and subject area are intimately linked, yet isolationism has only rarely

been considered problematic in the disciplinary sciences. Even when it has, central questions such as how we might develop an adequate vision of ontology and/or epistemology to underpin pluralism have not been addressed [except, in a very limited sense, by Bohr (1963) in the discipline of physics].

From this we have to reach the unfortunate conclusion that most disciplinary scientists are unaware of, or put aside any concern they might have about, the ways that mutually supportive method- and subject-isolationism restrict their knowledges and interests.

On the other hand, isolationism has been considered extremely problematic in systems science, which refuses to recognise disciplinary boundaries defined by subject matter. In systems science, knowledges of the physical world, seen as value-neutral, often rub against those with an obvious social context, seen as value-laden.

For many systems scientists isolationism has become deeply divisive, with people becoming entrenched in one of the hard/soft/emancipatory positions and ending up

sniping at each other. This destructive effect raises some quite disturbing questions:

Is this divisive isolationism in systems science an inevitable consequence of trying to take on too broad a range of interests?

Is pursuit of the ideal of the unity of science, however laudable in theory, necessarily doomed to be counter-productive in systems science because it is not possible to develop a set of ontological and/or epistemological ideas that are capable of dealing with all the anomalies that arise when different kinds of inquiry rub against each other?

The answer to these questions is only "yes" if we refuse to accept the possibility of pluralism. Pluralism actually legitimises both systems science and pursuit of the ideal of the unity of science (through either the holistic or complementarity routes).

The only qualification I feel we must make at this stage is that, in my view (which will be explained later), the ontological and epistemological back-bone

of pluralism (a philosophy that is capable of dealing with all the anomalies that arise when different kinds of inquiry rub against each other) is not yet sufficiently well developed.

It is the purpose of the latter half of this thesis to begin to address what I see as this need for ontological and epistemological development.

9.12 Conclusion

Now we begin to see why both this chapter, and the whole thesis, has been titled Unity and Pluralism. One of my central contentions is that unity, in terms of the ideal of the unity of science, and pluralism, in terms of recognising the legitimacies and limitations of all working methods, have to be appreciated as interdependent.

Not only this, but the pursuit of both is dependent on the establishment of a credible ontology and/or epistemology that is capable of dealing with all the

anomalies that arise when different kinds of inquiry rub against each other.

We say we are committed to pursuit of the ideal of the unity of science, but this could only be a vague generalisation with little practical meaning if it did not take into account the legitimate uses of a wide range of methodologies (pluralism).

However, pluralism would mean nothing more than accepting that different isolationist positions exist in parallel if we could not build a theoretically coherent, unified but multi-faceted, vision of ontology and/or epistemology.

In this chapter we have begun to answer the question, "why pluralism?" in terms of pursuing the ideal of a unified science. In the next chapter I intend to ask why we should be interested in either. This will inevitably mean expanding upon my claim that isolationism prevents us pursuing the ideal of unrestricted knowledges and interests.

Notes

1. The only authors I have come across who have argued against pursuing the ideal of the unity of science are Jackson and Carter (1990a,b). However, they make the assumption that such a vision of unity is necessarily positivistic in character (i.e., the sole task of science is to pursue a single Grand Truth). I hope that this chapter makes it clear that I believe such a positivistic 'unification' of science to be a contradiction in terms.

2. It would be a mistake to assume that this argument relies upon being able to know in absolute terms when knowledges and interests are being restricted. In order to have such absolute knowledge we would have to "know everything and know that it is valid" (Flood, 1990a) in advance of thinking about the restrictions. If we did indeed "know everything", then there would be no restrictions in the first place!

3. Following Flood (1990a), I believe it is important to be aware that the move from an explicitly

reductionist to a more holistic science does not reflect a shift away from the paradigms of functionalism and structuralism in the thinking of most scientists. While most people now recognise that some phenomena can only be understood as emergent properties of whole systems, it is still the structure and function of these systems that is considered to be important. That this is the case within biology is highlighted by Sheldrake's observation (1985) that the research practices of reductionist and holistic biologists is, for all intents and purposes, identical.

4. This is a powerful argument but, as I have suggested, it is one that sets up an early, rather limited conception of pluralism as a straw doll to knock down. You will notice that in this thesis I talk about pursuing the ideal of a unification of science, rather than full unification in terms of institutions. I would argue that, while pluralism demands an open and conciliatory attitude to other people, it also demands personal commitment to critically developed beliefs. Respect for others, the generation of diversity, and commitment to critically appraised beliefs do not necessarily work in opposition to each other within a

wider systemic picture of a pluralist research process.

5. Although Checkland (1981) and other interpretive systems thinkers talk about the researcher remaining neutral when facilitating debate, they are not using the term "neutral" in the same sense as I am here. Soft systems thinkers take a non-neutral line in the sense that they see knowledge as being the 'property' of groups and individuals. It is not, to use Popper's words (1972), "knowledge without a knowing subject".

6. In talking about explorations of the natural world and explorations of knowledges that are seen to have obvious social contexts, I am explicitly trying avoid the classic distinction between the natural and social sciences because it appears to me that this division is an artificial one that is epistemologically impoverished. For example, it is quite possible to study social relationships as 'natural' phenomena, and conversely, because we can only discuss 'natural' phenomena as human beings perceive them, these can also be seen as 'social constructs'. That this is problematic for all the traditional epistemological

positions becomes apparent when we examine a discipline like sociology where both phenomena seen to be objectively factual and phenomena with an obvious social context are studied. In order to maintain theoretical coherence, sociologists working from these traditional perspectives have to content themselves with separation from others in isolationist paradigms.

7. Of course this argument against isolationism already presupposes that it is possible to achieve an adequate ontology and/or epistemology to support pluralism. If this were not possible, far from restricting knowledges and interests, isolationism (of one kind or another) would have to be seen as essential in order to avoid the acceptance of knowledges that cannot be validated by whatever criterion is considered appropriate.

CHAPTER 10: ONTOLOGICAL COMPLEXITY

Having established the need for pluralism in terms of pursuing the ideal of the unity of science, which is generally seen as a cornerstone of both the disciplinary and systems sciences, it might be useful to take a further step back and ask, not only "why pluralism?", but also "why the ideal of the unity of science?".

10.1 Interdependence

In the coming chapter I want to argue that there has been a recent revolution in our thinking about the nature of the global problems that we are facing. It is revolutionary, not so much because new problems are emerging, but because concepts that have previously been seen as separate have now come to be viewed as essentially dependent upon one another.

Take, for example, the concepts of ecological harmony, social justice and individual freedom. Traditionally, ecological harmony has been seen in terms of balanced

ecosystems. Social justice has usually been seen in terms of social power and money relationships, encompassing issues like the distribution of wealth between various social groups and individuals, the explicit reward and prohibition of peoples' ideas and actions, and inclusion and exclusion from social activities. Individual freedom, on the other hand, has normally been thought of as maximisation of choice. These concepts are now coming to be seen as interdependent rather than as conflicting ideals which have to be played off one against the other.

It is clear that a world of interdependent problems cannot be dealt with effectively by a fragmentary science. Over the coming pages I want to demonstrate this interdependence by taking these three concepts (ecological harmony, social justice and personal freedom) and showing how they come together in the new analysis.

10.2 Linking Social Justice and Ecological Harmony

Let us look first at what is now widely seen as an ecological crisis that we have brought upon the planet. A plethora of ecological problems seem to be facing us: the "greenhouse effect", atmospheric ozone depletion, "acid rain", industrial pollution affecting the food chain, the increasingly rapid consumption of non-renewable resources, etc.

We can say that those who participate in mainstream production and consumption within the industrialised areas of the world, and those whose production systems have been conditioned by the demands of people in these areas, have been treating natural resources as if they were infinite, and as if their consumption has no other effect than improving human life-styles.

All our traditional models of economic growth have been based on what we are now seeing as an essentially erroneous set of assumptions. We are beginning to appreciate that many of the resources that we have taken for granted are not going to run out in some future mythical age when technology will have advanced

so far that people will have evolved alternatives, but that the development of much modern technology is itself part of the ecological problem.

Broadly speaking, in industrial economies, technological innovation tends to increase the energy-intensiveness of an enterprise and reduces its labour-intensiveness. People are supposedly freed for new activities but, because of pressure for further innovation and economic growth, this 'spare time' is eaten up by new work initiatives which perpetuate the cycle of increasing consumption.

Furthermore, the traditional view of economic growth has proven to be very short-sighted. While industry grows in the present through consumption of non-renewable resources, this not only prevents future industry from using those resources, but polluting industrial by-products can often cause unpredictable environmental and economic harm. For a far-sighted review of these issues, see McBurney (1990).

To turn to the theme of social justice, we can identify

a number of issues which have a close relationship with these ecological problems and our potential capacity to solve them.

For example, many Third World countries are still pursuing the goal of traditional economic growth in order to improve the living standards of their people. Several writers (e.g., Vittachi, 1990 and Shiva, 1990) have pointed out the hypocrisy of First World commentators who refuse to look at the issue of justice and simply say that Third World countries must limit their growth for fear of worsening the ecological crisis.

These First World commentators seek to deny material wealth to others while retaining their own, and the ecological argument is used to perpetuate injustice. Shiva (1990) is almost certainly right when she points out that Third World countries like India and China will simply not accept any restriction on non-sustainable growth while this hypocrisy continues.

Both Shiva and Vittachi argue that it is the responsibility of the industrialised world, which is

still by far the greatest polluter and consumer of non-renewable resources, to redistribute wealth and adjust to ecologically harmonious life-styles first. Only then will countries that have continually suffered economic injustice be willing to develop in a sustainable manner.

Clearly, on a global scale, justice and ecology are intimately linked. The rich and powerful can no longer turn to the poor and powerless and say, like a parent to a child, "don't worry, you'll grow out of it". Nor can the First World say "we can't afford to let you grow".

The Third World is only being treated like a dependent child because of the economic power of the First, and people in the Third World will not suffer such injustice for long. In this new era, only by addressing injustice can both First and Third Worlds stay healthy.

This example shows how the achievement of ecological harmony may well depend upon dealing with injustice, but the link operates both ways. The very relevance of

the concept of justice may depend, in many instances, on appreciating the need for ecological harmony.

After all, if justice within the sphere of industrial relations is only seen in terms of the power and money relationships between employees and their employers, then this completely ignores the long-term potential for some industries to obliterate the power structures and material wealth of both groups (perhaps, in some industries, along with the people themselves!).

10.3 Linking in Personal Freedom

Also intimately linked with these themes is the concept of personal freedom. Freedom, that is, from the repression and mis-direction of emotion and the acceptance of ideologies that prevent critical thinking. In short, freedom from restrictions of creativity.

This is, of course, an expanded definition of personal freedom that goes beyond thinking about the simple maximisation of choice to encompass the necessary

conditions for choice (freedom from ignorance and emotional repression).

Clearly, the very life and livelihood of the individual is dependent on him or her successfully living within a sustainable ecology and a just society. However, we also find that personal freedom, as defined above, is a prerequisite for the achievement of ecological harmony and social justice.

Over the coming pages, it might be useful to draw loosely upon the philosophy of Foucault (e.g., 1980) and the psychoanalytic tradition of Freud (e.g., 1915) in order to understand this better.

The knowledge that is held and valued by groups and individuals must play a key part in supporting unjust and ecologically unsustainable social systems. Let us consider just three discourses which are dominant today and help support our unsustainable course into the future:

There is the mainstream discourse of automation, which

assumes the replacement of labour with increased energy consumption to be beneficial; there is "economic growth", which assumes near infinite resources; and then there is international debt, which assumes that repayment to financial institutions of all loans is an inviolable right, thus ensuring that the net international redistribution of wealth runs, on average, from the poor to the rich. These are just three of many discourses which allow destructive aspects of the social system to perpetuate themselves.

When knowledges that inform counter-discourses and encourage liberation are suppressed, what is the position of the individual? The individual must inevitably contribute her or his energies to the continuing perpetuation of the system. There must be alternative knowledges and discourses available before problems can be recognised and change effectively enacted.

This is a similar argument to that proposed by Foucault (1980), whose central thesis is that knowledge and power are intimately linked, and that discourses can be marginalised and suppressed by "non-discursive

subjugators" (see my review of Foucault's theory of power and knowledge in Chapter 6). Because of this marginalisation of discourses, Foucault sees the liberation of suppressed knowledges as the primary tool for change.

However, while the word "discourse" implies shared knowledge assumptions and rules for communication, there is a sense in which knowledge can be said to belong to individuals. We all have a strong, conscious sense of "my knowledge" and "his or her knowledge" which, maybe because it is centred in the individual (either the self or another), is differentiated from knowledge that is thought of as generally shared. Kelly (1970) puts this in strong terms:

"Persons differ from each other in their constructions of events. Having assumed that construction is a personal affair, it seems unlikely that any two persons would ever happen to concoct identical systems. I would go further... and suggest that even particular constructions are never identical events. And I would extend it the other way too, and say that I doubt that two persons ever put their construction systems together in terms of the same logical relationships".

While I would follow Holland (1970) in arguing that it is important not to over-emphasise individual knowledge to the detriment of understanding shared knowledges, it is worth pointing out the value of an awareness of the individual.

Not only does each individual have a unique position as a nexus for the meeting and critique of different discourses, but we also each have a unique relationship with the natural world. While this is informed, and our knowledge of it is defined, by socially learned meanings, it nevertheless shapes the individual perception of shared knowledge.

Thus an individual's creativity, born out of his or her unique position in the natural world, can, through communication, eventually transform the shared meanings themselves, and thereby initiate action to change the social system.

So, when Foucault talks about fighting against the subjugation of knowledges, he has identified an essential prerequisite for the achievement of both social justice and ecological harmony. The personal

freedom to be creative, and individual freedom to pick up new (or old and buried) knowledges, are both essential for the initiation of change.

Within the individual, understandings that stymie creativity and the search for knowledge (such as adherence to a view of science that proscribes all but one or two methods of inquiry) represent a lack of personal freedom (often imposed internally, but having roots in the wider system) that must be recognised and dealt with.

But this is by no means the end of the story. We can turn to Freud (e.g., 1915) for another perspective on individual freedom. As well as challenging the subjugation of knowledges, perhaps there is also a need for freedom from the repression, mis-representation and mis-direction of emotions. Freud describes the mis-direction of affect (emotion) as follows:

"It may happen that an affective or emotional impulse is perceived but misconstrued. Owing to the repression of its proper representative it has been forced to become connected with another idea, and is now regarded by consciousness as the manifestation of that idea".

Freud also identifies three other possibilities for the existence and awareness of affect:

"Either the affect remains, wholly or in part, as it is; or it is transformed into a qualitatively different quota of affect, above all into anxiety; or it is suppressed, i.e. it is prevented from developing at all... We know, too, that to suppress the development of affect is the true aim of repression and that its work is incomplete if this aim is not achieved".

By "repression", Freud means the unconscious self-subjugation of ideas and feelings that, because of previous life experiences, are felt as threatening. Just as discourses that restrict creativity and exploration can become installed in the individual, so can destructive patterns of emotion.

Emotion has been seriously neglected by many thinkers. Habermas (1972), for example, makes a persuasive argument for the inextricable binding together of the concepts of knowledge and human interests (as touched upon in Chapter 5). This involves an understanding that our basic human interests direct the search for knowledges, and yet the relationships we maintain

between these interests are based upon the knowledges we already have.

However, emotions help us to prioritise our interests, not only in the long-term when passionate feelings sustain our stamina for lengthy, drawn out campaigns, but in the short-term when there is no time for rational self-reflection and an instant reaction is called for.

Emotion must surely be seen as having an essential two-way relationship with knowledges and human interests. Feelings help to prioritise our interests, and knowledges, both conscious and unconscious, inform our ways of feeling.

We see that a prerequisite for the promotion of personal freedom is movement towards ecological harmony and social justice, both of which, if ignored limit life and freedom.

Similarly, the promotion of personal freedom is a prerequisite for the creation of new social ways of

(generally seen to be the province of biologists) be related to social justice (normally the province of sociologists) in any informed and satisfactory manner?

10.5 Systems Science and Complexity

Now, it has been suggested that the very purpose of systems science is to deal with complexity (see, for example, Flood and Carson, 1988). One could also argue that a set of disciplinary sciences embracing the ideal of unification through complementarity have a similar purpose.

However, I would like to suggest that the interdependence of concepts like ecological harmony, social justice and personal freedom implies a qualitatively different kind of complexity than that which systems science is normally seen to address. In order to point up the differences between my own view and the traditional systems scientific understanding, it might be productive to offer a brief review of the latter. Much of this review has been developed from the

being that are ecologically sustainable and just. The three ideas (ecological harmony, social justice and personal freedom) are essentially linked and, while they can be appreciated as independent concepts, concentration on one to the complete exclusion of the other two must inevitably lead to us painting an impoverished picture of the world.

10.4 Complexity and the Ideal of the Unity of Science

Given the complexity of the problems we and future generations seem to be facing (so that previously discrete issues such as the promotion of ecological harmony, social justice and personal freedom now come to be seen as intimately linked), any research practice that we propose to adopt must be capable of addressing all our concerns and interrelating them when necessary.

As so many systems scientists have argued over the years, it is quite clear that a fragmentary science would simply be incapable of doing this. If disciplinary separation were to be regarded as absolute, how, for example, could ecological harmony

arguments of Flood (1987) and Flood and Carson (1988).

10.5.1 The "People" Aspect of Complexity

It is generally accepted that complexity must be more than "the quantity of relationships between things". One potential, alternative definition might be "the quantity of relationships between things in relation to the human capacity to handle an amount of information". Thus a system is called "simple" if all perceived relationships can be appreciated by the observer, and "complex" if they cannot.

That complexity is as much about "people" as "things" has long been recognised. Indeed, Ashby (1973) gives a wonderful illustration of this, which is summed up neatly by Klir (1985):

"To the neurophysiologist the brain, as a feltwork of fibres and a soup of enzymes, is certainly complex; and equally the transmission of a detailed description of it would require much time. To a butcher the brain is simple, for he has to distinguish it from only about thirty other meats".

10.5.2 The "Things" Aspect of Complexity

Nevertheless, because relationships between "people" and "things" have generally been thought about in a manner that assumes ontological realism, the main focus of systems science has been on "things", and the "people" aspect has been subsumed within this.

What I mean by this is that both "people" and "things" are considered to have an objective reality "out there": it is therefore considered legitimate to talk about "our understanding of relationships between things" rather than "our understanding of different aspects of our understanding", which would be our focus if we were to assume ontological idealism. In the latter case, "things" are a property of "people", but, in the former (ontologically realist) case, we talk about relationships between "people" and "things" as if both were "things".¹

This ontologically realist language of complexity is common in systems science. Weaver (1948), for example, differentiated between three "ranges" of complexity:

organised simplicity, organised complexity, and disorganised complexity.

Organised simplicity is when investigation reveals simple organisation behind a 'facade' of complexity; perhaps the complexity can be reduced to a few dyadic relationships. Disorganised complexity is when one has to deal with a high degree of randomness. In contrast with both of these, organised complexity refers to situations where things follow an identifiable pattern, but the information cannot be reduced very far without a significant impoverishment of understanding.

Here, then, we have "things as objective reality" that are linguistically separated from the understanding of the observer: "the complexity can be reduced to....dyadic relationships"; "one has to deal with....randomness"; "things follow....a pattern, but the information cannot be reduced".

Such language has been developed to the point where the "people" aspect of complexity receives only nominal recognition. Yates (1978), for example, sees complexity arising when one or more of the following are found:

significant interactions; high numbers of parts, degrees of freedom or interactions; nonlinearity; broken symmetry; nonholonomic constraints. Only the word "significant" in the first of these betrays the presence of the "people" aspect of complexity.

10.6 A New Understanding of Complexity

Now, I have suggested that the interdependence of concepts like ecological harmony, social justice and personal freedom (discussed in the previous chapter) implies a qualitatively different kind of complexity than that which systems science is normally seen to address.

We might call the concept of complexity usually used by systems scientists natural world complexity. That is, as defined earlier, complexity is thought of as the quantity of relationships between things in relation to the human capacity to handle an amount of information. Traditionally, ecosystems can be seen in these "natural world" complexity terms.

However, given our new understanding of interdependence, we really have to ask whether this "natural world" vision of complexity is adequate. My own view is that it is not. Let me illustrate why with reference to our earlier example of interdependence between the concepts of ecological harmony, social justice and personal freedom.

If these notions come to be seen as interdependent, then the introduction of social justice brings values (ideas of what is right and wrong) into the picture. It is not enough merely to describe a view of social justice in relation to a notion of ecological harmony (i.e., make a truth claim about the relationship that exists between them in the "natural world"). Such a description might be useful, but ultimately human beings participate in, rather than just observe, reality [see the work of Vickers (e.g., 1965) for a further discussion of this]. We therefore have to choose between the different values we might be able to hold. We have to make value judgments. How can our traditional view of complexity cope with these?

Furthermore, if these concepts come to be seen as inseparable from the knowledges and emotional states of individuals who have the capacity to change the shape of more widely held truth and value judgments, this forces us to paint subjectivity into the picture. Thus the traditional view of complexity looks even further impoverished.

Yes we can have natural world complexity, in which a complex system is seen as one in which the relationships between things are beyond adequate human comprehension. However we can also have social world complexity, which describes the level of our understanding of the relationships between value judgments, and the ways in which these have been normatively constructed. Furthermore we can have internal world complexity, in which the clarity of our understanding of an individual's own unique perspective (his, hers, yours or mine) is considered.

Interestingly, Flood (1987) has also proposed that we should look at more than just "natural world" complexity. He suggests that complexity in the realm of

"people" is qualitatively different from complexity in the realm of "things". This is because "people" can see "things" in very different ways. However, Flood does not separate subjectivity from normative forces as I do here. One could perhaps see my own argument as a development of Flood's.

Now, taking the natural, social and internal worlds together provides us with a new vision of complexity that is more than the sum of the three parts. The relationships between the three "worlds" (natural, social and internal) can themselves be seen in terms of simplicity or complexity, and so we can justifiably call this new understanding ontological complexity.

I would contend that it is the explicit emergence of ontological complexity that is the real challenge facing us.

Later in this thesis I will offer more detailed support for describing this meta-level complexity as "ontological". In the meantime, however, let us take the term as given.

10.6 Conclusion

Now we can complete this chapter with deeper, although not final, answers to the questions "why pluralism?" and "why the unity of science?"

Only pluralism, in the way it brings together, on an equal footing, methods previously seen as incommensurate, can address ontological complexity. The different "worlds" require different methods of intervention, so pluralism is essential if inquiries and interventions in all three worlds are to be drawn upon and interrelated as necessary.

Also, only by pursuing the ideal of the unity of science can we explore an extended realm of subject matter in which the interrelation of understandings drawn from different worlds becomes unproblematic.

It is these answers that will be deepened further over the coming chapters.

Notes

1. I am not suggesting here that we shouldn't talk about people and things as separated, and as if both were things. However, I will go on later to argue that there is more to complexity. This development will necessarily entail a movement away from traditional ontological realism (see Chapter 14).

CHAPTER 11: ECOLOGY AND THE POVERTY OF SYSTEMS SCIENCE

The purpose of this chapter is to continue the argument started in Chapter 10 and go a little further in revealing the possible contexts of our debate about pluralism and the unity of science.

I have already demonstrated how pluralism might be seen as a response to a change in the way in which we view complexity. I believe we need to move from thinking about natural world complexity alone to an understanding of a meta-level ontological complexity that is more than the sum of the parts of natural world complexity, social world complexity and internal world complexity.

In order to conduct that analysis I used an example of how the concepts of ecological harmony, social justice and individual freedom can be seen as closely interrelated. Each of these concepts brings a new "world" into play, yet to deny validity to the discussion of any of them would seriously impoverish our understanding.

11.1 A History of Western Ideas of Holism

So, if we are going to deepen the debate further, let us move beyond the relatively simple questions "why pluralism?" and "why the unity of science?", and ask "why now?". Why has ontological complexity come to the fore in the latter half of the 20th Century?

In order to answer this question I will need to engage in a historical reconstruction of the history of systems science.

Specifically, I want to challenge the assumption that systems science is solely a 20th Century phenomenon. This 'fact' has rarely been subjected to any deep analysis. Van Gigch and Stolliday (1980), for example, suggest that the emergence of systems science was a result of practitioners of the 'human' sciences experiencing difficulties with the methodologies they imported from the 'natural' sciences. Like most accounts this takes a point of origin for systems science in the 20th Century for granted.

Even Flood and Carson (1988) devote a paragraph to the historical roots of systems science, acknowledging that the idea of holism has been around for much longer than we might at first think, but do not discuss the possible implications of a reconstruction of the history of the holistic idea.

Through an analysis of the history of systems science I hope to demonstrate, not only that its key tenets can be traced back thousands of years, but that the suppression of holism in the 17th Century, and its re-emergence now, has an ecological context.

Furthermore, by broadening the boundaries of what we consider to be systems science to take in philosophy that is usually labelled "pre-scientific", I want to demonstrate that the pluralist vision is closely attuned to some of the earliest known manifestations of Western holism.

Indeed, it is much more closely attuned to these than the work of the systems pioneers of the early and middle 20th Century (e.g., Cannon, 1932; Angyal, 1941;

Feibleman and Friend, 1945; Wiener, 1948; Bertalanffy, 1950). We will come to see that these thinkers were heavily influenced by the dominant epistemological paradigm of their day.

11.2 Assumptions about History

Before engaging in this historical reconstruction, I need to make clear what assumptions I am making about the nature of historical reconstructive activities themselves. We should note, for example, that there are several possible approaches to history, and each of these makes different assumptions. Flood and Gregory (1988) identify four such approaches to thinking about the history of systems science:

"(1) Linear sequential - ideas develop linearly, that is, history is linear and knowledge is cumulative; typically chronological expositions.

(2) Structuralism - the use of scientific models to explain (via their behavioural characteristics and so on...) the structure and processes of history, and the cumulativeness of knowledge.

(3) World-Viewism - the notion of normal science, the stress of anomalies and revolutions through extraordinary science, and the non-cumulativeness of

knowledge, that is, it is the world-view that changes, and not necessarily incrementally.

(4) Genealogy - the notion of discursive formations, or statements, in the form of networks that cut across sentences and other written discourses. These discursive formations are dynamic, and shaped by power relations extant outside of discourse (that is, institutions and other bodies) and thus the use of critique in seeking truth is important".

I cannot honestly say that my own approach to historical reconstruction fits neatly into any of these categories. Let me use the language of complexity introduced in the last chapter to explain what I mean.

For me, a history has to be constructed out of truth statements. That is, it is a narrative about the 'natural world'; a description of "what has been" that we advance in the spirit of critical thinking. In other words, we do not think of it as absolutely true, but it aims toward the ideal of truth.

However, this is not to say that there is no normative or subjective construction involved in the production of a history. All histories have their social contexts, and competing visions of history may emerge. Not only this, but the moral stance adopted by an individual or

group may well integrate with the vision of history to produce a coherent whole.

Thus, for example, the history of Capitalism offered by Marx (1887) differs substantially from any history that capitalists themselves could ever accept. Marx's commitment to communism is consistent with his historical analysis as well as the personal understandings of all those who have trodden the path of socialism.

We see then that histories are constructed out of truth statements about the 'natural world'. Nevertheless, each version of history has its particular social context, and its unique meaning to individuals.

In taking this view, the distinctions made by Flood and Gregory (1988) between different approaches to history become less important than they might at first appear.

Whether our history is one of cumulative development (linear or structural), competition between world views, or discursive constitution of truths, it is

still told through a narrative of truth statements.

Like all truth statements, these can be challenged. It may be that the author's limited life experiences can be shown to have 'distorted' his or her vision of history. Similarly, it could be that certain discursive (normative) assumptions about the 'right' way history should be viewed can be shown to have permeated the vision, and that an alternative 'right' way to look at things would provide a different narrative about truth.

In reconstructing the history of systems science over the coming pages I will be producing a narrative version of truth myself. However, I must make an open declaration of its social meaning in terms of one particular contemporary vision of rightness:

Just as I believe we can show that the characterisation of systems science as a 20th Century phenomenon has an ecological context, so might the development of this historical reconstruction. Perhaps we need it so that we can reveal the 'restriction' of early systems thinking by a continued acceptance of some of the assumptions of traditional scientific discourse. In my

view these assumptions now need to be challenged so that we can begin to deal more effectively with the ontological complexity presented by many of the most important issues, especially global issues, we currently face.

I believe that it is right to challenge restrictive, scientific practices, and right to challenge uncritical humanist assumptions in our ways of thinking (see Chapter 13 for more details). The historical narrative developed in this chapter 'fits' with these views of rightness: there is no unilinear 'path' running from this vision of truth to this view of rightness, nor is there a unilinear path running from rightness to truth - the two are in a mutually supportive systemic relationship.

11.3 Assumptions about Science

There is also a second assumption that needs to be declared before I start this historical reconstruction. In saying that systems science has roots stretching

back beyond the 20th Century, and that it is not productive to boundary our understanding of the history of systems thinking at the point that the word "science" was explicitly added, I am not using the traditional view of what science is.

Scientific and other practices are virtually impossible to separate through any rational process of argumentation (Weimer, 1979), so it makes sense to challenge definitions of "science" whenever we feel they impose unacceptable limitations.

Indeed, application of the word "science" (in the more limited, conventional sense) to ideas of holism will come to be seen as part of the mechanism by which earlier holistic viewpoints could be buried and the claim to a new start in the 20th Century justified. This is not to say that we should abandon the term "science": it makes more sense to liberate it from its association with unacceptable assumptions.¹

11.4 The History of Holism

The holistic enterprise can be seen to have roots in Western thought that go back well beyond those of the traditional sciences, which are said to have their seeds in Aristotle's explicit demarcation of the object from the subject. These seeds led to the first understandings of "objectivity" that were to be nurtured into flower by Descartes in the 17th Century.

Of earlier Greek thinkers, Heraclitus (approximately 600-500 BC) in particular has been singled out by Heidegger (1956) as of central importance because of his sophisticated formulation of the logos - the essential unity of all things which the rational classificatory part of us prevents us from genuinely experiencing.

Similarly, Popper (1962) identifies Heraclitus as an influential figure, primarily because he was the first to concentrate on the phenomenon of change, proposing that the material Universe is an ordered process rather than a collection of static things.

Of course the shift away from this early identification of holism did not happen overnight. While Aristotle's thinking might have been formative in the move toward scientific reductionism, it was not until the 17th Century, and most obviously through the writings of Bacon, Galileo, Descartes and Newton, that modern scientific thinking began to develop from the seeds planted centuries earlier.

Pre-Cartesian mediaeval Christian thinking, according to Sherrard (1987), was still implicitly holistic and mystical. In his own words:

"This Christian society was an organically integrated society. It was a kind of sacred order established by God in which everything, not only Man and Man's artifacts, but every living form of plant, bird or animal, the sun, moon and stars, the waters and the mountains, were seen as signs of things sacred,...expressions of a divine cosmology, symbols linking the visible and the invisible, earth and heaven".

Furthermore, Sherrard notes that scientific techniques, in embryonic form, were available to mediaeval Christians,

"But these techniques deliberately were not employed or developed beyond a certain point - the point at which they would begin to impede or prevent what was far more important: the realization of the overriding imaginative view of life. Here the primary concern was religious, not technical, and technical processes that upset the overriding conceptions of harmony, beauty and balance were, quite simply, rejected".

Thus it was Descartes writings, which mathematicised the world and separated its workings from those of God, that Sherrard sees as having the most profound and decisive influence in the development of modern science.

However, it was actually not until the 18th and 19th Centuries that scientific thought led to the beginnings of the massive industrial and technological explorations that have since been intensified and now characterise the modern picture.

When reductionist science began to emerge and dominate, what happened to holism? Did it simply evaporate, not to be seen again until the 20th Century? The answer, interestingly, is "no".

A few writers were still bringing forth holistic ideas,

some of which would not look out of place in today's systems movement. For example, Hutton (1795) stated that:

"the explanation, which is given of the different phenomena of the Earth, must be consistent with the actual constitution of this Earth as a living world, that is, a world maintaining a system of living animals and plants".

Unsurprisingly, however, Hutton's work did not become part of the mainstream history of science. Perhaps we only speak of it now because people like Grinevald (1988) have excavated it in the light of modern planetary systems theories (such as that proposed by Lovelock, 1979, 1988). So, holism was well and truly suppressed in mainstream science. But did it still have any influence?

Interestingly, if we examine the romantic art theories that emerged during the 17th and 18th Centuries, we see that holism was alive and well. Wiedmann (1986) describes the holistic nature of these theories, and the importance of a systemic vision of science to them:

"If Newton incurred the wrath of the Romantics, some sciences falling outside the mechanistic mode of explanation, found their rapturous approval, none more so than the sciences of Electricity, Galvanism and Magnetism.... For the Romantics the very success of these sciences was glorious proof at last that matter as such was not the ultimate reality. Something existed within and between matter, something far more original and fundamental, a dynamic interplay of forces and polarities, a ceaseless 'productive activity' as Schelling loved to call it, which held the whole Universe together.... This vision of a 'productive activity'....brought about a radical and irreversible shift....which replaced the limited notions of atomism and mechanism with the more creative and flexible models of organicism and universal dynamism. The Romantics ushered in Man's preoccupation with change rather than with permanence, with process rather than products, with force and flux rather than with finished forms and seemingly unchanging timeless substances. There is no Being, they proclaimed, only Becoming".

Furthermore, he goes on to show how this holism manifested itself in the works of writers and artists of the time:

"This fascination with eternal flux and transformation expressed itself in the artists' attraction to nature's fierce primeval forces as manifest in raging storms, gigantic seas or lava-hurling mountains. It also expressed itself in the painters' exclusive concentration on whirling, shifting clouds, for clouds in particular were seen as repositories of electricity and, beyond that, as manifestations of the 'energy divine'. Romantic literature and art are inseparable from this passion for energy and force, a passion which profoundly affected their respective matter and

form, their substance and style".

Now, the sciences of electricity, galvanism and magnetism came to be integrated into the mechanistic world view within the reductionist scientific discourse, and it was left to artists to realise their holistic significance. So, it seems that reductionist science merely marginalised holistic concerns into the arts, where they could be valued by a different audience. In characteristic, atomist style, scientists even had to separate science itself from other creative activities.

11.5 The Present Day

Interestingly, despite the remarkable similarity between the Universe as conceptualised by Heraclitus in ancient Greece and the Universe as thought of today by holistic physicists such as Bohm (1980), we still tend to labour under this assumption that the emergence of systems scientific thinking in the West is a 20th Century phenomenon.

The historical short-sightedness that seems to prevail with regard to holistic thinking, even within systems science (the only approach which places holism at the centre of its agenda), might itself be a symptom of the dominance of traditional science which has long emphasised the values of logic, rationality and testability.

The original belief of holists that rational thought actually provides an insurmountable barrier to complete insight is certainly not 'testable' in the conventional sense of the word, and early thinkers like Heraclitus were philosophers who did not equate testability with validity. Therefore no need was seen to challenge this belief through empirical study.

However, mid-20th Century systems scientists have phrased their concerns in language that has clearly been influenced by traditional science. In particular General Systems Theory (e.g., Bertalanffy, 1950) arose out of the discipline of biology, and its focus on mathematical descriptions of the workings of real-world systems had a resonance across all the 'natural'

sciences.

Given Heidegger's powerful argument (1956) that a general acceptance of Aristotle's split between the object and the subject created such a fundamental shift in our method of questioning that the possible validity of other ways of thinking has become almost inconceivable, it is hardly surprising that pre-Aristotelian holism (i.e., that of Heraclitus and others of his time) is not considered of the same kind as that which has recently emerged.

From this point on, then, let us work with the new historical vision which assumes that systems thinking does indeed stretch back beyond the 20th Century, and that it was the influence of the cannons of traditional science that has caused us to differentiate ancient and modern holism so sharply.

11.6 Marginalisation of Early Holistic Ideas

Given that we are now assuming it is valid to bring

early holism into the history of systems science, we have to ask why this form of thinking was marginalised so comprehensively by the growth of reductionist science.

The answer, according to Heidegger (1956), is quite simple. Science has been shown to "work". That is, the sharp demarcation of the subject from the object that led to a separation of truth (the observed) from values (properties of the observer), cultivated a form of 'uninhibited' inquiry, in the sense that relatively little moral restraint was placed on it.

This led to discoveries which had a profound effect on the material conditions of nearly everybody in the West. People were seen to live longer as medical science advanced, and the proliferation of labour-saving devices were seen to improve the quality of peoples' lives dramatically. Increasingly the shift was toward an energy intensive society in which production and consumption per individual rose steadily, and this was largely attributed to the success of scientific innovation.

Small wonder, then, that the old holism which operated from completely different epistemological premises, which refused to let the search for truth be separated from human values, was spurned. It was inevitably inhibited as a form of inquiry. It simply could not 'deliver the goods'.

11.7 The Re-Emergence of Holism

Now, Heidegger's analysis is considered uncontroversial these days, and few people would seek to refute it. Yet, if we delve more deeply into the assumptions of his argument and relate them critically to a recent holistic understanding of evolution that has been proposed within the discipline of biology, we might be able to create some insights that will provide a clue as to why, in the 20th Century, we have experienced the re-emergence of holism.

When we say that science has "worked", we can ask "worked in what sense?". For example, what does the accumulation of material benefits for human beings mean

in ecological and evolutionary terms?

The holistic perspective we can use to answer these questions emerged as a reaction against neo-Darwinian evolutionary theory (Darwin's natural selection combined with Mendel's genetics), which has remained dominant in the discipline of biology until relatively recently.

At the risk of over-simplification, we can say that neo-darwinian theory proposes that organisms need to adapt to their environment. Furthermore, the organisms which adapt most successfully will survive and have the chance to pass on their characteristics, via their genetic codes, to the next generation.

One of several problems with this, pointed out by a number of holistic thinkers (e.g., Lovelock, 1988; Ho, 1989), is that "neo-Darwinism....pre-supposes the separation between organism and environment - the one varying independently and the other selecting" (Ho, 1989).

Thus, physical maternal influences (Ho et al, 1983; Ho,

1984), the environment of the previous generation (Oyama, 1985; Ho, 1986) and cultural, social and behavioural learning from peers are relegated to either non-existent or secondary roles in evolution (genetic factors being seen as primary).

More importantly, however, the possibility of organisms helping to create their environments is not really considered. The idea of organisms as active elements of a wider system presents us with a conceptual key with which to unlock an answer to the question of what we mean by saying that science has "worked".

It is possible to claim, when we observe science "working", that it has given us the capacity to shape our environment more radically, to change the ecosystem within which we evolve so that we can both increase our numbers and improve the quality of human life. Why, then, are some people now saying that traditional science is no longer "working"?

It appears that the relative freedom of traditional science from moral constraint has given rise to rapid,

and it now seems inadequately understood, developments in technology. As McBurney (1990) and others have argued so persuasively, while in the short term our technological ability to shape our environment has proven very successful for human beings, we have come to see that we are creating a habitat that will not sustain us in the longer term. Thus isolationist, 'objective' science is itself part of our ecological problem.

It could be that holism has re-emerged because of the need to reintegrate understandings of the objective, normative and subjective into a more comprehensive whole which will have the ecological function of helping us restore a degree of life-enhancing harmony to the world.

What I am suggesting, then, is that the emergence of our understanding of ontological complexity is happening now because we have reached the point where the unfettered technological expansion that justified both traditional science and a reductionist understanding of complexity is coming to an end.

11.8 Reinterpreting Holism

Widening our historical picture of systems science helps us to see that the understanding of ontological complexity I have evolved has some connection with pre-17th Century, and in particular pre-Aristotelian, thoughts on the problem of holism.

Of course they are by no means identical, and I am certainly not suggesting that we are retreating to a pre-industrial age of philosophy. However, the key similarity is that the way we have started to conceptualise our problems embraces the natural world, social values and what goes on in the internal "worlds" of individuals.

Similarly, much pre-Cartesian thinking deals with all three, although a key difference is that mediaeval Christian thought, for example, was mystical in its holism. There was no attempt to make an ontological or epistemological analysis of the three "worlds" (natural, social and internal) that could be used to

understand inquiry and intervention.

It is quite clear that mid-20th Century systems science, and the isolationist hard tradition that has grown out of it, fails to achieve this reintegration between the objective, normative and subjective because it tries to marginalise the latter two.

Our reconstructed history of systems science helps us to realise that the understanding of complexity evolved by the supposed 'Founding Fathers' owes much to reductionism. Ontological complexity is reduced to natural world complexity. Furthermore, their philosophical and methodological response to this reduced conception of complexity shares the value-neutral epistemological roots of the natural, disciplinary sciences.

In this sense, then, the 'Founding Fathers' can be said, through no fault of their own, to have been subject to the 'false consciousness' (if I may be permitted to use the term in a broader sense than the original Marxist one) of a dominant understanding which we can no longer regard as adequate.

Partly because of the depths to which older understandings have been suppressed, we have not responded adequately or quickly enough to ecological necessity, and it is only now that a deeper vision is evolving.

All this has profound implications for our understanding of the word "holism" itself. Far from being holistic, hard isolationist systems science has been shown to reduce everything down to an impoverished "natural world" holism. I would argue, then, that the word "holistic" itself should be 'liberated', and only used to describe approaches to inquiry and intervention that embrace the legitimacy of considering all three of the objective, normative and subjective realms.

11.9 Conclusion

Here, then, we have not only answered the question "why pluralism?" (in terms of pursuit of the unity of science and a need to address ontological complexity),

but we have also made a start on answering the question "why now?".

I have argued that many of the contemporary issues we are dealing with, especially issues of global ecology, present a high degree of ontological complexity. This can only be addressed using a truly holistic approach: i.e., one that reintegrates the objective, normative and subjective. Such an approach must inevitably involve prioritising pursuit of the ideal of the unity of science, and must therefore also allow methodological pluralism.

"Why now?". We can say that reductionist science, which has even spread its influence into the supposedly "holistic" work of the 'Founding Fathers' of systems science, is no longer "working". It is not "working" in the sense of helping us to create sustainable systems in which we can live harmoniously. Perhaps our new vision of unity and pluralism will equip us more adequately to do this.

We are now at a point where we should have a reasonable understanding of what Critical Systems Thinking and

it's associated idea of pluralism, as they have been developed to date, are all about. We should also have some understanding of why these notions might be important at the present time; in other words, what it is that legitimates them.

At the end of Chapter 9 I suggested that my only reservation was that the philosophical underpinnings of the perspective were insufficiently developed. In Section 3 of this thesis I will move on to issues of ontology and epistemology in order to begin to address this problem.

We will also find that the issue of ecology discussed here will need to be reintroduced and deepened when we start to deal with the question of the legitimacy of alternative visions of ontology and epistemology.

Notes

1. Addition of the word "science" to a discourse is essentially a means of legitimising it, while at the

same time controlling its content and expression through the imposition of a set of discursive assumptions (Foucault, 1970). There is nothing wrong with this - we cannot escape legitimising things in this way - but a realization that this is what we are doing does impose a duty upon us to be critical of our assumptions in using a term like "science". We might not have to abandon a word in order to free ourselves from discursive assumptions we are not happy with.

SECTION 3
EPISTEMOLOGY, ONTOLOGY AND PLURALISM

CHAPTER 12: META-METHODOLOGICAL REFLECTIONS

In Section 1 of this thesis I described the Critical Systems vision of pluralism as it has been evolved to date. This involved discussing the differences between pluralism, pragmatism, isolationism and imperialism. It also involved presenting the System of Systems Methodologies: the Critical Systems meta-framework aligning systems methods with ideal-type contexts of application.

Furthermore, I clarified a central problem: that the notion of paradigm incommensurability could be seen to sweep our fledgling notion of pluralism off its feet if we are not rigorous in our thinking.

Paradigms can quite obviously be incommensurate with one another because they represent "moments" of concretised theory in a wider developing discourse. Even the assumptions of pluralism can be challenged by isolationists in their own terms.

It is therefore necessary to declare the paradigmatic

nature of Critical Systems Thinking. If we accept the possibility of pluralism, then we must also be accepting ontological and/or epistemological assumptions that people working in other paradigms could not agree with. We therefore have to ask what these assumptions might be.¹

12.1 Habermas's Three Interests Revisited

The majority of Critical Systems thinkers have sought to underpin the notion of pluralism with Habermas's epistemological framework of knowledge-constitutive interests. Let us just refresh our memories, as the last time this was mentioned was in Chapter 5.

Habermas's central concern (1972) is that traditional scientific inquiry, hermeneutic science and self-reflective critique should all be seen as having their place in addressing different human interests - interests embedded in the need for environmental control, common social understanding and emancipation from false consciousness respectively.

According to Habermas, these are not specific interests arising out of local context. They are general interests that all human beings share: i.e., they are an essential part of human nature. Habermas supports his belief that these are general interests with reference to what he describes as the basic human activities of "work" and "interaction".

All human beings need to "work": i.e., they need to exercise instrumental control over their environments. Therefore we have a technical interest in achieving this control.

Also, human beings need to interact and communicate with one another. We therefore have a practical interest in achieving mutual understanding.

The pursuit of both of these interests can be frustrated, however, by the noxious exercise of power which establishes false consciousnesses in groups and individuals. We therefore also have an emancipatory interest in freeing ourselves from the constraints of false consciousness.

We should note here that Habermas talks in terms of knowledge-constitutive interests. This is because, when it comes to the specific interests we pursue, knowledges shape our interests, and our interests direct the search for knowledges.

Of these three knowledge-constitutive interests, Habermas (1978) says that it is the emancipatory interest, pursued through self-reflective critique, that is pivotal. Ultimately we pursue the ideal of undistorted communication. This is a postulated ideal speech situation in which no false consciousness is manifest, and in which arguments can be won or lost by "the peculiarly unforced force of the better argument" (Habermas, 1974).

In pursuing the ideal of undistorted communication we can draw upon traditional science and hermeneutics to provide support for our self-reflective activity, which in turn helps us to conduct our traditional scientific and hermeneutic inquiries in a non-oppressive fashion.

Habermas (1972) claims that we need to continually

pursue all three interests. However, we find that the forces of power (specifically forces of "late Capitalism" in Habermas's analysis) cause the technical interest to dominate and the practical and emancipatory interests to be marginalised.

This is why, traditionally, scientists have described their activities as value-neutral. By neglecting the need for mutual understanding and self-reflection, scientists end up extending instrumental control of the environment in the service of forces of power.

Our task in both this chapter and the next is to reflect upon Habermas's framework of knowledge-constitutive interests in order to consider whether it is adequate as an underpinning for our notion of pluralism.

This chapter will deal with its adequacy at the levels of methodology and meta-methodology, Chapter 13 will assess its legitimacy in terms of our current ecological concerns, and Chapter 14 will explore the territory of ontology.

In discussing methodology and meta-methodology in this chapter we will have to deal, first and foremost, with various authors' uses of Habermasian theory to underpin the System of Systems Methodologies. This is, of course, the most widely accepted pluralist meta-theory within the discourse of Critical Systems Thinking.

12.2 The Question of Alignment

Let us begin, then, by addressing the problem, first identified in Chapter 5, of aligning the three interests with the two dimensions of the System of Systems Methodologies. To refresh our memories, in Chapter 5 I presented my interpretation of what appeared to me to be two very different alignments.

Let us detail these once again. First of all, Jackson (1985b, 1988) aligns the "System" dimension with the technical interest, and the "Participants" dimension with the practical interest. The emancipatory interest is seen as an extension of the practical interest, and it is aligned with coercive contexts in the System of

Systems Methodologies.

However, if I have understood their argument correctly, Flood and Jackson (1991) appear to align all three interests with the various elements of the "Participants" dimension. The technical interest is aligned with the unitary contexts, the practical interest is aligned with the conflictual contexts and the emancipatory interest is aligned with the coercive contexts.

Over the coming pages I want to look more closely at these alignments in terms of Habermasian theory. Before doing so, however, I need to acknowledge that I will be using a different interpretation of Habermas's theory of knowledge-constitutive interests than the one used by both Jackson (1985b, 1988) and Flood and Jackson (1991).

All three of the above papers draw upon Habermas's (1972) work, in which he describes the emancipatory interest as an extension of the practical interest. Given this assumption, both Jackson's and Flood &

Jackson's positions, as I have interpreted them, are perfectly logical.

However, in updating his 1972 work, Habermas (1978) shifted his view somewhat and declared that the emancipatory interest is pivotal between the technical and practical interests. This means that the desire human beings have to free themselves from false consciousness comes to mean more than being self-reflective in order to improve our pursuit of the practical interest. It also means using self-reflection to change structures in the world through pursuit of the technical interest.

In fact, in his 1978 vision, Habermas's three interests are systemically interrelated so that the results of our pursuit of the technical and practical interests also feed back into emancipatory self-reflection.²

I wish to use this later version of Habermas's theory because, to me (as well as others like Tsivacou, 1992), it makes sense for emancipatory self-reflection to be seen as both following, and giving rise to, physical changes in the world as well as ideological changes in

discourse.

Indeed, this is entirely consistent with my own division of complexity into three realms: complexity in the natural world (which we have a technical interest in mastering), complexity in the social world of normative judgments (which we have a practical interest in coming to grips with), and complexity in our understandings of the subjective internal worlds of individuals - including our own subjective understanding (which we have an emancipatory interest in grasping).

Clearly, because I am drawing upon a later version of Habermasian theory, the following critiques of Jackson's (1985b, 1988) and Flood and Jackson's (1991) alignments of the three interests with the System of Systems Methodologies do not undermine their original arguments which are entirely consistent with Habermas's 1972 work.

12.2.1 Alignment with the "Participants" Dimension

I would contend that alignment of the three interests with the "Participants" dimension of the System of Systems Methodologies is problematic in terms of Habermas's 1978 work.

If self-reflective critique is pivotal, as Habermas (1978) claims, then it cannot be an element within the System of Systems Methodologies. If we are going to be faithful to Habermas's vision, we cannot say that we are sometimes faced with situations of false consciousness and sometimes not. The ideal speech situation is always just out of reach, meaning that false consciousness is always a problem. We therefore need to be able to engage in self-reflective critique at any time - not just when we have defined a context as explicitly coercive.

12.2.2 The Two Dimensional Alignment

Unfortunately, Jackson's (1985b, 1988) alternative alignment of the technical interest with the "System"

dimension, and the practical interest with the "Participants" dimension, exhibits the same alignment of the emancipatory interest with just one aspect of the System of Systems Methodologies - the coercive contexts. Again there is the suggestion that we are not dealing with false consciousness all of the time. This is, of course, in conflict with Habermas's (1978) theory (but not his 1972 work, which Jackson used).

Unfortunately, if we wish to use Habermas's 1978 work, the above alignments made by Jackson, and Jackson and Flood, may need to be developed further before we can say that we have an entirely adequate set of epistemological assumptions to support the System of Systems Methodologies.

12.3 Further Avenues of Exploration

Over the coming pages I will discuss two possible avenues for this development. However, each of them will be seen to be equally problematic.

The purpose of this discussion is, if you like, to serve as a warning of unfruitful avenues of exploration that may initially seem seductive. Following these three problematic 'developments', I intend to discuss a third that appears to avoid any problems of contradiction with Habermas's (1978) work.

12.3.1 Self-Reflective Reductionism

The first of these potential solutions is to take Jackson's alignment (1985b, 1988) and move the emancipatory interest outside the System of Systems Methodologies.

The technical interest is still seen to lie behind the "System" dimension, and the practical interest behind the "Participants" dimension. The emancipatory interest, however, comes to lie behind the need for explicit reflection upon the reasons for conducting problem-solving research and designing appropriate methodologies (i.e., in Kantian terms, the need to engage in practical reason).

At first this sounds like an ideal development because the emancipatory interest becomes pivotal, as in Habermas's vision (1978). The suggestion is that reflection upon complexity and the relationships between participants in a problematic situation is what constitutes pursuit of the technical and practical interests respectively.

A problem arises, however, when we realise that, if this is just reflection, the researcher must still be pursuing the emancipatory interest. He or she is simply reflecting upon his or her perceptions of the situation.

Pursuit of the technical interest must actually involve prediction and control of the environment. Pursuit of the practical interest must involve communicating with other people in order to facilitate mutual understanding. Simple reflection by itself achieves neither of these things.

This potential development appears, then, to be reducing the technical and practical interests to the

emancipatory interest. It therefore creates a new problem - one of self-reflective reductionism.

12.3.2 Methodological Inflexibility

If we must avoid treating the technical and practical interests as purely reflective (thereby subsuming them within the emancipatory interest), what other options might there be for aligning Habermas's three interests (1978) with the System of Systems Methodologies?

We can look toward the work of Gregory (1990) for the inspiration to lay a second path. She maintains that the problem with trying to align the three interests with different aspects of the System of Systems Methodologies is that you end up selecting between interests. Of course, this conflicts with Habermas's (1978) view that the three interests are interrelated and the emancipatory interest is pivotal. Gregory's solution is to insist that all of the interests should be pursued explicitly every time research is conducted.

At least two possible stances arise from this argument.

First, it could be suggested that we should dispense with the notion of contextualising existing methods. Perhaps our priority should be to develop a new method, or set of methods, that focuses explicitly upon the three interests. Indeed, this has been suggested as a serious possibility by Flood et al (1992).

Alternatively it could be argued that we would be able to preserve our contextualisation of existing methods through the System of Systems Methodologies if we could demonstrate that, by drawing upon several different methods in each research project, all three interests could be explicitly addressed. Theoretically, it should be possible to achieve this through the practice of methodological partitioning.

Indeed, Gregory (1990) does point to methodological partitioning, suggesting that this is her preferred option. On balance it would probably be mine, as open communication with other authors who have already designed systems methodologies can only really be maintained if we take their ideas seriously.

Given Gregory's assumption that truly critical research involves explicit consideration of all three interests, both hard and soft systems thinking would need to be drawn upon, as would explicit self-reflective critique, for a particular research project to be considered adequate.

Here, methodological partitioning would have to play a central role in determining when hard and soft methods should be employed, and the whole process would have to be guided in a critically self-reflective manner.

This is certainly an effective way out of our epistemological dilemma. It allows for the System of Systems Methodologies and Habermas's (1978) work to co-exist without internal contradiction.

However, while Gregory's position is coherent philosophically, it does present methodological problems. If one always has to draw upon both hard and soft methods for the research to be considered adequate, then we are inevitably going to be restricted

in the research that we will be able to conduct. Gregory's solution involves the imposition of a meta-methodological rule upon systems practice that limits our ability to compromise methodologically in order to achieve desired ends.

To provide a hypothetical example, we may be approached by a hospital manager who tells us that his or her organization is experiencing major conflicts between a number of doctors and their nursing staff. As a result, morale is low and nursing staff turn-over is high. There are worries that this in-fighting may indirectly be putting patients' lives at risk. We have been asked to intervene, and intervene quickly.

Using the System of Systems Methodologies in the usual way we might decide that the context is, say, conflictual. Strategic Assumption Surfacing and Testing or Soft Systems Methodology might therefore be appropriate responses. Alternatively we might decide that the power doctors have over nurses makes the context coercive. Critical Systems Heuristics would therefore be appropriate. In each case the methodology

would be directed at the presenting problem, and could be enacted promptly.

However, if we were also required to employ a hard method in conjunction with one of the above, two immediate issues arise. The first is one of time: methods like Systems Dynamics cannot be implemented speedily. If we really believe we are faced with a life or death situation, can we afford the time to set up a computer programme? The second issue is one of relevance: no hard method will address the presenting problem of inter-staff conflict directly.

When there is sufficient time, it is a positive advantage to go beyond the presenting problem and see if there are other unmentioned problems that are systemically related to the presenting one. In the long term, a more effective solution might be achieved by doing this. However, in the short term, a "quick fix" using a single method might sometimes be necessary in order to achieve an ethically sound result: i.e., in the case of our hypothetical hospital, to minimise the risk to patients.

Gregory's suggestion of explicitly pursuing all three interests through the use of several different systems methods in conjunction with one another solves our epistemological problem of reconciling Habermas's (1978) work with the System of Systems Methodologies. However, it inevitably saddles us with a degree of methodological inflexibility that may well put the legitimacy of Critical Systems Thinking at risk when we are faced with important decisions that have to be taken at speed.

12.3.3 Beyond Alignment

So, all alignments of the three interests with the System of Systems Methodologies have their problems. Where, then, can we go from here? Even if Habermas's later theory of knowledge-constitutive interests (1978) cannot be used to underpin the System of Systems Methodologies directly, maybe it can still be used to support the wider notion of pluralism.

Perhaps, rather than aligning the three interests with

aspects of the System of Systems Methodologies, they can be seen in relation to the specific methods within it. There need not be any one-to-one pairing of elements of the System of Systems Methodologies with the interests: maybe each method can be said to involve pursuit of all three interests at some stage, if only implicitly.

How could this be possible? The answer is that each method might be said to prioritise one interest over the others. Hard systems methods might make the technical interest dominant and soft methods might do the same for the practical interest. Pursuit of the emancipatory interest through self-reflection would, in any research, be pivotal.

However, this would not be a return to the positivistic notion of the supposedly autonomous researcher bearing full responsibility for deciding research parameters. Habermas (1972, 1985) rightly criticises this conception on the grounds that researchers must be subject to some social constraints if their work impacts on the lives of other people.

One could only claim that this represents a return to the notion of the morally autonomous researcher if self-reflective activity (pursuit of the emancipatory interest) was seen as lying beyond the influence of our actual actions and communications (pursuit of the technical and practical interests).

No, in Habermas's understanding (1978), the three interests are intimately tied together: self-reflection may inform the ways in which we pursue both instrumental action and mutual understanding, but the link actually operates both ways. Our self-reflective activity may be influenced by the outcomes of our instrumental actions and the mutual understandings we pursue.

We are now saying that use of a hard systems method makes the technical interest dominant, and use of a soft method brings the practical interest to the fore. However, in the wider process of thinking about methodology, self-reflective activity is needed to determine which interest should be made dominant at any particular moment in time.

Here we have effectively 'split' our understanding of pluralism from the System of Systems Methodologies. The former can be founded upon Habermas's (1978) theory with no internal contradiction. However, the latter now comes to be seen as just one of many possible meta-methodological frameworks. All such frameworks gain their legitimacy from their perceived usefulness in a particular set of practical contexts. They are tools to aid emancipatory self-reflection.³

12.4 Conclusion

In this chapter I have argued that, purely in terms of internal consistency, the Critical Systems notion of pluralism can be underpinned by Habermas's theory of knowledge-constitutive interests (1978). However, in order to achieve this internal consistency, I have had to make a clear demarcation between the wider theory of pluralism and the System of Systems Methodologies (which can now be seen as one of many possible meta-methodological frameworks).

Having established its logical congruence with our notion of pluralism, in Chapter 13 I will proceed to discuss the legitimacy of the theory of knowledge-constitutive interests in terms of the discourse of global ecology introduced in Section 2 of this thesis.

Notes

1. This is not to say, of course, that when pluralists contextualise ideas drawn from other perspectives they are merely masking their imperialist intent. Imperialists denature other perspectives, while pluralists reconstruct their essential elements within a multi-faceted meta-theory. Imperialists strip perspectives of their most important defining features, clothing them in a uniform of their own design. Pluralists, on the other hand, take care to preserve all of their most important aspects other than those which are intrinsically isolationist.

2. Habermas's 1978 work is the second edition of his

1972 book. This updated version deals with what he claims is a misunderstanding of his original intent. Habermas says that he always meant to portray the emancipatory interest as pivotal, and that people have wrongly understood the emancipatory interest as being an extension of the practical. However, this 'misinterpreted' understanding is actually credible in its own terms, and is widely accepted (witness its use in Critical Systems Thinking for example), so it is perhaps appropriate to describe Habermas's 1972 and 1978 positions as different.

3. Interestingly, it would appear that Jackson (1991a) has reached a similar conclusion: he discusses a whole range of possible ways in which methods might be divided, suggesting that he too prefers to separate the wider notion of pluralism from any one specific meta-theory aligning methods with ideal-type contexts of application.

CHAPTER 13: ECOLOGY AND THE POVERTY OF HUMANISM

We have established that Habermas's theory of knowledge-constitutive interests (1972) provides an effective epistemological underpinning for the Critical Systems notion of pluralism. Effective, that is, in terms of the internal consistency of the arguments. However, we must ask whether this is the right underpinning: i.e., whether it is legitimate given our current concerns.

In Chapter 10 I introduced the concept of ontological complexity. That is, I suggested that our research practice needs to be able to address complexities of the objective natural world, the normative social world, and the subjective inner world of the individual. Ontological complexity is the meta-level complexity of possible relationships between these "worlds".

Ontological complexity has become an issue now because of the interdependencies we are beginning to experience between concepts like ecological harmony, social justice and personal freedom. It is my contention that

our realisation of these interdependencies signals a major shift away from humanism toward an ecological perspective in many of today's most important discourses.

In the current chapter I intend to explore what we might mean by "humanism" and "the ecological perspective". I will argue that humanism represents an uncritical acceptance of system boundaries that privilege the individual human being, and/or human society, in analyses. The ecological perspective refuses such uncritical privileging.

Having defined what I mean by an ecological perspective I will be in a position to argue that this, rather than humanism, is the most legitimate perspective to take given our current concerns.

We will then be in a position to take another look at Habermas's theory of knowledge-constitutive interests. We will discover that this does, in fact, make major humanistic assumptions that renders it inappropriate as an underpinning for the Critical Systems notion of

pluralism.

13.1 From Humanism to the Ecological Perspective

There is a vast literature on the pros and cons of humanism, and the merits of an ecological perspective. It is not my intention to provide a comprehensive review of this literature - such a task would fill a thesis on its own, and many and varied works have already been written on the subject.

There is much involved in such a shift in understanding. There are important implications for epistemology (e.g., Bateson, 1979; Abram, 1988; Ash, 1989), scientific practice (e.g., Capra, 1982; Ravetz, 1988; Finger, 1988; Ho, 1989; Birch, 1990; Lovelock, 1990; Metzner, 1991), economics (e.g., McBurney, 1990; Max-Neef, 1991), the role of human beings in relation to a planetary ecology (e.g., Lovelock, 1979, 1988; Berry, 1990; Dodson Gray, 1990), aesthetics (e.g., Goldsworthy, 1988; Hillman, 1989), our understanding of spirituality (e.g., Panikkar, 1989; Birch, 1990; Schwarz, 1990; Van de Weyer, 1991) and even our basic

model of the Universe (e.g., Bohm, 1980). This is just scratching the surface: the shift from humanism to an ecological perspective must inevitably invade every aspect of understanding and action.

However, let us focus down by defining our terms; by reducing the difference between humanism and the ecological perspective to its bare essentials. It is commonly said that, at root, the difference between them is that humanism places people at the centre of discourse, while the ecological perspective allows us to decentre ourselves.

One can already see this ecological decentring in much of the work that has been done in the "natural" systems sciences, but it is perhaps most clearly evident in studies of planetary ecology, or "geophysiology" as Lovelock (e.g., 1988) calls it.

In proposing that the earth is essentially a self-regulating "organism"¹, which he calls Gaia, Lovelock shows how human beings are merely playing a part in the whole "geophysiological" process of global development.

While human beings might fight for personal survival, or the survival of their societies, Lovelock makes it clear that the elimination of our species would not be especially meaningful in terms of the larger "organism" of which we are a part. Human beings are therefore decentred in this analysis, and the Earth as a whole comes into central focus.

The essence of such decentring is actually a shift from privileging a boundary placed around the human being, or the human species, to privileging a boundary placed around the wider system of which the human being is a part - in Lovelock's analysis, the planet.

As Ulrich (1990b) makes clear in his discussion of an ethics of ecology, use of the human boundary does not become invalid in the ecological perspective. However, the issue of which boundary we should privilege in any given analysis needs to be thought about critically. The ecological perspective allows for a decentring of human beings; it does not prescribe it in every case.

Obviously we have to ask, "what ecological and social consequences arise from carrying the assumption of the

permanently privileged human being into everyday life, and, more particularly (in the context of this thesis), into the research arena?" It is how we view these consequences that will determine the legitimacy, or otherwise, of humanism.

My contention is that, if an uncritically privileged boundary is always placed around the human (whether individual human beings, human societies or human communicative systems), then that which is seen as lying beyond the human boundary (our "environment") will inevitably be marginalised.²

We might ask, "so what?". The answer to this question is actually quite complex. Let me present a one-paragraph precise that can be fleshed out over coming pages.

I would argue that boundaries and ethics are intimately interrelated. In order to preserve the credibility of the ethics that arise to support our privileging of the human boundary, everything that is marginalised by this boundary has to be made profane. Therefore our

environment is subject to abuse, much of which is ritualised. Because there is no real separation between "us" (human beings) and "it" (the environment), this is not 'just' environmental abuse - it is self-abuse. Our "selves" are wider than the uncritically privileged boundaries of our human bodies.

To understand why uncritical privileging of the human boundary leads to the marginalisation of anything non-human, and why everything non-human then comes to be regarded as profane and may therefore be subject to ritual desecration, we will have to pursue a new development in systems theory.

Over the coming pages I will present an idealised model showing a relationship between the practice of drawing or assuming boundaries, making ethical judgments, marginalisation, and the imposition of a sacred or profane status on marginalised elements of systems.

To maintain the flow of the wider argument this will, of necessity, be a brief exposition: for a much more detailed account, including practical examples that have been worked out more fully, see Midgley (1992a).

Having presented the model, we will be in a position to use it to explain why the philosophy of humanism inevitably results in ecological desecration.

13.2 Boundaries, Marginalisation, Ethics and Value

Our first task in constructing an idealised model to explain the relationship between boundaries, marginalisation, ethics and the imposition of value judgments will be to make clear what we mean by "marginalisation". This task can be approached through a couple of brief practical examples in the first instance. These should help illuminate the theoretical discussion to follow.

13.2.1 Marginalisation

To give an example of an obvious marginal element, we might look at the conventionally accepted organizational boundaries of a business. Customers, for instance, might not be seen as 'within' the

organization in the same sense as the workers, but the organization could not function without them so they cannot be placed wholly on the 'outside' either.

While customers are fairly obviously marginal to the way businesses are traditionally defined, it is more difficult to identify 'hidden' marginalised elements. People who are unemployed are a typical example. Local unemployed people would be excluded from most conventional organizational analyses, but they actually have a stake in the company's recruitment policy, might have a potential place within the traditionally defined organization, and are an integral part of the wider system of which the organization is also a part.

Those elements of the wider system (including people who are unemployed) which are tacitly recognised as being pertinent to the organization, but are not explicitly taken into the definition of the organisation's boundaries, can be described as marginal to them.

It is essential to be clear that defining a marginalised element involves recognising an

alternative system boundary. To explain this, let me use the analogy of a piece of paper. On the one hand the margin defines the edge beyond which there is no writing. A margin on a piece of paper is not one-sided however: it is also defined by the boundary of the paper itself.

Now, it is a commonplace notion that a system boundary is defined by what is included in the system and, implicitly, what is excluded. The marginal area at the boundary, however, can only be defined with respect to another boundary because, if there were no outside limits, then there would be no way to differentiate what is marginal (but possibly hidden at first) from what is excluded.

What is excluded appears invisible - indeed, it is only seen to exist by implication given that we always acknowledge the theoretical presence of a wider system. For recognition of tangible and pertinent existence to take place, however, there must be boundaries defining a second system, and when there are, then we are no longer dealing with exclusion but with marginalisation.

See Figure 13.1 for a diagrammatic representation of this.

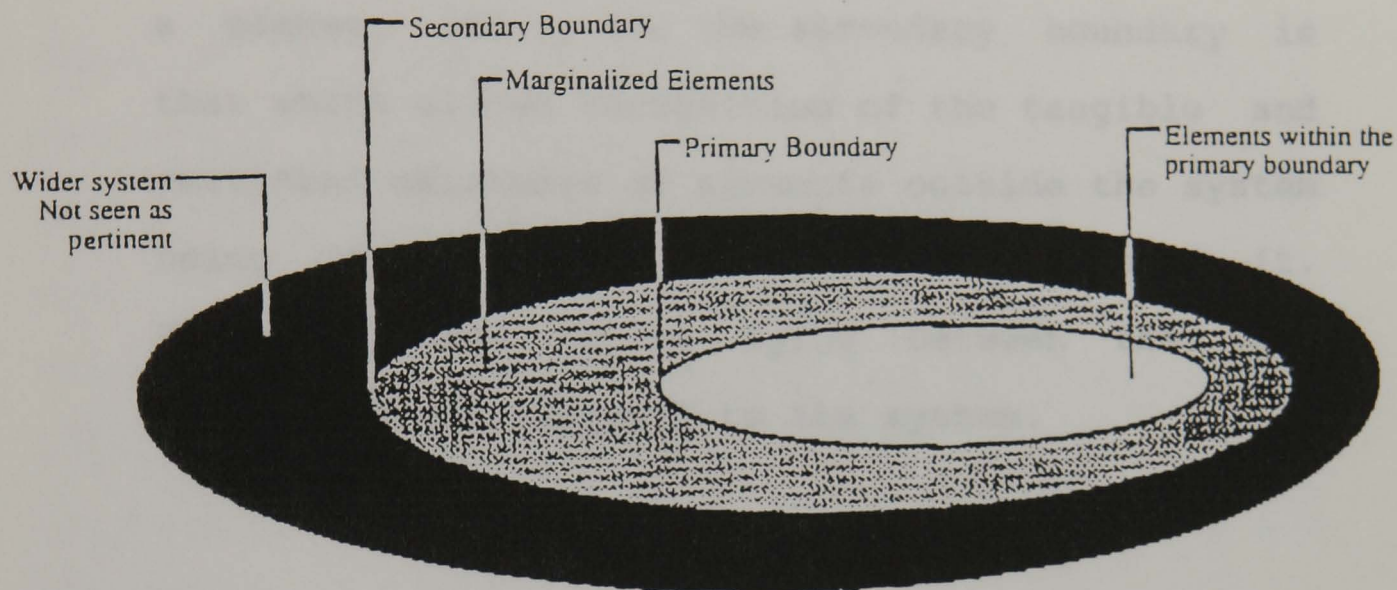


Figure 13.1 Marginalisation

We can codify this analysis in the following way:

(1) Marginalisation implies the use of more than one system boundary, even if one or more of these boundaries is being employed tacitly or unconsciously.

(2) We are therefore able to develop a systems language of primary and secondary boundaries. The

primary boundary is that which is most obvious (it might be placed around a traditionally defined organization, a particular eco-system, a society, a planet, etc.), and the secondary boundary is that which allows recognition of the tangible and pertinent existence of elements outside the system being defined that nevertheless affect it. Elements seen to be lying between the two boundaries are marginal to the system.

13.2.2 Values and Boundary Judgments

The above is a reinterpretation of the systems idea that has, of necessity, been kept relatively simple in order to introduce a new language of boundary and marginalisation. Now it is time to use this new language to build our model of the relationship between boundaries, marginalisations, ethics and the imposition of value judgments upon marginalised elements.

What I want to do is to start by looking at the tension between what I have described as the primary and secondary boundaries. To do this we will first have to

examine the relationships that exist between truth-orientated knowledge and value judgments.

There is, of course, a massive body of literature which challenges the assumption of the analytical philosophers that knowledge is value-free. In *Critical Systems*, the first writer to explore the idea that knowledge must be seen as value-laden was Ulrich (1983, 1988), who claimed that where the boundaries of analysis are drawn effects the ethical stance taken and the values pursued.

To use our example of an organizational analysis, and the question of whether people who are unemployed should be included within the boundaries of it, it is obvious that the issues that can emerge within the primary boundary (i.e., when people who are unemployed are ignored) will be different to those that can emerge if their concerns are able to be explicitly addressed.

If people who are unemployed are ignored, then (to generalise) it is most likely that issues of efficiency and effectiveness will emerge that take the status-quo

value system for granted. If their concerns are admitted into the analysis, then the status-quo value system which allows the perpetuation of their unemployment is likely to come into question.

In this sense, then, the boundaries of accepted knowledge define the values that can emerge. Similarly, the values adopted will direct the drawing of boundaries that define the knowledge accepted as pertinent. We are therefore equally justified in saying, on the one hand, that our moral choices have a basis in fact and, on the other, that the choices made between boundaries are essentially ethical or moral choices.³

13.2.3 Values and Marginalisation

I began this section of the chapter with an attempt to bring out an understanding of marginalisation as the inevitable process of consigning elements into the region between the primary and secondary boundary. Now I want to take one more step and use this analysis to build upon Ulrich's notion of the relationship between

ethical reasoning and the making of boundary judgments.

My essential concern is to show that value judgments are not only related to what is or is not contained within given boundaries, but that they are also related to what lies in the margins. Indeed, we might postulate that the imposition of a profane status upon some marginal elements might reinforce or bolster the supposed objective necessity of the primary boundary, while imposition of a sacred status might protect the secondary boundary from dissolution.

The words "sacred" and "profane" might require a little explanation. Essentially these mean 'valued' and 'devalued' respectively. This terminology has been borrowed from the tradition of anthropology, exemplified by the work of Douglas (1966), and it should be stressed that they are not meant in an exclusively religious sense but refer to the development of the 'special status' of a marginalised element, whether positive (sacred) or negative (profane).⁴

Let us make it clear how a status of sacred or profane might be imposed on marginal elements by returning to Ulrich's understanding (1983, 1988) that choice between boundaries can also involve choice between different ethical concerns. I would like to suggest that, when the primary and secondary boundaries carry different ethical implications, a tension is set up.

In our earlier example of an organizational analysis, for instance, we can see a tension between the concern for organizational effectiveness that is generated within the primary boundary of the business, and the concern surrounding employment rights that is generated by widening the analysis to the secondary boundary. At the risk of over-simplification, the two ethics in conflict might be characterised as "we should ensure our workers' survival in the market-place" versus "all people should have equal opportunities for employment".

Now, because most ethical issues and associated boundary judgments, both primary and secondary, can be said to have roots in culture (i.e., they are inter-subjectively accepted at either a conscious or an

unconscious level), we are able to find evidence for cultural reactions to the ethical tensions that arise.

These cultural reactions, I would argue, involve the imposition of value judgments on elements that are marginal to boundary definitions: i.e., marginal elements are characterised as either "sacred" or "profane". Profanity supports the primary boundary by denigrating those elements that are marginal to it. In contrast, sacredness in the margins supports the secondary boundary.

It works like this because sacredness is the 'other' to profanity, and profanity the 'other' to sacredness. Therefore, when marginal elements are seen as profane, elements within the primary boundary become sacred by implication and the primary boundary, along with its associated ethics, are reinforced. When marginal elements are seen as sacred, however, what is defined solely by the primary boundary becomes profane by implication, and the secondary boundary, with its associated ethics, comes to the fore.

This is not the end of the story however. Not only do

ethical tensions give rise to sacredness and profanity, but this whole process actually comes to be overlaid with social ritual (Douglas, 1966; Leach, 1976). Ritual can be defined as behaviour, in whatever context, that contains certain stereotypical elements that involve the symbolic expression of wider social concerns.

An observation of the presence of ritual can give us a clue as to where sacredness and profanity might lie, and hence where ethical conflicts related to marginalisation might be found.^{5,6} In order to make all this clearer, the whole process has been represented diagrammatically in Figure 13.2.

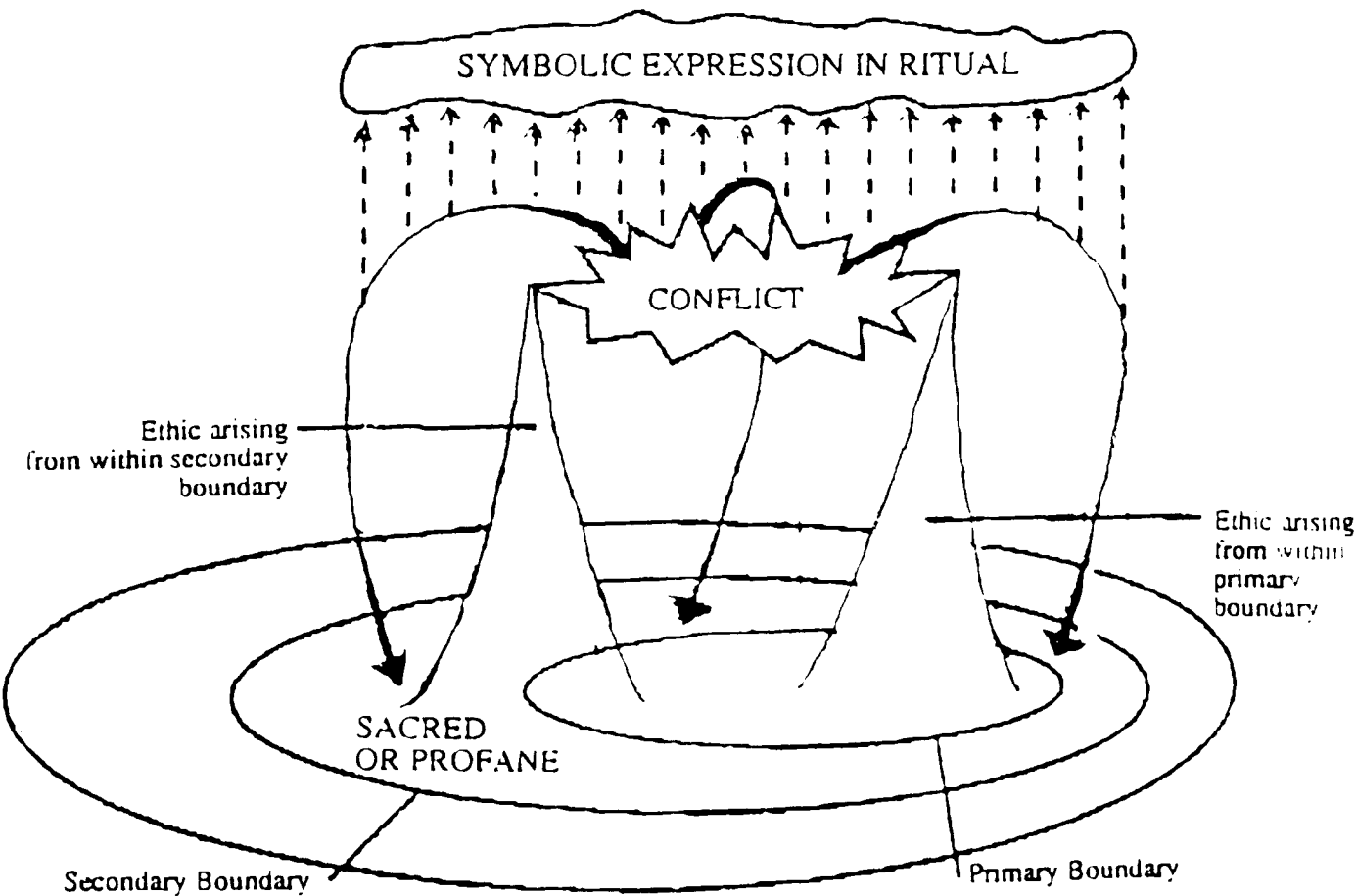


Figure 13.2 Margins, Ethics, Sacredness, Profanity and Ritual

To explain, in figure 13.2 we see one ethic arising from within the primary boundary, and another from within the secondary. These come into conflict - a conflict that can only be dealt with by making one or other of the two boundaries dominant. This dominance is achieved by making elements in the margin (between the primary and secondary boundaries) either sacred or profane. The whole process is symbolically expressed in ritual which, in turn, helps to support the total system. Here, then, we see some of the complexities of relationships between boundaries, ethics and value judgments.⁷

13.2.4 Dynamism and Complexity

Although this is in itself not a simple set of relationships, there is a dynamism and complexity lying behind the relatively static model presented in figure 13.2.

To begin with there is no absolute a priori 'starting point' for analysis. If, for instance, we were to try to treat the system boundaries as entirely static

starting points which give rise to ethical conflict, then we could have no notion as to whether marginal elements would actually become sacred or whether they would become profane.

Sacredness and profanity, and the associated dominance and suppression of system boundaries, only have meaning in relation to a history of movements within the system, and in relation to interactions between the system and numerous others. This last point is crucial.

As Douglas (1966) has pointed out, sacredness and profanity (and associated ritual) only make sense ultimately if seen in the context of the wider system: the single system with its discrete primary and secondary boundaries is an idealised, semi-dynamic model that helps us understand the principles involved in the relationship between boundary and value. In everyday life, however, we move from one system representation to another, and these will often overlap.

We might gain insight into some phenomena by using this

model, but like all models it is a means of reducing complexity. We should always remain critically aware that we live within a dynamic web of boundaries, marginalisations, ethical conflicts and value judgments, and never be tempted to regard any systems representation as an absolute.

13.3 The Profane Environment

Holding this warning in the back of our minds, it should nevertheless be helpful to use this model to clarify how and why "the environment" becomes marginalised, made profane, and then comes to be subject to (often ritual) abuse.

Let us take as our primary boundary the one that is commonly placed around the human species. Let us also take as our secondary boundary the planet as a whole. This represents the common humanist division we find between "ourselves" and our "environment". We actually see this division reflected in all sorts of classifications, such as "natural" versus "man-made", and "natural science" versus "social science".

Now, the ethic that arises from the primary boundary is pursuit of human survival and well-being, regardless of "environmental consequences": i.e., consequences that are seen as arising 'outside' the primary boundary. In contrast, the ethic that arises from the secondary boundary is pursuit of planetary survival and well-being. Of course the planetary boundary includes human beings.

These two ethics clearly come into conflict. Human well-being, defined in a manner that excludes the non-human world of which the human being is a part, allows, for instance, the indiscriminate plunder of the world's rainforests in a non-sustainable manner. Planetary well-being, on the other hand, is directly threatened by such activities: the global climate is altered and, perhaps more important in terms of planetary ecology (Lovelock, 1988), species diversity is drastically reduced.

We see quite clearly that it is the non-human "environment" that is marginalised between these two

boundaries. As the two ethics come into conflict, it is this "environment" that is in danger of being made either sacred or profane.

Now, humanism involves privileging the primary boundary and its associated ethic. Given ethical conflict, this is achieved through the social process of making the "environment" profane. To generalise, the non-human world comes to be regarded as either an untamed wilderness full of potential danger or as a "natural resource" for human control and consumption (or possibly both).

Both interpretations invite desecration, and this is seen most publically in ritual form. We engage in rituals where human beings "conquer" nature: expeditions into unexplored regions, the climbing of inhospitable mountain peaks, and the taming and exhibition of wild animals in circuses are all examples.

Similarly, use of the non-human "environment" as a "natural resource" also becomes most obvious when desecration takes ritual form: for example, when we

fence off land as "private property", carry out an LD50 test⁸ for a new cosmetic using laboratory animals, watch a bullfight or prepare a lavish meal from the carcass of an animal, we are stating that we have the right to use the marginalised non-human "environment" as we see fit.⁹

13.4 The Question of Legitimacy

This attitude to the "environment" that emerges out of the systemic assumption of humanism pervades much mainstream Western thinking.

Now, the question of the legitimacy of humanism arises because we cannot actually say that there is a real separation between "us" (human beings) and "it" (the environment). This is the inevitable conclusion that arises out of our discussion in Chapter 10 of the interdependencies we are now experiencing between notions like ecological harmony, social justice and individual freedom.

Indeed, in Chapter 10, we showed how the perpetuation of a number of discourses (for example, economic growth and automation) lead to the social destruction of ecological harmony. These discourses are essentially humanist in their boundary assumptions: for example, the economy is seen to "grow", but it is generally not appreciated that this growth can only happen if we suck "resources" in from outside the boundary of our human economy.

If the separation humanism invokes can indeed be described as an artificial one, then we are entirely justified in saying that the (often ritual) abuse of the non-human is not merely "environmental" - it is just as much self-abuse. Our "selves" are, of course, wider than the uncritically privileged boundaries of our human bodies.

If the uncritical privileging of the human boundary is the defining feature of humanism, and this inevitably gives rise to abusive action, then, I would suggest, we must take a moral stand against its legitimacy. The alternative already identified - one that is consistent with our wish to promote, rather than destroy,

ecological harmony - is an ecological perspective that allows us to centre or decentre ourselves as appropriate.

13.5 Knowledge-Constitutive Interests Revisited

Having explored some of the problems of humanism, we are now in a position to return to Habermas's theory of knowledge-constitutive interests (1972). This is, I would argue, irredeemably humanist. In particular, we can identify a major assumption Habermas makes which indicates that he has indeed privileged the human boundary uncritically.

Habermas's major assumption is that the three interests are indeed human interests. He is quite explicit about this, stating that his theory is "anthropological". The interests emerge from the need for human beings to work (to predict and control their environment), to co-operate in working (to move toward consensus through communication), and to free themselves from oppressive power relationships (to reveal "distortions" in

communication that serve to perpetuate situations that are against our interests).

If, however, we accept that the human boundary does not necessarily have to be seen as the origin of our interests, we can develop an alternative scenario. Yes, it would appear that human beings have to be present for there to be interests in the first place, but these interests may actually be seen as emerging from wider system boundaries that embrace more than the human. We could, for example, suggest that the planetary boundary is a more appropriate one to use.

The implications of such a scenario are profound. Perhaps the most important is that the technical interest can no longer be seen as representing a human need to predict and control the environment. Moving to the planetary boundary would suggest that the technical interest - if it is still legitimate to use such a term - is concerned with action to promote ecological harmony.¹⁰

Given that Habermas (1972) talks about specifically human interests, and about human beings predicting and

controlling their "environment", we cannot help but conclude that his theory of knowledge-constitutive interests is indeed intrinsically humanist.

As I have already argued, uncritically privileging the human boundary leads to a marginalisation of the "environment" and the attribution of a profane status to it. An abusive relationship with the non-human "environment", which is just as much self-abuse as abuse of the "other" given that human beings are most appropriately seen as part of wider systems, cannot help but ensue.

If humanism lacks legitimacy given our current awareness of ecological interdependence, and Habermas's theory of knowledge-constitutive interests (1972) makes humanist assumptions, then I would suggest that it is inappropriate for use as an epistemological underpinning for the Critical Systems notion of pluralism.

13.6 Conclusion

It would appear that we have no choice but to abandon the theory of knowledge-constitutive interests despite the fact that, on the surface, it would appear to be logically consistent with Critical Systems Thinking. Our task in the next chapter will therefore be movement toward the identification of a possible alternative.

Notes

1. In saying that our planet is an organism, Lovelock (1979, 1988) makes it clear that he is not suggesting the Earth is "alive" in the same sense as a human being, an anteater or a bacterium. Nevertheless, the Earth has similar organismic characteristics, such as the ability to self-regulate. The word "organism" is used, it would seem, as a metaphor.

2. Throughout this chapter I have placed the word "environment" in inverted commas. This is because "environment" essentially means "that which surrounds". The term "environment" therefore already assumes a

boundary around something that is being surrounded; in relation to our current discourse this 'something' is the human species. The inverted commas signal a recognition that talking about the "environment" as a generalised entity betrays a humanist assumption in language.

3. The relationship between boundary (an aspect of truth) and value (rightness) is an essentially systemic one. It would be a nonsense to say that either one should be seen as an absolute a priori. Nevertheless, while we may paint a meta-theoretical picture of the interdependence of boundary and value, in the actual process of thinking we move between "worlds" of truth, rightness and subjective understanding (See Chapter 14 of this thesis as well as Midgley, 1990c, 1992b). In practice, then, we talk in terms of the origin of a particular value or ideology lying in 'the system', or a system boundary as having a particular ideological root: the notions of origins and roots in everyday thinking are essentially bound to the rationality of the moment and, following their emergence, should ideally become available for critique. When theories of

origin become ossified, whether these be theories of the natural world (e.g., evolution, creation, the 'inalienable' laws of physics) or theories of ontology or epistemology (e.g., that any of the natural, social or subjective "worlds" has an absolute a priori status) then critical thinking inevitably becomes limited.

4. The choice of the words "sacred" and "profane" is deliberate. Although I could have employed a more 'neutral' or secular terminology such as 'valued' versus 'devalued', this would have left me open to the accusation of perpetuating an artificial Western distinction between the secular and religious (with language associated with the secular being better respected in academic circles). In terms of the relationships between boundary, value and ritual, I believe that the same processes operate whether they be classified as religious or secular. Also, the more emotive language of sacredness and profanity better conveys the urgency of addressing some of the problems that can be seen to arise through marginalisation.

5. Of course sacredness and profanity, with their associated rituals, can also be seen to flow from other

sources not traditionally described in systems terms. For example, Douglas (1966) and Leach (1976) both offer interesting examples of danger that is seen to arise in the margins of categorisations: Douglas's analysis of the Abominations of Leviticus is particularly interesting for the way it explains the Biblical proscription of certain meats on the basis that the animals from which they are derived infringe the God-given categorisation system which animals, birds and fish should conform to in order to be considered holy. Although we often refer to a series of related categorisations as a "categorisation system", this is not systemic in the same sense as I have used the term, and hence the analysis presented in this paper should be seen as complementary to anthropological analyses and not in competition with them. Indeed, exploration of the mutual reinforcement of categorisation systems and boundary judgments will hopefully prove a fruitful further avenue for research.

6. It must be emphasised that it is ethical conflict in relation to marginalisation that is the key to understanding sacredness and profanity here. Where

consideration of primary and secondary boundaries do not give rise to obvious issues of rightness, then sacredness and profanity will not come to the surface of consciousness, although they might nevertheless be acted out unconsciously. This is perhaps why so many 'natural' scientists still claim that knowledge and boundaries can be regarded as value-free: they see no rightness implications in the choices they make between system boundaries in their areas of interest. There is both a validity and a legitimacy problem here. All choice involves judgments of right and wrong (Habermas, 1976a), including choices between boundaries, so the argument for value-neutrality is invalid unless one dispenses with the notion of choice itself. Also, we have recently come to realise that the way we look at the ecology of the natural world has very definite implications for what we judge to be right and wrong socially (see, for instance, Chapter 10 of this thesis), so the continued legitimacy of the argument for value-neutrality in terms of being able to support a viable social system must also be brought into question.

7. Flood (1990a) has introduced Foucault's theory of

power and knowledge into the discourse of Critical Systems Thinking. Foucault (e.g., 1980) sees an intimate relationship between power and knowledge in that each is a meaningless concept without the other. Indeed, power is expressed in the rise of some knowledges into positions of dominance and the subjugation of others. In many ways, then, the processes identified in this part of the thesis complement Foucault's understanding by providing some further explanations of the 'mechanisms' by which some knowledges and ethics achieve dominance while others come to be suppressed.

8. "LD50" is short for "lethal dose, 50%". All drugs and cosmetics using previously unutilised ingredients have, by law, to be force fed to animals (usually rabbits) until 50% of them have died.

9. It is no wonder, then, that so many people in the Green movement write about the beauty of walking (e.g., Kumar, 1992), and so many others espouse vegetarianism. The value of the secondary boundary, and its associated ethic that promotes planetary well-being, is threatened

by marginalisation of the "environment" and the designation of everything non-human as profane. A natural defensive reaction is to make the "environment", or aspects of it such as land and non-human animals, sacred.

10. One could argue that part of the problem here is that Habermas has based his humanism on an implicit acceptance of neo-Darwinian evolutionary theory. In Chapter 11 I followed Ho (1989) in arguing that the idea of species in competition does not take on board the interdependent relationships we can find between "organisms" and their "environment". It is as valid to say that the organism helps to create the environment as it is to say that the environment establishes conditions which the organism must adapt to.

CHAPTER 14: TOWARDS AN ADEQUATE ONTOLOGY

We have established that, for Critical Systems Thinking to be credible, we require some exploration of the philosophical assumptions that underpin the notion of pluralism. This is because the different methods we draw upon in pluralist research assume very different things about "reality" and our knowledge of it. In other words, we must discover a form of underpinning that will allow us to harmonise our use of the different methods so as to remove philosophical contradiction.

We have also established that Habermas's theory of knowledge-constitutive interests (1972) is adequate to the task of underpinning the Critical Systems notion of pluralism. However, we must raise questions about its legitimacy in the light of our wish to promote ecological harmony. Such questions arise because of the fundamentally humanist assumptions Habermas makes.

Our task in this chapter is to identify an alternative. Such an alternative must be discovered otherwise our understanding of pluralism will inevitably founder upon

the rock of contradiction.

14.1 From Epistemology to Ontology

Habermas's theory of knowledge-constitutive interests (1972) is an epistemological theory. It claims to tell us something about what we can know. It is interesting to note, however, that in the late 1970s and early 1980s Habermas began to abandon his work on epistemology in order to focus upon ontology - the study of what is [see, for example, Habermas (1976a)].

Giddens (1985) notes that Habermas did not say why he changed his emphasis, and has never made any attempt to relate his epistemological and ontological theories together.

In the absence of any clear explanation, it seems reasonable to suggest a possibility. We should note that all epistemological statements inevitably involve ontological assumptions. If we talk about knowledge, we should not try to avoid discussing the "reality" this

knowledge appears to be part of.

As Fuenmayor (1991a) points out, the relationship between ontology and epistemology is circular: even "reality" is only knowledge of reality, although this knowledge always seems to be part of something "real" (which, of course, is itself only knowledge of what is real). Perhaps Habermas, already being of a mind to favour a theory of the communicative construction of reality (1972, 1976a), decided that epistemology might most usefully be seen as an aspect of ontological exploration.

This is certainly my own feeling, which is why, in this Chapter, I intend to focus upon ontology rather than epistemology in order to try to develop an adequate philosophical underpinning for our notion of pluralism that can be considered legitimate, as well as logically consistent, given our current ecological concerns.

It is important for me to acknowledge that I am only at the beginning stages of this ontological exploration. As such, the material presented here will no doubt undergo further clarification as my thinking develops.

Although I cannot say that these ideas are perfectly formed as yet, I do believe that the line of reasoning I have pursued here shows some promise.

14.2 The Limits of Ontology

Let us begin, then, by clarifying what we will not be doing in conducting an ontological exploration. We will not be stepping beyond discourse, even though we might recognise that there is more to reality than discourse alone.

In order to understand why this is the case we need to follow Heraclitus (approximately 600-500 BC) who declared that the fundamentally interconnected nature of the Universe is simply not accessible to human rationality. It can only be accessed when language is by-passed: "when you have listened, not merely to me (the speaker), but when you maintain yourselves in hearkening attunement, then there is proper hearing"¹.

Heraclitus talked about the Logos. At the risk of

making a slipshod translation into modern systems language, the term Logos can be said to refer to the ultimate reality of interrelation and change that binds absolutely everything together into a dynamic, unfolding process. When we see and think, Heraclitus felt, we can only ever be aware of a tiny part of the picture, and the image we have of reality is distorted by our static classifications and the bounded nature of our vision.

The Logos, then, escapes adequate description. Consequently it also escapes any possibility of total rational justification. The everyday interconnectedness we have empirical knowledge of is not the ultimate interconnectedness of reality. As far as our everyday thinking goes, the Logos cannot be known; it can only represent an ideal that reminds us that no boundary is absolute.

If the Logos escapes description, it might seem that the only adequate vision of ontology is one which dispenses with language and thought in the exploration of reality. Indeed, this is what some people writing from a spiritual tradition [e.g., McBurney (1990)] have

claimed.

However, I would have to argue that ontology is, most basically, concerned with discourses about reality. It is not about "experiencing" reality through spiritual enlightenment. This is not to say that such experiences are invalid - just that ontology consists of statements and arguments about reality. Even the writings of spiritual visionaries like Krishnamurti (1991), beautiful though they are, are essentially discursive: they guide one down a spiritual path.

Indeed, McBurney (1990) recognises the irony of trying to describe the indescribable. Perhaps, as Wooliston (1992) argues, when McBurney advises the abandonment of conceptual thinking he is actually pointing to the gaps between the words - looking toward the "other" of language that defines, and is in turn defined by, its limits. If so, then McBurney's thinking is doubly ironic, if no less inspiring for that.

It seems that an adequate ontology will inevitably be based in language. It will be a series of statements

about reality, crystallising elements that, in some sense, will appear to be useful in helping us to understand where we are. "Usefulness" can, of course, only be judged in terms of other discourses: in this case our discourses of interdependence, pluralism, and ontological complexity.

Given that we will be making discursive claims about reality that we know are inadequate in the face of the Logos, but nevertheless seem to be useful, we need to ask which elements we should be focusing upon.

14.3 Three Paradigms of Ontological Thought

We can turn for inspiration to some of the ontological claims that have been made in the past. A review of the literature suggests that three broad paradigms of thought have been developed².

First, we have authors who take a realist line. Essentially, these thinkers claim that there is a world "out there", independent from the observer, that we make reference to even if our knowledge of it can never

be perfect. Realists maintain that all language and action is directed toward something or other, so refusing to talk about independent reality makes no sense. Realism is, in a way, a "common sense" view of the way things are, although a sophisticated philosophical tradition has been developed to support it. Recent writers in this tradition include Popper (1972) and Bhaskar (1978, 1979, 1986, 1989).

Second, we have authors in the tradition of Berkeley (1710) and Kant (1787) who take an idealist position. These writers believe that reality is constituted by subjective knowledge. Kant, for example, talks in terms of the "transcendental subject". Idealists point out that, were we not here, the very notion of "reality" would simply disappear. How, then, can we say that "reality" is independent of human knowledge?

The third paradigm, although having roots in idealism, moves away from "subjective knowledge" to focus upon the normative construction of both "external" reality and "internal" understanding. Here, all our knowledge of what is, and what we are, is said to have its

origins in the social rules and forces that govern the production and reproduction of knowledge.

A particularly fascinating writer in this tradition is Foucault (e.g., 1972). Foucault advances the thesis that power and knowledge come to be intimately related in the evolution of everyday discourse. According to him, it is in the process of conducting day to day human communications that knowledges rise and fall, come to dominate or come to be suppressed according to the patterns of existing power relationships. Furthermore, it is these knowledges that actually shape the patterns of power themselves. Therefore Foucault claims that the very concepts of power and knowledge are meaningless if considered independently from one another [Foucault (1980)]. For Foucault, there are no absolute truths and no essences of self - there is only power working through discourse to constitute "truths" and "subjectivities".

Of course this is just one view of the 'mechanism' of normative construction. Another contrasting view can be found, for example, in Habermas's theory of communicative action (e.g., 1984a,b), touched upon in

Chapter 6.

We can now try to bring the best of all three perspectives into a new, multi-faceted paradigm to arrive at an adequate vision of ontology that will not exclude the most important insights of any one of them.³

At first sight this would seem to be an impossible task because of the supposedly "fundamental" differences between them. Realists, for example, tend to describe both normative forces and subjectivity as emergent properties of object relations.

Idealists, on the other hand, view both object relations and normative forces as relative to subjectivity. This is the case with early idealists, although it could be argued that later idealists blur the 'boundary' between the normative and subjective.

In contrast to both these positions, those who focus upon social rules and forces talk about both object relations and our understandings of self as normatively

constructed through a knowledge/power network, or a socially shared classificatory system.

In order to construct a new, multi-faceted paradigm we will need to preserve the essential elements of the above positions. I would suggest that the first step toward achieving this can be taken by contextualising possible uses of these essential elements within a theory of the process of thinking. This will involve an "alignment" of the three ontological paradigms with three uses of their essential elements.

By suggesting that these elements are complementary in some respect we will have removed them from their original paradigms which are, of course, incommensurate with one another; we will have moved them into our new paradigm.

Such a theory of the process of thinking will have to acknowledge that thought has a time dimension. Thus the use of any one of the essential elements of the three positions becomes a "moment" of thought. From there we will be able to take a further step toward a new vision of ontology by considering the implications of each

kind of "moment" for an adequate statement about "reality".

So, where can we look for inspiration to construct such a contextualisation? Possibly in the writings of Habermas (1976a) - although, for reasons to be touched upon later, his ideas might require a little reworking.

14.4 Habermasian Thought

Habermas (1976a) has developed a particularly interesting vision of ontology based upon an analysis of rational argumentation. He claims that there are four implicit validity statements inherent in any sentence intended for communication. Giddens (1985) summarises his position neatly:

"When I say something to someone else, I implicitly make the following claims: that what I say is intelligible; that its propositional content is true; that I am justified in saying it; and that I speak sincerely, without intent to deceive".

The first of these implicit claims, that what I say is

intelligible, is simply a precondition for effective communication. However the other three, when made explicit, can all be questioned and justified through rational argumentation.

It is these three claims that refer directly to three "worlds": the claim that my statement's propositional content is true relates to what is thought of as the external natural world; the claim that I am justified in making it relates to our social world; and the claim that I speak sincerely relates to my internal world⁴.

Habermas makes it clear, however, that these three "worlds" are bound together intimately - they are actually only extricated from one another through the functioning of 'good' rational argumentation⁵.

We are saying, then, that it is possible to make, and challenge, truth statements, rightness statements and statements about an individual's subjectivity. There are therefore three domains of rationality. The first is the world of object relations (where inquiry is primarily truth-orientated), the second is the world of

normative value judgments (where inquiry is primarily rightness-orientated), and the third is the internal world of the individual (where inquiry is primarily orientated toward understanding subjectivity)⁶.

We are not, however, able to access all three domains of rationality at the same moment in time. We are limited to thinking about "reality" in terms of a series of issues, moving from one related issue to another.

14.5 Implications for an Adequate Ontological Statement

Habermas's ontology appears to bring the essential ingredients of our three paradigms of ontological thought (object relations, normative forces and subjectivity) together in one new paradigm.

However, in grounding this vision in communication, Habermas gives language and argumentation an a priori status. In effect, language and argumentation represent his "reality", and the three "worlds" he identifies are merely extrapolations from it. To me this is rather

problematic because the existence of argumentation seems to presume, for example, the existence of beings who argue.

In one sense I can see why Habermas hesitates in making an ontological leap from argumentation to the existence of beings who argue. It fits with his wider understanding of the "life-world". The life-world, according to Habermas (e.g., 1984a,b), is the totality of shared understandings that language refers to. It is the existence of the life-world that makes communication possible.

This is a development of Wittgenstein's idea (1958) that language does not refer to external reality, yet is necessarily conditioned by it. Giddens (1991) offers a useful summary of Wittgenstein's position:

"There is a universally experienced world of external reality, but it is not directly reflected in the meaningful components of the conventions in terms of which actors organise their behaviour. Meaning is not built up through descriptions of external reality, nor does it consist in semiotic codes ordered independently of our encounters with that reality. Rather, 'what cannot be put into words' - interchanges with persons and objects on the level of daily practice - forms the necessary

condition of what can be said and of the meanings involved in practical consciousness.

To know the meaning of words is thus to be able to use them as an integral part of the routine enactment of day-to-day life. We come to know reality not from perceiving it as it is, but as a result of the differences formed in daily practice".

In the light of such a philosophy, Habermas's refusal to make an ontological statement that stretches beyond language and argumentation does make some sense. To move from argumentation to the existence of beings who argue would be to risk speaking about something we can have no knowledge of. That is, the external reality of those beings.

Nevertheless, I would argue that such ontological statements are less problematic than they might at first appear. If we follow Wittgenstein in accepting that nothing we describe is a direct reflection of external reality, then this must include all descriptions contained within ontological statements. Whether we focus upon language and argumentation or something beyond this, we are still not talking about "ultimate" reality.

There is therefore no need to stop with the (surely counter-intuitive) position that language and argumentation represent an ontological a priori. The posited existence of argumentation is itself merely a truth claim that can be anchored with reference to a wider set of truth claims about "reality".

So, let us make a statement about "reality" that has been extrapolated from Habermas's thinking:

"Reality" is constituted by objective phenomena ("objects", "systems" and "relations"), many subjectivities, and power (expressed in the evolution and use of normative rules). All three (objective phenomena, power and subjectivity) are absolutely and inextricably interdependent.

This requires a little explanation, especially with regard to the notion of an interdependence between objective phenomena, power and subjectivity. We can, in fact, show how each of these is dependent on the others. So, in all, six dependencies can be revealed (although to reveal them in the form of a linear

argument is inevitably rather artificial):

First of all we have to acknowledge that "objective phenomena" rely for their recognition upon the presence of sentient beings. We must ask, then, "what are the conditions for recognising something as objective?". In order to be described as "objective" rather than "subjective", it must be assumed that these phenomena are appreciated by more than one sentient being - i.e., more than one subjectivity⁷. This is the case because "objective" is the other to "subjective", and "subjective" presumes a single subject. The first dependency is therefore revealed: recognition of objective phenomena depends on the existence of multiple subjectivities.

Furthermore, in order for these beings to realise that this is the case, they must be able to communicate. Communication presumes the evolution of a normatively accepted set of rules (a language), and it is just such rules that I have defined as constituting power. Here we see the second dependency: the recognition of objective phenomena depends upon the operation of power.

Now, we have noted that power presumes the evolution of normatively accepted rules. Evolution means change, and change can only come about if there are different perspectives (i.e., subjectivities) impacting upon these rules. If normative rules required no active development by their users, then no changes in shared knowledges could occur. Shared knowledges and normative rules (most especially rules for communication) are intimately linked because even the use of words to express knowledge requires the acceptance or evolution of rules to define what these words might mean. The fact that we can identify changes in shared knowledges, rules, and therefore power relations, shows us where the third dependency lies: the operation of power depends upon there being subjectivities impacting upon it.

If there are indeed many subjectivities, then we have to ask "how can this be?" What conditions could give rise to differences between subjectivities? The answer, I would suggest, is that subjectivities are localised in time and space - in the domain of objective

phenomena - so that (inevitably limited) perspectives differ from one another⁸. Here, then, we have the fourth dependency: the existence of multiple subjectivities depends on there being objective phenomena.

Now, in arguing that the existence of objective phenomena depends on the operation of power, I suggested that in order for subjects to share the realisation that there are objective phenomena, they must be able to communicate. Communication relies upon a normatively accepted set of rules (a language), and it is just such rules that constitute power. However, we can also say that, in order for subjects to share the realisation that they are actually subjects (and that there is more than one subject), they must similarly be able to communicate. Therefore we are in a position to reveal the fifth dependency: the existence of multiple subjectivities also depends upon the operation of power.

So, there is only one possible dependency left. Given that the operation of power depends upon the existence of multiple subjectivities impacting upon it, and the

existence of multiple subjectivities depends on there being a realm of objective phenomena, we have to say that the operation of power also depends on there being a realm of objective phenomena so that subjectivities can be separated across time and space in order for them to have their impact upon it.

Here we see the intimate interdependence of objective phenomena, power and subjectivity, albeit described using a restrictive linear language.

We need to reiterate, however, that we cannot deal with all of these simultaneously during the process of argumentation: we make and challenge statements orientated toward the ideals of truth (about objective phenomena), rightness (about what should be normatively accepted), and subjective understanding (about the orientation of a particular subjectivity) in a linear fashion. It therefore seems to me unsurprising that so many writers have sought to prioritise one of these aspects of "reality" and have then reduced the others down to emergent properties of it.

Hence we have the three seemingly opposed viewpoints (realism, idealism and normative constructivism), each reflecting the dominance of one particular facet of "reality". In consequence, as I shall argue in more detail soon, we also have the emergence of isolationist paradigms of scientific inquiry which try to make one of the three ideals (truth, rightness or subjective understanding) dominant.

14.6 The Limits of Human Expression

Before we reflect upon this vision of ontology in the light of our understanding of the ecological perspective outlined in Chapter 13, let me reiterate once again, in order to be absolutely clear, that the ontological statement I have made does not describe "ultimate" reality. It will be seen to have meaning, however, in terms of the discourses we are concerned with in this thesis.

We have identified three broad paradigms that focus upon the constructive power of object relations, subjectivity and normative forces. This statement

brings the essential elements of all three into a description of "reality".

By declaring that this ontological statement gains its meaning from its relationship with other discourses, rather than from "ultimate" reality in any direct sense, we are acknowledging that all statements (which are necessarily embedded in the conceptual realm) are inadequate to describe that reality.⁹

14.8 Beyond Humanism, Toward an Ecological Perspective

Let us stop for a moment and reflect once more upon the assumptions this vision of ontology makes in terms of the humanist/ecological distinction outlined earlier. You will remember that the purpose of developing this ontology was to move us beyond the humanist perspective underpinning Habermas's theory of knowledge-constitutive interests (1972).

Habermas (1972) makes the assumption that interests flow from bounded human beings who need to predict and

control their "environment". In contrast, I am following Habermas's later work (1976a) which talks about making, and arguing over, truth statements, rightness statements and statements about subjective understanding. According to Habermas, these reflect three "worlds": the external natural "world", the normative social "world" and the internal "world" of the individual.

This would appear to move beyond humanism because, in making truth statements, one can be critical about the boundaries one adopts. The human boundary need not be privileged automatically.

However, as I noted earlier, Habermas's vision (1976a) is grounded in an a priori theory of language and argumentation which, I would suggest, has not been recognised for what it is - an ontological theory. The notion of argumentation as ultimate reality appears somewhat counter-intuitive to me. After all, who is doing the arguing?

We have seen how, in Habermas's terms, refusing to specify who is doing the arguing does make some sense,

given that he is pursuing a development of Wittgensteinian theory. However, if we accept my earlier argument that Wittgenstein's position is not actually compromised by specifying elements of "reality", then we begin to wonder what is being passed over when Habermas fails to say who it is that argues.

Could it be that it is always human beings who argue after all? In which case, the humanist assumption of a privileged human boundary might be there, lurking uncritically in an area which Habermas refuses to speak of.

However, when we move out of the communicative paradigm by suggesting that "reality" is more than communicative, and is actually constituted by the trinity of objective phenomena, power (expressed in the evolution and use of normative rules) and subjectivity, we bypass this potential problem.

It is possible to specify that a human being, or a group of human beings, gives rise to (or argues with) a statement. It is equally possible to suggest, however,

that a statement or argument has a wider origin. Yes, human beings need to be present, but the privileged boundary for understanding the origins of a statement or argument could be local, regional, cultural, societal or even planetary.

We should note that even "subjectivity" - one of the constitutive elements of "reality" - does not necessarily presume the privileging of a human boundary. Given our acceptance of the fact that the boundary between human beings and their "environment" is only one of many possible boundaries that can be privileged, a subjectivity can be seen as rooted in any boundary containing a person. This boundary might be the person's body, it might be their society, their immediate environment, their country, or (again) even the planet.

We see quite clearly that this vision of ontology overcomes the bonds of humanism that tied the early work of Habermas. It does not prevent the use of a human boundary, but refuses it any a priori privilege. It is therefore consistent with the ecological perspective outlined in Chapter 13.

14.9 Ontology and Ontological Complexity

We now have the beginnings of an ontological vision that, I would argue, promises to be both credible in terms of internal logic, and legitimate given our current ecological concerns.

In the next chapter I intend to return to the main theme of this thesis, methodological pluralism, in order to show how this vision of ontology might underpin it. However, before rounding this chapter off, I need to deal with one final issue.

In Chapter 10 I introduced the notion of ontological complexity. This is the understanding that complexities of the objective natural "world", the normative social "world", and our subjective inner "worlds" come together to form a meta-level complexity - an "ontological complexity" - that we have to deal with in our inquiries.

This is important because so many of the issues we are dealing with today, especially global issues, are characterised by a complex interdependence between what we see as ecological truths, ways in which groups of people think it is right to behave, and individual perspectives that impact upon both of these.

To refresh our memories, we left Chapter 10 with an acknowledgement that the term "ontological complexity" would be taken as given, but would be fleshed out later in the thesis. It is time to do this now. In particular, I need to explain why I have called this complexity "ontological".

Our meta-level complexity can be described as "ontological" because, in trying to deal with interdependence between the various realms of complexity through conceptual rationality, we inevitably concentrate upon the relationships between truth statements, rightness statements and statements about subjective meaning. These statements reflect the three constitutive elements of "reality" in our ontological discourse: object relations, power (expressed in the evolution and use of normative rules)

and subjectivity.

Thus our discourses of ontology, ontological complexity and ecology become enmeshed together. We have a vision of "reality" that is constituted by objective phenomena, power and subjectivity (see earlier in this chapter); an understanding of complexity that focuses upon meta-level relationships between these constitutive elements as they come to be separated out through rational thinking (Chapter 10); and an emerging ecological perspective that requires both the possibility of decentring human beings (Chapter 13) and the inclusion of normative and subjective concerns alongside explorations of objective phenomena (Chapters 10 and 11).

14.10 Conclusion

Here I have begun the task of developing a vision of ontology that is consistent with the critical ecological perspective outlined in Chapter 13, and which clarifies the notion of ontological complexity

introduced in Chapter 10.

In the next chapter I will be in a position to focus once again upon the central theme of this thesis, methodological pluralism, in order to show how the vision of ontology presented here might help us understand systems practice and deal with some of the philosophical problems raised by bringing ideas from so many diverse paradigms into one new home.

Notes

1. Translated from Greek into German by Heidegger (1954), and from German into English by Krell and Capuzzi (1975).

2. Let me acknowledge that, in reducing all writing on ontology down to three paradigms, I am riding roughshod over the intricate arguments that have been played out in the literature. No doubt there are philosophers who would argue for defining a multitude of paradigms, but here I am talking about clarifying three meta-paradigms.

3. I am presuming here that such a new, multi-faceted paradigm would be useful. In contrast, Woolliston (1991c) sees no need for one: he talks in terms of a "unity of difference" being provided by the localised act of focusing upon what is supposedly incommensurate. Woolliston's perspective provides an interesting counterpoint to my own, and is worth exploring. Ultimately, however, I do not see Woolliston's view as incompatible with the ideas expressed in the current paper because I am not holding up this new paradigm as an absolute first principle. Essentially, because I acknowledge that paradigmatic statements about ontology are discursively true, rather than "true" in an absolute sense, I regard the multi-faceted paradigm I am developing as useful in relation to other discourses we are currently dealing with: i.e., those surrounding the notions of pluralism, complexity, interdependence and the future of systems science. It therefore has a "local" significance (in both time and space), even when our discourses are about "global" issues!

4. We should note that Habermas drew upon, and adapted,

the work of Popper (1972) when developing his "three worlds" idea.

5. Although I am drawing upon the work of Habermas here, I feel that it is important to state my own, very different, view of what 'good' rational argumentation is. Habermas (1984a,b) says that 'good' argumentation is to do with extricating the three "worlds" from one another in any analysis. Some cultures, he maintains, have a prevailing "world view" which collapses two or more of the "worlds" together. For instance, the rights and wrongs of social relationships might be seen as an extension of nature in some cultures because the dominant view of both is governed by some form of myth. What is considered right is therefore taken for granted because of what is considered to be true, and both are "solidified" in myth. Habermas believes that such "world views" represent an intrinsic restriction of 'good' rational argumentation: "myth binds the critical potential of communicative action, stops up, so to speak, the source of inner contingencies springing from communication itself" (Habermas, 1984b). In contrast, I believe that what constitutes 'good' argumentation has to be defined in the context of other discourses we

regard as important. It is therefore possible for us to claim that, in some contexts (e.g., when we are dealing with complex global issues), extricating the three "worlds" from each other might be necessary, while in others it might not be. We therefore escape Habermas's inevitable conclusion that forms of rationality other than the most "advanced" Western rationality must in some sense be "poorer".

6. An example of systems practice that is explicit about the use of Habermas's three domains of rationality has been described by Fairtlough (1989).

7. It should be noted here that subjectivity and consciousness are not synonymous: a person's subjective perspective includes far more than they are consciously aware of.

8. Of course even time and space, like any other "objective phenomena", depend for their recognition upon the existence of multiple subjectivities and power (expressed through the evolution and use of normative rules), so we have not escaped into a simple

ontological realism here.

9. We also have to acknowledge that the ontological statement presented here entails a further "inadequacy". We have noted that we have no choice but to deal with "reality" in terms of a series of issues, moving from one related issue to another, because we cannot think about truth, rightness and subjective meaning simultaneously. Obviously human linguistic expression is severely limited, and there is an immense irony in recognising this limitation. While I have made an ontological statement about the way that objective phenomena, power and subjectivity constitute reality together, this is explicitly a truth claim. It asks us to focus on its propositional content, referring to the "world" of object relations, to the (hopefully temporary) exclusion of the values it presupposes and its subjective meaning, which remain implicit. This is ironic because, although I have claimed that the three are absolutely interdependent in constituting reality, one cannot even express this interdependence in an ontological statement without focusing upon just one aspect of that reality! This is, as we have seen, a function of the linear nature of language. All we can

do, as I have done to an extent in this paper, is make a statement (in this case a truth statement about "reality") and then go on to raise the issues that have been made implicit by this - in this case the rightness of the statement in terms of other discourses (pluralism, ontological complexity, etc.), and its possible subjective meanings.

CHAPTER 15: ONTOLOGY, PLURALISM AND LEGITIMATION

It is now time to return to the main theme of this thesis. I need to show how the vision of ontology I have evolved might underpin our understanding of methodological pluralism.

Following this we will be in a position to link all the various issues pursued so far in Sections 2 and 3 of this thesis: a multi-faceted ontology, ontological complexity, critical ecology, the ideal of the unity of science, and methodological pluralism. In summary, we will be able to conclude that pluralism is actually essential for the continued legitimation of systems science.

15.1 Ontology and Pluralism

Let us begin by demonstrating how the vision of ontology evolved in the last chapter might underpin our notion of pluralism.

I have suggested that, reflecting our three

constitutive aspects of "reality" (objective phenomena, power and subjectivity), are three ideals of inquiry: "truth", "rightness" and "subjective understanding".

Pursuit of the ideal of "truth" means trying to gain as 'accurate' a knowledge as possible about objective phenomena; pursuit of the ideal of "rightness" means trying to use the most appropriate normative rules (it is the evolution and use of such rules that constitute power), and pursuit of the ideal of "subjective understanding" is about gaining as clear a picture as possible of a particular subjective perspective.

Now, if "truth", "rightness" and "subjective understanding" are all legitimate ideals to aim for, and we acknowledge the fact that all methods designed so far prioritise one ideal over the others, then methodological pluralism becomes essential if we are to address ontological complexity adequately.

Of course, the above paragraph hinges on the words "all methods designed so far prioritise one ideal over the others", so let us look at this assertion a little more

closely.

What we find when we begin to look at methodology is that different research methods do indeed emphasise the use of these ideals of "truth", "rightness" and "subjective understanding" in different ways. There is therefore a direct link between our vision of ontology, the three ideals of inquiry, and research methodology. We can consider some examples. Over the coming pages I will look at both "hard" (positivistic) and "soft" (interpretive and emancipatory) systems methods to show how these ideals are pursued¹.

15.2 Hard Systems Methods

Hard (positivistic, quantitative) methods can be divided into those which are "summative" and those which are "formative". This distinction comes out of the evaluation literature.

Summative methods are those which involve presentation of findings in the form of a report as the sole means of communicating the results of research. Formative

methods, on the other hand, are generally conducted in organisations and involve an ongoing, dynamic relationship between the researcher and the researched, where each inform and shape the practice of the other.

15.2.1 Summative Methods

We can begin with summative methods. These try to reveal what the subject of investigation 'is really like'. In other words, their primary purpose is to pursue the ideal of truth. In this pursuit of truth, the value system giving rise to the initial selection of variables is not up for analysis. Indeed, it is often ignored completely. We therefore find many summative, hard systems methods described in the literature as value neutral.

Methods which are explicit about the ideology underpinning them tend to be the exception rather than the rule. Good examples of summative, hard systems methods which do declare their ideological standpoints (in this case methods for evaluating services for

"disadvantaged" people) have been designed by Wolfensberger and Glenn (1975) and Wolfensberger and Thomas (1983). However, we should recognise that the standard, quantitative framework these authors use would become redundant if the underlying ideology were to be open to question during the actual conduct of research.

Interestingly, the methods designed by Wolfensberger and co-workers rely to some extent on interviews with individuals to generate data. Here the ideal of understanding subjectivities comes into play, but of course the subjective expressions of the interviewees are judged solely in terms of the value systems handed down in the methods. Information from interviews simply goes toward building a picture of the "truth" (seen through the particular value-filter being used).

While methodological rigour is thought to be important in the pursuit of truth, there is little methodological guidance provided for the exploration of subjectivity - and, as we have noted, the value-filter through which truth is pursued is not open to analysis at all.

15.2.2 Formative Methods

Indeed, this is not just the case with summative methods. We also find that hard, formative systems methods are equally dominated by the pursuit of truth. Although some might claim that, with formative methods, the question "is it true?" is replaced by "does it work?", this latter question can be paraphrased more accurately as "is it true that it works?".

In cases where organisational change is stimulated by quantitative analysis using a mathematical model, and the results are fed back to improve the model, there may also be discussions about the selection of variables. Such discussions will revolve around issues of rightness - "which are the right variables to use?". They will, however, have improvement of the model - i.e., improvement of pursuit of the truth - as their primary focus [see the work of Forrester (1961, 1969), Meadows (1980) and Roberts et al (1983) for examples]. Therefore, rightness issues remain subordinate to questions of truth.

Hard (positivistic) methods, then, whether summative or formative, are all essentially truth-seeking. In so far as rightness and subjectivity come into play at all, their exploration is always subordinate to the overriding ideal of truth.

15.3 Soft Systems Methods

We can move on now to look at soft (qualitative) methods. Essentially two different kinds of soft method have evolved in the systems sciences:

First, there are those which have come to be called interpretive. These methods seek to establish visions of ideal states, or desirable options, which reality and subjective viewpoints can be tested against. They attempt to clarify differences of viewpoint in order to promote dialectical argument and, ultimately, mutual understanding and agreement. The idea is that a degree of consensus-formation and/or rational decision-making on rightness issues (perhaps a compromise based on a feasible option) will result from the exploration of

viewpoints, although discussion will often have to be iterative and on-going.²

Second, there are those methods which have been termed emancipatory. These are similarly based upon the rational exploration of different viewpoints concerning rightness, but they place more emphasis on making the interests that consensus decisions serve explicit. Let us explore each of these in turn.

15.3.1 Interpretive Methods

There are many different interpretive systems methods. The basic idea of them all, however, is summed up in the following transcript of the words of a researcher in the field, quoted by Patton (1978):

"I think that we reported basically other people's stories to them. We tried to put a structure on it, we tried to analyse it but we were not going in with any kind of a priori kinds of assumptions".

This quotation reveals the basic assumption of

interpretive methods that rightness explorations have to come out of inter-subjective communication in the local context. The researcher in the field felt that, in his or her research, no prior assumptions were being made in this exploration, and that the imposed structure emerged out of the expressions of subjectivity themselves.

Patton (1987), on the other hand, retreats from "negative connotations associated with the term 'subjectivity'" and asserts that:

"The practical solution may be to replace the traditional search for truth with a search for useful and balanced information, and to replace the mandate to be objective with a mandate to be fair and conscientious in taking account of multiple perspectives, multiple interests and multiple possibilities".

A number of interpretive systems thinkers have emphasised the importance of seeking neutrality. Principle amongst these is Checkland (1981). The neutral researcher is said to be....

"one who is not predisposed toward certain findings ahead of time". [He or she] "enters the field with no axe to grind, no theory to prove,

and no predetermined results to support" (Patton, 1987).

This requirement for "neutrality" helps clients avoid dependency on the "expert", but it also means that once a consensus on rightness (or a compromise to effect practical action) has been arrived at, the researcher is 'prevented' from engaging in further explorations of the interests this consensus or compromise might serve.

If explorations of rightness are the main focus, yet there are multiple viewpoints, explorations of subjectivity will obviously be needed to promote the mutual understanding that is necessary for rational debate about rightness issues. Such explorations of subjectivity will always be subordinate to the main purpose of the work, however: they will be conducted in order to facilitate debate (and ultimately consensus or compromise) on rightness.

Similarly, if interpretivists wish to discard the pursuit of truth in favour of "a search for useful and balanced information" [Patton (1987)], this information will only be "useful" in the context of its

relationship with issues of rightness. What interpretivists are actually doing, then, is making truth-orientated explorations subordinate to inquiries into rightness.

Clearly, it is the ideal of rightness that comes to dominate in interpretive research, with the ideals of truth and exploration of subjectivity playing subordinate or contingent roles. Once a consensus or compromise upon rightness has been arrived at, however, there is no methodological requirement for further challenge. Indeed, the possibility of further challenge is actually impeded by a requirement for the researcher to remain "neutral".

15.3.2 Emancipatory Methods

Supporters of an emancipatory systems approach are similarly concerned to avoid domination by the "expert", but they tend to differ from interpretivists in their understanding of what this should entail.

Interpretive thinkers stress the "neutrality" of the

researcher when it comes to forming a rational consensus or compromise on rightness. In contrast, emancipatory thinkers seek, as far as possible, to avoid merely replacing the unquestioned ideology of the expert with the unquestioned ideology of the participant group.

Interpretive research accepts intuitive consensus-formation about rightness judgments as a valid meeting point of subjectivities, whereas the emancipatory perspective insists that the interests being served by any such consensus be laid open to analysis.

Here, then, emancipatory researchers part company with interpretivists. They refuse to accept the idea that the researcher can ever be neutral. While 'democratic' participation is regarded as important, this doesn't mean automatic acceptance of consensus or compromise without an understanding of where this is coming from.

Emancipatory thinkers also emphasise that as wide a variety of interested parties as possible should give their consent to compromise or consensus. Inevitably,

then, the researcher is not absolved from the moral responsibility of contributing to the formation of the vision of rightness, both through helping to assemble the interested parties and through direct participation in debate.

In using emancipatory methods there will inevitably be a tension between respect for the viewpoints of others and the need for everyone, including the researcher, to remain critical of the values underlying consensus or compromise. This is, essentially, a tension between the different "moments" of inquiry (truth-seeking, rightness-seeking or seeking an understanding of subjective viewpoints) that may inform the inquiry process in different ways.

Nevertheless, we can still say that emancipatory research, in a similar manner to interpretivism, pursues the rationalisation of rightness as its dominant ideal. Truth-orientated inquiries and explorations of subjectivity play subordinate or contingent roles. Arguably truth-seeking (about interests being served) has a more prominent role in emancipatory research than in interpretive inquiry, but

they are still both harnessed in the interests of rightness exploration.

15.4 Exploring Subjectivity

We see from the above that hard systems methods emphasise pursuit of truth as the dominant ideal, while soft (interpretive and emancipatory) methods focus primarily upon rightness. Interestingly, as far as I am aware, there are no systems methods which concentrate on subjective understanding as a dominant concern: there is clearly scope for development here.

It is not my intention to pursue this development in the current thesis. Nevertheless we might note that, given the arguments presented here, there is a need for a truly subjective systems perspective within, and not instead of, a pluralist perspective. This must be distinguished from the interpretive writings of Churchman (e.g., 1968a), Ackoff (e.g., 1974) and Checkland (e.g., 1981) which, although acknowledging subjectivity, still hold rightness as their dominant

ideal.

Perhaps the psychoanalytic tradition [descended from the work of Freud (e.g., 1915)], Kelly's personal construct theory (1955), and existential philosophy [e.g., Merleau-Ponty (1962)] will be of use in creating such a subjective systems perspective.

15.5 Underpinning our Vision of Pluralism

There is a clear line, then, running from ontology, through our understanding of inquiry, and into research methodology. The three constitutive elements of reality come to be separated through rational analysis, and are explored through the pursuit of three different ideals of inquiry. Separate systems methodologies have evolved which take one of these ideals and make it pivotal, but the various methodologies actually make different ideals pivotal.

The Critical Systems idea of pluralism would suggest that, in systems research, the three ideals of "truth", "rightness" and "subjective understanding" all need to

be considered, but also each needs to become pivotal at different times - that is, if we are to deal adequately with the ontological complexity that I have claimed is a key feature of many of the problems, especially those of a global nature, that we are currently facing.

If we accept the argument that there is a need to address ontological complexity, and we also accept that different systems methods prioritise these ideals in different ways, then confining research to the use of one method, or a limited set of methods that are all seen to work in a similar manner, is nothing short of contradictory. This is because such confinement will inevitably prioritise one of the ideals of "truth", "rightness" or "subjective understanding" over the others.

15.6 Paradigmatic Assumptions

Having established the beginnings of what I would regard as a credible philosophical basis for the Critical Systems notion of pluralism, it would be

useful to reflect once again upon the 'problem' I identified in Chapters 7 and 8: that the various approaches drawn upon in a pluralist paradigm could be seen as philosophically contradictory if we are not rigorous in our thinking.

In Section 1 I suggested that the paradigmatic assumptions of a pluralist perspective would need to be declared in order to resolve potential contradiction. Effectively I have begun the task of doing this by starting construction on a new ontology.

However, I would suggest that the specifically multi-faceted ontology I have begun to build has implications for how we might describe the difference between a pluralist paradigm (encompassing a meta-theory) and an isolationist one.

15.6.1 A Paradigm of "Moments"

To restate Flood's position (1989a), the theoretical isolationist operates with a limited "world view" which allows a degree of methodological complementarism, but

this is kept within strictly defined limits. We have to ask: how do pluralist "meta-theories" differ from isolationist "world views"?

The key difference actually lies in the way pluralists and theoretical isolationists view the operation of methodology. All the methods employed by a theoretical isolationist will be seen as working in a similar manner. In contrast, pluralists recognise that there are different "moments" in inquiry. Their meta-theories will attempt to explain how and why these "moments" differ. In every case theoretical isolationists see only one kind of "moment".

Therefore, as I suggested in Chapter 8, pluralists contextualise the essential elements of the ontological and epistemological paradigms that methods are drawn from. We can now clarify that this contextualisation takes the form of reconstructing essential elements as "moments" within a wider vision of inquiry. In contrast, theoretical isolationists do indeed denature the essential elements of other paradigms, reducing everything they stand for down to one single "moment".

This is why it is important for pluralists to talk about the impoverishment of isolationist perspectives and not try to challenge their validity. Validity debates in this area will inevitably be unproductive because all the main paradigmatic positions can be defended in their own terms.

Productive communication can be achieved, however, by looking at the legitimacy of pluralist versus isolationist perspectives in relation to their implications for research (and general) practice. We need to discuss the ways in which research impacts upon the world, and ourselves within it.

15.7 The Legitimation of Systems Science

Indeed, this argument holds for the practice of systems science as a whole. Systems science receives legitimacy from its ability to handle particularly complex issues; especially, at the present time, global issues that cannot be defined by any single disciplinary boundary.

If we accept, as I have proposed, that many of these issues are characterised by ontological complexity rather than a more limited "natural world" complexity, then a methodological pluralism that can effectively partner pursuit of the ideal of the unity of science will actually be essential for the continued legitimation of systems science.³

15.8 Conclusion

In this chapter we have completed the line of argument from ontology, through ontological complexity, through ideals of inquiry, to research methodology. We have seen how, if we are to deal with ontological complexity in an adequate manner, we must indeed embrace a pluralist research practice. Therefore we arrive at the final conclusion of this thesis: pluralism is essential for the continued legitimation of systems science.

Notes

1. The "split" between positivistic, interpretive and emancipatory systems methods has been inherited from the work of Jackson (1987a).

2. It might be controversial to assert that discussions on rightness are the primary focus of interpretive methods. However, I believe that a careful, critical reading of Checkland (1981) will confirm this. Checkland talks about generating options that are both "systemically desirable" and "culturally feasible". What he is saying, then, is that the right options will be those which are both desirable in relation to the "selection of root definitions and conceptual model building", and feasible in the sense that they can be implemented given the characteristics of the people involved in the situation. Judging systemic desirability and cultural feasibility therefore means judging what the right course of action is, given the circumstances and the outcomes of previous explorations - or, more accurately, given a truth statement about the circumstances and the outcomes of previous

explorations. Now, Checkland has been criticised for "managerialism" - that is, allowing the views of those with power to predominate over others [Jackson (1982), Burrell (1983), Rosenhead (1984), Green (1991)]. One could interpret this as meaning that his methodology takes a dominant view of rightness for granted. We must be clear, however, that this would be wrong: managerialism does not result directly from a lack of critical thinking about rightness, but from a lack of critical thinking about truth. In other words, the managers' view of the circumstances against which desirability and feasibility are to be judged is taken for granted. Because truth and rightness are intimately linked, a narrow view of truth will restrict the rightness options that can emerge.

3. We should note, of course, that such a pluralism should be consistent with an ecological approach which can be critical of anthropocentrism if it is to maintain legitimacy.

CHAPTER 16: WORK FOR THE FUTURE

In Section 1 of this thesis I outlined the idea of pluralism as it has been discussed in systems science, reviewed Critical Systems Thinking (the perspective which gave birth to the idea), and conducted some initial work on the paradigmatic nature of this perspective.

In Section 2 I explored some of the contexts of the debate about pluralism. I demonstrated that pluralism is essential if we are to pursue the ideal of the unity of science in a holistic manner. Further, I argued that many of the problems we are currently facing, especially global problems, are characterised by ontological complexity rather than a simple "natural world" complexity. In order to address ontological complexity adequately, I argued that we need methodological pluralism.

In Section 2 I also noted that the focus upon ecology encourages us to rethink the history of systems science. We find that ideas of holism have a history in Western thought stretching back to pre-Aristotelian

philosophy, and that our current concerns are by no means new. They have, however, been marginalised by a powerful scientific discourse of dualism and reductionism which is only now losing its dominance through the rise of the ecological perspective. As we have seen, this ecological perspective demands pluralism to achieve the reintegration of the objective, normative and subjective realms.

In Section 3 I moved on to look at an ontological position that could underpin our notion of pluralism, granting it legitimacy as well as an internal logical validity. I noted that some kind of multi-faceted ontology or epistemology is required in order to contextualise all the potentially contradictory assumptions made by methods drawn from other paradigms.

One possibility identified was Habermas's epistemological theory of knowledge-constitutive interests. However, this was found to lack legitimacy because of the humanist assumptions it makes. A start was therefore made on developing a new vision of ontology which suggests that "reality" is constituted

by objective phenomena, power (expressed in the evolution and use of normative rules) and subjectivity.

Also in Section 3 I explained how our vision of ontology underpins a theory of three ideals of inquiry. Each different systems methodology makes a different one of these ideals dominant, so we see a logical line running from ontology, through the ideals of inquiry, into research methodology.

Finally, I left the last Section by returning to the need to address ontological complexity. It was argued that, if we are to deal with ontological complexity anywhere near adequately, we have to be able to make any of the three ideals dominant at any time in our research. Of course, methodological pluralism is necessary to achieve this. Indeed, if we accept that the very purpose of systems science is to deal with complexity, methodological pluralism must be seen as essential for the continued legitimation of systems science.

16.1 Critical Systems Thinking Revisited

Now, I would suggest that, if they are taken seriously, these ideas will necessarily effect the whole discourse of Critical Systems Thinking. Many of the arguments presented in this thesis have direct implications for other peoples' work (as reviewed in Chapters 4 to 6).

To explore all these implications adequately would inevitably fill another thesis. When I started writing up, it was essential for me to draw some boundaries around what needed to be included to produce a logical argument. Some things therefore had to be left out (given realistic time and space restrictions). I decided that providing a full analysis of these implications could in fact be pursued as part of my post-doctoral research.

However, I thought that it might be interesting for the reader if I were to put up some "sign posts" for future work. Hence this chapter. Over the coming pages I want to focus on just a few areas in which the work I have conducted looks like it might have the greatest impact. Toward the end I will also include some thoughts that

go beyond simple explorations of the possible impact of this work on the Critical Systems literature; I want to identify some new and fruitful areas for research.

At this stage, none of the ideas will be explored in any depth, and little support will be given for the positions I will be adopting: the purpose of this chapter is merely to mark out territory for future exploration.

16.2 Ontology and the Language of Research

Clearly, the vision of ontology I have begun to develop moves us beyond the ontological schema worked out by Flood and Keys (1989). Perhaps, as we no longer need to talk about "ontological nominalism" and "epistemological anti-positivism", we should not follow Flood (1988, 1990a) in pursuing his "substantive soft systems language". Maybe all languages (objectivist, moral and subjectivist) have their appropriate place.

16.3 What is "Being Critical?"

Such a rethink of appropriate language also leads into a rethink about what we mean by "being critical". Perhaps, to be truly critical, we need to be relating information about the objective natural "world", the normative social "world" and the subjective inner "worlds" of individuals together. I believe that it should be possible to demonstrate that confinement to just one of these "worlds" - pursuit of only one of the ideals of inquiry - results in a mere juxtaposition of alternative viewpoints rather than real critical thinking.

While on the subject of critique, I also hope to challenge what I see as an artificial divide between critical thinking and commitment. Every rational thought requires commitment: if one is critical of something, one must be critical from some standpoint one has committed oneself to.

Such a development should offer an effective challenge to some of the post-modern writings of Woolistson (e.g., 1991a) who, if I have understood his argument

correctly, appears to be suggesting that critical thinking using ideas drawn from the margins of convention should be pursued for its own sake, rather than for the sake of what one has committed oneself to.

16.4 Emancipation

Then there is the question of the relationship between the Critical Systems "commitment" to "emancipation" (using Jackson's terminology, 1991b) and the vision of pluralism I have devised.

Perhaps deciding whether or not it is relevant to talk about emancipation, or defining emancipation (if we have already decided that it is an appropriate term given our purposes), can be seen as a research project in itself. Such a project requires pluralism to explore it critically, yet the outcomes of it may shape future concrete expressions of pluralism by giving rise to a diversification of new meta-theories.

16.5 Subjective or Communicative Ethics?

Talk of emancipation leads to Ulrich's insistence (1983) that an emancipatory ethics must be communicative rather than subjective. However, the vision of ontology I have developed would suggest that ethics should be seen as both communicative and subjective.

16.6 An Ideal Model of the Research and Change Process

If explorations of subjectivity must indeed play a major role in systems practice, and yet the System of Systems Methodologies fails to contextualise methods that prioritise this ideal of inquiry, it might be worth developing an alternative meta-theory for use in organizational research.

I already have such an alternative in the developmental stages, and this will also address problems of coercion (that cannot be resolved through rational debate) and "false consciousness" (a useful term to describe thinking that has been limited by system constraints).

I would suggest that Flood and Jackson (1991), who have arguably produced the most complete description of the way the System of Systems Methodologies works in practice, still only make nominal mention of coercion and false consciousness.

16.7 A Diversification of Meta-Theories

In Chapter 12 of this thesis I suggested that epistemology or ontology should be related directly to the different methodologies rather than to dimensions of a meta-theory such as the System of Systems Methodologies.

Now, this should actually allow a diversity of possible meta-theories to develop, each of which will be useful in different situations. Furthermore, which meta-theory should be used at any particular time will become a matter of debate because different visions of rightness will be embedded in them.

16.8 Diversification at the Methodological Level

Just as diversity needs to be encouraged in the development of meta-theories, diversity also needs to be promoted at the methodological level.

If we are to take the notion of pluralism seriously, then we should not stick solely to methods that have been described in systems terms: we also need to include methods from the traditional sciences and other areas of practice such as evaluation and action research. This will inevitably take us beyond the boundaries of organizational research.

Furthermore I would argue that, if we are really going to try to deal with coercion, then there is a pressing need to break down the boundary between "scientific" methods and the methods of political action and campaigning.

16.9 What is this Thing called "Science"?

This is where my thoughts depart from the relatively

simple task of reflecting upon Critical Systems Thinking in the light of the work in this thesis. Breaking down the boundaries of "science" to include methods of political action and campaigning raises the question originally posed by Chalmers (1982): "What is this thing called science?".

Because it is virtually impossible to boundary science in a logically consistent manner (Weimer, 1979), we inevitably have to move toward Foucault's understanding (1970) that addition of the term "science" to a discourse is essentially a means of legitimising it, while controlling its content and expression through the imposition of a set of normative, discursive assumptions.

Of course such normative assumptions are what I have defined in this thesis as constituting power, and I have described power as an inherent aspect of reality. We cannot get away from the operation of power. Even if we abandon the term "science" in favour of something else, this will still have its normative assumptions.

Are we unable, then, to take control of the terms we use? To liberate the meanings of words? Foucault's thinking would suggest a pessimistic answer because any supposed 'liberation' would merely represent the domination of a new set of normative assumptions. Thus there is no real concept of 'agency', except the agency of knowledge and power, in Foucault's work.

While this may be the case from a purely Foucauldian position, a challenge for the future might be to develop a new philosophy of science that can help us get to grips with the notion of agency (whether human or other), perhaps in a pluralistic sense. This is something I am only now beginning to think about.

16.10 Conclusion

So, we see that there is much more that remains to be done. In this penultimate chapter I have marked out possible future areas of research. Some are already quite well worked out, while others are only ideas at the stage of germination. No doubt there are also a myriad of other possibilities that I am unaware of as

yet. We shall see.

CHAPTER 17: CONCLUSIONS

Now it is time to conclude this thesis. I intend to close by reviewing the five central, interlinked aims for this work that I set out in Chapter 1. Each of these represents an area of work that is new to, or develops, the Critical Systems literature. The aims were:

- (1) To explain why a pluralist meta-theory must be paradigmatic.
- (2) To explain why methodological pluralism and pursuit of the ideal of the unity of science are so intimately bound together.
- (3) To examine the social and ecological contexts of the debate about pluralism.
- (4) To make a start on demonstrating how the Critical Systems understanding of pluralism might be underpinned by a credible vision of ontology.
- (5) To demonstrate how pluralism might enhance the

legitimacy of systems science for the future.

Let me take each of these aims in turn:

17.1 The Paradigmatic Nature of Pluralist Meta-Theories

The first aim was to explain why a pluralist meta-theory must be paradigmatic. This was done by showing how people who support isolationist perspectives can always object to pluralism in their own terms, meaning that there are inevitably paradigmatic assumptions embedded in the notion of pluralism.

The main assumption we can draw out is that pluralists recognise different "moments" in inquiry. Their meta-theories will attempt to explain how and why these "moments" differ. In every case theoretical isolationists see only one kind of "moment".

Therefore, pluralists contextualise the essential elements of the original ontological and epistemological paradigms that methods are drawn from.

In contrast, theoretical isolationists and imperialists denature the essential elements of other paradigms as their working methods are plundered.

17.2 Unity and Pluralism

The second aim of this thesis was to explain why methodological pluralism and pursuit of the ideal of the unity of science are so intimately bound together.

A review of a diverse range of disciplines reveals the fact that different methods, assuming different visions of epistemology, have evolved to address different subject areas. We can therefore say that subject and method are intimately linked.

Disciplinary scientists acknowledge that pursuit of the ideal of the unity of science is important, but do so by recognising complementarity between the various subject areas. Therefore they rarely venture onto each others' territories.

Systems scientists, on the other hand, refuse to

recognise disciplinary separation. They pursue the ideal of the unity of science through a process of defining and redefining systems. As a consequence, the breadth of the subject matter that they inevitably tackle raises problems that no isolationist epistemological or methodological position has yet been able to deal with.

Specifically, systems scientists find that the objective, normative and subjective elements of their inquiries rub together abrasively. The result, given that everybody can see flaws in everybody else's epistemological positions, is a destructive form of isolationist entrenchment.

We see that disciplinary scientists only nominally pursue the ideal of the unity of science. Systems scientists, on the other hand, take this ideal more seriously. However, if subject and method are indeed intimately linked, then access to the whole subject area of science must depend upon the development of methodological pluralism.

17.3 Social and Ecological Contexts

The third aim of the thesis was to examine the social and ecological contexts of the debate about pluralism.

Reflection upon some of the major issues of today, especially issues of a global ecological nature, reveals that they are characterised by interdependencies between the ecological, the social and the personal. There are, for example, intimate relationships between the maintenance of ecological harmony, social justice and personal freedom.

Indeed, it might be that the re-emergence of holistic ideas in the form of modern systems science is tied in with these ecological issues. Traditional science, which concentrated on the pursuit of objective information and marginalised issues of rightness and subjective understanding, "worked" while human beings were able to accumulate material wealth without any drastic ecological consequences.

Now we are no longer able to do this, there is a need

to reintegrate the objective, normative and subjective realms. Since pre-Aristotelian times this integration has been central to the project of holism. Perhaps modern systems science has surfaced in the 20th Century to fulfil this reintegrative function through the pursuit of pluralism and the ideal of the unity of science.

17.4 Ontology

The fourth aim of the thesis was to make a start on demonstrating how the Critical Systems understanding of pluralism might be underpinned by a credible vision of ontology.

The problem all pluralist perspectives appear to face is philosophical contradiction. This is because they bring many contrasting methods into the pluralist paradigm, and yet the original paradigms these ideas are drawn from make fundamentally different assumptions about the nature of 'reality' and our knowledge of it.

The defining assumption of a pluralist perspective is that it is possible to contextualise the essential elements of each of the original paradigms in a new, multi-faceted vision of ontology or epistemology. It is necessary to make such a vision explicit if we are to avoid philosophical contradiction.

The epistemology that most Critical Systems thinkers use to underpin their understanding of pluralism is Habermas's theory of knowledge-constitutive interests (1972). Unfortunately, this makes some major humanist assumptions, and it therefore lacks legitimacy given our need to address the ecological issues facing us today.

A possible alternative is a vision of ontology in which 'reality' is said to be constituted by objective phenomena, power (expressed in the evolution and use of normative rules) and multiple subjectivities.

These constitutive elements are entirely interdependent, but in the process of rational analysis they come to be separated out from one another through pursuit of three ideals of inquiry: "truth",

"rightness" and "subjective understanding".

In looking at methodology, we find that different methods make different ideals dominant, suggesting that this multi-faceted vision of ontology does indeed provide the basis for a credible philosophical underpinning for our notion of pluralism.

17.5 The Legitimation of Systems Science

The fifth aim of the thesis was to demonstrate how pluralism might enhance the legitimacy of systems science for the future.

If systems science is going to address issues that are characterised by interdependencies between the ecological, the social and the personal, then it will need to deal with complexities in all three areas. Indeed, we not only have to address "natural world" complexities, "social world" complexities and "internal world" complexities, but we have to deal with the meta-level complexities of relationships between all three.

I have described these meta-level complexities as "ontological". This is because the three kinds of complexity reflect the three constitutive elements of reality in the vision of ontology I have presented.

My argument is that pluralism and pursuit of the ideal of the unity of science are such important issues now because only a pluralistic and holistic research practice will allow us to address ontological complexity adequately. This is how embracing pluralism will enhance the legitimacy of systems science for the future.

REFERENCES

Abram, D. (1988). The Mechanical and the Organic: Epistemological Consequences of the Gaia Hypothesis. In, Gaia, The Thesis, The Mechanisms and the Implications. Proceedings of the First Annual Camelford Conference on the Implications of the Gaia Hypothesis. Bunyard, P. and Goldsmith, E. (eds.). Camelford: Wadebridge Ecological Centre.

Ackoff, R.L. (1974). The Systems Revolution. Long Range Planning, 7, 2-20.

Ackoff, R.L. (1981). Creating the Corporate Future. New York: J. Wiley and Sons.

Adorno, T.W. (1957). Soziologie und Empirische Forschung. In, Wesen und Wirklichkeit des Menschen. Zeigler, K. (ed.). Gottingen: Vandenhoeck & Ruprecht.

Albert, H. (1971). Theorie und Praxis: Max Weber und das Problem der Wertfreiheit und der Rationalitat. In, Werturteilsstreit. Albert, H. and Topitsch, E. (eds.). Darmstadt: Wissenschaftliche Buchgesellschaft.

Angyal, A. (1941). Foundations for a Science of Personality. Cambridge, Mass: Harvard University Press.

Ash, M. (1989). Journey into the Eye of a Needle. Hartland: Green Books.

Ashby, R.W. (1973). Some Peculiarities of Complex Systems. Cybernetic Medicine, 9, 1-7.

Atthill, C. (1975). Decisions: West Oil Distribution. London: BP Educational Service.

Bachrach, P.M. and Baratz, S. (1963). Decisions and Nondecisions: An Analytical Framework. American Political Science Review, 57, 641-651.

Banathy, B.H. (1987). Choosing Design Methods. Proceedings of the 31st Annual Meeting of the International Society for General Systems Research, held in Budapest, Hungary, 54-63.

Banathy, B.H. (1988). Matching Design Methods to System Type. Systems Research, 5, 27-34.

Bateson, G. (1979). Mind and Nature: A Necessary Unity. London: Wildwood House.

Bauman, Z. (1976). Socialism: The Active Utopia. London: George Allen and Unwin.

Beer, S. (1981). Brain of the Firm. Second Edition. Chichester: Wiley.

Beer, S. (1985). Diagnosing the System for Organisations. Chichester: Wiley.

Berkeley, G. (1710). The Principles of Human Knowledge. 1962 Edition. Warnock, G.J. (ed.). London: Fontana Press.

Bernstein, R.J. (1983). Beyond Objectivism and Relativism: Science, Hermeneutics and Praxis. Oxford: Basil Blackwell.

Berry, W. (1990). The Futility of Global Thinking. Resurgence, no. 139, 4-6.

Bertalanffy, L. von (1950). The Theory of Open Systems in Physics and Biology. Science, 111, 23-29.

Bhaskar, R. (1978). A Realist Theory of Science. Second Edition. Brighton: Harvester Press.

Bhaskar, R. (1979). The Possibility of Naturalism. Brighton: Harvester Press.

Bhaskar, R. (1986). Scientific Realism and Human Emancipation. London: Verso.

Bhaskar, R. (1989). Reclaiming Reality. London: Verso.

Birch, C. (1990). A Deeper Religion, A Deeper Science. Resurgence, no. 143, 8-9.

Bohm, D. (1980). Wholeness and the Implicate Order. London: Ark.

Bohr, N. (1963). Essays 1958/1962 on Atomic Physics and Human Knowledge. London: Interscience Wiley and Sons.

Brewer, J. and Hunter, A. (1989). Multimethod Research: A Synthesis of Styles. London: Sage.

Brokowski, A. (1976). Program Evaluation as Distinct from Evaluation Research. Division of Community Psychology Newsletter, 10, 3.

Bruscaglioni, M. (1982). Il Comportamento Organizzativo. In, La Psicologia Organizzativa. Bruscaglioni, M. and Spaltro, E. (eds.). Milano: Angeli.

Buckley, W. (1967). Sociology and Modern Systems Theory. Englewood Cliffs: Prentice Hall.

Burrell, G. (1983). Review of "Systems Thinking, Systems Practice" by Peter Checkland. Journal of Applied Systems Analysis, 10, 121-129.

Burrell, G. and Morgan, G. (1979). Sociological Paradigms and Organizational Analysis. London: Heinemann.

Campbell, J. (1988). The Power of Myth: Conversations between Joseph Campbell and Bill Moyers. Flowers, B.S. (ed.). New York: Doubleday.

Cannon, W.B. (1932). Wisdom of the Body. New York: Norton.

Capra, F. (1982). The Turning Point: Science, Society and the Rising Culture. London: Fontana.

Capra, F. (1983). The Tao of Physics. Second Edition. London: Fontana.

Chalmers, A.F. (1982). What is this Thing called Science? Second Edition. Milton Keynes: Open University Press.

Checkland, P.B. (1972). Towards a Systems Based Methodology for Real World Problem Solving. Journal of Systems Engineering, 3, 87-116.

Checkland, P.B. (1975). The Development of Systems Thinking by Systems Practice: A Methodology from an Action Research Programme. In, Progress in Cybernetics and Systems Research. Volume 5. Trappl R. and Harika F.de P. (eds.). Washington DC: Hemisphere Publications.

Checkland, P.B. (1981). Systems Thinking, Systems Practice. Chichester: John Wiley.

Checkland, P.B. (1985). From Optimizing to Learning: A Development of Systems Thinking for the 1990s. Journal of the Operational Research Society, 36, 757-767.

Chestnut, H. (1967). Systems Engineering Methods. New York: Wiley.

Churchman, C.W. (1968a). The Systems Approach. New York: Dell.

Churchman, C.W. (1968b). Challenge to Reason. New York: McGraw-Hill.

Churchman, C.W. (1971). The Design of Inquiring Systems: Basic Concepts of Systems and Organizations. New York: Basic Books.

Churchman, C.W. (1979). The Systems Approach and its Enemies. New York: Basic Books.

Connerton, P. (1976). Introduction. In, Critical Sociology. Connerton, P. (ed.). Harmondsworth: Penguin.

Cooper, R. and Burrell, G. (1988). Modernism, Post-Modernism and Organizational Analysis: An Introduction. Organizational Studies, 9, 91-112.

Cowan, E.L., Budin, W. and Wolitzky, D.L. (1960). The Social Desirability of Trait Descriptive Terms: A Factor in the prediction of Q Sort. Journal of Personality, 28, 530-544.

Cowan, E.L. and Tongas, P.N. (1959). The Social Desirability of Trait Descriptive Terms: Applications to a Self-Concept Inventory. Journal of Consulting Psychology, 23, 361-365.

Daellenbach, H.G., George, J.A. and McNickle, D.C. (1983). Introduction to Operations Research Techniques. 2nd Edition. Boston, Mass: Allyn and Bacon.

Daenzer, W.F. (ed.) (1976). Systems Engineering. Zurich: BWI.

Dahl, R.A. (1958). A Critique of the Ruling Elite Model. American Political Science Review, 52, 463-469.

De Masi, D. (1987). L'avvento Post-Indusriale. Milano: Francoangeli.

De Neufville, R. and Stafford, J.H. (1971). Systems Analysis for Engineers and Managers. New York: McGraw-Hill.

Derrida, J. (1973). Speech and Phenomena, and Other Essays on Husserl's Theory of Signs. Evanston: Northwestern University Press.

Derrida, J. (1976). Of Grammatology. Baltimore: John Hopkins University Press.

Derrida, J. (1978). Writing and Difference. London: Routledge & Kegan Paul.

Dodson Gray, E. (1990). Did God put Humans in Charge? Resurgence, no. 143, 4-7.

Douglas, M. (1966). Purity and Danger: An Analysis of the Concepts of Pollution and Taboo. London: Ark.

Dreyfus, H.L. and Rabinow, P. (1982). Michel Foucault: Beyond Structuralism and Hermeneutics. Hemel Hempstead: Harvester Press.

Einstein, A. (1934). The World as I See It. New York: Covici Friede.

Emery, F.E. (ed.) (1969a). Systems Thinking, Volume I. Harmondsworth: Penguin.

Emery, F.E. (ed.) (1969b). Systems Thinking, Volume II. Harmondsworth: Penguin.

Emery, F.E. and Trist, E.L. (1965). The Causal Texture of Organizational Environment. Human Relations, 18, 21-32.

Evans, G. (1990). Computers and Mental Health. London: Portugal Prints.

Fairtlough, G.H. (1989). Systems Practice from the Start: Some Experiences in a Biotechnology Company. Systems Practice, 2, 397-417.

Fay, B. (1975). Social Theory and Political Practice. London: George Allen and Unwin.

Feibleman, F. and Friend, F.W. (1945). The Structure and Function of Organisation. Philosophical Review, 54, 19-44.

Feyerabend, P.K. (1962). Explanation, Reduction and Empiricism. In, Minnesota Studies in the Philosophy of Science, vol.3, 28-97. Feigl, H. and Maxwell, G. (eds.). Minneapolis: University of Minnesota Press.

Finger, M. (1988). Gaia: Implications for the Social Sciences. In, Gaia, The Thesis, The Mechanisms and the Implications. Proceedings of the First Annual Camelford Conference on the Implications of the Gaia Hypothesis. Bunyard, P. and Goldsmith, E. (eds.). Camelford: Wadebridge Ecological Centre.

Flood, R.L. (1987). Complexity: A Definition by Construction of a Conceptual Framework. Systems Research, 4, 177-185.

Flood, R.L. (1988). The Need for a Substantive Soft Systems Language. Journal of Applied Systems Analysis, 15, 87-91.

Flood, R.L. (1989a). Six Scenarios for the Future of Systems 'Problem Solving'. Systems Practice, 2, 75-99.

Flood, R.L. (1989b). Archaeology of (Systems) Inquiry. Systems Practice, 2, 117-124.

Flood, R.L. (1990a). Liberating Systems Theory. New York: Plenum.

Flood, R.L. (1990b). Liberating Systems Theory: Towards Critical Systems Thinking. Human Relations, 43, 49-76.

Flood, R.L. (1990c). Management Workers of All Countries Unite!: Revolutions and Counter-Revolutions, or Differences and Contradictions. In, ENDEC '90, proceedings of the International Conference on Entrepreneurship, Singapore, March 1990, pp. 271-276.

Flood, R.L. (1990d). Critical Systems Thinking and the Systems Sciences. In, Toward a Just Society for Future Generations. Volume I: Systems Design. Proceedings of the 34th Annual Meeting of the International Society for the Systems Sciences, held in Portland, Oregon (USA), July 8-13, 1990.

Flood, R.L. and Carson, E.R. (1988). Dealing with Complexity: An Introduction to the Theory and Practice of Systems Science. New York: Plenum.

Flood, R.L. and Gaisford, P. (1989). Policing Vice in the West End: A Systemic Perspective Points to a Multi-Agency Approach. OR Insight, 2, 10-15.

Flood, R.L. and Gregory, W. (1988). Systems: Past, Present and Future. In, Systems Prospects: The Next Ten Years of Systems Research. Flood, R.L., Jackson, M.C. and Keys, P. (eds.). New York: Plenum.

Flood, R.L. and Jackson, M.C. (1991). Creative Problem Solving: Total Systems Intervention. Chichester: Wiley.

Flood, R.L., Jackson, M.C. and Schechter, D. (1992). Total Systems Intervention: A Research Program. Systems Practice, 5, 79-83.

Flood, R.L. and Keys, P. (1989). Methodology choice, Complexity Texture, Self-Reflection. Cybernetics and Systems, 20, 401-415.

Folkes, J. (1988). Microjob Annual Report. London: Microjob.

Forrester, J.W. (1961). Industrial Dynamics. Cambridge, Mass: MIT Press.

Forrester, J.W. (1969). Principles of Systems. Cambridge, Mass: Wright-Allen Press.

Forrester, J.W. (1971). World Dynamics. Cambridge, Mass: Wright-Allen.

Foucault, M. (1970). The Order of Things. London: Tavistock.

Foucault, M. (1971). Orders of Discourse. Social Science Information, 10, 7-30.

Foucault, M. (1972). The Archaeology of Knowledge. London: Tavistock.

Foucault, M. (1973). The Birth of the Clinic. London: Tavistock.

Foucault, M. (1976). The History of Human Sexuality: An Introduction. London: Penguin.

Foucault, M. (1977). Discipline and Punish. New York: Pantheon.

Foucault, M. (1980). Power/Knowledge: Selected Interviews and Other Writings 1972-1977. Gordon, C. (ed.). Brighton: Harvester Press.

Foucault, M. (1984a). The Use of Pleasure: The History of Sexuality, Volume 2. London: Penguin.

Foucault, M. (1984b). The Care of the Self: The History of Sexuality, Volume 3. London: Penguin.

Francescato, D. (1989). Methodologies of Organizational Change: The Need for an Integrated Approach. Paper presented at The 4th West European Congress on the Psychology of Work and Organization held in Cambridge, England, on 10-12 April, 1989.

Francescato, D. (1991). A Multi-Dimensional Perspective of Organizational Change. In, Systems Science in the 21st Century: Integrating the New Sciences of Complexity in the Service of Humans and their Environment. Proceedings of the 35th Annual Conference of the International Society for the Systems Sciences held in Ostersund, Sweden, 14-20 June, 1991.

Francescato, D. (1992). A Multi-Dimensional Perspective of Organizational Change. Systems Practice, 5, 129-146.

Freire, P. (1972). Pedagogy of the Oppressed. Harmondsworth: Penguin.

Freire, P. (1973). Education: The Practice of Freedom. Translated and edited from the original Spanish, Educacao como Practica da Liberdade (1969: Santiago: Institute for Agricultural Reform), by M. Bergman-Ramos. London: Writers and Readers Publishing Cooperative.

Freud, S. (1915). The Unconscious. In, On Meta-psychology: The Theory of Psychoanalysis. The Pelican Freud Library, Volume 11. Translated into English by Angela Richards (1957). Harmondsworth: Penguin.

Fuenmayor, R.L. (1985). The Ontology and Epistemology of a Systems Approach. Ph.D. Thesis: Lancaster University.

Fuenmayor, R.L. (1989). Interpretive Systemology: A Critical Approach to Interpretive Systems Thinking. Proceedings of the 33rd Annual Meeting of the International Society for General Systems Research, held in Edinburgh, Scotland, on 2-7 July 1989. Comment made in his presentation that was not in the published paper.

Fuenmayor, R.L. (1990). Critical and Interpretive Systems Thinking: 1. What is Critique? In, Toward a Just Society for Future Generations. Volume I: Systems Design. Proceedings of the 34th Annual Meeting of the International Society for the Systems Sciences, held in Portland, Oregon (USA), July 8-13, 1990.

Fuenmayor, R. (1991a). The Roots of Reductionism: A Counter-Ontoepistemology for a Systems Approach. Systems Practice, 4, 419-448.

Fuenmayor, R. (1991b). The Self-Referential Structure of an Everyday Living Situation: A Phenomenological Ontology for Interpretive Systemology. Systems Practice, 4, 449-472.

Fuenmayor, R. (1991c). Truth and Openness: An Epistemology for Interpretive Systemology. Systems Practice, 4, 473-490.

Gigch, J.P. van and Stolliday, I. (1980). Epistemological Foundations of the Systems Paradigm. In, Progress in Systems and Cybernetics. Pichler, F.R. and Hanika, F.de P. (eds.). Washington DC: Hemisphere.

Giddens, A. (1985). Reason without Revolution? Habermas's Theorie des Kommunikativen Handelns. In, Habermas and Modernity. Bernstein, R.J. (ed.). Cambridge: Polity Press.

Giddens, A. (1991). Modernity and Self-Identity: Self and Society in the Late Modern Age. Cambridge: Polity Press.

Goldsworthy, A. (1988). Art in Nature: Andy Goldsworthy Talks to Neil Sinden. Resurgence, no. 129, 28-31.

Goode, H.H. and Machol, R.E. (1957). Systems Engineering. New York: McGraw-Hill.

Gosling, W. (1962). The Design of Engineering Systems. London: Heywood.

Green, S.M. (1991). Review of "Soft Systems Methodology in Action" by Peter Checkland and Jim Scholes. Systems Practice, 4, 530-535.

Gregory, W. (1989). Critical Theory and Critical Systems Heuristics: The History and Development of an Emancipatory Systems Approach to Social Change. Proceedings of the 33rd Annual Meeting of the International Society for General Systems Research (Volume II), held in Edinburgh, Scotland, on 2-7 July 1989.

Gregory, W. (1990). Critical Systems Thinking and LST: How "Liberating" are Contemporary Critical and Liberating Systems Approaches? In, Toward a Just Society for Future Generations. Volume I: Systems Design. Proceedings of the 34th Annual Meeting of the International Society for the Systems Sciences, held in Portland, Oregon (USA), July 8-13, 1990.

Grinevald, J. (1988). Sketch for a History of the Idea of the Biosphere. In, Gaia, The Thesis, The Mechanisms and the Implications. Proceedings of the First Annual Camelford Conference on the Implications of the Gaia Hypothesis. Bunyard, P. and Goldsmith, E. (eds.). Camelford: Wadebridge Ecological Centre.

Gustavsen, B. (1986). Forandring och Infrastruktur - en Presentation av LOM-Programmet. Arbete, Manniska, Miljö, no. 4, 3-14.

Gustavsen, B. and Engelstad, P. (1986). The Design of Conferences and the Evolving Role of Democratic Dialogue in Changing Working Life. Human Relations, 39, 101-116.

Habermas, J. (1970a). On Systematically Distorted Communication. Inquiry, 13, 205-218.

Habermas, J. (1970b). Towards a Theory of Communicative Competence. Inquiry, 13, 360-375.

Habermas, J. (1971). Towards a Rational Society.
Boston: Beacon Press.

Habermas, J. (1972). Knowledge and Human Interests.
London: Heinemann.

Habermas, J. (1974). Theory and Practice. London:
Heinemann.

Habermas, J. (1976a). Communication and the Evolution
of Society. English edition published 1979. London:
Heinemann.

Habermas, J. (1976b). The Analytic Theory of Science
and Dialectics. In, The Positivist Dispute in German
Sociology. Adorno, T.W. et al (eds.). New York: Harper
Torchbooks.

Habermas, J. (1978). Knowledge and Human Interests. 2nd
Edition. London: Heinemann.

Habermas, J. (1984a). The Theory of Communicative
Action, Volume One: Reason and the Rationalisation of
Society. Cambridge: Polity Press.

Habermas, J. (1984b). The Theory of Communicative Action, Volume Two: The Critique of Functionalist Reason. Cambridge: Polity Press.

Habermas, J. (1985). An Alternative Way Out of the Philosophy of the Subject: Communicative versus Subject-Centred Reason. In, The Philosophical Discourse of Modernity: Twelve Lectures by Habermas J. English translation published 1987. Cambridge: Polity Press.

Hall, A.D. (1962). A Methodology for Systems Engineering. Princeton: Van Nostrand.

Heidegger, M. (1954). Logos. In, Vortrage und Ausfsatze. 3rd Edition (1967). Pfullingen: Verlag Gunther Neske.

Heidegger, M. (1956). What is Philosophy? Translated from the German Was ist Das - die Philosophie? by Kluback, W. and Wilde, J.T. London: Vision Press.

Heraclitus (6th and 5th Centuries B.C.). The Cosmic Fragments. 1954 Edition. Kirk, G.S. (ed.). Cambridge: Cambridge University Press.

Hillman, J. (1989). And Huge is Ugly. Resurgence, no. 134, 4-9.

Hindess, B. (1982). Power, Interests and the Outcomes of Struggle. Sociology, 16, 498-511.

Ho, M.W. (1984). Environment and Heredity in Development and Evolution. In, Beyond Neo-Darwinism: Introduction to the New Evolutionary Paradigm. Ho, M.W. and Saunders, P.T. (eds.). London: Academic Press.

Ho, M.W. (1986). Heredity as Process: Towards a Radical Reformulation of Heredity. Rivista di Biologia, 79, 407-447.

Ho, M.W. (1989). Reanimating Nature: the Integration of Science with Human Experience. Beshara, no. 8, 16-25.

Ho, M.W., Tucker, C., Keeley, D. and Saunders, P.T. (1983). Effect of Successive Generations of Ether Treatment on Penetrance and Expression of the Bithorax Phenocopy in *Drosophila Melanogaster*. Journal of Experimental Zoology, 114, 257-268.

Holland, R. (1970). George Kelly: Constructive Innocent and Reluctant Existentialist. In, Perspectives in Personal Construct Theory. Bannister, D. (ed.) London: Academic Press.

Hollway, W. (1989). Subjectivity and Method in Psychology: Gender, Meaning and Science. London: Sage.

Honderich, T. (1976). On Inequality and Violence, and Differences We Make Between Them. In, Three Essays on Political Violence. Oxford: Basil Blackwell.

Horkheimer, M. (1937). Traditionelle und Kritische Theorie. Zeitschrift für Sozialforschung, 6, 245-294.

Hume, D. (1777). Enquiries Concerning Human Understanding and Concerning the Principles of Morals. Reprinted 1975. Third edition, edited by Selby-Bigge, L.A., and with text revised and notes added by Nidditch, P.H. Oxford: Oxford University Press.

Husserl, E. (1929). Cartesian Meditations. 1960 Edition. The Hague: Martin Nijhoff.

Hutton, J. (1795). Theory of the Earth with Proofs and Illustrations. Two Volumes. 1959 Edition. New York: Stechert-Hafner.

Jackson, M.C. (1982). The Nature of Soft Systems Thinking: The Work of Churchman, Ackoff and Checkland. Journal of Applied Systems Analysis, 9, 17-29.

Jackson, M.C. (1985a). Social Systems Theory and Practice: The Need for a Critical Approach. International Journal of General Systems, 10, 135-151.

Jackson, M.C. (1985b). Systems Inquiring Competence and Organisational Analysis. Proceedings of the 1985 Meeting of the Society for General Systems Research, pp. 522-530.

Jackson, M.C. (1987a). Present Positions and Future Proposals in Management Science. Omega, 15, 455-466.

Jackson, M.C. (1987b). New Directions in Management Science. In, New Directions in Management Science. Jackson, M.C. and Keys, P. (eds.). Aldershot: Gower.

Jackson, M.C. (1987c). Community Operational Research: Purposes, Theory and Practice. Dragon, 2, 47-73.

Jackson, M.C. (1988). Systems Methods for Organizational Analysis and Design. Systems Research, 5, 201-210.

Jackson, M.C. (1990). Beyond a System of Systems Methodologies. Journal of the Operational Research Society, 41, 657-668.

Jackson, M.C. (1991a). Systems Methodology for the Management Sciences. New York: Plenum.

Jackson, M.C. (1991b). The Origins and Nature of Critical Systems Thinking. Systems Practice, 4, 131-149.

Jackson, M.C. and Keys, P. (1984). Towards a System of Systems Methodologies. Journal of the Operational Research Society, 35, 473-486.

Jackson, N. and Carter, P. (1990a). In Defence of Paradigm Incommensurability. Research Report No. HUSM/PC/2. Hull: Department of Management Systems and Sciences, University of Hull.

Jackson, N. and Carter, P. (1990b). In Defence of Paradigm Incommensurability. Journal of Organizational Behaviour, 12, 109-127.

Jantsch, E. (1975). Design for Evolution. New York: Braziller.

Jenkins, G.M. (1969a). The Systems Approach. In, Systems Behaviour. 2nd Edition. Beishon, J. & Peters, G. (eds.). London: Harper Row.

Jenkins, G.M. (1969b). The Systems Approach. Journal of Systems Engineering, 1, 3-49.

Kant, E. (1787). The Critique of Pure Reason. Second Edition. Translated by Smith, N.K. and published in 1933. Basingstoke: MacMillan.

Kant, E. (1788). Critique of Practical Reason and Other Writings in Moral Philosophy. Translated and edited by Beck, L. Published in 1949. Chicago: University of Chicago Press.

Kelly, G.A. (1955). The Psychology of Personal Constructs. Volume One: A Theory of Personality. New York: W.W. Norton & Co.

Kelly, G.A. (1970). A Brief Introduction to Personal Construct Theory. In, Perspectives in Personal Construct Theory. Bannister D. (ed.). London: Academic Press.

Kenny, D.T. (1956). The Influence of Social Desirability on Discrepancy Measures between Real Self and Ideal Self. Journal of Consulting Psychology, 20, 315-318.

Keys, P. (1988). A Methodology for Methodology Choice. Systems Research, 5, 65-76.

Klir, G. (1985). Complexity: Some General Observations. Systems Research, 2, 131-140.

Krell, D.F. and Capuzzi, F.A. (1975). English translation from the original German of Martin Heidegger's Early Greek Thinking: The Dawn of Western Philosophy. San Francisco: Harper and Row.

Krishnamurti, J. (1991). Meeting Life. London: Arkana.

Kuhn, T. (1962). The Structure of Scientific Revolutions. Chicago: University of Chicago Press.

Kuhn, T. (1970a). The Structure of Scientific
Revolutions. 2nd Edition. Chicago: University of
Chicago Press.

Kumar, S. (1992). No Destination. 2nd Edition.
Hartland: Green Books.

Larrain, J. (1979). The Concept of Ideology. London:
Hutchinson.

Leach, E. (1976). Culture and Communication: The Logic
by Which Symbols are Connected. Cambridge: Cambridge
University Press.

Levy, P. (1981). On the Relation between Method and
Substance in Psychology. Bulletin of the British
Psychological Society, 34, 265-270.

Lorenzen, P. (1969). Normative Logic and Ethics.
Mannheim: Bibliographisches Institut.

Lovelock, J. (1979). Gaia: A New Look at Life on Earth
Oxford: Oxford University Press.

Lovelock, J. (1988). The Ages of Gaia: A Biography of Our Living Earth. Oxford: Oxford University Press.

Lovelock, J. (1990). The Greening of Science. Resurgence, no. 138, 12-19.

Lukes, S. (1974). Power: A Radical View. London: Macmillan.

Lyotard, J.F. (1984). The Postmodern Condition: A Report on Knowledge. Manchester: Manchester University Press.

Marx, K. (1887). Capital: A Critique of Political Economy, Volume I. Fourth edition. Engels, F. (ed.). Translated from the German Das Kapital by Moore, S. and Aveling, E. London: Lawrence & Wishart.

Mason, R.D. and Mitroff, I.I. (1981). Challenging Strategic Planning Assumptions. New York: Wiley.

Masterman, M. (1970). The Nature of a Paradigm. In, Criticism and the Growth of Knowledge. Lakatos, I. and Musgrave, A. (eds.). London: Cambridge University Press.

Max-Neef, M. (1991). Follies of Humankind. Resurgence, no. 145, 8-10.

McBurney, S. (1990). Ecology into Economics Won't Go: or, Life is Not a Concept. Hartland: Green Books.

Meadows, D.M. (1980). The Unavoidable A Priori. In, Elements of the System Dynamics Method. Randers, J. (ed.). Cambridge, Mass: MIT Press.

Merleau-Ponty, M. (1962). The Phenomenology of Perception. London: Routledge and Kegan Paul.

Metzner, R. (1991). Age of Ecology. Resurgence, no. 149, 4-7.

Midgley, G.R. (1988). A Systems Analysis and Evaluation of Microjob - A Vocational Rehabilitation and Information Technology Training Centre for People with Disabilities. M.Phil. Thesis: City University.

Midgley, G (1989a). Critical Systems: The Theory and Practice of Partitioning Methodologies. Proceedings of the 33rd Annual Meeting of the International Society for General Systems Research (Volume II), held in Edinburgh, Scotland, on 2-7 July 1989.

Midgley, G.R. (1989b). Critical Systems and the Problem of Pluralism. Cybernetics and Systems, 20, 219-231.

Midgley, G. (1990a). Creative Methodology Design. The Systemist, 12, 108-113.

Midgley, G.R. (1990b). Review of "Multimethod Research: A Synthesis of Styles" by John Brewer and Albert Hunter. Systems Practice, 4, 68-72.

Midgley, G.R. (1990c). Critical Systems and Methodological Pluralism. In, Toward a Just Society for Future Generations. Volume I: Systems Design. Proceedings of the 34th Annual Meeting of the International Society for the Systems Sciences, held in Portland, Oregon (USA), July 8-13, 1990.

Midgley, G.R. (1992a). The Sacred and Profane in Critical Systems Thinking. Systems Practice, 5, 5-16.

Midgley, G.R. (1992b). Pluralism and the Legitimation of Systems Science. Systems Practice, 5, 147-172.

Midgley, G. and Floyd, M. (1988). Microjob: A Computer Training Service for People with Disabilities. London: Rehabilitation Resource Centre.

Midgley, G. and Floyd, M. (1990). Vocational Training in the Use of New Technologies for People with Disabilities. Behaviour and Information Technology, 9, 409-424.

Mingers, J.C. (1980). Towards an Appropriate Social Theory for Applied Systems Thinking: Critical Theory and Soft Systems Methodology. Journal of Applied Systems Analysis, 7, 41-50.

Minson, J. (1980). Strategies for Socialists? Foucault's Conception of Power. Economy and Society, 9, 1-43.

M'Pherson, P.K. (1974). A Perspective on Systems Science and Systems Philosophy. Futures, 6, 219-239.

Nietzsche, F. (1901). Der Wille zur Macht. Originally published posthumously as Volume 15 of his collected works. An English edition, The-Will-to-Power, was edited by Kaufmann, W. and translated from the original German by Kaufmann, W. and Hollingdale, R.J. in 1968. London: Weidenfeld and Nicholson.

Northrop, F.S.C. (1967). The Method and Theories of Physical Science and their Bearing upon Biological Organization. In, Great Ideas in Modern Science. Marks, R.W. (ed.). New York: Bantam Books.

Offe, C. (1972). Strukturprobleme des Kapitalistischen Staates. Frankfurt am Main: Suhrkamp.

Oliga, J.C. (1986). Methodology in Systems Research: The Need for a Self-Reflective Commitment. In, Mental Images, Values and Reality. Dillon, J.A. (ed.). Louisville: International Society for General Systems Research.

Oliga, J.C. (1988). Methodological Foundations of Systems Methodologies. Systems Practice, 1, 87-112.

Oliga, J.C. (1989a). Power and Interests in Organizations: A Contingent, Relational View. Paper presented to the 33rd Annual Meeting of the International Society for General Systems Research, held in Edinburgh, Scotland, on 2-7 July 1989. Not published in the proceedings, but available from the author at the School of Accountancy and Commerce, Nanyang Technological Institute, Nanyang Avenue, Singapore 2263.

Oliga, J.C. (1989b). Ideology and Systems Emancipation. Paper presented to the 33rd Annual Meeting of the International Society for General Systems Research, held in Edinburgh, Scotland, on 2-7 July 1989. Not published in the proceedings, but available from the author at the School of Accountancy and Commerce, Nanyang Technological Institute, Nanyang Avenue, Singapore 2263.

Oliga, J.C. (1990a). Power-Ideology Matrix in Social Systems Control. Systems Practice, 3, 31-49.

Oliga, J.C. (1990b). Ideology and Systems Emancipation. Systems Practice, 3, 453-477.

Optner, S.L. (ed.) (1973). Systems Analysis. Harmondsworth: Penguin.

Oyama, S. (1985). The Ontogeny of Information. Cambridge: Cambridge University Press.

Panikkar, R. (1989). Making a Bridge to the Unknown: Jane Clark and Alison Yiangou talk to Raimon Panikkar. Beshara, no. 10, 24-29.

Patton, M.Q. (1978). Utilization-Focused Evaluation.
Beverly Hills, CA: Sage.

Patton, M.Q. (1980). Qualitative Evaluation Methods.
London: Sage.

Patton, M.Q. (1987). How to Use Qualitative Methods in
Evaluation. London: Sage.

Popper, K.R. (1959). The Logic of Scientific Discovery.
New York: Harper. Originally published as Logik der
Forschung, 1935.

Popper, K.R. (1962). The Open Society and its Enemies,
Volume I: The Spell of Plato. Fourth Edition. London:
Routledge and Kegan Paul.

Popper, K.R. (1963). Conjectures and Refutations.
London: Routledge and Kegan Paul.

Popper, K.R. (1972). Objective Knowledge. Oxford:
Oxford University Press.

Prigogine, I. (1989). The Rediscovery of Time: Science in a World of Limited Predictability. Beshara, no. 9, 28-32.

Quade, E.S. and Boucher, W.I. (1968). Systems Analysis and Policy Planning: Applications in Defence. New York: Elsevier.

Quade, E.S., Brown, K., Levien, R., Majone, G. and Rakhmankulov, V. (1978). Systems Analysis: An Outline for the IIASA International Series of Monographs. Journal of Applied Systems Analysis, 5, 91-98.

Rappoport, A. (1960). Fights, Games and Debates. Ann Arbor: University of Michigan Press.

Ravetz, J. (1988). Gaia and the Philosophy of Science. In, Gaia, The Thesis, The Mechanisms and the Implications. Proceedings of the First Annual Camelford Conference on the Implications of the Gaia Hypothesis. Bunyard, P. and Goldsmith, E. (eds.). Camelford: Wadebridge Ecological Centre.

Rawls, J. (1971). A Theory of Justice. Cambridge, Mass: Harvard University Press.

Reed, M. (1985). Redirections in Organizational Analysis. London: Tavistock.

Reynolds, G. (1984). Portugal Prints. In, Westminster Association for Mental Health Annual Report 1983-84. London: Westminster Association for Mental Health.

Roberts, N., Anderson, D., Deal, R., Garet, M. and Shaffer, W. (1983). An Introduction to Computer Simulation: A System Dynamics Approach. Reading, Mass: Addison-Wesley.

Rorty, R. (1989). Contingency, Irony and Solidarity. Cambridge: Cambridge University Press.

Rosenhead, J. (1984). Debating Systems Methodology: Conflicting Ideas about Conflict and Ideas. Journal of Applied Systems Analysis, 11, 79-84.

Rotter, J.B. (1966). Generalized Expectancies for Internal versus External Control of Reinforcement. Psychological Monographs, 80, 1-28.

Schechter, D. (1990). Critical Systems Thinking and Democratic Organizational Structure. In, Toward a Just Society for Future Generations. Volume I: Systems Design. Proceedings of the 34th Annual Meeting of the International Society for the Systems Sciences, held in Portland, Oregon (USA), July 8-13, 1990.

Schechter, D. (1991). Critical Systems Thinking in the 1980s: A Connective Summary. In, Critical Systems Thinking: Directed Readings. Flood, R.L. and Jackson, M.C. (eds.). New York: Wiley.

Schwarz, W. (1990). Greening of the Soul. Resurgence, no. 138, 24-27.

Scriven, M. (1977). Evaluation News, Vol. 3. Pt. Reyes, CA: Evaluation Network.

Sheldrake, R. (1985). A New Science of Life: The Hypothesis of Formative Causation. Second Edition. London: Paladin.

Sherrard, P. (1987). The Rape of Man and Nature: An Enquiry into the Origins and Consequences of Modern Science. Ipswich: Golgonooza Press.

Shiva, V. (1990). Cry Foul, Cry Freedom. New Internationalist, No. 206, 20-21.

Smart, B. (1983). Foucault, Marxism and Critique. London: Routledge and Kegan Paul.

Smith, B.L.R. (1966). The RAND Corporation: Case Study of a Non-Profit Advisory Corporation. Cambridge, Mass: Harvard University Press.

Spinner, H. (1974). Pluralismus als Erkenntnismodell. Frankfurt am Main: Suhrkamp.

Tsivacou, I. (1992). Truth and Emancipation in Critical Systems Methodologies. Systems Practice, 5, 181-191.

Ulrich, W. (1983). Critical Heuristics of Social Planning: A New Approach to Practical Philosophy. Berne: Haupt.

Ulrich, W. (1988). Systems Thinking, Systems Practice and Practical Philosophy: A Program of Research. Systems Practice, 1, 137-163.

Ulrich, W. (1990a). What is Called "Critical Systems Thinking"? The Programmatic Intent and Current State of "Liberating Systems Theory". In, Toward a Just Society for Future Generations. Volume I: Systems Design. Proceedings of the 34th Annual Meeting of the International Society for the Systems Sciences, held in Portland, Oregon (USA), July 8-13, 1990.

Ulrich, W. (1990b). Critical Systems Thinking and Ethics: The Role of Contemporary Practical Philosophy for Developing an "Ethics of Whole Systems". In, Toward a Just Society for Future Generations. Volume I: Systems Design. Proceedings of the 34th Annual Meeting of the International Society for the Systems Sciences, held in Portland, Oregon (USA), July 8-13, 1990.

Van de Weyer, R. (1991). The Health of Nations: Political Morality for the 21st Century. Hartland: Green Books.

Vester, F. and Hesler, A. von (1980). The Sensitivity Model. Frankfurt: Regionale Planungsgemeinschaft Untermain.

Vickers, G. (1965). The Art of Judgement. New York: Basic Books.

Vittachi, A. (1990). The Denial Syndrome. New Internationalist, No. 206, 24-25.

Warren, M. (1984). Nietzsche's Concept of Ideology. Theory and Society, 13, 541-565.

Weaver, W. (1948). Science and Complexity. American Science, 36, 536-544.

Weber, M. (1907). Die Objektivitat Sozialwissenschaftlicher und Sozialpolitischer Erkenntnis. Archiv fur Sozialwissenschaft, 19, 22-87.

Weimer, W.B. (1979). Notes on the Methodology of Scientific Research. New Jersey: Lawrence Erlbaum Associates.

Weiss, C. (1972). Evaluation Research: Methods of Assessing Program Effectiveness. Englewood Cliffs, NJ: Prentice-Hall.

Weiss, C. (1973). Where Politics and Evaluation Meet. Evaluation, 1, 37-45.

Weiss, C. (1977). Between Cup and Lip. In, Resource Materials for Community Mental Health Program Evaluation. DHEW Publication ADM77-328. Hargreaves, W.A. et al (eds.). Washington DC: Government Printing Office.

Wellmer, A. (1970). The Critical Theory of Society. New York: Herder & Herder.

Wiedmann, A. (1986). Romantic Art Theories. Henley-on-Thames: Gresham Books.

Wiener, N. (1948). Cybernetics. Cambridge, Mass: MIT Press.

Wilber, K. (1990). Eye to Eye: The Quest for the New Paradigm. Expanded Edition. Boston: Shambhala.

Wittgenstein, L. (1958). Philosophical Investigations. Second Edition. Translated into English by Anscombe, G.E.M. Oxford: Basil Blackwell.

Wolfensberger, W. and Glenn, L. (1975). PASS 3 Handbook. Program Analysis of Service Systems: A Method for the Quantitative Evaluation of Human Services. Toronto: National Institute on Mental Retardation.

Wolfensberger, W. and Thomas, S. (1983). PASSING: A Method of Evaluating the Quality of Human Services according to the Principle of Normalization. Normalization Criteria and Ratings Manual. 2nd Edition. Toronto: National Institute on Mental Retardation.

Wooliston, G. (1990). Extremities Enriching Mainstream Critical Systems Thinking. In, Toward a Just Society for Future Generations. Volume I: Systems Design. Proceedings of the 34th Annual Meeting of the International Society for the Systems Sciences, held in Portland, Oregon (USA), July 8-13, 1990.

Wooliston, G. (1991a). Architecture of Critical Systems Thinking. Research Report no. HUSM/GW/7. Hull: Department of Management Systems and Sciences, University of Hull.

Wooliston, G. (1991b). Critical Systems Thinking: Real Fiction? In, Systems Thinking in Europe. Jackson, M.C. et al (eds.). New York: Plenum.

Wooliston, G. (1991c). Will and Representation of Paradigmatic Commensurability. In, Systems Science in the 21st Century: Integrating the New Sciences of Complexity in the Service of Humans and their Environment. Proceedings of the 35th Annual Conference of the International Society for the Systems Sciences held in Ostersund, Sweden, 14-20 June, 1991.

Wooliston, G. (1992). Review of "Ecology into Economics Won't Go: or, Life is Not a Concept" by McBurney, S. Systems Practice, 5, in press.

Yates, F.E. (1978). Complexity and the Limits to Knowledge. American Journal of Physiology, 4, R201-R204.